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NATIONAL JUDICIAL ACADEMY

WORKSHOP ON INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) TOOLS & USAGES

FEBRUARY 19-21, 2016

COMPILED AND EDITED BY

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WORKSHOP ON INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) TOOLS & USAGES: 19– 21 FEBRUARY, 2016

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TENTATIVE PROGRAMME SCHEDULE

DAY 1 **19th February, 2016 Friday**	**Session 1** **9:00 AM – 10:00 AM** Use of Video Conferencing Technology in Judicial administration	**TEA BREAK**	**Session 2** **10:30 AM –11:30 AM** Digitalization of Records • Courts records • Revenue records • Evidence records	**TEA BREAK**	**Session 3** **12:00 PM – 1:00 PM** Security for Courts: Records and Networks	**LUNCH BREAK**	**Session 4** **2:00 PM –3:00 PM** National Judicial Data Grid	**3:00PM – 4:00 PM** Functioning of internet and related concepts *Google India*
DAY 2 **20th February, 2016 Saturday**	**Session 5** **9:00 AM – 10:00 AM** E-Justice: Reengineering the Judicial process through effective use of technology		**Session 6** **10:30 AM –11:30 AM** Development of Tools and Websites to facilitate wider and easy communication with public		**Session 7** **12:00 PM – 1:00 PM** Phase II of E-Courts project		**Session 8** **2:00 PM –3:00 PM** Use of Mobile Technology in Judicial Administration	**3:00 PM– 4:00 PM** *Library Reading* / **4:00PM – 5:00 PM** *Computer Skills Training*
DAY 3 **21st February, 2016 Sunday**	**Session 9** **9:00 AM – 10:00 AM** Connectivity and Local Area Network (LAN) issues in district Courts		**Session 10** **10:30 AM –11:30 AM** Development of Apps to facilitate work at district Court		**Session 11** **12:00 PM – 1:00 PM** Feedback and Evaluation ***National Judicial Academy***			

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Use of Video Conferencing Technology in Judicial adjudication and collection of evidence: Land mark Case Laws

1. **State of Maharashtra Vs.Dr.Praful.B.Desai; (2003) 4 SCC 601**

- **Brief facts**

The judgment relates to a case in which a US-based doctor had opined against operation of a cancer patient through video conferencing. Ignoring the advice, two Indian doctors operated on the lady, who later passed away. The patient's family went to court against the doctors. However, the US-based doctor, Ernest Greenberg, refused to come to India, but expressed willingness to give evidence through video conferencing. But the Bombay high court did not allow the trial court to go ahead citing Section 273, which lays down the procedure for recording evidence.

The husband of the deceased, P C Singhi and the Maharashtra government had appealed against the high court order in the Supreme Court. The prosecution has alleged that the two Indian doctors Praful B Desai and A K Mukherjee did not take good care of the patient after the operation as a result of which she suffered a lot before her death.

- **Judgment**

The Supreme Court held that a trial judge could record evidence of witnesses staying abroad through video conferencing. Interpreting Section 273 of the Criminal Procedure Code in the light of technological advancements, a bench comprising Justice S N Variava and Justice B N Agrawal said recording of evidence through video conferencing would be perfectly legal.

Speaking for the bench, Justice Variava said, "In cases where the attendance of a witness cannot be procured without an amount of delay, expense or inconvenience, the court could consider issuing a commission to record evidence by way of video conferencing."

Referring to the chances of witness abusing the trial judge during video conferencing, the apex court said, "As a matter of prudence, evidence by video-conferencing in open court should be accepted only if the witness is in a country which has an extradition treaty and under whose laws contempt of court and perjury are punishable."

The court then directed the Mumbai court to set up a commission and take help of VSNL in recording Dr Greenberg's statement through video conferencing in the presence of the two accused doctors. It also allowed the two accused to cross-examine the US-based doctor. Rejecting all arguments about inferior video quality, disruption of link and other technical problems, the bench said by now science and technology has progressed enough to not worry about video image/audio interruptions or disruptions.

The counsel for the two doctors argued that the rights of the accused under Article 21 could not be subjected to a procedure involving 'virtual reality'. Rejecting the argument, the bench said video conferencing has nothing to do with virtual reality and gave the example of the telecast of the cricket World Cup. It could not be said that those who watched the World Cup on television were witnessing virtual reality as they were not in the stadium where the match was taking place, the court pointed out. "This is not virtual reality, it is actual reality".

The Court also observed that, "The evidence can be both oral and documentary and electronic records can be produced as evidence. This means that evidence, even in criminal matters, can also be by way of electronic records. This would include video conferencing. Video conferencing is an advancement in science and technology which permits one to see, hear and talk with someone far away, with the same facility and ease as if he is present before you i.e. in your presence. Thus, it is clear that so long as the accused or his pleader is present when evidence is recorded by video conferencing that evidence is recorded in the "presence" of the accused and would thus fully meet the requirements of section 273.

2. **Basavaraj R. Patil Vs.State of Karnataka (2000) 8 SCC 740.**

The question was whether an accused need to be physically present in Court to answer the questions put to him by the Court whilst recording his statement under section 313. The majority held that the section had to be considered in the light of the revolutionary changes in technology of communication and transmission and the marked improvement in the facilities of legal aid in the country. It was held that it was not necessary that in all cases the accused must answer by personally remaining present in the Court. Once again, the importance of information technology is apparent from this decision. If a person residing in a remote area of South India is required to appear in the Court for giving evidence, then he should not be called from that place, instead the medium of "video conferencing" should be used. In that case, the requirements of justice are practically harmonized with the ease and comfort of the witnesses, which can drastically improve the justice delivery system.

3. High Court of Calcutta *in* ***Amitabh Bagchi v Ena Bagchi*** **[2005] AIR 2005 Cal 11** provided a list of 14 safeguards to be employed for conducting video conferencing

- Before action of the witness under Audio-Video Link starts the witness will have to file an affidavit or an undertaking duly verified before a Judge or a Magistrate or a Notary that the person who is shown as the witness is the same person as who is going to depose on the screen with a copy of such identification affidavit to the other side.

- The person who wishes to examine the witness on the screen will also file an affidavit or an undertaking in the similar manner before examining the witness with a copy of the other side with regard to identification before hand.
- As soon as identification part is complete, oath will be administered through the media as per the Oaths Act, 1969 of India.
- The witness will be examined during working hours of Indian Courts. Plea of any inconvenience on account of time difference between India and other country will not be allowed.
- The witness action, as far as practicable, be proceeded without any interruption without granting unnecessary adjournments. However, discretion of the Court or the Commissioner will be respected.
- Witness includes parties to the proceedings.
- In case of non-party witness, a set of plaint, written statement and/or other papers relating to proceeding and disclosed documents should be sent to the witness for his acquaintance and an acknowledgement in this regard will be filed before the Court.
- Court or Commissioner must record any remark as is material regarding the demur of the witness while on the screen and shall note the objections raised during recording of witness either manually or mechanically.
- Depositions of the witness either in the question answer form or in the narrative form will have to sign as early as possible before a Magistrate or Notary Public and thereafter it will form part of the record of the proceedings.
- Mode of digital signature, if can be adopted in this process, such signature will be obtained immediately after day's deposition.
- The visual is to be recorded at both the ends. The witness alone can be present at the time of video conference, Magistrate and Notary is to certify to this effect.
- In case of perjury Court will be able to take cognizance not only about the witness gave evidence but who induced to give such evidence.
- The expenses and the arrangements are to be borne by the applicant who wants to this facility.
- Court is empowered to put condition/s necessary for the purpose.

4. **<u>In M/S SIL Import, USA Vs. M/S Exim Aides Silk Exporters</u> *AIR 1999 SC 1609.***

The Supreme Court observed that, "a notice envisaged under section 138 can be sent by fax. Nowhere is it said that such notices must be sent by registered post or that it should be dispatched through a messenger. Chapter XVII of the Act, containing sections 138 to 142 was inserted in the Act as per Banking Public Financial Institution and Negotiable Instruments Laws (Amendment) Act, 1988. Technological advancements like Fax, Internet, E-mail, etc were on swift progress even before the Bill for the Amendment Act was discussed by the Parliament. When the legislature contemplated that notice in writing should be given to the drawer of the cheque, the legislature must be presumed to have been aware of the modern devices and equipments already in vogue and also in store for future. If the Court were to interpret the words "giving notice in writing" in the section as restricted to the customary mode of sending notice through postal service or even by personal delivery, the interpretative process will fail to cope up with the change of time. So if the notice envisaged in clause (b) of the proviso to section 138 was transmitted by Fax, it would be compliance with the legal requirement". Thus the requirement of a written notice will be satisfied if the same is given in the form of a fax, e-mail etc, using the information technology. It must be noted that a notice by e-mail can be send instantaneously and its delivery is assured and acknowledged by a report showing the due delivery of the same to the recipient. This method is more safe, accurate, economical and lesser time consuming as compared to its traditional counterpart, popularly known as "Registered post with acknowledgement due".

5. In *Alcatel India Ltd v Koshika Telecom Ltd & ors* [2004] CLC 1582 the Court allowed the witness to give evidence through video conferencing, as the witness was unhealthy.

6. *In Sakshi v Union of India* AIR 2004 SC 3566. The courts have on several occasions also resorted to using this technology, based on compelling facts and circumstances. For instance, examination of a victim who had been sexually exploited and/or was suffering from post-traumatic stress disorder was allowed to be done via video conferencing.

7. In the matter of *Liverpool and London Steamship Protection and Indemnity Association Ltd v MV 'Sea Success I' & anor* [2005] (4) ALLMR 17 the Bombay High Court allowed the plea of the plaintiff to depose using video conferencing, as the witness was staying in UK with her two minor children and was unable to come to India.

Information & Communicationa Technology Tools and its implementation:

By Mohammad Uzair, E-Court Mode Project, J&K

1. Video-Conferencing

Technique

- Court is connected to the Jail by ISDN Lines and at both the ends a camera unit and a display unit like, 29" TV Screen is provided with recording facility at the Court's end.
- Under-trial is produced at the Jail end. The Judge, Lawyers and witnesses etc. remain present in the Court and regular trial is conducted.
- The judicial remand of the under-trial can also be extended without physically producing him in Court.

A Model Video Conferencing Court

Benefits

- Dreaded criminals can be tried without risk
- Trial is expedited with use of this facility
- Cost and manpower in producing undertrials only for remand extension can be saved
- Multiple trials of an accused lodged in one jail is possible in different states
- Evidence of witnesses unable to come to Court can be recorded

- In child sexual offences, minor witness can be screened from the accused by use of this facility

Practical Aspects

- Judicial remand extension of undertrials is already done in Delhi, Hyderabad & Bangalore
- Trial of Accused Telgi lodged in Pune Jail is conducted simultaneously in most of the states by using video conferencing facility
- Possibility of recording evidence of Bharti Yadav in Nitish Katara murder case is being explored

2. Data Management

Technique

- Data is captured at the filing stage in computers for new cases
- Data of old cases is fed in computers using dedicated manpower
- Data relates to date of filing, full description of parties, law provision invoked, property no., detail of witnesses, stage of trial, next date of hearing and advocate's name etc.
- Data is updated on daily basis without fail

Data Server Room

Benefits

- Cause-lists can be generated at the press of the button
- Periodical statements can be easily generated
- Cause-diary can be prepared as per set norms
- Automatic marking of cases is possible
- Age-wise / category-wise segregation of cases is possible
- Reduce the pendency of cases by implementing appropriate automated processes

Practical Aspect

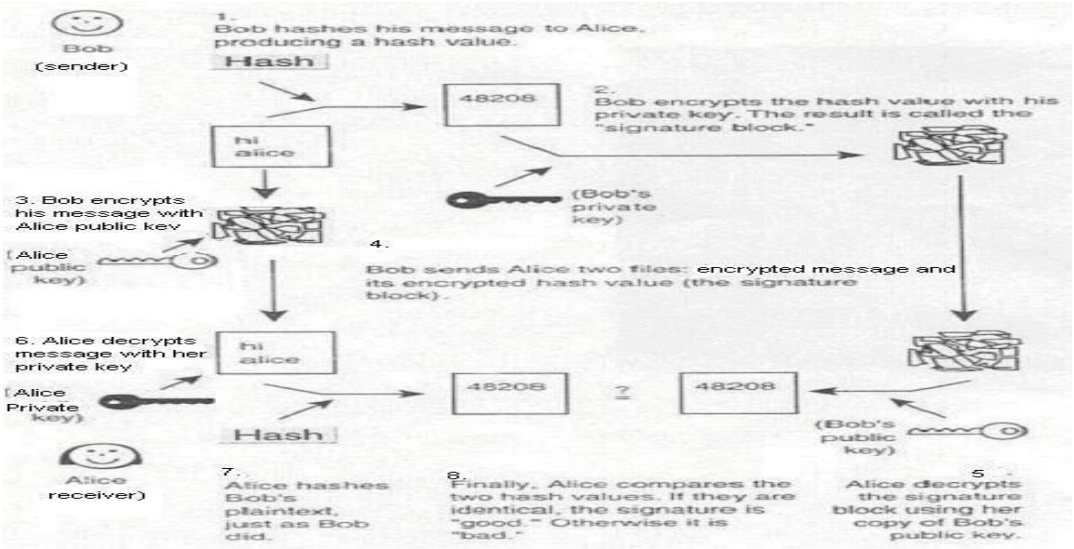
- Automatic marking of cases is functional in Hon'ble Supreme Court of India
- Almost all the High Courts and some District Courts are maintaining upto date data-banks and preparing automatic cause-lists
- Party name-wise, case number-wise, Act-wise searches are possible on these data-banks

3. Digital Signatures

Technique

- The data to be sent through internet / e-mail is encrypted by using the digital signature card provided by the Service Provider
- The said data is then sent to the receiver through e-mail / internet in encrypted format
- The receiver decrypts the data by using the verifier software provided by the Service Provider

Digital Signatures



Benefits

- The communication can become 100% safe by using digital signatures
- Release warrants can be sent from Courts to Jails within minutes of the passing of the order
- Certified copies can be immediately issued by the copying branch as soon as the order is digitally signed
- Incidents like release of Sher Singh Rana from Tihar Jail on the basis of forged release warrants can be avoided

Practical Aspects

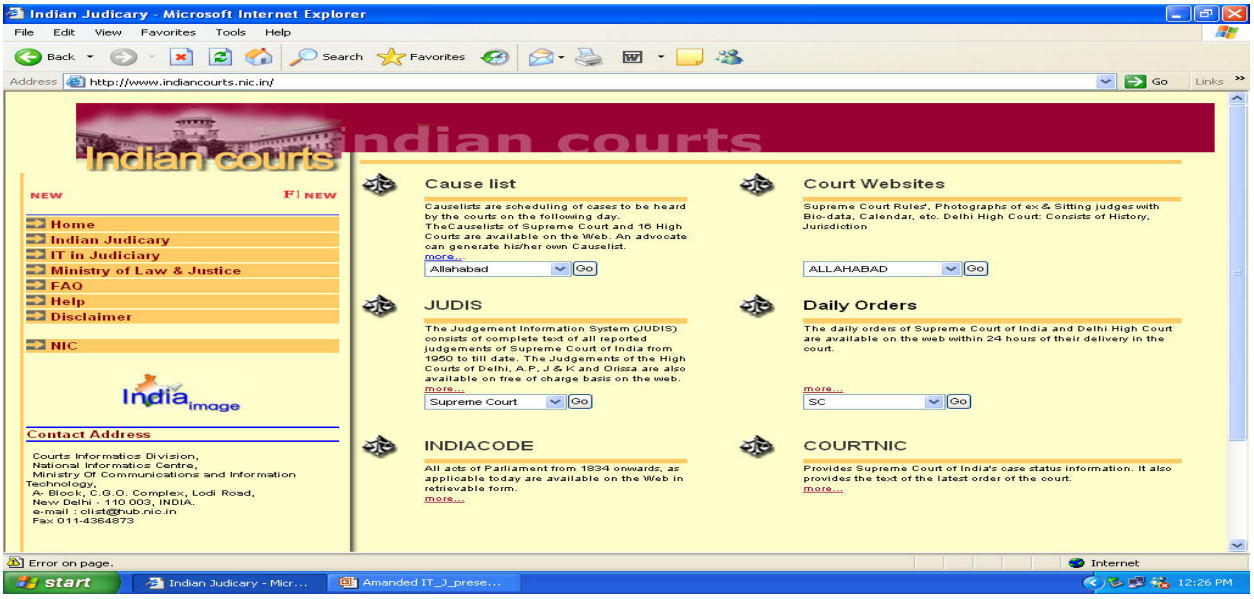
- In High Court of Delhi judgements are digitally signed side by side with physical signatures
- Digital signatures have been issued to few Judges in District Courts of Delhi on experimental basis
- Digital Signatures will be available to all the Judges in Delhi District Courts soon
- Tihar Jail officers are also in the process of getting digital signatures

4. ***Web-Sites***

Technique

- Every District Court can have its own website giving information like, location, jurisdiction, cause-lists, judgments and facilities for litigants etc.
- Website can be hosted at the servers of NIC
- Data-bank of the Court is to be linked through high-speed lines with NIC Headquarters

Website is to be updated on daily basis



Benefits

- Upto date information is available to the lawyers and litigants
- Availability of current cause-lists, orders and judgements on internet free of cost
- Transparency in the functioning of Courts
- Faith of the public in judiciary is reinforced
- Online inquiries can be made

Practical Aspects

- Supreme Court and most of the High Courts already have their websites
- For District Courts a beginning has been already made in Delhi www.delhicourts.nic.in
- Some other Districts like Kanpur Dehat, Bilaspur and Etawah (U.P.) have also made some progress

5. *E-Courts*

Technique

- Paper-less Courts
- Audio-visual presentation facility
- Video-conferencing facility
- Lawyers can bring their own Laptops
- Automatic recording of evidence

- Existing files- Scan & OCR Software to be used

Benefits

- Record of Court can be stored on few DVDs
- Immediate retrieval of record is possible
- Physical Barriers are broken
- Accurate record of evidence takes place
- Visual animations & presentation of Arguments
- Internet Aids are available for citations & research
- Real time monitoring of cases is possible
- Congenial and comfortable atmosphere increases efficiency

Practical Aspects

- Already exist in USA, Europe & Australia
- Still at conceptual stage in India
- To be modeled on the pattern of Court 21 of USA
- Training of Judges is required to use this technology
- IT Professionals, Judges, Architects Co-ordination
- Dedicated Staff to be trained
- E-Filing of Cases to be introduced simultaneously

6. *E-Filing of Cases*

Technique

- Simultaneous filing of Soft & Hard Copies of Pleadings
- Filing can be done on Internet or on the Facilitation Centre on CDs or Floppies
- Dedicated Server to be provided for E-Filing
- Combination of E-Pleadings, Computer order-sheets, evidence and Judgements = Digitized Record
- E-Summons + E-Plaint = Complete Summons
- Technology available for E-Service of Summon

Benefits

- Digitization of Records
- Full utilisation of E-Courts is Possible
- Immediate service of E-Summons
- Convenience of filing from Home/Office
- Cost of maintaining paper files saved
- No chances of misplacing of files
- Trials will be expedited

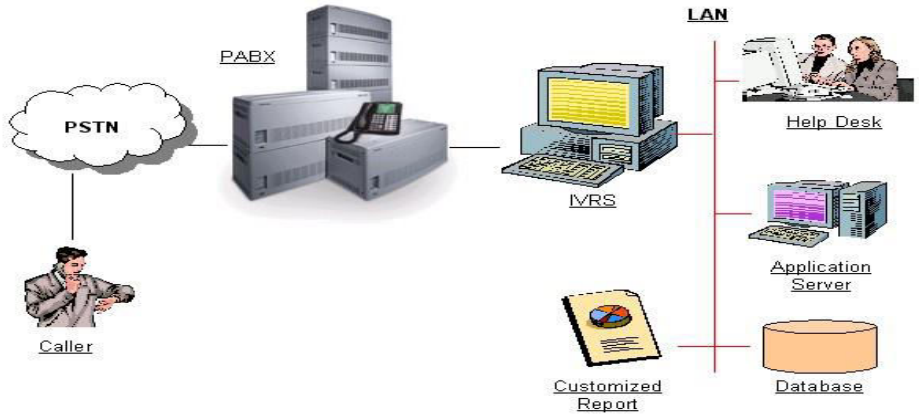
Practical Aspect

- Supreme Court E-Filing Module is ready
- District Court E-Filing Module will be ready by the year-end
- High Court Rules to be amended accordingly
- Staff, Judges and Lawyers to be trained
- Lawyers to be given licenses to file E-Cases

7. *IVRS & SMS FACILITY*

Technique

- Unique combination of Information Technology & Communication Technology
- Data-Bank to be integrated with Mobile Phone Service Provider's System
- Minute to Minute updation of Proxy Server
- Progress & Status of pending cases to be available on voice enquiry via IVRS
- Automatic SMS response system to give details of cases on the basis of case ID



Benefits

- People without access to computers can also enquire about their cases
- Immediate response to the enquiries 24 X 7 X 365
- Even illiterates can come to know the fate of their cases
- Accurate information will be available
- It will bring transparency to the judicial system
- No need to come to Court Complex to make enquiries

Practical Aspects

- IVRS is already operational in Supreme Court
- SMS facility is being tested in Delhi District Courts
- Some service providers are showing keen interest in this value-added service
- Minute-to Minute Cause List on Mobile Phone is at the designing stage
- Europe and US are lagging behind in this field

8. Touch Screen Enquiry

Technique

- Technology similar to Bank ATMs

- A proxy Databank Server is to be dedicated
- Broadband or Satellite Communication is to be used to connect Kiosk to Databank
- Kiosks in Facilitation Centres in Court Complexes and remote blocks/villages
- Tie-ups are possible with Banks having ATMs

Benefits

- Decongestion of Courts
- Less requirement of staff in facilitation centers
- Kiosks can be put up in different locations so people will get information near to their homes
- Litigants will save cost and time

Practical Aspects

- Village Resource Centers are coming up in villages of District Sultanpur & Raibreli (U.P)
- Budget for E-Kiosks has been provided in current year in Delhi District Courts
- Banks and other companies are already providing various services apart from banking by using touch screen Kiosks

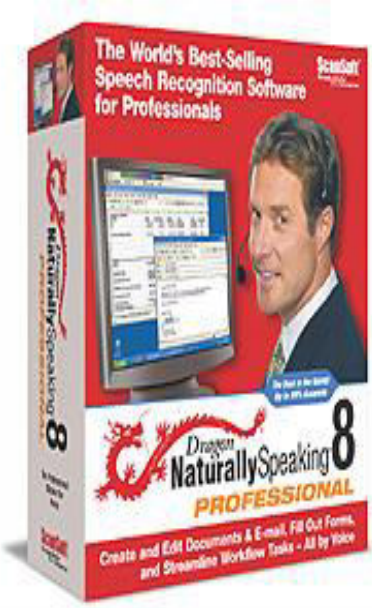
9. *Dictation Capturing System*

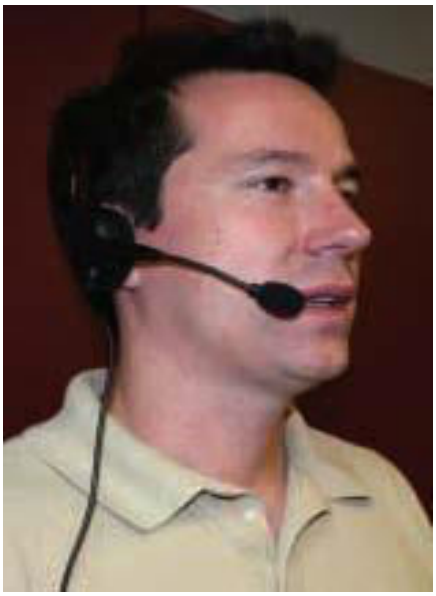
Technique

- Various options are available in the market :

a) Dragon Natural Speaking Software
b) Dictaphones
c) Dictation Softwares on PC / Laptops

Dictation Capturing System





Benefits

- Saves time of the Judges
- Dictation can be given in spare time even at home
- Dependency upon stenographers is reduced
- The whole process of Judgement Writing is expedited
- Dictaphones can be used even while traveling

Practical Aspects

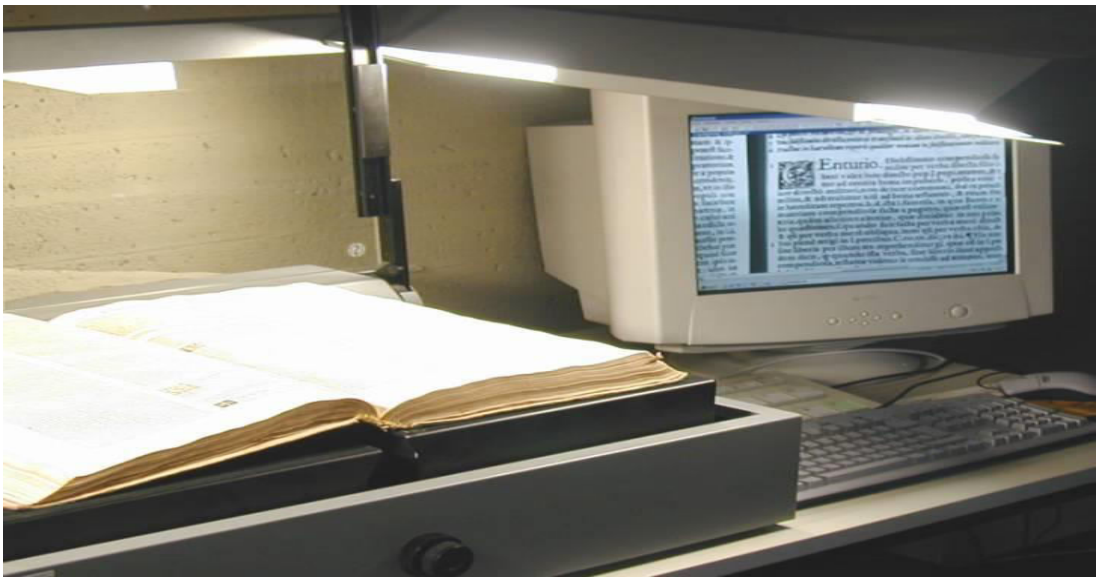
- Dragon Natural Speaking software is now available with Indian Accent but it takes time to train it to recognise your voice
- Dictaphones are extensively used in MNCs and abroad by managers and professionals like doctors, lawyers and chartered accountants etc.
- Limited use of these techniques has already began in Judiciary

10. Digitisation of Record Room

Technique

- Technology for fast scanning of Court files is available
- After scanning the files, OCR (Optical Character Recognition) software is run

- Proper indexing of the documents is done and the files are saved in original scanned format as well as in Word Format with index



Benefits

- One normal typed page is equal to 10 KB and after compression with Win Zip it is equal to 2 KB
- One Flash Drive of 256 MB capacity can store 1.28 Lac pages in Win Zip compressed format.
- One CD Rom of 700 MB can store 3.5 Lac pages
- One Hard Disk of 40 GB can store 2 Crore pages.
- The savings in maintaining record rooms will be huge
- Data can be retrieved very fast

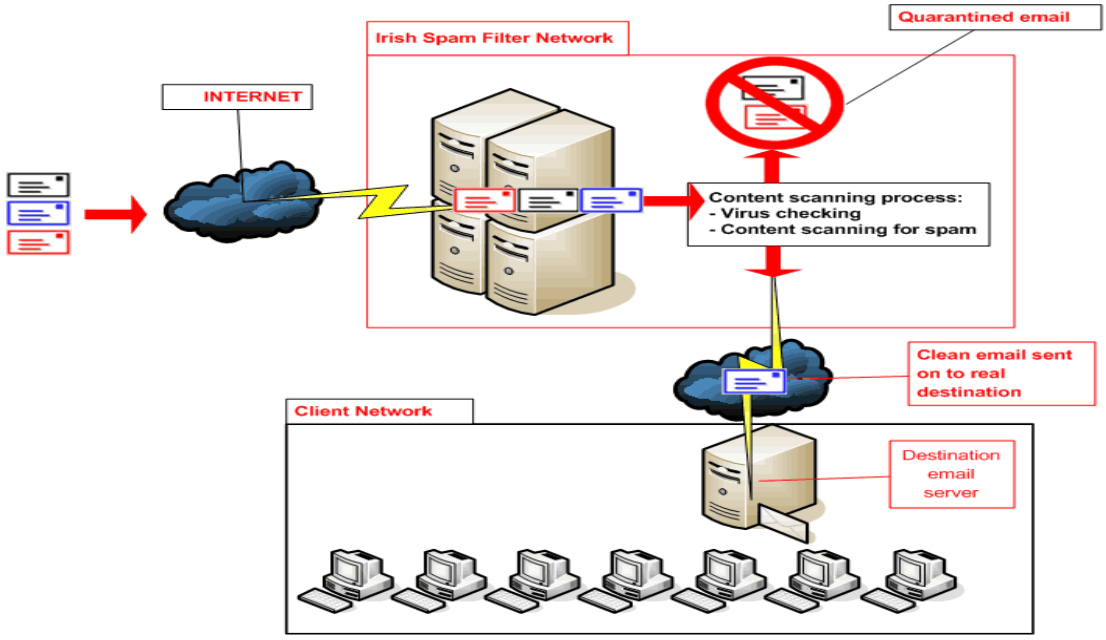
Practical Aspects

- Record rooms of Supreme Court and many High Courts are being digitized
- Pilot project to digitize the District Courts record room in Delhi is in final stages
- Certain changes in the rules are required to carry out record room digitization
- E-filing will certainly help in creating digital record rooms

11. E-mail Communication System

Technique

- Dedicated e-mail servers are to be installed in all Courts in India
- All the Courts are to be put on a VPN (Virtual Private Network) with Broad Band / Satellite Channels
- The Judges and Court officials are to be given E-mail IDs, Digital Signatures and training



Benefits

- Inter-Court & Intra-Court communication will become fast and secure
- Cost of paper, printing and distributing the mail / letters will be saved
- Orders from the superior Courts will reach instantly to the subordinate Courts ensuring immediate implementation

Practical Aspects

- Judges in Delhi District Courts are being provided with individual e-mail IDs and Digital Signatures
- On trial basis release orders are being sent to Tihar Jail through secured e-mail in addition to conventional paper based orders.
- Part communication between different Court Complexes in Delhi is being done through e-mail

E Judiciary: a Step towards Modernization in Indian Legal System

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Abstract

E judiciary a step towards modernization in Indian legal system: Indian legal system having a hoary past under different rulers though underwent metamorphosis but the basic structure of it did not alter to a great extent. During the period of East India company changes took place to have a modern judicial system. After independence the old system continued to a great extent under the frame work of Constitution of India and Indian judiciary became a unified pyrimidicle structure. The modern India while has the said structure the information and communication technology has virtually paved a new line of thinking in modernizing Indian judicial system. An overall review of the development in administration of justice till now achieved and the things to be achieved are going to be considered in the light of artificial intelligence and its use in sentencing process. Video conferences from jail to court, court to court, court to witnesses are some of the innovative study, which is going to be discussed.

In the field of legal education the technological impact is also going to be discussed. The paper intends to have a study under three different groups such as a study with reference to past computerization, the present stage of computerization and how it has to evolve in future. Ultimately to have a scientific empirical analysis to have a look as to how the computerization in judiciary has become an effective tool to bring down the pendency of cases and to reduce the delay. What course of action is to be resorted to have technology friendly courts?

Introduction

Judiciary in India has a hoary past since a long time. Among the Nations of Asian Continent, it may not be out of context to say that administration of justice in India has a historical background of nearly 5000 years. Different Rulers from time to time had governed the affairs of the State and had administered justice by resolving disputes. Even during medieval period, the same trend continued more or less on similar pattern. The modern setup of Indian judiciary traces its immediate existence to the advent of British rule in India. The courts were established at Presidency towns by East India Company and subsequently followed by British Parliament[1]. Further in the native states, the judiciary was functioning under the aegis of the local rulers, gradually adopted the same pattern.

Structure of Judiciary in independent India

In independent India, after adopting "for ourselves[2]" the Constitution, steps were taken to have a unified or integrated judiciary with a pyramid type structure having the Supreme Court[3] as the Apex Court of the land with administrative total independence and the High Courts[4] at the level of each State and sub-ordinate judiciary[5], nay District Judiciary[6] at the level of the Districts[7], subject to control and supervision of respective High Courts.

[1]Constitutional history of India by M. P. Jain
[2] Preamble to the constitution of India- We the people of Indiahaving solemnly resolved to constitute India in to a Sovereign, Secular, Democratic Republic and to secure to all its citizens JUSTICE; social, economic and Political,. LIBERTY of thought, expression, belief, faith and worship, EQUALITY OF status and Opportunity, and to promote among them all FRATERNITY ASSURING Dignity of Individual and UNITY AND INTEGRETY OF NATION, in our Constituent Assembly this 26th day of November 1949, do here by ADOPT, ENACT AND GIVE TO OURSELVES THIS CONSTITUTION.
[3]Article 124 constitution of India
[4]Article 214 constitution of India

The Supreme Court is the highest court of the country having judicial authority, while the High Courts have both administrative and judicial power in respect of the affairs of the district judiciary. The constitutional role of both Supreme Court and High court may be said to be that of two brothers. Though the High Court has vast power[8] yet the Supreme Court is like an elder brother, having certain plenary powers and powers of extraordinary nature. Article 142 of the constitution of India envisages that the ruling of the Supreme Court binds all courts in India and therefore all courts including High Courts are bound by the decision of the Supreme Court. Both the Supreme Court and high court are the court of record[9] and have powers to punish persons for the contempt of court.

In the hierarchy of the courts, as referred to above, among the District Courts further classification is noticeable by having courts for civil and criminal justice. At the level of the civil justice system, the civil judge junior division finds a place at lowest point of the hierarchy. The civil judge senior division presides as an appellate court and also court of original jurisdiction. Above the civil judge, senior division, the district court acts as a link between the High Court and the courts sub-ordinate to the District Court. The District Court possesses not only both appellate and original jurisdiction but also administrative control, subject to the overall control of High Court, in respect of courts subordinate to it. Similarly, in criminal side, the court of judicial Magistrate first class, Chief Judicial Magistrate and over which the session courts are constituted. Any order passed by the sub-ordinate judiciary is appealable to the High Court and Supreme Court. Sub-ordinate judiciary is bound by the decisions of the not only Supreme Court of India but also the respective High Courts to which the Court is under control.

Work Load and Ratio of Judge and Common Man

After India attained independence, not only there is an explosion of population but the pendency of cases has grown in a multidimensional way. The back-log of cases has grown and ultimately it has virtually over-burdening the judiciary[10]. Some of the jurists and judges have commented that probably to clear the outstanding pendency; another 320 years are needed[11].

India has 15,000 judges as against the sanctioned strength of 17,641 including 630 High Court Judges. This works out to a ratio of 10.5 judges per million populations[12]. The mounting arrears of cases in Courts, particularly in District Courts and High Courts, have been a cause of great concern[13].

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[5]Article 235 constitution of India

[6] The word district judiciary is used keeping in view the observation made by FNJPC report, where in it was stated that use of phrase subordinate judiciary conveys a wrong signal and needs to be rechristened.

[7] Some of the authors say that it is not a pyramid like structure but a structure having horizontal nature where the high court and supreme court have appellate power over the sub-ordinate judiciary, and as such it is appropriate to not to call a judiciary having structure like a pyramid.

[8]The high court can issue writs and orders not only for the violation of the fundamental rights but also for the violation of constitutional and statutory rights. The Supreme Court can issue the writs only when there is a violation of Fundamental rights. However the Supreme court has certain extraordinary jurisdiction to decide the dispute between State and Centre, State and State, references by the President of India, special leave to interfere with reference to any order passed by any court or tribunal where there appears to be a substantial injustice being caused, notwithstanding as to whether an appeal against the said order lies or not, to do substantial justice.

[9]Article 129 with reference to Supreme Court and Article 214 with reference to the High courts.

[10] Some critics say that the judiciary in India is over burdened and the days are not too far that it may collapse on account of its overweight unless some remedial steps are taken. Justice BB Malhotra Judge Allahabad High Court, in an article "Court Management" published [J.T.R.I. JOURNAL – First Year, Issue – 3 - Year – July – September, 1995]

[11]Indian judiciary would take 320 years to clear the backlog of 31.28 million cases pending in various courts including High courts in the country, Andhra Pradesh High Court judge Justice V VRao said.Courts will take 320 years to clear backlog cases: Justice Rao - India - The Times of India.One estimate is that if the Indian courts were not to take more cases from today and dispose off the cases at the present rate, then, it may take nearly 300 years to clear the present back log of 30 million cases pending in the various courts of IndiaVittal

[12] The present strength is around 19000 including 18000 judges of courts subordinate to High courts.

[13]In 1985, there were 1,24,02,216 cases pending in the subordinate courts. The Judge strength in 1985 was 9,232. In 1995, the pendency of cases increased to 2,06,46,592; whereas, the number of Judges in 1995 was 10,652. Thus, increase in number of judges has not kept pace with increase in number of cases. During the period 1985 and 1995, the overall Judge strength increased by about 15.4% as against the increase in the pendency of cases by about 66.5%. FNJPC REPORT VOL I

The objective of bringing about the reduction in the time period of disposal of cases and to reduce the existing pendency of cases in a time bound period is of paramount importance[14].

Former Chief Justice of India Dr. M.N. Venkatachaliah indeed had pointed out that, the disillusionment with the judicial system has led to a dangerous increase in janadalats or kangaroo courts in many parts of the country. It is time the county took a serious and comprehensive look at the entire legal system with special attention to tackling the problem of backlog. Too much time has gone by and too little has been done to sort out a problem that undermines the rights of litigants and accused, damages the credibility of the judiciary, and weakens the very basis of the democratic order.

The judges are to decide not only the disputes but also have to act as administrators in administering the affairs of his court and should act as good managers. The lack of administrative capability and facilitating the judicial work in a time bound manner had virtually created a situation of poor management of resources. The judicial productivity and quality of justice, as Dr. Madhava Menon has stated, had reached a bad shape[15].

Need for a New Look?

E-Governance is the key word in every department of life today. It increases productivity, enhances transparency and accountability, reduces red tape and corruption in administration.

Technological Developments in the field of information and introduction of computers have made a turning point in the history of human civilization. It has brought about a sea change in all fields of human activity. It has resulted in enhanced efficiency, productivity and quality of output in every walk of life. The information technology has been advocated in the western countries for the last two or three decades. This scenario gained alarming thoughts to have technology combined in administration of justice.

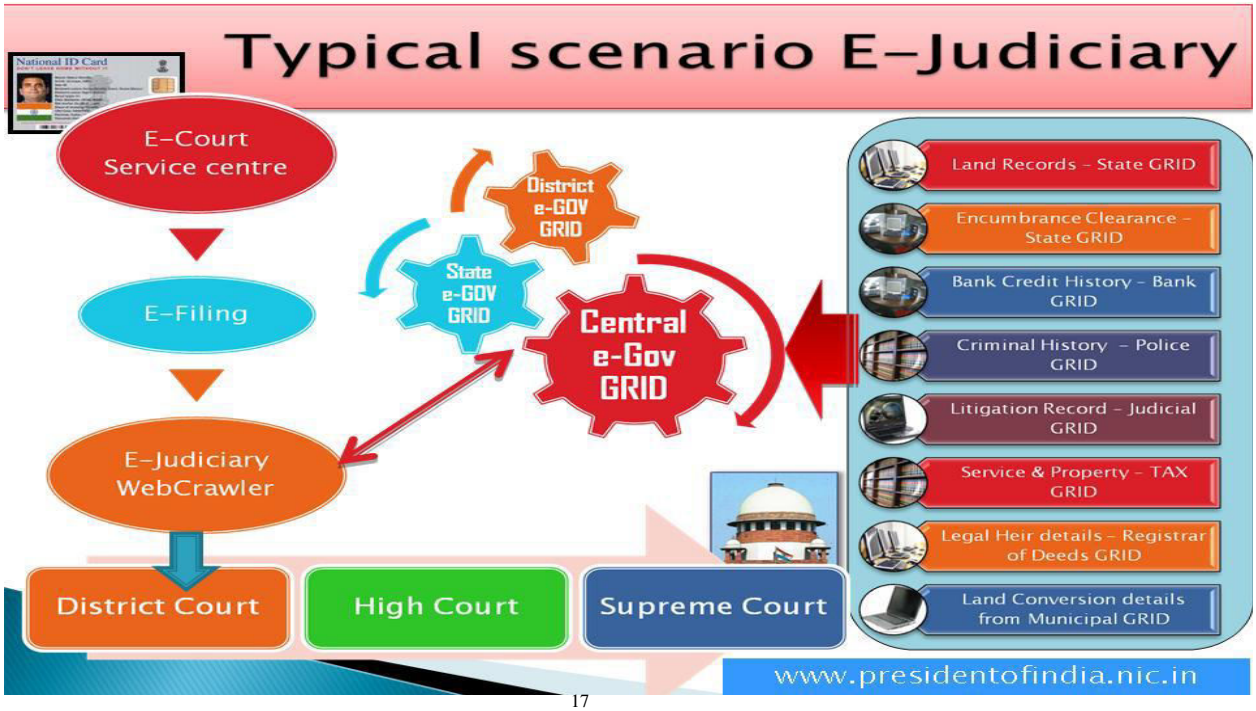
Former President of India, who himself is a technocrat had stated about introducing of technology in courts had stated that:-

Technology is definitely an essential element of change in all spheres of life. The human element involved also is an important factor. If technology is properly used, it can bring about tremendous changes for the betterment of life. Any change we contemplate is for speedy justice delivery mechanism keeping in focus the quality, transparency and public accountability[16].

[14]JTRI JOURNAL 2012 STRENGTHENING THE JUDICIARY TOWARDS REDUCING PENDENCY AND DELAYS- Justice P. Satashivan.

[15] State of Justice an agenda for change Dr.MadhavaMenon The Hindu news paper dated 8th July 2001.

[16]Dr,A.P.J.AbdulKalam



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At first, at the level of the Supreme Court and High Court, the technology was pressed into service and the cases were tried to be disposed off expeditiously[18].

[17] President Bharatratna Dr.A.P.J.Abdul Kalam stated: Let me unfold the scenario. A litigant comes with his with all the documentary evidence which he possesses. E-Court Service Centre helps electronically to identify a civil lawyer to present his case. The lawyer files the case with a prescribed format in the e-Court. Once the case is filed, the e-Court web service agent crawls across the state and central e-governance grid and collects the relevant land records registry and gets the encumbrance certificate details of the litigantsand the defendants. If necessary, it also collects the credit history of the parties from the banking grid, criminal record if any from the police grid, litigation records if any from the other courts, property tax and service tax payment data for the particular disputed land from the State e-governance grid, legal heir verification from the Registrar of Deeds and classification and conversion details of the particular land from the district e-governance grid. The judicial officer now
has the documentary evidence submitted by the litigant and defendant and the certified and authentic documentary evidence collected from various government units which have relevance to this case on the fly in front of him. This will enable the judicial officer to apply his or her mind objectively with optimal examination and cross-examination of the witnesses leading to taking a fast decision in the particular case.
Linkage with NeGEP (National e-Governance Programme): This entire process happening in the network speed reduces the time gap in judgment. Affected party can go online for appeal with the judgement giving reasons and further documentary evidence to the higher court electronically if required. Higher courts get the entire data electronically and they can apply their legal provisions to entertain the case based on its merit and give their verdict without loss of time. The entire e-governance framework should facilitate the case to flow digitally in a secure environment with digital signature across the various stages within the court and across the courts. The data collection and verification with different respondents cutting across various institutions and individuals takes place in a seamless interoperable manner through the e-governance grid data collection mechanism. This data is presented in the form of text, audio, video right from the FIR, interrogation, enquiry, arguments and judgments. The case object is flowing digitally from District Courts to High Courts and High Courts to Supreme Court in a seamless fashion. The other horizontal and vertical e-governance grids such as police grid, banking gird, institutional grids, state grid and central government grid will assist the e-judiciary electronically and facilitate the decision making process in a transparent manner. Basically, in an e-judiciary environment, a case object is traveling into various stages of judicial process and creates Meta data in each stage of the judicial process, thereby creating a foot print of data about the case. An ICT legal expert system assists the advocates and the judges with the legal provisions, previous case history, previous judgment details in various courts thereby helping them to arrive at a decision based on the spirit of the legal provisions. Hence a fully operational e-Governance GRID is vital for the success of E-Judiciary.

List of Business Information System, Filing Counter Computerization, COURTNIC, JUDIS, Supreme Court and High Courts pending Cases on IVR, display boards, and Cause Lists on Internet, are some of the positive steps which were taken in a consistent manner over a period of time. These things indeed have a very high impact in not only making the institution of judiciary at higher level a people friendly but also has cut the expenditure on the exchequer. The transparency affected has brought about a friendlier environment between the Bench and bar[19].

The pendency of cases which was virtually at a level of peak during 1987, that is earlier to the introduction of computerization at Supreme Court had reached a considerable low level by 2003[20].

Computerization of District Judiciary across the Country

This experimentation which had been done at the level of High Court and Supreme Court needed to be implemented at the level of the Trial Court, as majority of cases were and are pending. The steps were taken to implement computerization at the level of the Trial Court. The same was done with an active association and involvement of National Informatics Centre, and also the zeal exhibited by progressive minded judges like Justice G. C. Bharuka[21], Justice Yatindra Singh[22], and Justice MadanLokur[23]. The State of Karnataka implemented at first the concept of computerization as a model state even at the level of taluk courts[24].

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[18] Ever since NIC took up computerization in Supreme Court in 1990, many applications have been computerized which have impact on masses i.e. litigants. Following are some of the applications which have been successfully implemented at Supreme Court and 18 High Courts and these applications have either direct or indirect impact on the masses. http://indiancourts.nic.in/courts/itinjud.html.

[19] Advocates are able to receive the Cause lists almost immediately after courts hours

Advocate can generate their own casuists which will contain only their cases, thus avoiding them to go through hundreds of pages to locate their cases

As the application is available on Internet, the litigant public can easily find out whether their cases are coming for hearing or not, without bothering the advocates

Some courts are considering to reduce the generation of copies of Cause lists, as most of the advocates are dependent on the Internet version of Cause lists, thus the courts can save good amount money on annual basis

[20]

year	institution	Disposal	pendency	Courtesy Supreme court registry.
1989	27469	21400	106027	
1990	28488	25238	109277	
1991	32501	35341	106437	
2002	44052	42439	24335	
2003	50394	47979	26750	

[21] Computers are not new to the Indian courts. Towards the end of 1989, one low-end computer was installed in Supreme Court of India for caveat matching. Immediately thereafter, in 1990, I initiated the process of court computersation in Patna High Court, as a sitting Judge at Patna High Court. On my transfer to Karnataka in 1994, I undertook to introduce ICT in the entire judiciary of the state of Karnataka. All the 600 courts in the Karnataka state located up to the taluk level were computerized. All the judicial officers and court staff were trained. There was a complete automation from filing of a case to grant of a certified copy. Digital production of under-trial prisoners by video-conferencing was made possible in all the three court-complexes at Bangalore, which was later extended to six more districts in Karnataka. Through the Karnataka judiciary website, cause lists of the High Courts and district courts was made available online, a day before, for the first time in the country. The system created has subsequently been adopted in different states in India.

[22] Worked to get the High court of Allahabad computerized.

[23] Worked to get the courts subordinate to High court of Delhi computerized.

[24] Enhancing productivity through computerization—Karnataka Experience by Justice S.R.Bannurmath. The Author Dr. S. B. N. Prakash as a District Judge had an opportunity to work as first Central Project Co-ordinator of Computerisation Project in the State of Karnataka and he worked for two spells in that Capacity.

Steps Taken to Implement the Policy of Computerization at District Level Judiciary

Chief Justice Lahoti, the then chief justice of Supreme Court of India, and Prime Minister had a joint meeting and decided that certain positive steps are to be taken under the aegis of Supreme Court and accordingly a high power committee was constituted. Thus the

The process of computerization in the Indian judiciary could be probably categorized into 3 phases[25], such as that of, identification of location and procuring the site for developing computerization. The second stage being concerned mainly to that of procurement of hardware and software needed to meet the computerization. The third stage was that of to bring about the further developmental activities to make computerization to meet the needs of the common man.

The first e-committee was constituted to undertake the work. The said committee was headed by justice Dr.G.C.Bharuka. Much of the mapping work was done by the committee on a war footing basis. The places were identified and as many as 3500 complexes having sub-ordinate courts to the extent of the 20,000 courts were identified. Working simultaneously at number of sites was really a herculean task and the same was done in a methodological manner. The committee worked out a detailed plan and program as to how the computerization should be done across the country. District judges and in some cases senior Civil judge (Senior Division) were identified and posted as nodal officers with a designation as "Central project co-coordinator" at the level of the high courts. They acted as a link between the High court and e committee and also were responsible to implement the plan in an effective manner.

Preparedness with Software

The software development is an important task and the same was done in association with National Informatics Centre. National informatics centre of Karnataka region under the guidance of experienced senior judge[26] had prepared customized software called 'litigation management system'. Now the same is replaced with a latter developed version such as that of "Case Management System" as developed by National Informatics Centre, Pune[27]. The technical skill of Indian software developers is utilized.

Network and its Expansion to the Rural Setup

The internet and network is more important in having the technology to function in a proper manner. If these things are not there then the use of desk top or laptop would be only to replace a traditional typewriter. Therefore in the State of Karnataka steps are taken at many of the courts to have dedicated line. The services of Indian telephones are availed of. The OFC is used to have quick transmission wherever it is needed. The best utilization of technology in developing Local area network, Wide area network, State Wide area network has been put in to an effective use.

Administrative Setup and Preliminaries

Whenever a plaint is instituted in a court capturing certain information like name of the parties, nature of the case, subject matter of the dispute, relief claimed, generation of order sheets, preparation of summons is an important work. Earlier these steps use to take lot of time and there by much wastage of man power use to be there. The litigant public had no opportunity to know the details at which stage the consideration was needed.

[25] As visualized by e-committee

[26] Justice Dr.G.C.Bharuka

[27] Justice Dr.G.C.Bharuka says, This software was conceived and designed solely by me. You will find mention of this fact in my book "Rejuvenating Judicial System Through E-Governanace And Attitudinal Change'" at page 158 (Designing Dispute Resolution System). Subsequently, two young software engineers were recruited by the High Court on its rolls for carrying out the coding under my supervision and guidance. This is how "LMS" surfaced and successfully deployed in Bangalore City Courts. NIC had no role to play in this exercise. In 2002 a team of officials under the leadership of Justice Chauhan (then a senior most District Judge) from Bombay High Court came to KHC to study the ICT implementation in Karnataka. On their request, I shared the entire structure of LMS with them. On that basis the software CIS was developed at Pune by the NIC team, which is now being implemented across the Indian Judiciary under the E-Courts project with some modifications. Unfortunately, CIS has many fundamental deficiencies.

These mechanical works is now done through the use of technology. The collated information has virtually facilitated the office to generate summons and notices almost instantaneously. The movement of papers and organized arrangement to track the said movement was established.

Recording of Evidence

Trial courts are the courts which basically record the evidence on disputed facts and render judgment by applying the principles of law. Recording of evidence correctly in a transparent way is an essential task. The old pattern of recording by hand and later development of getting it typewritten in open court has now given way to a system of using the technological means to record the statements of the witness in open court. Besides this the high end printers are now installed with network connection and as such the litigant public and members of the bar representing parties can have the printouts without much delay.

Providing Individualize Lap Tops

After the completion of the said stage to a major extent, the procurement of the hardware and software started and as such not only software has been developed but also standardized software was procured. Each of the judicial officers was provided with Laptops, Printers individually and training was given to make them more computers friendly. Besides the judicial officers, the clerical and administrative staff was trained as to how they should use the computers on a network basis. The network was developed at the level of LAN, WAN, SWAN and also an attempt to have national grid have data bank. Providing individual lap tops with broad band facility has made it possible to have access to internet and to have the window open to the world at large to have a broader vision in deciding a case in an effective manner. In fact this is a part of e-courts implementation project as projected by the National Informatics Centre.

First Information Report and Technology

First Information Report is a document prepared by police organizations in Bangladesh, India, and Pakistan when they receive information about the commission of a cognizable offence. It is generally a report lodged with police by any person having social concern. Section 154 of Cr pc deals with reference to First Information Report. The delay in submitting First Information Report to the Magistrate would invariably inure benefit to the accused as a doubt would be created in the mind of the court as to whether the said document is a tailored one or otherwise. The delay in transmission of the report could be solved by submitting the same through the use of technology. The steps are now taken to transmit First Information Report online. As an experiment in the State of Karnataka now the transmission of First Information Report to the court of District judge is undertaken. By utilization of the technological program there will not be any delay which gives rise to unwanted arguments and also would prevent any loss of time. In due course the steps have to be taken to transmit them from the jurisdictional police station to the court of Magistrate with in whose limit the offence had been reported.

Heeding towards Third Stage Development

The third stage has an important stage under which the computerization has gone to the level of various stake holders such as litigant public, judges, and ministerial staff of the court, advocates and various other governmental agencies.

The digital signature is provided for each of the presiding officers and to high court judges and their personal assistants. The judgments are now authenticated with digital signature. In the state of Karnataka, at the level of High Court, the practice of scanning the judgments and archiving is now done away with. On the other hand the digitized copies are now stored with authentication.

The similar practice is to be extended even at the level of the subordinate courts. Likewise an important step which requires to be taken is that of insisting advocates and litigant public to file their pleadings and documents in the form of soft copy, preferably by using PDF technology. This should be insisted as additional information without dispensing with the existing hard copy system. Indeed the computers and the technological development have percolated in India even at rural level. When once such a step is taken it would facilitate to have effective paperless courts on a later date.

The cause list system is now gradually dispensed with at the level of high courts. Karnataka high court has saved nearly utilization of one lakh sheets of paper every month.

Kiosks and People Friendly Environment

Access to justice and transparency in judicial process are very important. An informed citizenry is always a good asset. To achieve this motto the kiosks and information centres are established. Through these centres one can have the needed information about the stage of the proceedings. Some of the high courts and district courts are web hosting the judgments of even subordinate courts[28]. SMS alert, IVRS to know the status of cases are now being introduced. The mobile technology in this context is used to a great extent.

Provisions to provide certified copy of judgments of the High court should be made available by utilizing the services of trial courts or even through pay pals or pay gates. The utilization of internet banking, credit and debit cards should be encouraged. Wherever it is possible the maximum utilization of e-banking should be provided, instead of asking the litigant public to make any payment either by way of demand draft or banker note.

Tools to prepare judgment:the preparation of judgment is the job of a judge when the parties or their respective advocates complete their job. For this work the judge has to relay on several things.

Legal Tools

Under e court project, the access to online journals like that of All India report, Supreme Court Cases are provided. The judgments of the Supreme Court are available on line. The judgments from 1950 till the date are now available at the click of mouse. Some of the high courts are web hosting the judgments of high courts, but the access to the judgments should be more user friendly than the present system of a tedious nature, which is not in a people friendly nature.

Language Tools

India is a country of diversity. The regional language plays a prominent role. Thepreparation of judgments, reference to documents and recording of evidence many a time requires reference to the local or regional languages. To facilitate the courts to have this working system the language tools are used. This has rendered work of judiciary to be more efficient and people friendly. The software as developed by center for Development of Advanced Commuting could be used[29].

Video Conferencing and Judicial Administration

What one had not conceived in mind earlier is now possible. The brick and mortar, physical presence and discussions across table are gradually giving way to new things in view of technological development. Video conferencing facility and teleshopping are now playing a prominent role the present day world. Judiciary cannot keep itself away from these changing phenomena.

Videoconferencing is not a new technology; it has been used since the 1970s in different places in United States of America. Videoconferencing works like a telephone call, except with the addition of a video image streamed between parties. In a court setting, videoconferencing may be requested by any party in a case. In its simplest form, the remote party and the party in the courthouse sit in front of television screens topped with a camera and microphone. The video and audio is then broadcast over telephone lines or a broadband connection. Each viewer will see the opposite party on their respective screen. As the ability to compress and transmit video and audio data increases, the speed and quality of videoconferencing also increases. Early models had audio/video synching issues and low-resolution images[30].

Videoconferencing is the wave of the future[31].Effective use of this technology is in use to some extent. To begin with the link between jail and courts were established at selected cities and court complex[32].

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[28]The high court of Karnataka is yet to take a positive decision in this context.

[29]The Centre for Development of Advanced Computing (C-DAC) has made pioneering contributions in developing Indian language tools with natural language processing, and in evolving script and font standards through its GIST technology, to enable and spread use of computers in various languages. It accordingly took up the initiative of developing important governances solutions in Indian languages, which impact Government and the citizens both.

[30]Videoconferencing in the Courtroom: Benefits, Concerns, and How to Move Forward Daniel Devoe and SaritaFrattaroli

[31]Meghan Dunn & Rebecca Norwick, *Report of a Survey of Videoconferencing in the Court of Appeals*, Federal Judicial Center 17(2006), *available at* *ht*tp://www.fjc.gov/public/home.nsf/autoframe?openform&url_l=/public/home.nsf/inavgeneral?openpage&url_r=/public/home.nsf/pages/1105.

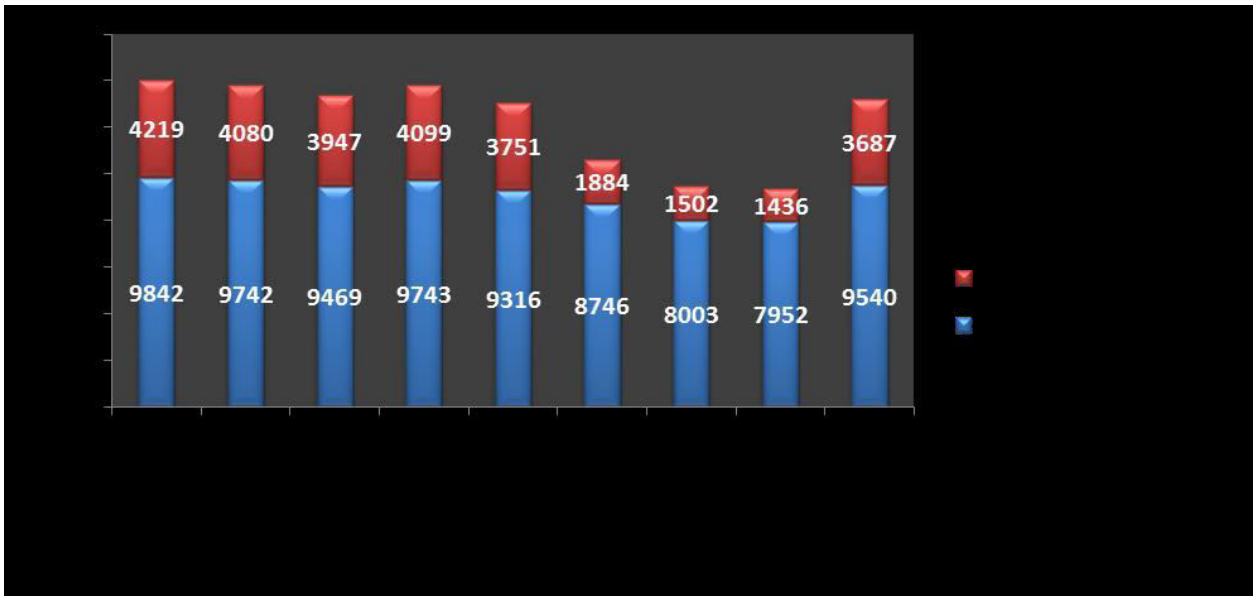
This facility is to be extended even in respect of civil cases[33].From 2003 till 2005 that is within a span of two years the High Court of Karnataka was able to save amount to a tune of Rupees ninety three lakhs eighty three thousand five hundred and forty one. Since then, it is under various stages of completion and functioning at the rest of the jails in the State. Video conferencing project titled e-mulakat started at BirsaMunda central jail, Hotwar, in April 2012[34]. In case if virtual court rooms as established in Singapore is established in India then videoconferencing will have a major role to play.

Video conferencing system is now put in to active use in bringing about an 'integrated criminal justice system[35]'.

E-court and Paperless Administration

National informatics centre has projected a Project Charter for e-courts. The e Court concept is further developed to bring about a paperless court and in this context, first paperless court of India is established at New Delhi. This has brought about a tremendous savings not only for the State exchequer with reference to under trials but also to litigating public who otherwise could not afford loss of time, work and money. What was once considered as a distant dream in India, that is the establishment of e-courts, indeed has now become a reality to some extent. No more it is a mere dream but a sign of progress and prosperity. The first e-court is established at National Capital Delhi. In days to come the same would have to be established at other places of country.

A following report generated by National informatics centre indicates as to the progress with reference to that of e-courts in the country. The said report could be reproduced as under.



Red color indicates status of taluka courts while blue colour indicates the district courts.

A monthly progressive report as prepared during the month of November 2013 is as under.

[32]The video conferencing facilities have been provided to have interlinked between the jail and court, with reference to under trial prisoners. Some of the courts have even used this facility of video conferencing facility for the purpose of recording evidences of the persons of witnesses staying abroad.

[33]In few cases the courts at Bangalore in the state of Karnataka used these facilities in civil cases.

[34] Telegraph e-edition Calcutta. Thanks to Kabir's efforts, 47 inmates under probation will no longer have to commute long distances to various district headquarters for their court hearings. Instead, these will be held through satellite videoconferencing from February-end, a facility provided by home department with technical support from JAP-IT. Vide oconferencing will be provided at the top floor of the two-storey building. The inmate and magistrate concerned will meet onscreen, eliminating safety and travel hazards, fuel cost and the efforts of police escorts to take and bring them back. Overall, the service will also help speed up the wheels of justice for these women, it is hoped.

[35] An integrated criminal justice system with have an effective network between court, prison, police station, crime scene capture, examination of crime scene, recording of evidence, release status of convicts on parole, bail orders, accused details as where he is located, medical treatment for the accused.

Total approved courts under e Courts project – 14,249 courts

1. Site Preparation

► Total Sites where Site Preparation is completed – 2,649 CCs (14,061 Courts) – 99% of 14249 courts
► Incremental change for Hardware installation in November – 0 CCs (0 Courts)

2. Computer hardware for district & subordinate courts:

► Total Sites where Hardware has been ordered – 2,583 CCs (13,822 Courts) - 97% of 14,249 courts
► Total Sites where Hardware has been installed – 2,523 CCs (13,416 Courts) - 94.1 % of 14,249 courts
► Incremental change for Hardware installation in November – 0 CCs (0 Courts)

3. LAN installation at district & subordinate courts:

► Total Sites where LAN has been ordered – 2,590 CCs (13,842 Courts) - 97.1% of 14,249 courts
► Total Sites where LAN has been installed – 2,427 CCs (13,067 Courts) - 91.7% of 14,249 courts
► Incremental change for LAN installation in November – 23 CCs (115 Courts) – 0.8% of 14,249 courts
► LAN installation completed at 23 CCs (115 Courts) in November: Allahabad – 8 CCs, Andhra Pradesh – 3 CCs, Maharashtra – 3 CCs, Gujarat – 1 CC, Tamil Nadu – 7 CCs, Bihar – 1 CC

4. CIS Software installation at district & subordinate courts:

► Total Sites where Software has been installed – 2,404 CCs (13,227 Courts) - 92.8% of 14,249 courts
► Incremental change for CIS installation in November – 8 CCs (16 Courts) – 0.1% of 14,249 courts
► CIS Software installation completed at 8 CCs (16 Courts) in November: Gauhati – 1 CC, Gujarat – 6 CCs, Punjab & Haryana – 1 CC

Future thinking and steps to be taken

The concept of e-courts could be thought of in two environments such as the court with brick and mortar concept, which is the courts in reality, and virtual courts.

The first e court established at New Delhi as a paperless court is not a virtual court but a real court; where in the use of paper is dispensed with.

Virtual courts will have no court hall, no timing of a specific nature, but will have an environment of lawyers, judges, parties and witnesses having meeting and exchange of documents by utilizing the facility of video conference, exchange of documents through Electronic Documents interchange, use of digital signatures. The technological improvements like Skype, face time, while could be used to have one to one look among different stakeholders simultaneously and also otherwise, to have discussions dialogues, the exchange of documents could be done by discoveries, interrogatories, and admissions which are available in the existing laws.

Virtual courts while has got a great effect in a positive manner in cutting the expenditure, as investment on building, storage, management of time in a modern racing society, it functions on 24x7x365 rather than having access at a limited time slot but has got certain disadvantages in developing and underdeveloped countries. The people may not accept wholeheartedly in a conservative society. The level of literacy is yet another important factor to be taken note of.

The virtual courts as developed in U.K. are almost a hybrid type of total paperless courts and conceptualized virtual courts. Though the police and the governmental authorities appreciate this new phenomenon[36] there appears to be a strong opposition from a section of members of bar appearing in criminal courts.

[36]The ministers witnessed the video technology in action when they visited a Police station in North Kent and a virtual court in Chester. They saw how it allowed for swifter and more effective court hearings, benefitting victims, witnesses and saving valuable police hours.
Virtual courts allow a defendant, charged in a police station, to have their first hearing held over secure video link from the magistrates' court. This can happen within hours of being charged and if the defendant pleads guilty, the court can often sentence on the same day.
The same equipment allows police witnesses to give evidence in court via the police station, an initiative known as 'Live Links', freeing up time to carry out frontline duties rather than travelling to and from court.
Courts Minister Jonathan Djanogly said: 'The expansion of virtual courts clearly demonstrates the Government's commitment to working with local police and the courts to ensure speedy and effective justice.
'Not only do they enable the quick resolution of cases they also save time as defendants do not need to be transferred between prison and the court.'

The virtual courts could be tried in cases of commercial transactions and in high level arbitrary proceedings where much of the transaction is documented.

Legal Education and ICT

Without proper education the divinity in a person will not come out. Swami Vivekananda stated that education is a process of unearthing the hidden features in a person. Education is a multifaceted aspect. It is not mere reading or writing or viewing a computer. It is a process of personality building.

Education is regarded as a basic infrastructure for an all-round development of a country. Indeed, it is integrally linked with the development process. In the post-Independence era, the education policy of the Government of India has been so framed as would provide free and compulsory education to all children at least up to the elementary stage. Keeping pace with the fast-growing field of Information Technology (IT), where the sky seems to be the limit so far as employment is concerned, a law student cannot neglect the information technology.

Imparting legal education is one of the noblest professions. The legal education does not mean to study the texts of law in its bare for, but is involves something more, that is to have economic social and political aspects. If need be a lawyer has to know the intricacies of medicine and engineering. The expose of truth is a thing which comes out from different types of information a person has gathered. The information gathered at different point of time if is used at appropriate time in a required manner then it would become a knowledge with wisdom.

The legal education is not only mean to generate good lawyers but it is intended to have proper citizens for the future Nation. They shall have concern regarding the human values and social requirement.

The ICT helps in acquiring knowledge and interact with the needy people by the students. The ICT makes a person not only with heal but would make him a person with heart and even vice-versa.

To have inter-disciplinary studies the ICT plays a positive role. The students at law school environment would not restrict them to a bookish knowledge but would enable them to have the knowledge from all walks of life. The digital library, digital archives, usage of information technology with care and caution if future and to do research the ICT.

The intervention of ICT has really made the globe a village. What could not have been even imagined could now be seen without much difficulty in these days of technology and technological changes. The students, teachers and persons concerned with the study of any system of knowledge cannot remain in an isolated world. This applies more particularly with reference to the students prosecuting legal education.

The legal education brings about the personalities as administrators, businessmen, lawyers, judges, and even legislators. To cater the need of one and all in a developing society the study should be focused with the background of information technology.

Professor Lakshminath[37] says:-

The prospects are bright both for teaching and research in the application of computers. Interdisciplinary studies in the area of law and computers would provide a meaningful interaction between the legal academics and technologists. Computers can be best used in two ways, to assist the legal profession.

Nick Herbert, Minister for Policing and Criminal Justice, said: 'Live links frees up valuable police time and resources to carry out their frontline duties and ensure crimes are dealt with more quickly and effectively.
This is important not only for the local police force but for victims and witnesses.'

Technology extended

The virtual courts initiative began in May 2009 in London (Camberwell Green) and Kent (Medway) and is now being extended this month to other locations in these areas as well as to Cheshire and Hertfordshire.
Live links, which is currently in use in Kent, London and Hertfordshire, is quickly expanding to other police force areas with Cheshire being the next area to implement the initiative.
The initiatives form part of a wider policy to digitalize, streamline and make the Criminal Justice system more efficient. By spring 2012, the entire criminal justice system is required to go digital, with secure electronic transfer of case files between the police, prosecutors and courts becoming the norm rather than the exception.
More than 1400 people have appeared using the virtual court system in Kent. Live links was introduced in July and in the first 24 cases, more than 100 hours of police time have been saved.

[37] Vice chancellor of Chanukya National law school Patna and Chancellor or Andhra Pradesh Law University, Vishakapattanam

One is the information retrieval system which can be developed with the help of law faculty and the computer science department. The second area in which computers can very usefully be employed is artificial intelligence system with which several types of stereotype cases can be decided with the help of computer programmes to arrive at more objective and quicker decisions. The law faculty should actively engage in collaborative research with the computer science department. This needs to be pursued vigorously to design meaningful computerized programs as alternative dispute settlement mechanism.

[38]Digital Revolution:

The digital revolution offers significant opportunities to those who provide legal assistance and education to low-income people and communities. New technologies enable us to create higher quality work product, conduct better research, work more collaboratively, learn more readily, and – most important – serve clients more effectively. Clients and advocates alike can find relevant information on the Internet, programs can use a variety of new management and evaluation tools, and everyone can communicate more easily.

In the past 10 years, our society has experienced a "digital revolution", the implications of which is as stunning as those of the industrial revolution, yet is even more remarkable because these changes are happening in a fraction of the time. Beginning with the affordable personal computer and taking a giant leap forward with the creation of the internet and the web browser, this revolution has changed how we work, play, communicate, learn, and obtain goods and services.

Yet the pace of change has not been the same in all sectors of society. Technology use by the middle and upper class and by the West is significantly ahead of use by poorer people and people of color, a gap that some observers have termed the digital divide. On a corporate level, this gap looms equally large between the private sector and the nonprofit sector.

These technological advances have:

a) Enabled greatly expanded access to legal information for both advocates and clients through internet and e-mail technologies;
b) Expanded access for clients by using telephones for screening, obtaining basic client information, referrals, and providing brief advice and services, and also by posting information on the Internet;
c) Enabled better case management and data collection, along with automated templates for document creation;
d) Improved communication between lawyers and clients through new telephone technologies, cell phones, and video conferencing;
e) Facilitated staff and volunteer recruitment through e-mail and the Internet;
f) Provided new avenues for outreach to clients and the public;
g) Increased training opportunities for advocates; and
h) Created a greater sense of community through e-mail and the Internet.

The uses of new technologies by the equal justice community in three functional categories can be discussed as follows:

a) Improving program and office management;
b) Increasing access to assistance and information for advocates; and
c) Improving client education, preventing legal problems, and assisting prospective litigants.

In addition to educating clients and communities about resources, the Internet can also provide people with information about their legal rights and about how to solve legal problems on their own when they are unable or unwilling to obtain an attorney. At the most basic level, brochures and manuals can be posted on websites, which is an efficient distribution and production mechanism.

Moreover, the potential of web technology exceeds simply improving access to what otherwise might be available in print. Computer can help pro se litigants create attractive, properly formatted and persuasive court forms and pleadings.

[38]"Digital Revolution and Artificial Intelligence – Challenges to Legal Education and Legal Research" By Prof. Dr. A. Lakshminath,Vice chancellor of Chanukya National law school Patna and Chancellor or Andra Pradesh Law University, Vishakapattanam

Computerized templates can use branching logic to take clients through the process of analyzing their case and providing the appropriate information to the court. Video screens can be used to show clients how to navigate through the courthouse, or even how to present their case. Audio files can present information in spoken form for clients who can't read (due to illiteracy or disability or whose language (such as Navajo). These programs can be made available at courthouse kiosks, libraries, and anywhere a client can obtain access to the Internet.

A multifaceted effort, including education, scholarship, resource development, and collaboration, can serve as a powerful catalyst for change, even when the total amount of resources available is relatively small.

Digital Revolution and Artificial Legal Intelligence:

The gizmos of the digital age owe a part of their numeric souls to Dennis Ritchie [1941-2011] and John McCarthy [1927-2011], the machine whisperers.

When Mr. McCarthy and Mr. Ritchie first developed an urge to talk to machines, people still regarded the word 'digital' as part of the jargon of anatomy. If they no longer do, that is because of the new vernaculars invented to cajole automatons into doing man's bidding. In 1958 Mr. McCarthy came up with the list-processing language, or LISP. It is the second-oldest high-level programming language still in use today – one whose grammar and vocabulary were more perspicuous and versatile than the machine code early programmers had to use. A little over a decade later Mr. Ritchie created C. C fundamentally changed the way computer programs were written for the first time it enabled the same programs to work, without too much tweaking, on different machines; before, they had to be tailored to particular models.

Much of modern software is written using one of C's more evolved dialects. These include objective C (which Apple favours), C# (espoused by rival Microsoft) and Java (the choice for a host of internet applications). Mr. Ritchie and his life-long collaborator, Ken Thompson then used C to write UNIX, an operating system whose powerful simplicity endeared it to the operators of the mini-computers which were starting to proliferate in universities and companies in the 1970s. Nowadays its iterations undergird the entire internet and breathe life into most mobile devices, whether based on Google's Android or Apple's iOS.

UNIX spurred the development of mini-and later microcomputers, Mr. McCarthy always argued that the future lay in simple terminals hooked up remotely to a powerful mainframe which would both store and process data: a notion vindicated only recently, as cloud computing has spread.

As for LISP, Mr. McCarthy created it with an altogether different goal in mind - one that was to talk back. Intelligently, LISP was designed to spark this conversation, and with it "artificial intelligence", a term Mr. McCarthy coined hoping it would attract money for the first conference on the subject at Dartmouth in 1956.

In 1962 he set himself the goal of building a thinking machine in 10 years. He would later admit this was hubristic. Not that technology wasn't up to it. The problem lay else where: in the fact that "we understand human mental processes only slightly better than a fish understands swimming." An intelligent computer, he quipped, would require "1.8 Einsteins and one-tenth of the resources of the Manhattan Project" to construct.

Neither was forthcoming. Mr. McCarthy continued to tinker away at a truly thinking machine at Stanford. He never quite saw his dream realized. Mr. Ritchie had more luck. "It's not the actual programming that's interesting," he once remarked. "It's what you can accomplish with the end results."

Bar and its Role

The judicial system of a country would be incomplete if there is no participation of Bar. Bench and Bar like two wheels of a chariot. The Bar has a role not only to provide personnel for future judiciary but also have to defend the interests of their clients. When computerization was started the Bar members were much relented to use the technology but now the things are changing gradually and are now coming out with an openness that ICT is to be considered as a part of life. In deed justice Ram Mohan Reddy of Karnataka High court had lamented that to the effect that how can we think of e-courts if advocates are not ready to adopt, cause-list provided in electronic form and object to the stopping of supply of cause list in printed form.

Some of the advocate have replaced the practice of using manual typewriter and on the other hand are using the computers to perform the work as was done by the said typewriters The office of each of the advocate should be computerized and the advocate to become computer friendly to make use of the systems. Now they are able to use the technology to have cause list and to know the display board position. This is only at a level of rudimentary nature[39].

Of course the use of lap tops, I-Pads, e-books, and other devises have brought in a concept of having mobile libraries by using the digital media, and there by it has reduced the burden of ecological imbalance. But this is not done on a large scale and needs to be attended to.

Bar Council of respective State, and if need be Bar associations, Advocates Academy, should give practical effective training to make the members of the Bar to respond in a positive way. Reorientation programs should be of an effective nature,

Conclusion

The information technology has paved its way and has made a firm inroad in to the judicial field of the country. Article 14 of the constitution while guarantees the right of equality the article 21 imposes a moratorium that the life and liberty cannot be deprived otherwise than the just, fair and reasonable procedure established by law.

In this context how far the further development of artificial intelligence could be used to impose appropriate sentence in a criminal case, speedy disposal of cases by using proper software are all the area which needs consideration.

As observed by Prof Lakshminath, Disruptive legal information technology and emerging Electronic Legal Information (ELI) may arise as the 4th cornerstone in face of the challenges, the other three being (i) Lawyer (ii) dissemination of law and (iii) Judiciary. Electronic Legal Information (ELI) refers to (i) an integrated Electronic Law governing civil procedures and other areas of substantive law, (ii) electronic legal document filings and evidence and (iii) electronic court case status information. ELI is transforming the existing cornerstones to their virtual existences, which take on new capability to face the challenges of high costs, delay and complexity.

For this purpose the days are not far off that we may have to translate all our legal texts from what so ever language it is in to the digital language as understood by the computers and systems akin thereto. The law as a constant need to be understood as in digital form to find out where there is deviation and so also to find out the degree of deviation. When the deviation is too much then the person could be considered as a deviant and appropriate rehabilitative steps or even if need be penal actions in accordance with constitutional goals could be taken to make the Rule of Law a reality than to allow the things to be governed by Rule by law.

[39] Meanwhile, K. Sridhar Rao, High Court judge, told the advocates that discontinuation of cause-list in printed form would help the court to avoid "wasteful expenditure" of Rs. 50 lakh annually. The High Court has been uploading the daily cause list on its website from past many years apart from providing updates on cause list through mobile phones to lawyers from the past couple of years.
Mr. Ram Mohan Reddy said there were plans to provide updates of cases to lawyers through their registered mobile phones, sending court notices through e-mail to government departments, etc. If lawyers were to object for mere stopping of supply of printed cause list, then how could the High Court move ahead in the era of technology to fasten the process of litigation, he asked.
Some advocates welcomed the change but wanted time to adopt to the new system, claiming that the April 12 deadline fixed by the court to stop the supply of cause list in printed form was too short.
Meanwhile, judges pointed out that the only difficulty for lawyers would be to change their mindset, and assured that the court would organize sessions at different courts in the city to create awareness about shifting towards computerized system and obtaining the case lists through mobile phones The Hindu dated 06/04/2013

ICT Tools and its relevance to the Judicial Process

Video Conferencing Tools

Video Conferencing permits virtual interfacing of a Judge with witnesses, holding of conferences, meetings, production of under-trial prisoners, etc. The facility would be installed in the prison. Similar facility would also be made available within the court premise or in the Judge's office. The Judge would be able to interact with the prisoner without the prisoner being physically brought before him. This would save a lot of time and resources, which would have been involved in the physical transportation of the prisoner from the jail to the court. The policemen and other concerned authorities would also be spared so that they can utilize their time in other official tasks.

Publishing Tools

Publishing tools would be utilized for various documentation of the judicial system. An enormous amount of documentation/paperwork is involved in the judicial process. Many times there is also duplication of paperwork and files. Publishing tools would enable preparation soft copies of documentation, printing, copying etc would also be done through the publishing tools. This would be done through printers, scanners, copier machines etc.

Word Processing Tools

Documentation of the judicial system would involve producing various transcripts, data recording etc. This would be done through word processing tools. These tools permit multi-lingual, electronic transcription, formatting and storage of oral evidence, orders and judgments.

Storage Management Tools

The enormous data created in the Judicial System needs to be systematically stored in soft form with proper indexing, filing of the data/records. The existing data of the judicial system would also be replicated in the soft form and this would create a database of documents. These documents would be stored in high-end server/data center. Various High Courts, district courts and other subordinate courts would also have their localized storage of data. This would be replicated as per the hierarchy of the court. For instance, the data at District Court would be replicated at the High Court level. This kind of distributed database architecture would involve the application of storage management tools. Further, document management tools would be employed to facilitate management of documents in a scientific and easily accessible manner.

Regional Language Tools

The Indian Judicial System has documentation in various regional language depending upon the location of the court. This is also useful for the general public/litigants who desire to have the information in their regional language. For the provisioning of regional language in the ICT implementation in the judicial system regional language tools would be utilized. The regional language tools would provide the various documents that would be printed or available online in the regional language.

Intercommunication Tools

These tools include various applications such as e-mail, chat, etc. This would be useful for the internal communication within the judicial system. The existing communication in the judicial system is predominantly paper based. By the utilization of the intercommunication tools the communication with and within the judicial system, be it between courts, or between various departments, would be much faster and efficient.

Fingerprint Recognition System

This would involve fingerprinting of the witnesses, accused, prisoners, etc. and storage in soft form. A centralized database of fingerprints would be created. This would form a good reference during investigation to identify professional criminals. This system would also identify professional litigants and professional witnesses and thus help in preventing of their impersonation.

Internet, Website and Email tools

Various website and internet tools such as web browsers, etc. would be required for viewing of the created database of documents. The online access to information would also require the website/internet tools so that a litigant would be able to access various information like case status, orders pertaining to its case, causelists, etc. Electronic mail would facilitate in issuance of summons, notices, warrants, reports, statements, etc.

Tools for Encryption, Recognition of Digital Signature, etc.

These tools enable the recognition of digital signatures and perform various encryption/decryption functions so as to help a litigant to view case-status in a userfriendly manner without compromising on the security of the documents and avoidance of hacking by miscreants, etc. These tools ensure security, confidentiality and nonrepudiation of documents. This can be meaningfully used for grant of certified copies of orders and judgments.

Voice Recognition and Recording Tools

This would be utilized for the tasks involving dictation, voice recording, etc. The judgments and orders being dictated by Judicial and Administrative Officers would be converted into digital form with the help of these tools.

The judicial process necessarily involved the preparation of various documents based on the dictation given by judges, etc. The manual work of taking the dictation work would be taken care of by the voice recognition system. But this tool is yet to acquire perfection. The experience so far is that it stores hardly 80% to 85% of the words spoken into the microphone. The tool is not apt for judicial functioning specially for the purpose of dictating judgments. It is a growing technology and may, in the coming years, become more efficient for the Indian environment. Still, a lot of research and development is required to be put in.

Imaging and Scanning Tools

Imaging and scanning tools would assist in storage and management of documentary evidence, photographs of accused, and litigant witnesses for future identification.

Web-enabled Connectivity

With the creation and implementation of a detailed Relational Database Management System (RDMS) and use of Wide Area Networking (WAN) including internet facilities, it is feasible to create a National Grid of court information for judicial reviews at all hierarchical levels as also for taking centralised policy decisions for effective court management and its implementation.
With the availability of national data in the centralized manner, well-devised national policies pertaining to delay reduction (i.e., arrears-control), programs can be conveniently implemented. A central data warehouse can be created where the data can be processed, analysed and reports can be prepared. The original, main data is filtered and transferred to the data mart which in turn, after further filtering, sends the data to the data warehouse. There can be a centralized research and planning wing for judiciary and the experts and jurists can then evolve centralized policies for the whole judiciary. Such an objective and rational administration is very much essential and critical for meaningful management of the judicial system today.

Bar Code Technology

Standard bar codes are like social security numbers or car licence plate numbers or in the context of court systems, like case numbers which act as reference number that a computer uses to look up associated descriptive data and other pertinent information. The process requires the conversion of a bar code that can be printed on or affixed to an item and subsequently, read by a light source and fed into the computer. This technology immensely helps in document management, moveable property identification. Bar code scanners are faster then human eye and far more accurate. Based on tests, bar code information has an accuracy rate of one error per ten million (one crore) characters. Compared to this, the keyboard error rates is one error per hundred characters. This form of "automatic identification" can help in prevent misidentification errors. It can be used in the court system. This can be used for locating files, documents concerning cases like pleadings, issues, evidence, both oral and documentary, orders, judgments as also the moveable properties seized, attached and exhibited. This technology can be very effectively tracks the file movements and its locations.

Document Management

Document management was originally developed to control and manage heavy information flows in corporate, non-profit and government organizations, document management systems focused on making data – whether legal documents, funding proposals, mail-merge documents, or white papers – readily accessible and easily archived. In essence, the goal was to organize files. Early systems focused on adding information about a document to the computer file containing the document, organizing that information in a database, and defining relationships between documents. What one had was essentially a computerised library.
Documents are defined by certain set criteria, generally known as metadata indexing elements. These include document author, date of creation of the document, type of document, topics covered in the document, completion date, related documents, keywords, and the like.
Document management can be very effectively used is the transcription and storage of judicial documents. One would no more be required to use a manual typewriter. Moreover, the typists and stenographers can better organize and format documents with facilities of simultaneous spell checks and font organisation and numerous other facilities. These documents can be easily accessible with all securities. The simple and basic advantages of using document management tools like, cut and paste instead of retyping on a separate sheet, the ability to make correction without the use of erasing liquids, transfer of document from one work station to another on a click of a mouse, etc. would be of immense help in lessening the manual work.

Database Management System

A well-structured database is the heart of court management, case management and caseflow management. There are several important databases which need to be created to store the information captured in a systematic and meaningful manner:

1. *Courts database*: This database contains the entire information of all the courts, like, (i) the class i.e. Civil Judge (Jr. Dn.), Civil Judge (Sr. Dn.) or District Judge; (ii) jurisdictions both territorial and pecuniary; (iii) name; (iv) location; and, (v) judicial and revenue district in which it lies.

2. *Location database*: This database helps in storing and retrieving of object/correct location of an immovable property or address of a person i.e. the court, judge, litigant, advocate, staff etc.

3. *Judges database*: The information relating to the central human object in the judicial system is stored in this database. It contains a Judge's personal data including date of entry into service, grade, promotions, adverse remarks, disciplinary proceedings, transfers and postings. It helps in taking vital decisions regarding performance of a judge which has a direct bearing on delays and arrears.

4. *Court Staff database*: Like that of judges, this database contains the entire relevant information of the supporting infrastructural staff provided to the court. This helps in maintaining discipline, work culture and available strength of this class.

5. *Litigants database*: This database contains the information relating to parties to a dispute brought before the court as required in the procedural laws. It helps in convenient and accurate creation of cause titles, summons and notices, orders, judgment and decrees. With the help of this database, many statistical reports can instantly be generated, like, (i) in how many cases the same litigant is involved many cases pending in the state or elsewhere; (ii) whether he had earlier filed any other case for the same cause of action; or, (iii) litigants classification with variables in order to have a behavioral study, etc.

6. *Advocates database*: This database is designed to contain all relevant information relating to enrolled advocates. It helps in many ways. If any advocate appearing for any litigant is disabled from appearing in any case, because of other assignments or has expired, then all such cases can be sorted out immediately and court notice can be sent to the parties at the earliest. It helps in retrieving and recording the names of advocates and printing their names correctly in cause-lists, orders, judgments, etc. It permits class analysis in all desired manners.

7. *Case database*: This database, like the Court database, contains another set of key information for understanding the system behavior. This database is capable of answering all queries relating to all cases i.e. case institutions, pendencies, disposals, stages, nature, etc. Information contained in this database can reveal out all the miseries which has led to systemic failures.

8. *Case Updation database*: This database takes care of case progression and provides a key to case flow management. It facilitates tracking of the stages of cases and helps in case management through supervisory process.

9. *Exhibits and Witnesses database*: The witness and exhibits database is an integral part of judicial process. This database helps the Courts in finding out the witnesses examined, the exhibits marked and submitted to the court, admissible documents and details of witnesses and the evidences produced before the court.

ICT in Indian Court

Challenges & Solution

Rishi Prakash, T. Mohanty, Ramji Gupta & Vinay Jain

Abstract **-** Over three million cases are pending in India's 21 High Courts and an astounding 26.3 million cases are pending in subordinate Courts across the country & only 14.7 Judges available per million people. With further growth in the number of cases increased the burden on our judicial system manifold. The cost and inefficiency of dealing with records has crept up slowly over time and become extremely unwieldy, inefficient and cumbersome. On the other hand if we see the efforts of the other investigating agencies like police, jails, forensic labs, hospitals etc in extracting information from accused, undertrials & evidences etc is enormous and extremely complex. Massive cost, time and risk are involved in bringing the accused, witnesses, reports etc to the courts. India is on the verge of technology revolution that enables law agencies to manage the case proceeding in electronic format, leading over paper-centric judicial scenario. This has also given birth to this new idea; adjudication through e-courts.

MoU has been signed among TIFAC (DST, Govt. of India), CDAC Noida and Gujarat & Delhi High Courts respectively under TIFAC's targeted programme: TECHNOLOGY VISION 2020 "Synergizing Science & Technology with Judicial Processes" to develop a state-of-the-art tamperproof & secured case recording & retrieval system which has been successfully piloted at City Civil and Session Court, Ahmadabad and the advanced version of this is recently implemented at Karkardooma District Court New Delhi.

I. INTRODUCTION

The rapid accumulation & slow disposal rate of pending cases has increased burden on our judicial system tremendously. Courts had to maintain all the records in physical manner i.e. either in files or registers and to keep such large data in paper form is not easy to retrieve and also not even safe and is prone to physical tempering & environmental degradation. The case takes long time to solve and apart from this

Cases/Judges/Courts keeps on changing during the course of judgment. Even the witnesses and accused keep on changing their statements and turns hostile. It is always difficult for the new Judges to retrieve the case information & status; so far the available source is the written information in the case files only. As far as police & jails are concern, they already cramped for resources in dealing and bringing accused and undertrials to the courts. Similarly experts from Hospitals and forensic labs faced severe difficulties in presenting their investigating reports in front of courts. Therefore, there is a definite scope of bringing ICT to help and develop Case Record Management System for courtroom and to conserve the case file & audio/visual record for future references.

II. SYSTEM FEATURES

The entire courtroom proceeding are videographed using multiple high resolution PTZ cameras. The control of recording software interface is on the hand of judge who can start/stop anytime. File records, evidences (knife, gun etc) and other case related documents(depositions, notes, files, summons, orders etc) has been scanned and digitized via scanners and visualizers and are available to authorized users like judge, lawyers and public prosecutor etc for reviewing. Deposition can be captured as dictated by the judge at the time of case hearing, which is also linking with video records. Adequate security features through data encryption, digital signature, Network and application level have been provided to safeguard information from both unauthorized viewing and intentional or inadvertent damage. The system provides a flexible retrieval of captured information and allows the user to specify partial search terms involving the document identifier and/or parts of the expected metadata. System is integrated with video conferencing system with other locations over broadband IP or ISDN network. These locations can be police stations, jail, FSL, hospitals etc. This is a great advantage as both precious time and cost is getting saved and it is much safer too.

This system has following features:

- Role based access to authorized users
- Uploading the scanned files/evidence and adding appropriate metadata.
- Allows Judges to see recording of proceeding for review and why case was rescheduled last time.
- Making the knowledge and information content available in 24x7 online environments.
- Appropriate Searching of case records.

- Provision to provide case CD/DVD to authorized person.
- Provision for taking record backup at a specified backup site.
- Live webcast of case proceedings through web portal.
- Can be use by court reporters that missed a word or statement.

III. SYSTEM WORKING OVERVIEW

The system application is broadly categorize in four major privileges areas inter- linked with courtroom operations. They are Judge, Administrator, Courtroom staff (Steno, Almad, Reader etc) and other users (like Public prosecutor, lawyers). Application features are made available as per there functions and defined roles and responsibilities. Some of the major tasks of the entire workflow are explained below.

Digitization of Case files:

A scanning room has been created inside the courtroom where case files are brought first. The case files are then scanned & digitized and uploaded in encrypted form on centralized storage server so that authorized person can access the case files through the software interface. In earlier system, bringing the case files from store room (Maal khana) take lots of efforts which can be saved now. Here authorized user can access the case files from anywhere on a single click.

Paperless Deposition:

The proceedings of court are completely paperless. The deposition is typed by steno on computer and the draft deposition is visible to the Judge and to the lawyers on their screen. Once the draft is approved, the deposition is then digitally signed by Judge. This file is then uploaded & gets appended in to the case file.

Recording of court proceedings:

The court proceedings can be recorded with multiple high quality PTZ camera through interface provided to Judge. The recordings are also kept in encrypted form on server. The user can access these recordings from the software interface which makes the user (Judge) flashback easily that what happened last time in this case and easily track the progress of the case.

Video conferencing:

Using video conferencing any person can give his/her deposition from remote place. He/she just needs a video conferencing setup either hardware or software based with internet connection. Initially three hospitals, FSL, two police stations and jail are connected to e-Court for video conferencing. Producing accused/witness every time in court consumes enormous amount of resources (transportation cost, security time and manpower etc) of the government, Using Video conferencing, they can give their deposition from hospitals and jails itself.

Evidences capture:

We provided imaging solutions for evidences and documents to court. The images from police, hospitals reports etc. can be uploaded from camera or any other imaging source. There is one visualizer to view & capture evidences and indexed with the in court case records.

Provision for DVD writing:

If any person (lawyer or concerned person) wants digital documents or videos of case, there is provision of providing required data on a CD/DVD.

Data sharing from remote location:

The police, hospital staff can remotely upload the documents or view the documents.

Court live proceedings:

The court's live proceedings can be seen on courts website by authorized person. If any person (lawyer or concerned person) wants to see live proceedings, he/she has to fill an online Registration form and after reviewing the application by administrator, access can be given to person for the particular case.

IV. TRADITIONAL SYSTEM VS e-COURT

When we think about judicial courts all that comes to our mind is thick files, hot arguments between lawyers and heated discussions. The judge can view the recordings and related documents of a particular case on just a click of a button. As a result of which both the judge and the lawyers need not to waste their time in finding a particular part in those documents (video or PDF) and can come directly to the point. Since every case is recorded the judge can review the earlier recordings to refresh his memory. Hence helping the judge, to give a quicker and correct judgment.

Traditional Functioning	**e-Court Functioning**
Physical carrying of Case File and evidences to Courtroom at each hearing.	No need to carry Case File and evidences at each hearing in physical form, same are available at click of mouse to Judge and

Physical carrying of Case Documents and evidences if required by Judge, Judicial Secretary for review.	concerned staff. Reduces the human load on the court premises also ease the maintenance of evidences and documents. Court authorities can avoid frequent physical movement of case related files and evidences
No provision of sharing case information online.	Different courts are able to share the information online.
Required Case documents and evidences of Case file are submitted manually in Court by Police, Hospital, Forensic Officials and other stake holders.	Through e-Court concerned Police, Hospital, Forensic Officials and other stake holders can upload the required documents to the case file from their premises itself. System provides adequate security mechanism like role based user access.
Case cannot be proceed due to the non availability of accuse/witness on the scheduled date and case delays many years for final hiring.	With the help of video conference facility accuse/witness can participate in court room proceeding.

V. COST BENEFIT ANALYSIS

The following data is approximate and value is based on the available recording done at e- court in H.264 (4CIF) format.

S No	Channel	Data (MB/ Min)	Total (MB/Hr)
1.	Judge View	1.85	111
2.	Accused View	1.65	99
3.	Witness View	2.05	123
4.	Mix Quad View	2.25	135
5.	Video Conf.	1.22	75
6.	Evidence View	0.55	33
7.	Operator View	1.60	96
TOTAL			**672 = ~700**

Average Calculation:

- Per day court runs for 7 hrs therefore 700 x 7 = 4900 MB = ~ **5GB/day**
- 22 days/month = 5GB x 22 = 110GB/Month X 10 (courts works for 10 months/year) = **1.1 TB/Year**

The following data is approximate and value is based on the available digitization done at e-Court for single case in .pdf format.

S No	Doc. Type	Data (KB/ page)	Avg page/Case	Total (MB/ Case)
1.	Case File	250	600	150
2.	Case/Evidence pics	3000	25	75
3.	Deposition/orders etc	100	100	10
Total			**725**	**235**

Average Calculation:

- Average Case handled by one court = 75/Year = 235 MB x 75 = 17.625 GB = **~18GB/Year**
- Average files generated = 725 x 75 = 54375 = **~55,000 files/Year**
- Traditional Court maintenance cost approx Rs 8 Lacs 40 thousand annually.
- Capacity of the Server is 2TB.On an average a Court consumes 1.3 TB of data annually for both video and document.
- e-Court Server maintenance & capacity enhancement cost is approx Rs 1.5 Lacs annually. **Study at Lal Bahadur Shastri Hospital**
- *On an average 10-12 Doctors travel to court daily from each Hospital*
- *Average DA/day /head = 350 Rupees*
- *Average TA/day/head = 100 Rupees*
- *Average per day cost = 450 x 12 = 5400/- per day)*
  Average Monthly expenditure = 118000/-
- *Average Annual expenditure = Over 14 Lakhs per Hospital*
- *Above cost does not include the salary part.*
- *Cost of patient care loss: ∞ INFINITY*
- *Travel and other related cost will be saved.*
- Support of other staff members involved in summon distribution, document gathering, logistic arrangements is not included in above study.

Study on Tihar Jail

- Approx 1,200 inmates taken to courts every day, at least 400 are under trials only seeking an extension of judicial remand.
- Jail vans have to make at least 10 trips to transport the under trials to court.
- We would save up to rupee 1.5 crore annually, the amount we spend on providing security and fuel.
- Earlier system costs around **20 Thousand Rupees per case** but using e-Court only **3 Thousand rupees spends per case**. We can save approx. 17 thousand rupees per case

VI. OUTCOME OF THE e-COURT

The entire existing files in Karkardooma eCourt have been digitized and a touch screen has been installed on the dais of Judge. He can view any file of the e-Court in digitized form by searching for the same date-wise, name-wise or Act/Section wise. There is a provision of a document visualizer and any document can be projected on the LCD Screens installed in the eCourt, so that the same are visible to the accused, witnesses or the prosecutor in the same Court, as well as when they are connected through Video-Conferencing. Other stakeholders of the case can have access to eFiles using secure login and password. The overall impact of establishment of E-Court will result in quick disposal of cases, ease of record maintenance, reliability of the evidence recorded and to bring more transparency in the functioning of the District Courts.

- Reduce the paper work. Ease of record maintenance

  ¾ Allow the judges to see e-files for review.
- Can be used by judge, judicial fraternity to review the case.
- Use as a backup by concern persons who have some doubt about the authenticity of the documents.
- Different courts will be able to share the information online.
- Playback live proceedings for court audience.
- Use of digital signature & encryption for integrity of documents.
- Tool for Education & Training of judicial officers and courtroom personnel.
- Doctors need not to cancel appointments for critical/emergency patients.
- Court, Hospitals, FSL, Jail can simultaneously share their presentations/documents and other information online in a secured mode.
- Remote parties can depose through Video Conferencing facility using ISDN and Broadband links in e-Court
- The documents of high secrecy which cannot be moved out of the department but needs to be shared with other agencies can be directly presented and discussed upon.
- System will increase physical security of doctors by not visiting the court thereby avoiding any physical presence in front of the accused or criminals.
- Doctors can depose and give expert opinion in much more relaxed and conducive environment.
- System can be used for other medical benefits other than the judicial matters.
- Travel and other related cost will be saved.

VII. SOME CHALLENGES & FUTURE SCOPE

With the arrival of e-Court concept the amount of data that needs to be managed and protect will be a mammoth and ultimate challenge for the judiciary.

- Based on data generated in the established e-Court, almost 85k files with 1.3TB data will be generated per year.
- System can't afford to lose even a single file as it makes the entire records unreliable and invalid in judicial terms
- Currently H.264 video format has been used with AES encryption for video recording which may be change/upgrade in the future therefore it is required to develop methodology for Interoperability of ever changing media formats/codecs.

Future Scope:

- e-Court on Cloud Network
- Setup TDR (Trustworthy Digital Repositories) for e-Court Records.
- Building Decision Support system for Judiciary
- Incorporation of OCR and smart discovery services, etc.

VIII. CONCLUSION

We have presented a state-of-the-art technique for introducing ICI in Indian courts for digitally preserving case files and visual information in chronological sequence. The design can be utilized to will help our judicial system to streamline and expedite their operation and case disposal rate in secure and cost effective manner.

ECOMMITTEE SUPREME COURT OF INDIA

POLICY AND ACTION PLAN DOCUMENT
PHASE II OF THE ECOURTS PROJECT
(as approved on 8th January, 2014)

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- 1-I Activities approved in Phase I
- 1-II Suggested three phases in report of NPAPIICT
- 1-III Present status of Phase I infrastructure and software implementation
- 2-I Extension/transition of Phase I to Phase II of the eCourts project
- 2-II Total Courts as on 30th November, 2013

CHAPTER 1

INTRODUCTION

EXECUTIVE SUMMARY

1. During Phase I of the eCourts Project, in a very large number of Court Complexes, Computer Server Rooms and Judicial Service Centres have been readied. The District and Taluka Courts as covered in Phase I of these Court Complexes have already been computerized, with installation of hardware, LAN etc. and Case Information Software (CIS). Consequently, these Courts are now providing basic case-related services to litigants and lawyers.
2. The e-Courts National portal (ecourts.gov.in) was launched by Hon'ble the Chief Justice of India on 7th August, 2013. This provides cause-list, case status information in respect of more than 2.5 crore cases (pending and decided) and has sometimes reached daily 'hits' in excess of 7 lakhs which is growing exponentially every week. This is a part of the National Judicial Data Grid that has been made operational and will be improved in a phased manner.
3. The e-Courts National portal also provides training material for judicial officers and staff, links to District Court websites and statistical reports that can be used as a judicial management information system. This portal is expected to play a key role in bringing about judicial reforms. The etransactions services of the eCourts portal as per etaal.gov.in have crossed 2.2 Crore.
4. A large number of District Courts have launched their websites for the convenience of litigants and others have been provided with a template for easy launch of a website.
5. Change Management exercise has been successfully implemented. All judicial officers in the country have been trained in the use of computers through 218 judicial officers who had been trained as Master Trainers for continuing training programmes. 219 CIS Master Trainers (District System Administrators) have been trained from amongst the court staff in the use of the Case Information Software. These CIS Master Trainers have trained more than 4000 System Administrators in the effective use of computers and CIS.
6. All High Courts are in the process of providing unique identification numbers to all judicial officers. Many High Courts have already completed this exercise.
7. All High Courts have taken up Process Re-engineering exercise, thereby having a fresh look at processes, procedures, systems and Court Rules.
8. Unified National Core version 1.0 of the Case Information Software has been developed. This is in use in almost all States. The process of migration of old data into the Unified National Core CIS version 1.0 is in progress.
9. Data entry of pending cases is in progress and has reached an advanced stage of completion.
10. The process of implementation of the Project has shown that many new courts have come up in the last several years and many more will come up. Provision needs to be made for newly established courts and courts that will come up in

the near future. Similarly, the strength of judicial officers has also increased. They too need to be provided for.

11. Wide Area Network connectivity needs immediate and effective attention to enable availability of information to litigants.

12. A large number of activities including scanning or digitizing case records, judicial and administrative automation etc. will be taken up in the next phase of the Project.

13. Cloud computing model will be implemented in the next phase of the Project.

1. Journey so far:

(a) Like all other organs of democracy, Judiciary is also endeavoring and persevering earnestly to transform itself by implementing tools and means of Information and Communication Technology (ICT). As a part of National eGovernance Plan (NeGP), eCourts Project is an Integrated Mission Mode Project under implementation since 2007 for Indian Judiciary based on the 'National Policy and Action Plan for Implementation of Information and Communication Technology in Indian Judiciary' (NPAPIICT), prepared by the eCommittee of Supreme Court of India in 2005 and approved by the Chief Justice of India. The activities under the Project which were approved by the competent authority for implementation, are enclosed at Annexure-1-I.

(b) NPAPIICT Report had suggested three Phases for implementation of the Project. The details of these Phases are enclosed at Annexure-1-II. While several activities suggested in these phases are being implemented in the ongoing phase of the Project, there are a number of activities which are yet to be undertaken in order to reach a holistic state of ICT enablement of the Courts which is ideally required as per the National eGovernance Plan (NeGP).

(c) The chart at Annexure 1-III (as provided by NIC) indicates, at a glance, the implementation of the Project as on 30th November, 2013 about the components of site preparation, LAN implementation, hardware installation and software deployment.

(d) With the infrastructure and software in place as stated above, most District

Courts have been able to provide basic services of filing, scrutiny, registration, allocation, cause-list generation and orders/judgments uploading in large number of cases etc. by using the software provided under the project.

(e) On 7th August 2013, Hon'ble the Chief Justice of India launched the e-Courts National portal of the eCourts project. The portal showcases the National Judicial Data Grid which provides, inter alia, training material for judicial officers and staff and general information to the public and will eventually be a very powerful mode of communicating all aspects of judicial reforms. More than 8000 Courts have secured their presence on the National Judicial Data Grid (NJDG) portal ecourts.gov.in and are providing Case Status, Cause lists online with some of them also uploading orders/judgments. Data of more than 2.5 crore pending and disposed cases is available on NJDG at present.

(f) The number of daily hits on the e-Courts National portal has reached more than 10 lac a day as per the National eTransactions Portal www.etaal.gov.in The total e-transactions so far since the launch of the portal have cross 2.2 Crore. The following chart shows the exponential growth of the hits on the eCourts National portal for availing the services:

Month-wise eTransactions through eCourts National portal

Sr. No.	Duration	No. of eTransactions
1	07-08-2013 to 31-08-2013	1,05,790
2	01-09-2013 to 30-09-2013	13,42,894
3	01-10-2013 to 31-10-2013	31,09,045
4	01-11-2013 to 30-11-2013	41,33,381
5	01-12-2013 to 30-12-2013	1,34,87,618

Day-wise eTransactions – December, 2013

1st to 15th	No. of eTransactions	16th to 30th	No. of eTransactions
01-12-2013	2,04,103	16-12-2013	7,60,297
02-12-2013	1,64,747	17-12-2013	6,83,037
03-12-2013	1,74,620	18-12-2013	6,09,130
04-12-2013	1,67,563	19-12-2013	5,23,059
05-12-2013	1,69,181	20-12-2013	4,30,330
06-12-2013	1,72,030	21-12-2013	5,18,803
07-12-2013	1,87,539	22-12-2013	76,934
08-12-2013	3,99,592	23-12-2013	6,011
09-12-2013	4,16,217	24-12-2013	1,68,123
10-12-2013	4,10,515	25-12-2013	7,53,453
11-12-2013	3,65,668	26-12-2013	15,70,321
12-12-2013	3,09,304	27-12-2013	10,75,418
13-12-2013	3,05,471	28-12-2013	10,92,861
14-12-2013	2,10,411	29-12-2013	8,41,234
15-12-2013	3,07,127	30-12-2013	4,14,519

Note: The e-transactions include the services of Case Status, Cause-list, Cases Filed and Cases Registered.

(g) As many as 400 District Courts have launched their websites, either of their own design or developed as per the template provided by the Project.

(h) As a part of the Change Management programme, more than 14,000

Judicial Officers have been trained in the use of Ubuntu-Linux Operating System (for their laptops). This has been achieved by training 218 judicial officers from all over the country as Master Trainers in different locations around the country.

(i) Similarly, more than 4000 Court Staff have been trained in Case Information Software as System Administrators. This has been achieved through training 219 Court Staff as CIS Master Trainers (District System Administrators) at the Maharashtra Judicial Academy and the Chandigarh Judicial Academy.

(j) An exercise has been initiated by requesting every High Court to provide a Unique Identification Number (UID) to every Judicial Officer. The UID will be prefixed with two alphabets representing the State, as for example with motor vehicles. The proposed time-line is 31st December, 2013. This information will be uploaded on the e-Courts portal. This will assist the High Courts in maintaining an accurate record of all judicial officers.

(k) An exercise in Process Re-engineering has already commenced. All High Courts have set up Process Re-engineering committees to modernize the processes, procedures and Civil Court/Criminal Court Rules. The Process Re-engineering committees are expected to complete the exercise by 31st January, 2014.

(l) A Unified National Core CIS software has been developed with the assistance of NIC Pune for use in all the District and Taluka Courts all over the country. This has been implemented in all the States and migration of existing data is expected to be implemented in almost all the States by 31st March 2013.

(m) Entry of case data is complete in some States, while adequate progress has been made in other States. On completion of data entry, every litigant can access information about his/her case from the e-Courts National portal.

2. Goalposts to reach:

An analysis of the conceptualization, planning and strategy of the first phase of the Project suggests that there are some more goalposts to cross. Delivery of all the

services by all the Courts, optimum automation of case workflow, use of computers by all important sections of the Registry for day to day processes and service delivery, unified CIS for all Courts, timely and regular updation of data on NJDG by all Courts, discontinuation of manual registers, ideal Central Filing Center with sufficient infrastructure, judicial performance assessment through ICT, scanning and digitization of the case records, court record room management automation, Court Libraries Computerization, Video Conferencing for all Courts with Jails, Legal Aid Offices (DLSA/TLSC) ICT enablement, WAN (Wide Area Network) connectivity for all Courts, solar energy for power backup, mobile based service delivery through SMS and Mobile Apps etc. are just a few of the many important objectives. In order to achieve them, the Court ICT enablement approach needs to be so taken up that the infrastructure for not just the Court Room but also for the Registry (Sections) of the Court Complex is provisioned. This is indispensable for ensuring optimum automation of judicial and administrative processes and also the ideal delivery for the litigant centric services. Sufficiency of the infrastructure keeping in view this aspect is a major goal to be achieved through next phase of the eCourts Project.

3. Miles yet to go:

Most of the deficiency in uploading of data onto NJDG and therefore the lack of delivery of services online is attributed to issues relating to lack of effective, stable and reliable WAN connectivity for the Courts. This aspect of WAN connectivity which has assumed almost as much significance as availability of electricity for a system to work; deserves immediate and effective attention. Howsoever robust and efficient the hardware and the software provided may be, this hindrance of connectivity becomes a bottleneck so serious that it chokes up the whole flow of information to the beneficiaries thereby making the achievements made so far immaterial for the litigants and the society at large.

The ongoing exercise of Process Reengineering in the eCourts project as initiated by the eCommittee, is expected to generate a huge requirement of implementation in the area of overhauled processes being followed in the day to day functioning of the Courts. The change, abandonment or new introduction of processes, apart from being brought in force through amendment in rules, will also need meticulous implementation through a major revamping exercise of customization and redesign of the present Case Information Software. This exercise

will need considerable planning and design efforts in addition to the efforts and time for development as well as roll out of the reformed and reengineered CIS.

The quantum of hardware provided in the present phase being too less, the optimum computerization of court processes has not been possible. The quantum of hardware was calculated on per Court Room basis with just one slimline PC and three thin clients per Court. Experience has shown that this number is too low as sections/registry of the Court also need to be considered for hardware for effective and optimum ICT enablement. This lack or paucity of hardware has also been a major reason for not wholly shifting to computerized processes from the manual processes. Considering this condition of the Courts which have been covered under the Project, the Courts not covered for computerization or established after its commencement but during the continuation of the present phase cannot get fully integrated with the NJDG. Also given that more hardware is required (in the registry, for instance) and that many courts in dilapidated, tenanted and newly established buildings have not yet been covered for computerization, full integration of all district and subordinate level courts in the country into the NJDG and the consequent benefits of NJDG for performance and analysis is yet to happen.

New courts are being added from time to time based on the decisions taken by respective High Courts and State Governments, decision of the Supreme Court in Brij Mohal Lal case on 19.4.12 to create additional 10% positions in subordinate judiciary, and the policy decision to double the existing strength of judges in a period of five years. Some of the newly created courts are being established in existing court complexes already covered by eCourts project and there is inevitably a time lag between their operationalization and computerization. Therefore, there are always courts that are not computerized, whether in existing or new court complexes. This results in difficulties for Judges to base their analysis on all existing courts and for lawyers and litigants to be sure whether benefits of computerization have accrued in courts they are litigating in. The uneven spread and availability of ICT resources creates a more difficult and intriguing situation for the Judges, Lawyers and litigants alike, specially where some Courts in the same Court Complex are still on manual processes even for basic needs like cause list generation etc. whereas all other Courts in the same complex are doing most of their day to day work on computers. As accretion of courts in a Court Complex may be a continuous process and there

may always be a lag between establishment of an additional court and its computerization, it is necessary to provide for ICT infrastructure requirements well before or at least at the time of notification of a new court.

Needless to say that, mere creation of additional Courts is not sufficient for reducing the backlog of cases. Only technological enablement of the Courts will effectively address the situation and would eventually fructify the real objective of the creation of additional Courts. It is high time that the additional Courts created during or before this phase of the project are immediately taken up for computerization with an added provision of also covering the yet to be created Courts at least till a cut-off date not earlier than two years of the three year duration of the next phase of the project.

With the advent of new technologies in the area of hardware, networking etc. the model based upon cloud computing concepts needs to be implemented instead of the present model of distributed and decentralized server infrastructure so as to reap the fruits of scalability, flexibility, economy, optimum use of resources offered by cloud computing model etc.

In addition to the above measures, in order to fully sync the Court processes with the latest trends in e-governance, activities like scanning/digitization of case record, document management system for digital archiving/storage/retrieval, business intelligence tools enabled management information systems, judicial and administrative workflow automation etc, are required to be taken up at the earliest possible opportunity as their implementation will require a considerable quantum of efforts, funds and time.

4. Hence another phase:

As a natural phenomenon, the journey covered so far with awareness about the goalposts yet to reach and the miles yet to go has made the stakeholders more impatient to see the justice delivery system of the country optimally transformed by way of modernization enabled by information and communication technology, thereby necessitating an immediate next phase of the e-Courts project which succeeds the current phase without any gap of time or efforts and also carries forward all pendencies, arrears and remainder resources of this phase to the next phase.

Thus, an inevitable component, apart from the other components stated hereinafter, of Phase II of the Project, will be to also serve as a complementary phase to the current phase by taking care of all the pending objectives and targets of this phase in itself with regard to the deliverables of Phase I for all the Courts covered and the Courts covered but not fully accomplished due to time-lags or other operational issues etc. The budgeting of Phase II of the Project will have to be done accordingly. This roll-over component will ensure a seamless transition of the Project to the next phase.

This policy and action plan document proposes the policy as well the implementation model for next phase that is Phase II of the eCourts Project.

Annexures of Chapter 1
1-I – Activities approved in Phase I
1-II – Suggested three phases in report of NPAPIICT
1-III – Present status of Phase I infrastructure and software implementation

CHAPTER 2

IMPLEMENTATION MODEL

EXECUTIVE SUMMARY

1. Experience has shown that decentralization of responsibilities is absolutely necessary. This has also been agreed to by the High Courts.
2. Consequently, at the ground level, the implementing agency will be the High Court. This will include implementation of LAN and procurement of hardware, its maintenance and upkeep.
3. The procurement will be as per the Procurement and Finance Model given in this chapter.
4. Policy inputs including for developing software (Open Source) will be provided by the e-Committee; technical and development support for CIS will be provided by NIC.
5. Financial disbursement arrangements will be so made which are conducive to optimum decentralization and also effectively eliminate delays in project implementation.
6. Project Monitoring Units (PMUs) will be set up at eCommittee and Department of Justice (DoJ) to assist the e-Committee and the DoJ in day to day monitoring of the Project.
7. Accurate and complete information regarding the number and location of courts and number of judicial officers needs to be collected immediately.
8. The formula for providing computers for the courts and laptops to judicial officers will be based on A= courts and judicial officers already covered in phase I; B= courts and judicial officers not covered in phase I due to increase in numbers or any other reason; C= courts and judicial officers that will come into existence till 31st March, 2016. Therefore, the total Courts and Judicial Officers to be covered will be A + B + C.
9. The project period for Phase II will be 3 years with additional adequate support for sustenance after this period.
10. Warranty period and obsolescence for computer hardware will be taken as 3 years and 5 years respectively.

1. Decentralization:

From the experience gained during the present phase of the project, one of the most important lessons learnt is that the majority of the implementation issues have their causes in too much of centralization of the implementation process in the project. This has led to a situation leaving little or no discretion with the High Court and District Courts for even minor implementation issues. One glaring example of this

predicament of High Courts and District Courts is that of dealing with vendors of hardware, LAN and UPS. The vendors having been selected and contracted for by and at NIC, Delhi level do not consider themselves accountable to the High Court / District Courts.

That apart, this factor has also been responsible for not infusing a sense of ownership and leadership amongst the High Courts / District Courts in the implementation of the Project. The aspect of decentralization has already been experimented with regard to construction of Computer Room, supply of DG Sets and Technical Manpower and has worked well so far. Technical manpower agency was earlier managed centrally and for last more than a couple of years, the funds have been transferred to High Courts to engage technical manpower required for project implementation for the remaining man months through an agency or directly. The D. G. Sets for all High Courts have been procured in a decentralized manner from the funds transferred from the Project.

It is therefore necessary that the procurement and supply of computers and indeed of all hardware, should be decentralized. In principle, this has been agreed to by the High Courts and also approved in the meetings of the eCommittee. The Project must be decentralized with greater responsibility being placed on the High Court to ensure that infrastructure, hardware and day-to-day issues are taken care of at their end.

At the same time, eCourts Integrated Mission Mode Project, being a Central Project under the NeGP Plan and for reasons of ensuring uniformity of infrastructure in Courts across the country, it becomes necessary to decide the design and specifications of the infrastructure at a central level. This is also significant from the point of view of software to be used and services to be rendered being more or less unified and centralized with only some variations from State to State. Hardware Infrastructure to be provisioned to the Courts from the eCourts Project, in order to be compliant and seamlessly integrated with rest of the components of the Project, will be recommended along with specifications centrally by the eCommittee with inputs from Department of Justice (DoJ), NIC and other concerned expert and experienced entities in the field.

In view of the above, optimum decentralization deserves to be adopted in the implementation of the Phase II of the Project. In the new decentralized model to be

adopted in Phase II, financial disbursement arrangements will be so made as are conducive to optimum decentralization and also effectively curb delays in Project implementation. The finance and procurement model will finalized in consultation with the High Courts and guidance and directions from Hon'ble the Chief Justice of India.

The High Court will be the agency responsible to deal with the vendors for the hardware and LAN components in the Project. It will also be open for the High Court to engage any agency for preparation of the site as per the specifications prescribed in the Project. Greater flexibility in the implementation of LAN will have to be provided to the High Courts keeping in view the localized vendor availability and its implementation being a major factor of delays.

The design and specifications of the hardware to be procured will be finalized by the eCommittee in consultation with the DoJ, NIC and any other expert technical persons/entities in the field.

The High Court will directly deal with the vendors making the performance of the Project tasks within the time-frame the responsibility of the High Court. The eCommittee or DoJ shall not directly deal with the vendors for the hardware procured for the High Courts or District / Taluka Courts etc.

2. Infrastructure Procurement and Deployment:

As per the policy statement in the paragraph above, the function of infrastructure procurement and its deployment as per the Project guidelines will be entrusted to the High Courts. This infrastructure includes, hardware LAN, UPS, DG sets in the Courts, multiple WAN connectivity from Courts upto SWAN leading to State Data Centres (SDCs) and other equipments being provisioned from the Project from time to time. Any procurement process by the High Courts will be as per the applicable rules to them. The tender publication in the procurement process will also be through Tender ePublishing mechanism offered by Central Public Procurement Portals (www.eprocure.gov.in) or the State Procurement Portal as applicable. eProcurement through such portal will also be preferable if possible and as feasible.

The model for procurement of hardware by High Court and the funds disbursement for the same will be as follows:

Finance and Procurement Model in Phase II of the Project

1. The minimum specifications for procurement of hardware will be decided by the e-Committee in consultation with NIC. Each High Court is at liberty to improve upon the specifications.

2. NIC already has empanelled vendors for e-governance projects. The cost price of each hardware item is either available with each vendor or may be obtained by NIC based on the minimum specifications decided by the e-Committee in consultation with NIC. (say Rs. Z).

3. As only FOSS applications will be used in the hardware being procured, no purchase of any software will be provisioned.

4. The number of items required for each Court/Court Complex is as per the number approved in the Project. (Say 2+6=X).

5. The total requirement of hardware to be procured will be based upon the proposals received from High Courts. (Number of Courts/Court Complexes multiplied by X=Y).

6. The fund requirement for the purchase of Y amount of hardware at Rs. Z per unit can be calculated and transferred to the High Court by the Department of Justice.

7. Thereafter the High Court can adopt either Option A or Option B, that is

   (a) **Option A**:

      i. The High Court will directly issue to an empanelled vendor the Purchase Order, and ensure the procurement and installation of hardware directly by the vendor, as per the minimum specifications (X), for the approved quantum (Y) and at a cost of Y multiplied by Rs. Z.

      ii. If the High Court is desirous of purchasing hardware having improved or better than the minimum specifications, any additional cost in procurement will be borne by the High Court.

      iii. The purchase contract will be only between the High Court and the vendor on mutually acceptable terms.

(b) **Option B**:

i. The High Court will, on its own, carry out the entire tendering process, procurement and installation of hardware directly and independently, as per the specifications (X) given in the central procurement process to procure hardware of quantum Y.

ii. If the High Court is desirous of purchasing hardware having improved or better than the minimum specifications, any additional cost in procurement will be borne by the High Court.

iii. The tendering process will be through Centre/State eProcurement portal.

iv. Upon completion of the tendering process, the Department of Justice will transfer the requisite funds (Y multiplied by Rs. Z) to the High Court.

v. If the tendering process results in an amount in excess of the funds transferred the High Court will bear the extra expenditure incurred.

vi. If the tendering process results in the tender being awarded for an amount less than the funds transferred, the balance will be immediately returned to the Department of Justice.

8. The High Court will directly provide a utilization certificate to the Department of Justice within 30 days of installation of the hardware.

3. Implementing Agency:

In the arrangement of decentralized procurement and vendor management and only centralized design and specifications as given above, the Project cannot go ahead with a unified single agency as an implementation body for the Project. As most of the implementation issues being related to the supply, installation and commissioning of the hardware/LAN infrastructure and the localized efforts involved in service delivery, each High Court will be designated as the Implementing Agency for all the tasks involved upto the Service Delivery by way of actualizing the Litigants Charter of Phase II of the Project.

4. Ownership and Leadership:

The High Courts will be impressed upon to own and lead the Project in their respective jurisdictions as per the plans and policies envisaged in the eCourts

Project. There cannot be true element of ownership and leadership in the implementation of the Project in real sense of the word, unless the High Courts have a role in selection of vendors, deciding their terms of references, Service Level Agreements (SLAs), payment terms, vendor obligation enforcement mechanism etc. All this can only be ensured by the arrangement as recommended in paragraphs hereinabove. With effective and optimum arrangement of decentralization and the scope of decision making for resolving implementation issues by themselves being in place, the sense of ownership and leadership becomes a natural phenomenon and also a responsibility coupled with authority for the High Courts.

5. Infrastructure Costing:

At the time of finalization of design and specifications at the central level, the approximate competitive cost of the equipment to be procured will be recommended. Any procurement of the same by the High Courts will have to be ensured within that cost. The amount will be transferred on finalization of such procurement process by the High Courts. This will be according to the Decentralization Finance and Procurement models to be finalized. There should be a scope of increase in the cost upto 10% for unforeseen or beyond control reasons like price hike etc.

6. Infrastructure and Services of National Informatics Centre (NIC):

There will be continued contribution for the Courts across the country from the resources of National Information Centre (NIC) for Data Centre Infrastructure at National as well State level along with the Disaster Recovery infrastructure, NICNet, Email Portal, NICCA for Digital Signatures for Judicial Officers and Court Officials, Software Development for CIS Core and Websites that is eCourts Portal, NJDG, District Court websites etc. SMS Gateway Infrastructure, FOSS guidance and consultation through Open Technology Group (OTG)-NIC-Chennai and other services and infrastructure of NIC presently available or coming up in future.

Role of NIC infrastructure becomes important for the reason that the Judiciary now would gradually shift to Cloud Computing model using the two tier Cloud Model that is State Level Clouds at State Data Centres (SDCs) for all the Courts of the particular State for all day to day Application and Data Server purposes and National Level Cloud at National Data Centre (NDC) as Disaster Recovery cum Backup Resource.

Courts across the country would also avail the services and infrastructure expertise of NIC to be a part of the National Knowledge Network (NKN) and National Optical Fibre Network (NOFN). In addition to assistance from experts of the respective divisions of NIC to the eCommittee in arriving at the design, specifications and costing of the infrastructure of the Project to be procured by the High Courts, NIC State Coordinator stationed at High Courts / State HQs will be instrumental in coordination and assistance in realizing the Project requirements at High Court level with regard to aspects relating to NDC, SDCs, Cloud for Courts at SDCs-NDC, NKN, NOFN, SWAN-NICNet Integration, WAN for Courts, coordination for Periphery Development and integration of the same with the Core as per eCommittee guidelines etc.

7. Software Resources:

System and Application software as covered in Chapter 5 hereinafter, will be decided centrally by the eCommittee. This is vital for ensuring uniformity and standardization in all softwares being used in the eCourts Project across the country. All the Software Solutions to be deployed for the Courts as a part of initiatives of the eCourts Project will only be Free and Open Source Solutions (FOSS) which also have community driven support on the web. FOSS without any licensing / subscription charges will only be considered for adoption for which the complete source code with build and installation procedures can be made available to the Courts. This is for ensuring that the support on FOSS can be managed through in-house experts and competing multiple vendors who have domain expertise for support and customization of the same.

Further details for System and Software Solutions, Case Information Software (CIS) in the eCourts Project and Workflow/Process Automation software intended to be implemented and any other FOSS Applications are dealt with in the respective chapters on them.

8. Project Management and Monitoring Mechanism:

eCommittee and DoJ will have Project Monitoring Units (PMUs) within their offices for effective management and monitoring of the Project. eCommittee will have to undertake overall management of the Project to ensure that the Project is heading in the right direction and with the right optimal speed. Department of Justice will be

monitoring the budgetary aspects and also the timelines of the implementation as per the Project objectives. Thus there will be following mechanism to monitor Phase II of the Project:

(a) **eCommittee – PMU** with an exclusive Member of the eCommittee [Member (Project Management)] looking after the day to day management and monitoring of the Project activities for their timely and proper execution assisted by a Personal Assistant and team of a Branch Officer, one Sr. Court Assistant , two Jr. Court Assistants, Data Entry Operator and Office Assistant support staff etc.

(b) **DoJ – PMU** with Joint Secretary, DoJ and a team comprising of a Director/DS with a PA, an Under Secretary with a PA, a Section Officer, two assistants, a typist and an outsourced expert in project management looking after day to day managing and monitoring of the Project for budgetary aspects, release of funds and timely completion of financial deadlines, responsibilities towards the parliament etc

9. Project Progress Monitoring System (PPMS) portal: The present PPMS (Project Progress Monitoring System) portal will be overhauled and revamped with more useful and MIS like features in order the facilitate both PMUs of the Project in effectively monitoring the progress and ensuring timely follow up action on any slippages in execution of the tasks. PPMS, though in a more robust form than present, may be eminently useful for PMUs to do constructive/timely monitoring. The requirements of resources like manpower or infrastructure may be met from the Project Management and Monitoring budget (Head No. 17) of the eCourts Project

10. Disbursal and Management of Project Funds:

(a) DoJ will take the necessary financial approvals from EFC and the competent authority for funds to be disbursed under the Project to High Courts for the Project components as per the Project approval. Empowered Committee will be authorized to reallocate funds across heads where recommended by eCommittee and considered feasible.

(b) A part of the funds under the heads of Project Management and Monitoring (Head No. 17 – Cost Estimates) will always be readily available for disbursement on due approval and rules/procedures on requirements

related to Project Management and Monitoring by the eCommittee and DoJ PMUs.

(c) The funds under the heads Manpower Resources (Head No. 8), Software Development, Customization and Support (Head No. 14), Change Management and Capacity Building (Head No. 15), Judicial Process Reengineering (Head No. 16) will be disbursed on recommendation of the eCommittee.

(d) A contingency fund for emergency needs of eCommittee will be provided for in the proposal and drawn by eCommittee directly from DoJ.

11. Identification of Courts and Judicial Officers:

(a) **Courts:** All courts and court complexes (old and new) must be identified at the earliest. An exercise is presently underway (as a test), with the assistance of a mobile application software made available by DeitY on the lines of the application used by Election Commission of India (used for booth locations and number) to actually locate each court complex and the exact number of courts available in that complex. This exercise is proposed to be carried out with the active assistance of the District Judges. The proposed time-line of completion is 31st March 2014. The result of this exercise will be made available on the e-Courts portal. An overall formula for ascertaining the number of Courts to be covered by the Project is recommended as follows:

(i) A = Courts already covered under Phase I

(ii) B = Courts not covered / left out in Phase I

(iii) C = Courts to be created during Phase II of the Project upto a cut-off date.

Courts to be covered in Phase II of the Project =

A (for remainder and the obsolete hardware / LAN) + B + C

(iv) The cut-off date referred above will not be earlier than two years of the duration of the Phase II of 3 years that is if the Phase II is to commence from 1st April, 2014 the Courts that may be created upto 31st March, 2016 will be the figure at C above.. A tentative number

as upper limit may be fixed for these Courts under category C keeping the target as per the judgment of the Hon'ble Supreme Court to double the judge strength in a period of five years. Taking the present strength of the Judicial Officers at around 16000, and the target of doubling the same in five years, 6400 Courts can be expected to be created in next two years that is the Project duration of the Phase II. Thus, for the figures under C category of Courts, the target number will be arrived at as 22400 Courts. A provision for adding more Courts than this figure, if created by 31st March, 2016 will also have to be made in the budget allocation.

(v) The remainder of the hardware/LAN for the courts of figure A above will be calculated by deducting the hardware/LAN provided in Phase I from the hardware/LAN to be provided in Phase II. If the hardware provided to Courts (under category A) is five or more years old, the same will be considered obsolete and full hardware as to be given in Phase II, will be provided to the Court. The cut-off date for calculating obsolescence of hardware will be the end of Project duration as referred above.

(vi) The inclusion of Courts in dilapidated/rented buildings will be considered with a yardstick of one year of duration of the Court expected to be there in such building. Thus the Courts which are expected to be shifted to new/other building in less than a year, will be considered only after being shifted. Another pre-requisite for considering Courts in dilapidated/rented buildings will be that on future shifting of such Courts from those premises, the expenditure of laying fresh LAN in the destination premises will be borne by the High Court / State Government. The Judicial Service cum Central Filing Centre may have to be arranged in suitable make-shift porta cabin.

(b) Judicial Officers: At any given time, it is not possible to say exactly how many judicial officers are in position. An exercise has been initiated by requesting every High Court to provide a Unique Identification Number (UID) to every Judicial Officer. The UID will be prefixed with two alphabets

representing the State, as for example with motor vehicles. The proposed time-line is 31st December, 2013. This information will be uploaded on the e-Courts portal. Each High Court will have to take the initiative in completing this exercise and to keep the information up-to-date. An overall formula for ascertaining the number of Judicial Officers to be covered by the Project is recommended as follows:

(i) A = Judicial Officers already covered under Phase I

(ii) B = Judicial Officers not covered / left out in Phase I

(iii) C = Judicial Officers to join during Phase II of the Project upto a cut-off date.

Judicial Officers to be covered in Phase II of the Project for Laptops and Printers = A (for obsolete laptops/printers) + B + C

(iv) The cut-off date referred above will not be earlier than two years of the duration of the Phase II of 3 years that is if the Phase II is to commence from 1st April, 2014 the Courts that may be created upto 31st March, 2016 will be the figure at C above. A tentative number as upper limit may be fixed for the number of Judicial Officers under category C keeping the target as per the calculation given above with 5 % addition to the figures for the Judicial Officers who may not be holding Courts for being on deputation to High Court/State Govt/Judicial Academies or any other bodies. This is required as the number of Judicial Officers are always higher than the number of Courts for a High Court. The laptops should be provided for all Judicial Officers whether on judicial or non-judicial/administration duties. Thus the figure for arriving category C figure will be 22400 + 1120 = 23520.

(v) If the laptop and printer provided to the Judicial Officers (under category A) are five or more years old, the same will be considered obsolete and new laptop and printer as to be given in Phase II will be provided to the Judicial Officer. The cut-off for calculating obsolescence of hardware will be the end of the Project duration as referred above.

(vi) Thus most of the coverage of Courts and Judicial Officer will be finalized by 31st March, 2016 so that all the needful activities with regard to the implementation may be finished well before the end of the Project.

12. Contingency Budget Head: Like Phase I of the Project, a budget-head for contingency expenditure will have to be provided to meet with the urgent miscellaneous expenses for effective and expeditious implementation of the Project. Apart from the earlier purposes and tasks covered by contingency expenses like hardware/LAN issues hampering the implementation/sustenance of the Project, aspects like justified data entry expenses requirement for District Courts, Conferences/meetings arrangement, officials travelling expenditure by eCommittee/DoJ functionaries, equipments/infrastructure requirements for PMUs etc. will have to be covered by the contingency budget head in Phase II. This list is illustrative only and any incidental expenditure for meeting with the Project objectives may be met with from this head as per Project approvals from time to time.

13. The duration of the Phase II: Keeping in view the advancement of eGovernance in other sectors and the required pace to reach the optimum computerization in order deliver the litigant centric services at the earliest, it is intended to implement Phase II of the Project in an accelerated manner. All the infrastructure requirements will be provided in first year of the Project, the rest of the software and knowledge intensive activities and scanning/digitization are planned to be accomplished in the next two years of the Project. Thus the ideal timeline for Phase II of the Project with all the components as proposed in this document is three years. Although support for sustenance of the components of Phase II will have to be provisioned for adequate additional period.

14. Transition from Phase I to Phase II :

The resource requirement estimation for Phase II of the Project should be so done that all the pending tasks of the current Phase I are also carried forward to the Phase II of the Project. The carried forward arrears of the Phase I of the Project will be taken up for implementation along with the components of Phase II as per this policy and action plan of Phase II.

The budgeting of the Phase II will take care of all the pending objectives and targets of this phase in itself with regard to the deliverables of Phase I for all the Courts covered and the Courts covered but not fully accomplished due to time-lags or other operational issues etc. This roll-over component will ensure a smooth seamless transition of the Project to the next phase.

The transition from Phase I to Phase II of the Project is also required to be so managed that there is no halt of activities or gap in the Project durations between Phase I and Phase II. A separate note in this regard is annexed at Annexure 2-I with Annexure 2-II.

Annexures of Chapter 2
2-I – Extension/transition of Phase I to Phase II of the eCourts project
2-II – Total Courts as on 30th November, 2013

CHAPTER 3

INSTITUTIONAL STRUCTURE

EXECUTIVE SUMMARY

1. The composition of the e-Committee generally remains the same. However, given the volume of work involved, one more regular member has been added and the list of invitee members has been made more broad-based.
2. The e-Committee will be involved in policy planning and providing strategic direction and guidance for the effective implementation of the Project.
3. In addition to its existing responsibilities, the DoJ will continue to monitor and assist in the implementation of the Project and will, additionally, be responsible to convene Empowered Committee as and when required.
4. The High Courts will be the implementing agencies for the Project in respect of the areas under its jurisdiction.
5. The High Courts will have the assistance of the High Court Computer Committee, Central Project Coordinator, District Court Computer Committees and a nodal officer for each district.

eCommittee is a body constituted by the Government of India under the Supreme Court of India for policy formation on and implementation of Information and Communication Technology in the Courts across the Country. eCourts Mission Mode Project, is a pan India Project funded by Department of Justice, Ministry of Law and Justice, Government of India for the Courts across the country. This necessitates closely coordinated efforts by eCommittee of the Supreme Court of India and the Department of Justice for realization of the goals set for ICT enablement of the Courts through eCourts Project. The proposed Implementation model as given in Chapter 2 hereinbefore will necessitate augmentation of teams at eCommittee as well as DoJ for effective and efficient management and monitoring of the Project. The detailed institutional structure for the purpose of implementation, management and monitoring of the phase II of eCourts Project is as follows:

1. Composition of the eCommittee, Supreme Court of India for Phase II:

(a) Hon'ble the Chief Justice of India as Patron-in-Chief of the eCommittee

(b) Hon'ble Judge Incharge, eCommittee.

(c) Regular Members:

(i) **Member (Processes) :** Generally to look after areas relating to implementation and application of Judicial Processes and automation thereof with respect to computerization of the Courts, documentation; aspects of judicial/administrative process workflow of Court functioning, Court Management and their incorporation in CIS, and eCommittee office administration, arrangements of Meetings, liasoning with and representation at DoJ and other Government Departments for Project implementation, eCommittee correspondence, coordination amongst Members-eCommittee.

(ii) **Member (Project Management)** : Generally to look after the Project Monitoring Unit (PMU) of the eCommittee and coordination with DoJ-PMU, also to look after overall day to day functions of the eCommittee-PMU and data collection and collation exercise and thereby consolidation of overall progress status of eCommittee and eCourts Project.

(iii) **Member (Human Resources)** : Generally to look after areas relating to management and monitoring of Human Resources provisioned through the Project, ICT training and capacity building of Judicial Officers and Court Officials, Tutorial Material and content development, Change Management exercise including the attitudinal and mindset change aspect

(iv) **Member (Systems)** : Generally to look after areas of Operating System and Application Software customization, deployment and development exercise being directly undertaken by the eCommittee and through other agencies like NIC and finalization of design and specifications of the infrastructure of Hardware/LAN/WAN etc. being provisioned under the eCourts Project.

A. Members at (i) to (iii) will be Judicial Officers called on deputation for eCommittee, Supreme Court of India from any of the States, of the rank of District and Sessions Judge or above or of the rank of Sr. Civil Judge / Chief Judicial Magistrate with overall service of more than 10 years in the Judiciary in the pay scale starting from Rs. 37400 – 67000 + 10000 (Pay band) or as per his/her cadre/scale in

parent department as per rules followed in the Supreme Court Registry. Judge In charge / Chairperson eCommittee may also recommend any other suitable candidate of equivalent/comparable rank for any of these positions.

B. Members at (iv) will be officer on deputation or on post retirement assignment to eCommittee, Supreme Court of India, of the rank of Dy. D. G., NIC (or equivalent) with sufficient experience and know-how in the field of software development / customization / deployment essentially in the area of FOSS technologies, design and specifications of hardware/LAN/WAN etc. along with tender documentation and processing. The salary will depend on the parent cadre of the candidate in case of deputation and as per pay minus pension arrangement or as per rules applicable in Supreme Court Registry. Judge In charge / Chairperson eCommittee may also recommend any other suitable candidate of equivalent/comparable rank for any of these positions.

C. Additional contractual support staff will need to be supplemented from the eCourts Project under the Manpower Resources head as given in Chapter on manpower resources.

(d) Invitee Members:

(i) Attorney General for India (ex-officio)

(ii) Solicitor General of India (ex-officio)

(iii) Hon'ble Judge from any High Court

(iv) Sr. Advocate, Supreme Court of India

(v) Representative of Bar Council of India

(vi) Secretary General, Supreme Court of India (ex-officio)

(vii) Secretary, Department of Electronics and Information Technology, Govt. of India (ex-officio)

(viii) Secretary, Department of Justice, Govt. of India (ex-officio)

(ix) Mission Director, eGovernance, DeitY (ex-officio)

(x) Director General, National Informatics Centre (NIC) (ex-officio)

(xi) Director General, Centre for Development of Advanced Computing (CDAC) (ex-officio)

(xii) Joint Secretary (Plan Finance II), Department of Expenditure, Govt. of India

(xiii) Joint Secretary and Mission Leader, eCourts MMP, DoJ

A. List of Invitee Members of the eCommittee will be open for review and revision by the Judge In charge/ Chairperson-eCommittee / Hon'ble the Chief Justice of India

B. Judge In charge eCommittee and/or CJI will be authorized to invite or co-opt additional members depending upon the subject to be discussed.

(e) Functions and Role of the eCommittee: eCommittee will provide policy planning, strategic direction and guidance to the Project for effective implementation of all components of the Project, the aspects incidental thereto and for resolution of issues hindering implementation of the Project.

2. Department of Justice, Govt. of India

(a) Role and Functions:

(i) Department of Justice (DoJ) will be responsible for necessary financial and other approvals from competent authorities, convening of the Empowered Committee and for disbursement to High Courts or other approved agencies at Centre for various Project components. The Empowered Committee shall be chaired by Secretary (Justice) and have as members representatives of eCommittee, Planning Commission, Department of Expenditure, DeitY and IFD of Ministry of Law and Justice.

(ii) DoJ will also be monitoring the budgetary aspects and also the timelines of the implementation as per the Project objectives through its Project Monitoring Unit that is DoJ-PMU, as well as be responsible for matters relating to Parliament.

(iii) Empowered Committee will be competent to re-allocate funds within

various Project components within the overall numerical and financial ceilings of the Project, including on recommendation of the eCommittee.

3. High Courts:

(a) Implementing Agency: As given in the Chapter 2 hereinbefore, the High Court will be the Implementing Agency for implementation of the Project in the Courts under its jurisdiction. This arrangement, apart from giving the requisite authority to High Court in resolving implementation issues, also entails responsibility to have the Project components implemented on time and the service delivery initiated as per the Litigants' Charter. For effectively implementing these objectives, the High Courts will continue to have the institutional structure as follows:

(i) High Court Computer Committee (HCCC): The High Court Computer Committee consisting of two or more sitting High Court Judges would oversee the various tasks related to implementation of eCourts Project components. The High Court Computer Committee would recommend various policy measures, administrative restructuring essential for ICT implementation in consultation with the E-Committee. Only the active participation, supervision and guidance of the High Court Computer Committee can ensure the successful implementation of the Project. This becomes more important in view of the effective decentralization being introduced in the Project and the High Court becoming the Implementing Agency of the Project.

(ii) Central Project Coordinator (CPC): The Central Project Coordinator would be a person of the rank of District Judge or Senior Civil Judge, who would co-ordinate the implementation of various modules/ tasks of the Project. The Central Project Coordinator would have a dedicated team of identified supporting staff. The CPC would coordinate with the eCommittee and the vendors, Connectivity Providers, State Data Centre, NIC-Pune team (for CIS) etc. for the implementation of all the tasks entrusted by the E-Committee. The Central Project Coordinator should be associated full time and exclusively for the eCourts Project. The responsibilities assigned to

the Central Project Coordinator are quite onerous and the Chief Justice of the High Court may be requested to nominate a competent and efficient officer as a Central Project Coordinator. The Computer Committee of the High Court should ensure that the Central Project Coordinator adheres to the timelines and targets. Communication channels must be kept open with the eCommittee at all times through ecourts.nic.in that is the PPMS portal. The eCommittee will be accessing these websites on a daily basis. Central Project Coordinators should update the information on a weekly basis. It will be reiterated to the High Courts that the CPC should be exclusively working for computerization only and no other unrelated duty should be assigned to the CPC. Apart from the duties relating to infrastructure deployment, the CPC will also be responsible for overall control of the CIS Periphery Development Team in coordination with the High Court NIC Coordinator for periphery development and its proper integration with CIS Core as per eCommittee guidelines.

(iii) District Court Computer Committee (DCCC): The District Court Computer Committee would consist of one Senior Additional District Judge and two Sr. Civil Judges or one Sr. Civil Judge one Civil Judge along with District System Administrators and System Administrator trained during the Phase I of the Project. This Committee would perform the overall monitoring of the Project implementation in the District under the overall supervision of the Principal District Judge. This Committee would work in close co-ordination with the Central Project Coordinator (CPC) of the High Court. The committee would undertake the various tasks detailed in the subsequent chapters, at District and Taluka/Tehsil/Sub-division levels.

(iv) Nodal Officer for Every Court Complex: There will be a Judicial Officer designated as a Nodal Officer in every Court Complex who is well conversant with ICT concepts and takes keen interest in computerization of the Courts. The Nodal Officer of the Court Complex will be the point of day to day contact for the CPC of the

High Court for follow up and monitoring of the Project progress and resolving the implementation issues.

CHAPTER 4

INFRASTRUCTURE MODEL

EXECUTIVE SUMMARY

1. Emphasis will be on cloud computing and therefore Server Rooms (as at present) will be replaced by Network Rooms. The specifications of these rooms will be decided on the basis of the number of courts in the complex.
2. To the extent possible, the existing Judicial Service Centres will be utilized as Reception and Inquiry Centres and also as Centralized Filing Centres. Additional hardware will be required for this purpose.
3. Minimum hardware for a court room, for a court complex and for a judicial officer is discussed in this Chapter. It is proposed to provide for newly created courts, newly recruited judicial officers and those courts and judicial officers not covered in Phase I. Obsolete hardware has also been provided for. The calculation is based on the formula mentioned in Chapter 2 above. Future requirements based on the Project document have been provided for to avoid any mid-stream shortfalls.
4. Display monitors outside every Court Room and in the Bar Rooms as Display Board for litigants and lawyers are also provided for.
5. Computerization of the offices of District Legal Services Authority (DLSA) and Taluka Legal Services Committee (TLSC) has also been provided for in this Phase of the Project.
6. The emphasis in this Phase will be on cloud computing, which is more efficient and cost effective. The existing hardware, not necessary with cloud computing will not be discarded but utilized elsewhere or within the same court complex.
7. It is proposed that State Data Centres will be used for Private Court Clouds. Disaster Recovery Centres for these Court Clouds will also be needed.
8. Connectivity has been a problem in Phase I of the Project. Therefore, all resources will be utilized for better connectivity, including WAN, SWAN, NICNET, NKN, NOFN etc. This is important considering that video-conferencing will have greater emphasis in this Phase.
9. Dependence on power back-up such as DG sets and UPS will continue. It is, however, also proposed that solar energy may be utilized in court complexes wherever feasible.

The edifice of computerization (egovernance) stands upon the infrastructure through which its software and human resources function to deliver the intended services. Howsoever efficient the software and *humanware* may be, if the hardware/networking infrastructure is not of the desired design, quantity and quality, the resources invested on software, hardware and *humanware* are bound to

under-perform, if not fail. It therefore becomes extremely important to provision the infrastructure considering the holistic vision of the output intended from the computerisation Project.

Sufficient Infrastructure the only option: The per Court and per Court Complex hardware infrastructure provided in Phase I of the Project has not been sufficient in actualizing a full-fledged computerized Court or Court Complex. The hardware has only been sufficient to use CIS for data entry, case updation, order/judgment writing and cause list generation. The Courts have not been able to fully shift to automated processes due to paucity of hardware provided and providing for obsolescence.

Phase II of the Project aims to take a holistic approach in computerizing and for automating the processes of the Courts, the requirement of hardware will be considerably higher than planned or provided in Phase I of the Project. For fully utilizing the infrastructure of Judicial Service Centre (JSC), using computers for process of Registry like certified copies issuance, process issuance, process service monitoring, judicial accounting, Court Library management, other workflow/process automation applications like eOffice etc. sufficient hardware infrastructure will invariably be required for all the Courts of the country.

The Working Group Report for the 12th Five Year Plan of Department of Justice, has also envisaged additional activities for inclusion in next phase of the eCourts Mission Mode Project that is use of solar energy, Video-conferencing facility for Jails, Enhancement of ICT infrastructure at Subordinate Courts, Digitization of old case records, Computerization of Judicial libraries, SMS Based Services, Touch Screen Kiosks etc. Therefore, the infrastructure model to be adopted in Phase II of the Project must holistically take care of all these aspects also.

Therefore, the following infrastructure model is necessary for effective implementation of the Project.

1. Sites - Network Rooms (NR): There have been two components of Sites that is Court Complexes namely Judicial Service Centre (JSC) and Computer Server Room (CSR). The Phase II of the Project will adopt the Cloud Computing Architecture for all application and database requirements for the Courts. Under the Cloud Computing Environment, applications and databases used by the Courts will

be hosted in Cloud Environment facilitated at State Data Centres (SDCs). As the server infrastructure will not be required at Court Complexes coming up on Cloud, new Court Complexes to be computerized in Phase II of the Project will have a Network Room instead of Computer Server Room. Though the size and other amenities for the Network Room may be more or less similar to Computer Server Room.

The technical specifications of the Network Room to be set-up will be finalized as per the requirements of the Court Complexes of varying number of Courts. The methodology for optimum utilization of the server infrastructure provided at Court Complex level in Phase I is proposed hereinafter.

2. Sites – Judicial Service Centre (JSC): The Judicial Service (JSC) in the Court Complexes will be utilized as a hub for Reception cum Inquiry and also as a Central Filing Centre (CFC). The JSCs provisioned in Phase I of the Project could not be utilized as Central Filing Centres, since the allocated hardware was insufficient and in some cases, the space was insufficient. Therefore, Phase II of the Project envisages to optimally utilize JSCs also as Centralized Filing Centre which is more litigant friendly and economic in resource utilization. The JSC cum CFC will be utilized along with other services for the litigants like case status information, certified copies, inquiries etc. only except where it is not feasible to for space constraints to have a CFC. In new Court Complexes, the provision of JSC-cum-CFC with sufficient space and civil/electrical infrastructure will have to be ensured as primary requirement. The technical specifications of the JSC-cum-CFC to be setup will be finalized as per the requirements of the Court Complexes of varying number of Courts.

3. Court Local Infrastructure Requirement Assessment Method: For simplification of the resource requirement assessment and avoiding the failures posed by complex methods of requirement calculations adopted earlier, it is recommended to use method of prescribing minimum basic infrastructure per Court/Court Complex/Judicial Officer which then can be multiplied with number Courts/Court Complexes/Judicial Officers to arrive at total infrastructure requirement. The number of Courts/Court Complexes/Judicial Officer to be used as multiplier will be calculated as per the ABC formula given in Para 11 of Chapter 2 of this document.

(a) Basic Infrastructure Requirement for a Court Room: The Basic Infrastructure for Court Room has been calculated keeping in view (including) the requirements of Computers, Thin Clients, Printers etc. at JSC and CFC for all related functionalities thereat, Registry processes like Certified Copies, Computer Generated Summon/Notices/Warrants, Judicial Accounting (Nazarat Section), retrieval of scanned/digitized case records, Email for Court Officials, Workflow/Process Automation Applications for administrative processes, Court Library etc. The LAN points will also have to cater to the requirement of using the laptop of the Judicial Officer in chamber as well as on dais. The hardware requirement assessment has been proposed so as to take care of not only the Court Room judicial functions but also the functions associated with Court Administration and Court Management.

Basic Infrastructure Requirement for a Court Room	
Infrastructure Item	Quantity
Slimline PC with latest optimum configuration	2
Thin / Shared / Cloud Computing Client	6
Printers (1 MFD Printer with ethernet port + 1 Duplex Printer with ethernet Port)	2
LAN Points	12
Extra Monitor + 2 port VGA Splitter/Extension/Distribution Unit	1
UPS 2 KVA with 2 hour backup	1
Display Monitor for Current Case Display Board outside Court Room with basic shared computing or thin client	1

These 8 systems can be 2 PCs with 6 thin clients as per the specifications prevalent in Phase I or 8 special configuration laptops having backup time

of more than 3 hours. In case of laptops with this much backup time being provided, the UPS for the Court as given hereinbelow will be omitted.

(b) Basic Infrastructure Requirement for a Court Complex:

Basic Infrastructure Requirement for a Court Complex	
Infrastructure Item	Quantity
Projector with screen	1
Kiosk with Printing Facility	0.2
Printers (1 MFD Printer with ethernet port + 1 Duplex Printer with ethernet Port) (except single court complexes)	2
Big Display Monitor for Current Case Display Board in the Bar Room with basic shared computing or thin client	1
USB Hard disk for Backup (1 TB or above)	1
D. G. Set with Online UPS for Network Room 5/10/15 KVA with 2 hour backup	1
Racks + Switches and LAN Points for Network Room etc.	As per LAN WAN requirement
Authentication Devices with GPS, GPRS, Camera etc. for Process Servers	As per requirement

(c) The minimum Kiosk to be supplied will be one for a Court Complex and the actual number of Kiosks to be supplied will be the number rounded off to nearest number. The number of Process Servers working with the District / Taluka Courts under each High Courts will have to be ascertained with regard to the infrastructure of Authentication Devices (e.g. PDAs) for Process Servers.

(d) The kiosk (with touch-screen and printer) will be a major tool for providing instant and most accessible litigant centric mechanism for service delivery. The services listed in Litigants' Charter in Chapter 14 have an important parameter whether the same are being provided through the Kiosk installed in the Court Complex. It is therefore proposed to provide for touch-screen kiosks with printer facility for all the Court Complexes wherein apart from viewing the information on the screen, the same can also be printed on the paper by the person accessing it. The charging mechanism may be either free or on nominal reasonable charges which do not require any human intervention and can be inserted in the machine itself like coins etc.

(e) Local Area Network:

(i) LAN Nodes location details will be finalized by the Administrative Head of the Court Complex with the assistance of District Court Computer Committee (DCCC) and Nodal Officer under the overall guidance of the High Court Computer Committee.

(ii) Site Preparation and LAN Implementation activities will have to be taken simultaneously as much as possible and in fast tracked mode.

(iii) All switches will be given requisite UPS with 2 hour backup time.

(iv) The LAN Points for JSC-cum-CFC and Registry will be provisioned from the 12 points per Court Room in as given in paragraph (a) above.

(v) The LAN points requirement has been arrived considering the usage of laptop by Judicial Officers, usage of LAN point for ethernet port enabled Printers and allocation/shifting of hardware to and from JSC-CFC and redundancy.

As it is very difficult if not impossible to calculate the exact number of Court Officials using computers for all of the above functions in different Courts of the country, the Base Unit of Infrastructure multiplied by the total number of Courts comes out to be the scientific and practicable method to calculate the total infrastructure requirements for the Courts. This model of requirement assessment leaves upon the wisdom and discretion of the Principal Judicial Officer

(PDJ/PJ/DSJ/CJM/PSCJ/PCJ etc.) having overall administrative control over the Court Complex to optimally distribute the infrastructure with the prime objective of attaining the maximum delivery of litigant services coupled with maximum judicial output by the Courts concerned. The number of LAN points in the Base Unit of Infrastructure is to be so fixed which gives this flexibility to the Courts for optimal and variable arrangement of distribution of hardware. The priority of sufficient requisite allocation of infrastructure at JSC-cum-CFC functions will be impressed upon and periodically reiterated with the High Courts and District Court computer committees.

4. Rationale for 2 + 6 (8) systems in per Court-Room hardware:

As stated above, the hardware of 2 + 6 (8) systems has been arrived as per Court Hardware Requirement Assessment model instead of slab based model which also caters to all other computer systems requirements of all the judicial as well as administrative processes requirement. The calculation of ideal hardware requirement and conservative requirement taking into consideration multiple duties with same personnel and sharing of systems by multiple personnel in a Court may be tabulated as follows:

Rationale for 2 + 6 Systems in Court Room Hardware				
Sr. No.	**Section**	**Personnel/Process**	**Computer Systems Ideally Required**	**Conservative Requirement**
1.	Court-Room	Bench Clerk / Reader / Shirestedar / Court Master etc. on dais	1	2
		Steno on dais	1	
		Ahlmad / Case Record Keeper / Misc. Clerk in the Court Room	1	
		Judicial Officer	Judicial Officer's Laptop	
2.	Judge's Chamber / Steno Room	Judicial Officer	Judicial Officer's Laptop	
		Steno Room	1	1

Rationale for 2 + 6 Systems in Court Room Hardware				
Sr. No.	**Section**	**Personnel/Process**	**Computer Systems Ideally Required**	**Conservative Requirement**
3.	JSC cum CFC	Filing/Scrutiny/Registration/Allocation	1	2
		Enquiry / Case Status & all services mentioned in the Litigant's Charter to be delivered from JSC-cum-CFC	1	
		Certified-Uncertified Copies Issuance	1	
4.	Registry Sections	Process Issuance	1	3
		Court Administration /Email for Court Officials/ eOffice (eFile/eHR/eLeave etc.) & other Office Automation Applications	1	
		Nazarat / Accounts	1	
		Record Room / Scanned / Digitized Records Access (DMS)	1	
5	Court Library	Librarian	1	
		Library Assistant	1	
	Total....	**Computer Systems**	**13**	**8**
		Judicial Officer's Laptop	**1**	

In view of the above, the overall conservative requirement of hardware for a single Court is arrived at as eight systems (combination of slimline PC with thin-clients/shared computing clients or all special configuration laptops depending upon the suitability and economy). The LAN Points Requirement, in addition to for these eight systems, will also be required for Judicial Officers' Laptop at two locations (2), Display Board Monitor outside Court Room (1) and one for the Printer having ethernet port, will be 12 per Court.

In case of there being more number of Courts in a Court Complex, the hardware to be provided will calculated by multiplying the number of Courts to per Court unit hardware. When the number of Courts increases, the number of personnel working in the Court Complex also rises. The related administrative functions also multiply for proper court administration of the Court complex. All this increased administrative workload cannot alone be met with the per-Court Complex hardware provisioned above as there are no computer systems in the per-Court Complex hardware unit proposed.

There will be corresponding increase in the JSC-CFC Service Windows with the increase in the number of Courts in the Court complex. The more the number of Courts, the more is the Registry workload in terms of process issuance, copying branch, as there is direct impact on the process issuance and copying branch work with multiple Judicial Officers working in the same Court Complex / Judicial Establishment. There will also be a parallel impact on record room, library, office automation functions. Looking to the services to be delivered as given in the Litigant's Charter through JSC-CFC, Kiosk, Web, Mobile Application, SMS etc., there will be a considerable back-end workload for the Court Officials in order to deliver the services e.g. the back-end processes involved in issuing bar-coded digitally signed certified copies online etc.

Moreover, with the objective of eliminating manual registers (process re-engineering) and the pressure on timely and complete data entry due to the transparency brought about by computerization and automation, the output cannot be allowed to be adversely affected due to insufficiency of hardware.

Furthermore, by way of abundant precaution and to ensure optimum utilization of resources, there will be defined mechanism of approval of hardware requirement by the eCommittee as given in the paragraph 5 hereinafter.

5. Mechanism for vetting by the eCommittee of the proposals sent by High Courts for hardware requirement:

In order to ensure optimum utilization of hardware resources and to avoid any excess / shortage of hardware for the Courts, the proposals of overall hardware requirement for all the Courts under the High Court will be vetted/ratified by the

eCommittee on the considerations of actual requirement of the Courts subject to the availability of sufficient Court Officials working on the systems. The approvals will be so accorded that the total requirements for all Courts under a particular High Court will be within the total hardware requirements for all the Courts calculated based upon the above given per Court and per Court Complex hardware requirement. As there may be variations in the deployment of basic computer infrastructure, based on court size; however, the overall average for the State would need to conform to the quantum of hardware as given in paragraph 3 above. The High Courts will draw proposals on the following criterion:

1. Readiness of site (JSC-CFC and NR) as per approved specifications with requirement power points
2. Availability of space for the hardware being sought
3. Availability of sufficient personnel to work on the hardware being sought
4. Justification of the hardware requirement keeping in view the workload, pendency, service transactions etc.
5. Undertaking to implement the Registry Process automation, library automation, scanning/digitization, Record Room Automation, office automation as the hardware requirement for the same is part of the per Court hardware calculation given above.
6. Undertaking to use only FOSS Applications as approved by the eCommittee with/onto the hardware procured from the project.
7. Undertaking to provision optimum/sufficient hardware for JSC-cum-CFC and to provide all the services as per the Litigant's Charter.

6. Basic Infrastructure Requirement for a Judicial Officer:

In phase I of the project, the Judicial Officers have been provided with a Laptop and a Laser Printer. Continuing this vital infrastructure in also in phase II of the project, laptop with printer and UPS for the printer will have to be provided in order to ensure optimum utilization of the same: The basic infrastructure requirement unit for a Judicial Officer will be as follows:

Basic Infrastructure Requirement for a Judicial Officer	
Infrastructure Item	Quantity
Laptop with webcam, multimedia, wifi etc.	1
Laser Printer	1
UPS (500-600 VA with 30 min backup) for printer	1

7. Basic Infrastructure for Legal Aid if existing in the Court Complex:

The Legal Aid setup has become an integral part of the justice delivery system. The office of District Legal Service Authority (DLSA) and Taluka Legal Services Committee (TLSC) are required to work in tandem with the Court processes for holding of lok adalats, listing of cases in lok-adalats, the cause lists, proceedings, orders etc. in those cases. This requires the DLSA and TLSC office to be integrated with rest of the Court complex ICT infrastructure. The Member Secretary at DLSA is a Judicial Officer, who will also have to use the laptop for his official duties. Therefore, the infrastructure for DLSA/TLSC is highly necessary to be provided which is proposed as follows:

District Legal Services Authority (DLSA)	
Infrastructure Item	Quantity
Slimline PC with latest optimum configuration	1
Thin / Shared / Cloud Computing Client	2
MFD Printer with Duplex with Ethernet Port	1
LAN Points	6
UPS 1 KVA with 1 hour backup	1

Taluka Legal Services Committee (TLSC)	
Infrastructure Item	Quantity
Thin / Shared / Cloud Computing Client	2
Printer (Duplex with Ethernet Port)	1
LAN Points	4
UPS 1 KVA with 1 hour backup	1

8. Cloud Computing Architecture:

To keep up with the advancement in computing technology, it is now high time that computerization of Courts Project also adopts the Cloud Computing Architecture like other eGovernance Projects. The cloud computing environment offers unique and valuable benefits for an eGovernance Project including the reduction in server infrastructure cost, centralized/federated application management, efficient server and resources management, automated scalability of application/web/database servers, management of resources during high demand and peak time phases, technical manpower cost saving etc. The Government of India has also promoted on policy level the use of cloud environment for eGovernance Project. On studying the features of the cloud environment and looking to the requirements of the Courts Computerization, it is recommended to have Private Clouds based on Openstack Cloud at State Data Centres level for the Courts within that State with D. R. of all of the SDC Cloud Installations at National Data Centre (NDC) making it a two tier Cloud Environment for Courts of the Country. The Cloud Environment apart from covering the court in Phase II, will also cover the Courts already computerized in Phase I of the Project as the central application and database server for all Courts will be at SDCs only. The server infrastructure already provided in Phase I will be suitably utilized as given hereinafter.

9. Wide Area Network (WAN) Connectivity for Cloud:

Shifting to Cloud Environment will need meticulously coordinated efforts in phased manner on the part of eCommittee, DoJ, DeitY, NIC, NDC, SDC and High

Courts. This will also call for a seamless, stable, reliable and secure connectivity from all Court Complexes in the country upto the State Data Centres located in the respective States. A right mix of options like SWAN, NICNET, 3G, Broadband, MPLS, NKN and NOFN, Wimax/VSAT can only ensure uninterrupted connectivity for the Courts across the country.

(a) Last Mile Connectivity with SWAN:

(i) The first preferred WAN infrastructure for the Courts will the State Wide Area Network (SWAN). It is required to ensure seamless, reliable, stable and uninterrupted connectivity from the Court Complex upto the nearest SWAN Point of Presence (PoP).

(ii) This connectivity upto SWAN PoP from the Court Complex will be with optimum bandwidth that can comfortably meet with the bandwidth requirement of the whole Court Complex. If the SWAN is not directly reaching by itself upto the Court Complex, the Project will have to provide for the infrastructure with recurring expenditure upto the Project period to have Last Mile Connectivity with Leased Line / Multiprotocol Label Switching (MPLS) / Wimax mechanism.

(b) Permanent Additional Connectivity Option upto State Data Centre: In addition to the connectivity provisioning suggested at (ii) above, at least one permanent additional (redundant/fallback) connectivity option by way of Hispeed Broadband or 3G connectivity with initial and recurring expenditure upto the Project period will have to be provisioned so as to enable the Court Complex connect directly upto State Data Centre through secured VPN connection.

(c) Difficult Terrain Connectivity Enablement: There will be required flexibility of connectivity provisioning in case of Court Complexes which are not able to get or have problems in getting quality connectivity as per the options (ii) and (iii) given above. For such cases, the option of VSAT should also be allowed for data uploading and server access mechanism. The VSAT would be considered in those cases where the Data volume is not high due to the availability of limited bandwidth through VSAT.

(d) **SWAN and NICNet Integration:** Still in a number of States, the SWAN is not fully integrated with NIC Network that is NICNet. As all the Court Complexes of the country have also to be integrated with National Data Centre (NDC) along with the access to NICNet (specially the 10 series URLs of NICNet), complete integration of NICNet with SWAN has to be provisioned. DeitY will be requested to make all efforts to extend the SWAN and NICNET to the District Courts, Taluka Courts and Jails to enable Video Conferencing.

(e) **Disaster Recovery Site of all Court Clouds at SDCs at NDC:** As the Court Clouds will primarily be at State Data Centres, a full fledged Disaster Recovery Mechanism will have to be put in place for all Court Clouds at National Data Centre.

(f) **NKN and NOFN Infrastructure for Courts:** It is proposed to have the all Court Complexes across the country included in the specialized high bandwidth networks being implemented in the country that is National Knowledge Network (NKN) and National Optical Fibre Network (NOFN). DeitY will be requested to make all efforts to extend the NOFN and NICNET / SWAN to the District Courts, Taluka Courts and Jails to enable Video Conferencing.

10. Utilization of Server Infrastructure already installed:

(a) As Cloud Computing Environment is being adopted for implementation in phase II of the Project, new Court Complexes will not require any server infrastructure as all application and database hosting needs will be catered to by Cloud Model only. The existing Court Complexes which already have server infrastructure and the same is not obsolete yet, will have to be optimally utilized even after the Court Complex shifts to Cloud Model.

(b) Multiple servers have been provided in Phase I of the Project. These servers may be so distributed amongst the Courts under the same High Court that each Court Complex has 1 server for being used as local back-up mechanism. This will ensure a local back-up server with almost all Court Complexes. This may need relocation of servers as deemed fit by

the High Court and the related cost need to be provisioned by the Phase II of the Project.

(c) Any extra thin clients that State / High Court may plan to deploy to augment the infrastructure of the Courts, the extra processing capacity offered by the extra servers (except the local backup server) may be utilized to connect the additional thin clients to these servers through LAN infrastructure of the Court Complex.

11. Power Backup:

(a) **D. G. Sets**: The D. G. Sets as proposed above and supplied in Phase I of the Project will be continued in Phase II for the new Court Complexes including the requirements for JSC-cum-CFC. The High Court will be offered flexibility in quantity and configuration of the DG Set within the overall budget for the Court Complex / High Court.

(b) **U. P. S.**: A 2KVA U.P.S. with 1 hour back-up for every Court Room to support its local infrastructure including thin clients (provided in Phase I as well as to be provided in Phase II) has been proposed in the requirements given above. Individual UPS with every switch (provided in Phase I as well as to be provided in Phase II) should also be provisioned.

(c) **Renewal Energy Alternatives - Use of Solar energy:** In the first phase of the Project, primary backup has been provided through uninterrupted power supply (UPS) with two hour battery backup for servers and desktops. In addition, DG Set based power back up is also provided. But this is being provided for the server rooms and Judicial Service Centers. There is no provision for power back up facilities for thin-clients, printers and other hardware items. During the implementation of the current phase of the Project, it is observed that the power situation needs augmentation in several parts of the country in order to fully utilize the infrastructure provided and to deliver litigant centric services. An alternate uninterrupted source of power back-up, which is environment friendly and easily available can be considered, in the next stage of the Project. Solar energy based backup is proposed, as it will be not only be affordable but also dependable. The provisioning of the solar energy will have to be so

planned that at least 50 % of the total Court Complexes (Phase I + Phase II) are covered with this power backup option.

12. Other Infrastructure for Courts/Court Complex: Apart from the infrastructure proposed above, other infrastructure relating to video-conferencing or any other component of the Project will be referred in the respective chapters on that particular component in this document.

CHAPTER 5

SYSTEM AND APPLICATION SOFTWARE FOR COURT PROCESSES

EXECUTIVE SUMMARY

1. The thrust in Phase II of the Project will be on software applications (including mobile phone applications) and will be citizen-centric.
2. The e-Committee will be the deciding agency for software applications to ensure compatibility and uniformity.
3. Only Free and Open Source solutions will be implemented.
4. The existing core-periphery model of Case Information Software will continue, the core being unified and for 'national' use while the periphery being as per the local requirements of each High Court. NIC Pune will continue to be the centre for software development for CIS and related applications
5. Each High Court will have the responsibility of developing the periphery software and ensuring that it is compatible with the unified core. Each High Court will need to engage programmers for the development of the periphery software. However, the Project will provide programmers to each High Court for three years.
6. Software compatibility and interoperability, both horizontal and vertical is absolutely necessary and all High Courts will need to ensure this.
7. Documentation will be kept properly so as to ensure that change of personnel does not hamper software development.
8. All data, including meta data will be unified and standardized in this phase.
9. In all its activities, the e-Committee will take the assistance of experts from the Government, including DeitY, CDAC etc.

The efficiency and sufficiency of hardware is worth its value only when equally efficient and useful softwares are installed with allied support mechanism onto that hardware. One of the major underlying guiding principles in the implementation of Phase II of the eCourts Project is the adoption of the best of the FOSS Applications for the Courts across the country. Efforts will be made to implement Phase II of the Project as a quality software solutions centric Project, which effectively transforms and automates with processes of the courts and helps in considerably enhancing the overall output of the justice delivery system, both quantitatively and qualitatively. With this objective in mind, the software implementation in the eCourts Project will be carried out as follows:

1. eCommittee to be the Nodal Agency for policy on all Software Solutions provisioned through the eCourts Project: In order to ensure optimum uniformity in

the software solutions in the eCourts Project across the country, the eCommittee will be nodal agency for policy on software solutions to be used on the hardware provisioned through the eCourts Project. This uniformity will ensure compatibility also in the initiatives going on at national level like National Judicial Data Grid (NJDG), integration of various stakeholders of the Justice Delivery System that is Jails, Police, FSL etc. in the vertical and horizontal integration of Case Information Software in the Courts of the country etc.

2. Free and Open Source Solutions (FOSS): All the Software Solutions to be deployed for the Courts as a part of initiatives of the eCourts Project will only be Free and Open Source Solutions (FOSS) which also have community driven support on the web. FOSS without any licensing / subscription charges will only be considered for adoption for which the complete source code with build and installation procedures can be made available to the Courts. This is for ensuring that the support on FOSS can be managed through in-house experts and competing multiple vendors who have domain expertise for support and customization of the same.

3. Operating System: Free and Open Source Desktop Linux Operating System as customized by eCommittee will continue to be supplied to the Courts for Laptops and other Computers being used by the Judicial Officers and the Court officials/officers. Linux OS for Server infrastructure as already provided in Phase I of the Project and the same for virtual / real servers to be used at State / National Data Centres will also be customized through eCommittee with assistance from Open Technology Group (OTG), NIC, Chennai. FOSS Software technology stack being implemented for various softwares and solutions in the Courts will be reviewed periodically or as and when required, by the eCommittee considering newer options and avenues coming up in the field of FOSS.

4. Case Information Software:

(a) Salient Features: The Case Information Software (CIS) deployed for District/Taluka Courts is a browser based application with open source technology stack for frontend / backend. The newer version of CIS to be taken up soon will be having improved user interface with workflow automation. The new version of CIS will be so developed that it is compatible with Cloud Architecture and also takes care of the Process Reengineering requirements of ongoing Process Reengineering exercise.

(b) **eCommittee's role in Core-periphery Model of CIS:** In order to ensure the uniformity and standardization in CIS across the country as per the approved Core-periphery model, the eCommittee will be the nodal centre for approval of functionalities in the Core of the CIS. Any improvement/addition etc. in Core may be made by the Courts through the respective High Courts which may then be considered at eCommittee for inclusion in CIS Core. The functionalities and specifications of the Periphery of the CIS will be finalized locally by the High Courts (depending on their requirements) ensuring that the Periphery is compatible with Core and the same will be integrated with Core as per the Core-Periphery integration guidelines to be finalized by the eCommittee with inputs from the NIC.

(c) **Role of NIC in CIS**: The role of National Informatics Centre (NIC)'s Software Development Centre at Pune has been pivotal in providing CIS development and customization services for the Courts across the country. All Courts will be migrated to the Unified National Core version of CIS as developed by NIC-Pune and will also be upgraded to newer versions of Unified National Core CIS as to be redesigned and reengineered as per the outcome of Process Re-engineering exercise going on across the country. The Case Information Software will be implemented as per the Core-Periphery model.

(d) **The Core and Periphery Model**: The Case Information Software (CIS) has been finalized as having two functional components of Core and Periphery. The core of the software has all the features and functionalities, with some configurable variances, as required by the Supreme Court, Parliament, the High Courts, the Central Government or any national agency. The core of the software shall not be open for customization. The core shall also not be distributed in source code form. Any modification relating to any feature of core of the software shall have to be sent to the eCommittee so as to maintain unified core of the software across the country.

(e) **CIS Periphery: -** Likewise, any case related information applicable at the State level as sought by the High Court, State Assembly, State

Government etc. shall form part of the periphery. The features and functionalities requiring customization and development like various report generation etc. shall also be a part of periphery which shall be open for local NIC/High Court units for customization as per the guidelines of the High Courts and ensuring its compatibility with the Core CIS. Periphery part of CIS also will have to be Cloud Model compatible like the Core CIS. All development/customization of Periphery part of CIS will be so carried out so as to be compliant with the Core part of the CIS. Since software management is being decentralized, each High Court must make special efforts to engage programmers as per the requirement of each High Court. Manpower for Periphery Development will be provisioned for a period of three years from the Phase II of the Project.

(f) Role of High Court in CIS: There will be a major role of the High Courts in designing, developing and implementing the Periphery part of the Unified CIS, which will be integrated with National Core of CIS using the mechanism facilitated by NIC, Pune team. The Periphery will be so developed and implemented so as to make it compatible and complementary to the Core of CIS and without altering any of the features and functionalities of the Unified Core of CIS. The mechanism of integration of Core and Periphery of CIS will be finalized by the eCommittee with assistance and inputs from NIC. Provisioning of manpower for CIS periphery development will be ensured for the duration of the project for each of the High Court from the eCourts Project funds.

(g) Periphery Development Team: The management of manpower for CIS periphery will be carried out by the High Courts as per the guidelines to be issued by the eCommittee. The team working on the development of CIS periphery will be under the overall supervision control of the Central Project Coordinator of the High Court and the technical aspects of the development of the periphery will be coordinated by the High Court NIC Coordinator with NIC Pune team. The role of High Court NIC Coordinator will also be very important in order to ensure technical compatibility of the Periphery with the Core in coordination with NIC Pune team and also for the adherence to standard development best practices by the periphery

development team. This team of professionals for development of the periphery of the new CIS and its rollout will also take care of installation of Unified Core of CIS as to be made available online on secured web resources. Thus the High Courts will have a pivotal role in overall implementation of CIS including the design and development of periphery part of CIS. Core-periphery implementation exercise will be governed by the CIS Guidelines to be given by the eCommittee from time to time.

(h) Horizontal and Vertical Integration of CIS: In order to achieve a seamless compatibility of application and data of CIS across all Courts of the country, the CIS should be horizontally and vertically integrated. By horizontal integration, the CIS of one District Court will be able to export to or import from the case-data of other District Courts, e.g. when a case is transferred from one Court to another or one Court Complex to another Court Complex, fresh data entry of the case will not be required and the system will be able to effect the transfer with all the case history details etc. intact in the system. By vertical integration the CIS of the Courts of different hierarchy, will be able to transmit data to and from each other e.g. a case record of a lower court directly being available to Appellate Court through a secured authentication mechanism, likewise an order issued by a Higher Court being reflected on the lower Court system of the concerned Court. This will require standardization of data structures, meta data etc. across the CIS at all levels of the Courts.

(i) Interoperability: One of the major baseline requirement of the Case Information Software to be refined and re-engineered in Phase II of the Project will its be its readiness for Interoperability with the central layer to be operational in the Integrated Criminal Justice System (ICJS). The integration of CIS (horizontal and vertical) as mentioned above, will only ensure its being communicative within judiciary. The interoperability compatibility of the CIS will ensure that the CIS is able to export / transmit the requisite information to the targeted stake holder that is police, jails, FSL etc. The information to be shared, with whom to be shared and the information that may not be shared with certain stakeholders will have to be worked out for this aspect of CIS.

(j) CIS for High Courts: The Case Information Software (CIS) presently being used at High Courts is of varying technologies and data structures at present. This difference of technologies and data structures may cause integration or interoperability issues. Recently, some High Courts have started to shift to Open Source Technology CIS from the earlier old technology (Foxbase etc.) CIS. This will need a migration exercise to be taken for porting of data to new CIS. In order to ensure uniformity of the central processes and data requirements and allowing variances of the local processes and data requirements, a CIS based on the Core Periphery model is proposed to be deployed for the High Courts also. Case Information Software for Supreme Court is ready and under deployment which is built on Open Source Technology stack. An attempt will be made to enable uniformity in data structures with local variances so that horizontal and vertical integration can be made possible.

(k) Documentation of CIS: In order to ensure smooth knowledge transfer and continuity of development and customization support for the CIS across the Courts, all documentation relating to CIS will be maintained properly. This documentation will involve the Functionalities Requirements Specification (FRS), Software Requirements Specifications (SRS), Data Flow Diagram (DFD), Entity Relationship (ER) Diagrams etc. Software Development team will have to ensure this. This is very vital so as to avoid problems of software customization and support when the teams working on software development change or some officials move on for other positions. There will be documentation of tutorials on CIS for coming versions also with audio video content on the same.

5. Other Workflow/Process Automation FOSS Applications: Other Free and Open Source Application software for workflow and process automation will from time to time be proposed for implementation for the Courts for various functions as given in Chapter 10 hereinafter. The implementation model for these application softwares will also be on the basis of Core Periphery model given above. The team of professionals working on periphery development as referred above will also look after implementation of these application softwares.

6. Standardization, Integration and Unification:

(a) Meta Data and Data Standards (MDDS): As per guidelines for the eGovernance Projects, the data structures and the meta data formats (that is the data about the data) are required to be standardized. This standardization has become more important and urgent in view of the inter-department or intra-department initiatives of integration and interoperability across the stakeholders of Justice Delivery System. MDDS will be finalized in coordination with DoJ and the High Courts.

(b) Case Type Standardization and Unification: The nomenclature of cases across the High Courts and the District/Taluka Courts is different across the country. This variance in case types and there being no mapping of case types between case types of different jurisdictions, may cause issues in aspects like integration of softwares across Courts, pendency and arrears assessment, policy making for Courts etc. In the Chief Justices Conference held in April, 2013 eCommittee was entrusted to work out and finalize the modalities to provide equivalent nomenclature to be included along with uniform nomenclature of the case types. This exercise will also have to be taken in coordination with High Courts.

7. Open Source Technology Support Mechanism: As all the software initiatives in the eCourts Project will be based on FOSS Applications, there will be considerable requirement of Support Structure for FOSS technologies. Entities/Vendors/Experts providing support and expertise on FOSS technologies will have to be empanelled/engaged for the Project period from the budget of the Project. Ultimate objective will be to strengthen the in house technical manpower for the same so that the sustainability of the FOSS applications deployed can be ensured even after the Project period is over.

eCommittee would also like to avail the resources and expertise of DeitY and its institutions like Centre for Development of Advanced Computing(CDAC) in ICT research and development for Courts, mGovernance initiatives for Courts, other value added eGovernance services and projects.

CHAPTER 6

SCANNING, DIGITIZATION AND DIGITAL PRESERVATION OF CASE RECORDS

EXECUTIVE SUMMARY

1. Due to space constraints and large volumes of paper, some High Courts are looking at digitizing case records. Recently, the Supreme Court has also initiated this process and assistance is being taken from CDAC for digital preservation solution.
2. Phase II will provide for scanning/digitization of case records of High Court and District Courts.
3. Phase II will incorporate the latest technologies in scanning, digitizing and preserving case records with the assistance of experts from various Government organizations.
4. Long term digital preservation solutions in the form of trusted digital repositories will be implemented for the scanned/digitized records.
5. Use of Open Source technology will be strongly encouraged in preservation of case records.
6. Eventually, Phase II will move towards 'less paper courts' and finally towards 'paperless courts'.

Although Paperless Courts across the country may be a dream, but at least 'Less Paper' Courts can made a reality by combining all the practical and implementable technical advancements offered in the ICT arena. To curtail use and handling of physical paper, the foremost necessity for the Courts is to start converting the existing case record to digitized form. This will entail a large scale scanning activity in the Court across the country. This will immensely help in saving of space and related infrastructure in preserving and retrieving the case record in a physical form. With this vision, the following activities in Phase II of the eCourts Project need to be provisioned:

1. Scanning and Digitization of the Case Record of High Court and District Courts: Case record of the pending cases and case record of the disposed cases which has undergone the basic weeding process will be covered in the process of scanning and digitization. The output file format of the digitized file will be PDF/A or its advanced versions with features like water-marking and digital signatures to ensure the authenticity of the digitized repositories to be created. For better search,

access and retrieval of the free text search enablement of PDF/A output will also have to be done.

2. Document Management System: There remains no optimum utilization of digitized output unless it is ported to a Document Management System (DMS). A Free and Open Source Solution (FOSS) DMS will be the DMS for Scanning and Digitization project in the Phase II of the eCourts Project. The Document Management System (DMS) adopted in the Project being undertaken for scanning/digitization of Supreme court Case Record is DSPace (a FOSS DMS) with customization to suit the requirements of the Registry. Data Fields which will be minimum necessary for data entry in the DMS will have to be finalized. Specifications of the FOSS Document Management System to be deployed will also have to be finalized after assessing the requirements of meta-data for High Courts and District Court Case Records.

3. Implementation Model for Scanning and Digitization: The implementation model of the scanning and digitization activity for the case record of the High Court and District Courts will be similar to the implementation model being adopted for local infrastructure deployment as given in Chapter 2. In order to preserve unified and standardized digitization parameters, design and specifications will be finalized centrally for being adopted for this component of the Project. This is vital to ensure seamless integration and interoperability amongst the Document Repositories of the Courts across the country. The experiences gained at Supreme Court and other High Courts in this area will be useful reference for designing the methodology and specifications for this activity.

4. Long Term Digital Preservation of Case Records: In the process of digitization of documents, after conversion from hard to soft copy, the chief requirements for optimum and sustained usage of the documents are **Retrieval and Preservation/Archival.**

(a) Retrieval: The Retrieval is ensured by porting the soft copies of the data into DMS. The objectives achieved by retrieval is only limited to frequent day to day use of the documents and does not take care of long term preservation and archival of documents.

(b) **Preservation/Archival**: The digital documents, most of which generally form the backbone of knowledge and reference warehouse of Courts, needs to be preserved and archived for considerably long period of time which may span over decades if not centuries. The need for an archival solution arises because of the inability of the retrieval solution to serve for long term preservation. The main challenge in the way of regular and uninterrupted long term use of the soft copies of the digitized data that is archival and preservation is the frequent obsolescence of technology. The phenomenon of obsolescence of technology mainly hinders archival and preservation in terms of three aspects which are (I) Technology of the storage media, (ii) the software used to access the soft copy of the data and (iii) Type (format) of file in which the soft copy is saved in digital form.

(c) **National Digital Preservation Programme:** The experience of the IT industry so far shows that every five years or so the technology advancements brings about a drastic changes in the types of storage medias, softwares for accessing files and types of files in which the documents are stored. DeitY has established a Centre of Excellence for Digital Preservation under the aegis of Centre for Development of Advanced Computing (CDAC) as a part of National Digital Preservation of Programme (NDDP) of the Government of India. (http://www.ndpp.in/). The software solutions for digital preservation address the obsolescence of technology with a very strategic and sophisticated methodology. The three types of obsolescence as enumerated above are addressed and managed distinctively and in such a modular method wherein a shift in technology of any of these three aspects successfully fits into the solution in sync with each other. The mismatch of technology or software version or file type version is taken care of by maintaining a real or virtual integrated environment for supporting each of the storage media, software and file format in any of the versions of their life cycle.

(d) **OAIS Framework:** Foremost of the solutions in the sphere of long term digital preservation is **OAIS (Open Archival Information System) framework**. OAIS framework provides methodology of software solutions for digital preservation which provides continued access to digital

materials for as long as necessary, involving the planning, resource allocation, and application of preservation methods and technologies to ensure that digital information of continuing value remains accessible and usable. It combines policies, strategies and actions to ensure access to reformatted and born digital content regardless of the challenges of media failure and technological change. The goal of digital preservation through OAIS is the accurate rendering of authenticated content over time.

(e) Trusted Digital Repositories (TDRs): CDAC has been working for implementing this framework based solution for District Courts of Delhi and Supreme Court on pilot basis by creating solution for establishing a Trusted Digital Repository. The ultimate benefit of scanning and digitization could be achieved when the need of preserving the physical case record is eliminated by means which offer reliable and established methods of Long Term Digital Preservation. Courts being one of the institutions with enormous record in physical form, Trusted Digital Repositories (TDR) for Courts will be highly necessary which may be considered for implementation in Phase II along with the Scanning and Digitization activity.

CHAPTER 7

VIDEO-CONFERENCING FOR COURTS AND JAILS

EXECUTIVE SUMMARY

1. Presently, an exercise is being undertaken to assess the viability of a software based solution for video-conferencing. If this solution is found viable, it will be used to connect all district court complexes with all Central Jails and District Jails. Failing this, leased line connectivity with Studio based VCs will be utilized.
2. In any event, connectivity issues will need to be addressed and made reliable, stable and effective in all respects.
3. Video-conferencing in Phase II will go beyond routine remands and production of under-trial prisoners. It will be used initially for recording evidence in sensitive cases and gradually extended to cover as many types of cases as possible.
4. Video-conferencing in Phase II will be compatible with recording facility.
5. To effectively assist in recording evidence, a document visualizer will also be necessary in all district court complexes.

The need and importance of video-conferencing infrastructure for Courts does not need emphasis as experience has already shown that this infrastructure has proved to be of immense benefit to Courts, Jails, law enforcement agencies, government witnesses, litigants etc. It is therefore proposed to have this component extended in the Phase II of the Project also for its optimum implementation.

1. Coverage of Court trial for VC: It is imperative to extend video conferencing beyond the present utilization for routine remand of under trial prisoners and recording evidence in some specific cases. It is proposed to broad-base video conferencing to include regular recording of evidence in sensitive cases, recording the evidence of doctors (and other professionals) in criminal cases, legal aid matters between the jail and Courts and sensitive matters pertaining to child abuse, domestic violence and sexual abuse and other areas as and when the need arises. Presently, some Court complexes are connected through video linkage with the Central Jail in the State and the District Jail in the district. It is proposed to connect every Court complex in a State with the Central Jail and every Court complex in a district with the District Jail.

2. Type of Video Conferencing: The video-conferencing based on software solution is being explored through a pilot being undertaken as part of Phase I. As per the studies so far, it has been found that the main concern that may come up for software based VC set-up is the connectivity bandwidth. It is therefore imperative that if, based on the success of the ongoing pilot, software based solution is chosen to be deployed in Phase II, the connectivity to be provisioned for VC set-up has to be at least 1 MBPS which is reliable and stable connectivity over and above the regular connectivity being provisioned to the Court complex as given in Chapter 4 of this document. Otherwise, the studio based VC set-up may be considered for deployment with the same or better leased line connectivity exclusively provisioned for VC set-up only. The VC set-up will have to be multi-point VC enabled.

3. VC set-up to be recording compatible: The video-conferencing set-up whether studio based or software based will have to be compatible with audio-video recording devices as there will be requirement of having recorded copy of the video conferencing sessions held. Audio-video recording device attachment with sufficient back-up and facility to replicate it on different media will also be provisioned from the Project along with the VC equipment.

4. Document Visualizer: As stated above, the video-conferencing infrastructure is also intended to be used for recording of evidence in addition to day-to-day remand purposes. This requires showing of certain documents of the case-file to the witness/accused at other end for which a document visualizer of requisite specifications will be required to be integrated with the VC set-up. The Document Visualizer will be provisioned from the Project.

The budget of the component on video-conferencing has to be planned taking into consideration all of the above aspects and the same has to be implemented as per the decentralized infrastructure implementation model given in Chapter 2.

CHAPTER 8 CAPACITY BUILDING MEASURES

EXECUTIVE SUMMARY

1. Capacity building through training judicial officers in the use of computers and court staff in the Case Information Software has been extremely successful. The Training of Trainers (ToT) model was adopted. This will continue in Phase II.
2. Additionally, refresher courses are planned every six months so that judicial officers and staff do not lose familiarity with computer systems and the various applications.
3. All State Judicial Academies will be involved in the capacity building exercise. Each such Academy will be equipped with a computer laboratory catering to the requirement of about 30 trainees at a time. Requisite staff will be engaged by the State Judicial Academy out of funds from the Project.
4. Each State Judicial Academy will be equipped with a video conferencing unit for distance learning purposes as well as for utilizing webcasting facilities of important lectures and events, both live and recorded
5. Learning Management System has been successfully adopted by the e-Committee to reach out to judicial officers and court staff. State Judicial Academies will be encouraged to use these tools.
6. As a part of the Change Management exercise which has been conducted for judicial officers and court staff, workshops will be held through Project funds to assist in changing the mindset of the Bar Councils, lawyers, Public Prosecutors and other stake-holders in the justice delivery system.

After hardware and software, the most important factor for the success of an eGovernance project is the humanware that is the human resources making use of the hardware and software. If the Human Resources of an organization truly adopt the technological enablement extended to them through the Project, only then the optimum fructification of the funds invested can be expected. Appreciating this aspect, Phase II of the Project, will intensively focus on multifarious initiatives of Capacity Building Measures, as given below:

1. ICT Training and Education:

(a) During the ICT Training Programmes conducted as part of the Change Management exercise undertaken by the eCommittee, Judicial Officers and Court Staff have been trained in the use of Ubuntu-Linux Operating System (installed in their laptops) and Case Information Software (CIS) respectively. Almost all Judicial Officers have been trained in the use of

laptops (Ubuntu Linux operating system) by 218 Master Trainers. The Master Trainers were trained by the eCommittee through a four-day intensive training programme. The entire basic training material both in the form of text and video have been made available to the Judicial Officers.

(b) About 4000 court staff has been trained in managing the computer systems in the court complex. The text and audio-video tutorial material has been made available online on the portal of the e-Committee. This has been achieved through CIS 219 Trainers who were imparted training in the Maharashtra Judicial Academy and the Chandigarh Judicial Academy.

(c) The training sessions conducted as part of eCommittee initiatives was based on 'Training of Trainers' (ToT) model. As the experience with this model has been very encouraging, the same will continue to be adopted in Phase II. There will be continuous Refresher and Advanced Training Programmes for the Judicial Officers as well as the Court Officials preferably every six months. These half yearly sessions will continue throughout the Project so that every Judicial Officer and Court Officials avails the Refresher Training four times in the Project period of 2 years. Financial provision will need to be made for this critical element of change management.

2. Computer Training Labs at State Judicial Academies:

(a) For sustainability of the efforts of ICT Training for Judicial Officers and Court Officials, there is an urgent need of providing a full fledged Computer Lab to the State Judicial Academies which most of them do not have. Phase II of the Project will provide the resources for providing ICT Infrastructure for setting up of a Computer Lab for every State Judicial Academy. Infrastructure of the configuration provided to Court Room and Court Complex that is Slimline PCs/Laptops, MFDs, Duplex Printers, Scanners, UPS, DG Set, LAN etc. may be provided to set up a computer lab at SJAs keeping in view the fact that the lab has to cater to the ICT training requirement of Judicial Officers as well Court Officials. The lab should be equipped to facilitate 30 trainees at a time with individual

systems. The infrastructure requirement for National Judicial Academy and State Judicial Academy is given as follows:

Infrastructure Requirement for Judicial Academies	
Infrastructure Items	Quantity
Projector with screen	1
Slimline PC with latest optimum configuration	31
Printers (2 MFD Printer + 2 Duplex Printer with Ethernet Port)	4
LAN Points	40
Flatbed Scanner with ADF - duplex	1
UPS 10 KVA with 2 hour backup	1
USB Hard disk for Backup (1 TB or above)	1
D. G. Set with Online UPS for Network Room 5/10/15 KVA with 2 hour backup	1
Racks + Switches etc.	As per LAN WAN requirement

(b) The State Judicial Academies will also need two resource persons each on a regular basis to take care of training as well as trouble shooting. Financial provision must be made for this purpose.

3. Video-conferencing for State Judicial Academies: Studio based VC set-up for SJAs will go a long way in materializing the objective of education at door-step for Judicial Officers saving considerable time, expense and efforts in travelling etc.

4. Video Streaming and Webcast Portal: Live and pre-recorded (on-demand) videos can be hosted and webcast and live presentations can also be arranged through NIC's Government Video Portal that is webcast.gov.in. Joining this portal will be of vital importance and usage for the SJAs to host the content, pre-recorded or live, on the training module of the Judicial Officers and Court Officials, whether on ICT or other subjects of training. Any cost involved in these initiatives will be provisioned through the Project during the Project period.

5. Learning eTools: Open Source Learning Management Tools can aid the Judicial Academies to augment the training potential and reach. A Learning Management System (LMS) is a software application for the administration, documentation, tracking, reporting and delivery of eLearning education courses or training programs. Learner/trainee can avail the benefits of training modules by just using Computer System and without having to physically visit distant locations to take part in the training sessions. eCommittee has successfully utilized this tool for training judicial officers and court staff through its portal. The State Judicial Academies will also be encouraged to have such tools adopted for their education and training programmes.

6. Regular Change Management Exercise:

(a) It is a well appreciated fact that introduction of new technological modes of working requires not only the training of the users but also the attuning of the mindset to really adopt the new modes of working. The attitudinal orientation of the users is of ultimate importance in order to shift to ICT enabled methods of working in the organization without which no headway can be made in realizing the goals of computerization.

(b) This aspect of mindset change and attitudinal orientation has been specifically attempted in the Change Management sessions undertaken by the eCommittee and by the Master Trainers Judicial Officers trained by the eCommittee. These efforts will be further enhanced during Phase II of the Project covering Judicial Officers, Court Staff, Lawyers, Public Prosecutors etc. to attain a holistic shift in mindset addressing the resistance to computerization issues due to some mental block.

(c) The ICT training and education exercise as referred above will be so interwoven with Change Management programme that the attitudinal change and mindset orientation aspects are taken care of in the most effective manner. It will also be ensured that like ICT training, the Change Management exercise also becomes a spiral process to effectively deal with the mental block issues for achieving the maximum possible acceptance and adoption levels of technology in the institution.

(d) Awareness programmes and initiatives will also be taken up for litigants and citizens at large to spread the information about the new modes of services and methods made available in emode by the eCourts Project. The emphasis of the Change Management initiatives will to make all concerned aware about benefits in store for all in the computerization of Courts and also the overall well-being of society due computerization of Courts. The expenses involved in this exercise will have to be provisioned through the Project during the Project period.

7. ICT Training for Electronic evidence: Electronic evidence is a reality today. With growing incidence of citing and submission of electronic evidence in Court Proceedings, the Judicial Officers and Court Officials need to be trained to appreciate and manage electronic evidence. Training exercise may consist of a component to promote awareness about this aspect amongst the Judicial Officers and Court Officials. Moreover, as all the Courts have not framed rules with regard to preservation of electronic evidence and its validity in Court proceedings, both criminal and civil cases. The entire gamut of electronic evidence, its preservation and evidentiary value will have to be studied by team of professionals, who may, if necessary, recommend changes to the Evidence Act, 1872.

8. Post Process Re-engineering Change Management: After the result of the process reengineering exercise, it is expected that there may be major boost in use of technology in day-to-day Court processes. The changed ways of working as per redesigned/renewed Court processes will need to be facilitated by deploying a new version of the Case Information Software. This will also need renewed and revised efforts for Change Management of the concerned users that is Court Officials and Judicial Officers to learn and imbibe the new set of functionalities facilitated by the new CIS. Therefore, like the ICT training exercise, the Change Management exercise will also be an ongoing affair during the project. Hence the budgeting in the project needs to be taken up duly considering this aspect also.

CHAPTER 9

JUDICIAL PROCESS RE-ENGINEERING

EXECUTIVE SUMMARY

1. Currently a process re-engineering exercise is being undertaken by every High Court for a fresh look at processes, procedures and systems. It is expected to be complete by 31st January, 2014.
2. The exercise will have to be repeated for ironing out the creases and also to incorporate technological changes that will be introduced in Phase II. The exercise may well be more or less continuous.
3. Automation, e-filing of cases, paperless courts will need radical changes in the processes and procedures of the courts and also in the mindset of all stake-holders.
4. The changes required for effectuating the Judicial Process Reengineering will be implemented in the new version of CIS.
5. Change Management warranted by Process Reengineering will also be duly taken up.

The internal processes of Justice Delivery System are distinct and peculiar to the institution because of plethora of applicable complex legislations, rules, regulations, judicial precedents and the local practices involved therein. In order to reap the optimum benefits of computerization, many of these processes shall have to be streamlined and a few of them may even have to be done away with and many new processes shall have to be designed. Many of these changes in the processes and procedures may not even be fitting into the present system of acts, rules, procedures etc. and for successful implementation of the same, proper amendment of rules/regulations at proper levels may be necessitated. This exercise of the streamlining and improvising current processes, eliminating redundant processes and designing new processes with respect to making the Court Processes ICT enabled and amending the procedures/rules accordingly is Judicial Process Re-engineering.

1. Judicial Process Re-engineering (JPR) in Phase I: In Phase I of the project, all High Courts have formed one or more Committees to take up the Judicial Process Re-engineering exercise for the Courts under their jurisdiction. The exercise of JPR Committees is expected to be over by 31st January, 2013 which will be followed by

rules amendment exercise necessitated to accommodate the new set of processes recommended through the JPR exercise.

2. Judicial Process Re-engineering for Phase II: As the technology offers newer avenues of automation very frequently, the study of processes for potential to automate further should also be an ongoing exercise. Therefore, in Phase II of the project also, a Judicial Process Re-engineering exercise will have to be taken up to make up any lost opportunities during JPR exercise of Phase I and to explore further automation of processes with latest trends in technology. Moreover, this would also percolate the JPR initiatives taken up in other States to all States for implementation as per the experiences gained by some of the States. A few of the many probable initiatives proposed to be taken up in Phase II are given as follows:

(a) Automation of Process Serving - Mechanism is necessary in order effectuate the avenues offered by amendments in the Civil Procedure Code with respect to sending Court Process through email to other Courts and to parties. This option of process service can be widely used only with help of an established mechanism of Acknowledgement for Emails in the form of Delivery and Read Receipt. Attempt will have to be made to explore provisioning of this mechanism which will very effectively address the issue of delays due to non-service or late service of Court Process.

(b) No Manual Registers: A major reason for non-adoption of computer based Institution and other Court Registers has been cited as the efforts required to main physical registers and the difficulties involved in maintaining double registers that is one physical and one on computer. In order to promote use of Computer for all day-to-day Court processes, all Court Registers should be maintained in eform only. Major and concerted JPR initiatives only will be able to realize this objective.

(c) eFiling: Presently, e-filing of case papers is being carried out on an experimental basis and some eCourts are also working on an experimental basis. e-filing procedures will need standardization as well as preservation of e-records. A team will need to be engaged to finalize the details for the same. This is an aspect of process re-engineering requiring considerable discussion and debate in the near future. An e-filing Portal for

the High Courts and the District Judiciary will have to be developed to facilitate online e-filing of cases. Initiatives for offline e-filing that is filing of soft copy along with the physical copy, will have to be taken up optimally.

(d) **Judicial Financial Accounts Book Keeping Practice:** The most widely used system of Accounts book keeping even presently in Courts across the country is the old system of book keeping that is Single Entry Bookkeeping System. This system is only suitable for very small entities or personal accounts having minimal number of transactions. The single entry system is also prone to human errors and is not suitable of being implemented in Computerized Financial Accounting System. Looking to the increased accounting activities in the Courts on judicial as administrative side, the latest scientific method of book-keeping suitable for Courts is Double Entry System of Book-keeping. Many of the Government/Public bodies have recently been shifting to this more dependable and authentic book-keeping system as part of the initiatives/recommendations of Comptroller and Auditor General. This needs considerable efforts as a part of JPR exercise and thereafter software implementation side in CIS.

(e) **Administrative Process Automation:** To optimize the human resources in the Courts, automation of non-judicial processes that is administrative function such as file movement and tracking, leave management, personnel information management system etc. are also the need of the day. Automation of these processes and eliminating the manual process involved therein also need refinement of rules and procedures. This can only be taken up in a full-fledged Process Re-engineering exercise. The phase II of the project will also have this as an objective as listed in Chapter 10.

To ensure expeditious justice delivery along with a litigant friendly court administration, process re-engineering must be coupled with systems re-engineering. This will need a detailed study and adequate financial provision. The entire exercise can be completed by the State Judicial Academy through its in-house resources provided adequate funds are dedicated for this purpose. This needs serious consideration.

3. Exploring Paperless Court:

(a) Paperless Court model will have to be studied using the FOSS technologies and overall infrastructure requirement will have to be assessed. Paperless Court option can only be taken if it is cost-effective and allow the model to replicated with reasonable additional cost.

(b) Another element of a paperless Court would involve the need of the Judge to make e-notes and mark case documents.

4. Judicial Process Re-engineering Impact on Case Information Software: The changes in the processes introduced as a result of the JPR exercise will have to be incorporated in the Case Information Software also. The new version of CIS will be so developed that it is compatible with Cloud Architecture and takes care of the Process Reengineering requirements as per the ongoing Process Re-engineering exercise.

5. Process Re-engineering necessitating Change Management: Organizational and work-flow related changes brought about through Judicial Process Re-engineering will have to strategically implemented which also involve the training and adaptation of manpower of the organization ranging from Court Officials to Judicial Officers to help them get acquainted, acclimatized and proficient at using the new processes and the new CIS redesigned accordingly. This will have to be taken care of during the ongoing Change Management exercise throughout Phase II of the project.

The efforts for JPR will be so applied in a concerted manner that it culminates in optimum reach of automation of processes to Court functioning. The successful implementation of best of the Judicial Process Reengineering potentialities will be the real parameter of success of computerisation of Courts.

CHAPTER 10

WORKFLOW AND PROCESS AUTOMATION TOOLS AND MEASURES

EXECUTIVE SUMMARY

1. On completion of the present on-going exercise of process re-engineering, some aspects of the CIS will need to be re-designed. This will necessitate the introduction of office automation in a big way.
2. Phase II will involve process and procedure automation not only in judicial functions but also in administrative functions concerning the Registry of the courts.
3. All judicial officers have already been provided with a facility of an e-mail address [abcd@aij.gov.in]. Court Officials will also be provided official email address management of which will require an administrator at the High Court level.
4. As in the Supreme Court, all judicial officers and staff upto Class III will be allotted digital signatures through a Registering Authority set up in the High Court.
5. Process serving has always been an issue with all district courts. It is proposed to provide all process servers with a service authentication device like a GPRS-GPS enabled PDA.
6. eOffice has been successfully implemented in the Supreme Court. It is proposed to extend its application to all High Courts and District Courts.
7. A financial accounting package suitable for the courts is proposed in Phase II. This will take care of miscellaneous matters including Nazarat, certified copy accounts etc.
8. eProcurement has been successfully implemented in the Supreme Court. This facility will be extended to all High Courts in view of the decision to decentralize procurement to the High Courts.
9. Free Open Source solutions will be adapted and implemented wherever it assists and suits the judiciary.

Presently, an exercise of process re-engineering is being undertaken by every High Court. Case Information Software will be redesigned and improvised for Phase II of the Project to incorporate the recommendations and amendments in rules on the conclusion of this exercise. It is expected that the major thrust of this exercise will be to do away with manual processes as far as possible and introduce re-designed processes which complement the ICT advancements.

Apart from this work-flow based automation to be brought about in the day to day judicial functions of the Court, there still remains an area of workflow and

process automation in other functions of the Courts that is administrative processes. If that area is left out in the computerization, it will be not a holistic automation. It is therefore required to take up the following initiatives and measures for work-flow and process automation of the same.

1. Official Email for Court Staff also: During the Phase I of the Project, official email addresses for Judicial Officers have been provisioned on the email portal services of NIC that is aij.gov.in through the Delegated Admin (DA) facility managed by the eCommittee. Court Complex official email creation is underway. As per official guidelines, all official communication being done through email is preferred to be done through official email address. As Phase II of the Project will be extending the ICT enablement upto Court Officials also by way of increased infrastructure, all Court Officials of Class I, II and III will have to be provided official email address. As it will not be possible to manage such a large number of email addresses creation and management centrally at Delhi, every High Court will be requested to have Delegated Admin at their level on the NIC email portal services from where the email addresses can be created and managed.

2. Digital Signatures for Judicial Officers and Court Staff: During Phase I of the Project, Digital Signature for Judicial Officers have been provisioned. Phase II of the Project will also aim to cover substantial number of Court Officials for Digital Signature allotment as most of the Office Automation and Online Judgments, Online certified copies will need to be digitally signed. In Supreme Court, all Court Officials of Class I, II and III are being allotted an official USB Token based Digital Signature Certificate (DSC) of NICCA from the Project by way of Registration Authority created at eCommittee office. In this manner, DSC creation, revocation, renewal etc. becomes easier, expeditious and decentralized. This experiment at eCommittee for DSCs of Supreme Court officers and officials has been successful. A similar arrangement will be requested at every High Court so as to expedite the Digital Signature allotment and management for officers and officials of High Court and District/Taluka Courts. Cost involved for the USB tokens will have to be provisioned from the Project.

3. Authentication Devices for Process Servers: As is widely appreciated that the major cause of delay in Court case disposal is the delays and lapses involved in process serving to the parties. Process Server of Courts discharges a very vital duty

which directly affects the further cycle of court case progress. It is required to modernize the process serving methods by using process service authentication devices like PDAs or similar GPS-GPRS based devices with camera. This will be helpful in ascertaining the location of endorsement made on the Court process along with image proof in certain cases. Provision of such authentication device needs to be made as referred in Chapter 4 on infrastructure.

4. eOffice Suite for Indian Judiciary: The Supreme Court has successfully implemented eOffice which is a mission mode Project of the Department of Administrative Reforms and Public Grievances (DARPG), Govt. of India, for Govt. departments, for automating the workflow of administrative files of the departments in a paperless mode. eOffice has several components like eFile (File Management and Tracking Software), eLeave (Leave Management System), eHR (Personnel Information Management System), eTour (Tour Management System) etc. This will be implemented in all courts across the country with no substantial extra hardware infrastructure except extra scanners for large Court Complexes having comparatively more number of Court Rooms and therefore bigger inflow of outside paper correspondence.

5. Financial Accounting Software with Payroll Management System: The judicial accounting module for the Nazarat section of the Courts will be taken care of in Case Information Software by way of CIS Periphery development. For other accounting aspects of Court Administration that is salary, other recurring expenditures like electricity etc., office infrastructure purchase and maintenance, other capital or operating expenses accounting will need softwares to manage them as per the procedures. Apart from exploring FOSS Applications for the same, any already working solutions in other Courts on FOSS technologies may also be considered for suitable customization for being shared with rest of Courts.

6. eProcurement Portal for High Courts: The Supreme Court has already successfully implemented ePublishing the tenders of materials. Government of India and a number of States have come up with portals for enabling the Government Departments to epublish the tenders for any of the purchases being done by the departments. As High Courts will be extensively doing the procurement on account of the decentralized model of implementation in Phase II, it will be required to join the CPP (Central Public Procurement Portal) which is also available for States at least for

ePublishing of the tenders. It is also possible to have the tenders process automated through eProcurement module of this portal which may also be explored wherever feasible.

7. Other FOSS Applications for Automation of workflow and processes: Apart from the solutions and areas as suggested above, any other relevant and necessary FOSS Application instrumental in automating the workflow/processes of day to day Court administration and management may also be taken up.

8. Integration between all Automation Applications – Judicial ERP: It is also necessary that all of the above suggested process automation solutions should be integrated with each other as much as possible and feasible so that it does not duplicate the efforts relating to certain data sets or applications common amongst those applications. An ultimate destination to be attempted may be in future to have most of the automation solutions deployed for Courts so integrated with each other that it forms an Enterprise Resource Planning (ERP) solutions for Judiciary that is the JudicialERP (JERP).

CHAPTER 11

JUDICIAL KNOWLEDGE MANAGEMENT SYSTEM

EXECUTIVE SUMMARY

1. The Supreme Court Judges Library has successfully implemented an integrated free Open Source application called KOHA. This is not only being used as an integrated library management system but also as a Digital Library. This will be utilized in the libraries of all High Courts and District Courts across the country.
2. Judgments delivered by a High Court or the Supreme Court will be made available through an in-house eJournal containing the judgments and its head notes.
3. A set of programmers will be required to develop the requisite software and a team of professional lawyers and academics will be required to prepare the head notes. The eJournal will be made available to all judicial officers free of charge, resulting in a huge saving.
4. The National Judicial Data Grid (NJDG) will be strengthened to mine data of all cases, decided or pending. This will enable policy planners and policy makers to manage case loads and bring in effective case management systems.
5. Phase II will be a knowledge intensive phase of the Project involving intensive software centric activities.

Justice Delivery System is a knowledge intensive domain as the function of adjudication is governed by vast and diverse laws; substantive as well as procedural. Courts apply and interpret legislated principles enshrined in the Constitution, the enacted laws and also the standards of practice at courts when dealing with daily caseloads as regulated by the prevailing procedural rules. Another prime governing factor in adjudication is the Case Law which is ever developing. The plethora of knowledge derived from all these governing aspects forms the backbone of adjudication process which needs to be supplemented with ICT tools like Court Library Management System, Case Law eJournal, Management Information Systems etc. With this underlying objective, the following knowledge based ICT enablement activities need to be taken up in Phase II of Project for Courts across the country.

1. Integrated Library Management Software (ILMS): Supreme Court, all High Courts and most District Courts have a library. For want of proper and sufficient computerization of libraries in District Courts and in some High Courts, optimum

utilization of resources invested in the library is becoming difficult, affecting the use and access of library facilities. Court Libraries need to be equipped with a robust library management software. This software caters to all functions of a library that is acquisition, circulation, catalogue generation etc. and is called an Integrated Library Management System (ILMS). A FOSS ILMS software will have to be deployed for Court Libraries similarly on the model of CIS deployment that is State Level Cloud Environment.

KOHA which is a FOSS ILMS has been successfully deployed in the Judges Library at Supreme Court of India. Requirement of systems (thin-clients) for Court libraries has been taken into account in arriving at the overall infrastructure requirement of the Court-rooms and Court complexes. The computerization of Court Libraries will also enable the beneficiaries to access its catalogue online and request books/journals online.

2. ILMS also as Digital Library: Efficient ILMS software is being used as a Digital Library wherein content in digital forms is ported and can be accessed by its beneficiaries online. Legal Research Documents, Committee/Commission Reports, Law Articles, Circular, Orders, High Court Rules etc. which are in Open Access content can all be ported to ILMS Digital Library. The Supreme Court Judges Library model will be taken up for rest of the Court libraries being computerized in the Project.

3. Official Case Law eJournal:

(a) The body of case law consists of judgments rendered by the Supreme Court and the High Courts. This case law keeps evolving from time to time by way of new judgments coming in on the same point of law upholding, overruling, citing, referring, discussing and / or interpreting earlier judgments. A comprehensive software mechanism in the form of Legal Database has to be in place which has the repositories of all the Supreme Court and High Court judgments and also keeps track of new judgments affecting the earlier judgments. This software also needs to have a mechanism for porting metadata of the judgment onto it which also includes Head Notes of the judgments. This software will have to be of Federated Architecture as the case law applicability and management will have to be High Court based.

(b) This software will have to be developed on FOSS technologies and will have mechanism for the High Courts to port their judgments with meta data and the head notes. This will eventually become the Official In-house Case Law eJournal of Indian Judiciary. Software solution development for this Official Case Law eJournal of Indian Judiciary will be taken up by the eCommittee from the manpower resources provisioned from the Project.

(c) The Head Notes creation and uploading to this software will have to be taken care of by the High Courts. Funds for Head Note creation will also have to be provisioned from the Project.

4. National Judicial Data Grid (NJDG): The large amount of data of being generated and updated continuously in the Justice Delivery System requires to be stored methodically and also regularly mined and analyzed for meaningful assistance in policy formation and decision making. National Judicial Data Grid (NJDG) is intended to be the National Data Warehouse for case data including the orders/judgments for Courts across the country. Phase II of the Project will aim at attaining the full coverage of case data of Courts across the Country. The uploading mechanism in Phase II will gradually shift to auto pull mechanism from State court cloud installations which will ensure smooth updation of data on NJDG.

(a) Data Analysis Tools in NJDG: Storing the data without the data analysis tools will be an unhelpful exercise. A phased exercise for improvising the NJDG needs to be taken up for furthering the qualitative use of the data uploaded onto the portal. Some of the data intensive tools and technologies that will have to be employed in order to actualize objectives of setting up of NJDG portal are as follows:

(i) Data warehousing: Data warehousing is the process of extracting and storing data to allow easier reporting. The process of Data warehousing will help in more efficient centralization or aggregation of data from multiple sources into one common repository. Data warehousing techniques will allow the possibility of various dynamic and comprehensive reports from the data made available on NJDG portal.

(ii) **Data mining:** Data mining is the use of pattern recognition logic to identity trends within a sample data set and extrapolate this information against the larger data pool that is NJDG. Data mining discovers hidden patterns in data. Data mining operates at a detail level instead of a summary level. Data mining process will assist in finding patterns in the given data set. These patterns can provide meaningful and insightful trend analysis for the policy makers. Data mining can also be used in a wide variety of contexts – in fraud detection, as an aid in litigation and adjudication trends, judicial performance enhancement measures etc.

(iii) **Online Analytical Processing (OLAP):** This tool will help efficiently querying multi-dimensional databases as are there in NJDG. Whereas data mining techniques help analyzing hidden trends from the data, OLAP will help in the summation of multiple databases into highly complex tables with summarized reports.

(iv) **Business Intelligence (B. I.) Tools:** The Data Mining and OLAP being complementary to each other will form the engine for B. I. Tools for the NJDG which help in the most informative management information system and dashboards for effective Court Management as referred in next paragraph on Judicial Management Information System (JMIS).

(b) **Judicial Management Information System (JMIS):** With all these enhancements in place in NJDG, it will be helpful in litigation and adjudication pattern analysis and also the impact analysis of any variations in governing factors relating to law, amendments, jurisdictions, recruitment etc. This will in turn be instrumental as guidance for policy formation and devising future and plans. NJDG will also continue to improve upon the statistical reporting, charts and dashboard made already available which are meant to serve as judicial performance enhancement measures for policy makers and policy planners such as the Chief Justice of a High Court or the Judge in administrative charge of a district The tools forming part of JMIS will effectively serve as a Decision Support System (DSS)

with the aid of data analysis tools referred hereinabove for optimum meaningful and intelligent utilization of data and document repositories.

(c) The manpower resources to be provisioned at NIC and eCommittee team will have to be augmented in order to achieve the above said objectives.

The comprehensive suite of all of the above solutions and facilities will form an ideal Judicial Knowledge Management System (JKMS) for Indian Judiciary.

CHAPTER 12

HUMAN RESOURCES

EXECUTIVE SUMMARY

1. Phase II will require considerable inputs on the software applications as well as monitoring effective management of hardware.
2. Experience in the working of Phase I has shown that the office of the e-Committee needs considerable strengthening. In addition to the existing sanctioned staff, the office will require support staff for Project monitoring, research in new technologies and for fine-tuning software requirements and solutions.
3. Similarly, the DoJ will also require manpower resources for DoJ-PMU.
4. While the NIC team in Pune is doing an excellent job, it will need further augmentation due to additional requirements that will crop up with new technologies being introduced, such as e-filing etc.
5. The workload on the Central Project Coordinators (CPCs) in the High Courts will also increase with greater demands of litigants and policy makers. It is proposed that the office of the CPCs be strengthened with additional manpower on a contractual basis till regular recruitments are made by the High Court.
6. Many court complexes are without qualified hands and in the event of a break-down, all work comes to a standstill. It is suggested that qualified personnel be made available in the districts and talukas so avoid any such mishap and maintain a smooth flow of work.
7. All additional manpower will be on a contractual basis for the project duration and their remuneration will come out of the Project funds,

Phase II of the Project will be knowledge activity intensive. Software aspect of egovernance will get due primacy during Phase II in order to attain the goals of effective automation of the processes. In view of this, the requirement of manpower (human) resources will be far more than Phase I. Overall human resources requirement from the Project is as follows:

1. Manpower for eCommittee:

(a) Sanctioned Staff Strength: As the eCommittee members strength and the workload with the eCommittee will be considerably higher during Phase II. The sanctioned strength of the eCommittee as per DoJ/MLJ/GoI Office Order dated 8/12/2004 as per present cadre is one Administrative Officer of the rank of Branch Officer, one Sr P.A.s (shorthand), four P.A.s

(shorthand), two Sr. Court Assistants, three Jr. Court Assistants and six Court Attendants. Apart from continuing the same strength, additional manpower requirement during the Project period of Phase II will be as follows.

(b) Support Staff for eCommittee-PMU: For the activities relating to Project Management, manpower for Monitoring, Data Collation and Documentation will have to be provisioned from the Project on Contractual basis: For the activities of Project monitoring and follow up, change management programme implementation, documentation of the Change Management and other tasks and formulating and implementing the exercise of Process Re-engineering for the Courts other activities of the Project, a team of 12-15 personnel will be required for the Office of the eCommittee to assist in the areas of Change Management, Process Reengineering, Project Monitoring and Follow up that is Data Entry Operators, Technical Assistants, Office Assistants, Senior Content Writers, Management Graduates / Change Management Executives etc.

(c) Software Developers Team at eCommittee: Software developer manpower for various tasks which will continue to be undertaken by the eCommittee during the Phase II also that is customizing and packaging of FOSS Linux Desktop OS and keeping it updated, Speech to Text Solutions, Mobile Convergence Applications, Office Automation Applications customization, implementation of various solutions developed at various High Courts relating to Complaints Logging Management System, Asset Inventory Software, Judicial Officers Personnel Management Software, Payroll Management etc. for other High Courts, eFiling Portal, developing/implementing additional legal/judicial applications for Ubuntu-Linux e.g. legal databases etc. For effectuating the above objectives, at team of 10 software personnel including Content Designers and Developers will need to be provisioned from the Project.

2. Support staff for DoJ-PMU: Joint Secretary, DoJ and a team comprising of a Director/DS with a PA, an Under Secretary with a PA, a Section Officer, two assistants, a typist and an outsourced expert in project management looking after day to day managing and monitoring of the Project for budgetary aspects, release of

funds and timely completion of financial deadlines, responsibilities towards the parliament etc

3. Software Developers Team at NIC-Pune: As the National Core CIS is being developed and redesigned at NIC Software Development team of Pune, strengthening of the development team will have to be ensured keeping in view the additional fact that considerable efforts for integration of Core-Periphery and development of part of Periphery for High Courts will be required. Provisioning for resources for CIS development, customization and support for next 5 years is underway. The same will have to be continued during Phase II of the Project.

4. Technical Support Team for CPCs: In view of the decentralized model of infrastructure implementation and Core-Periphery model of Software development and deployment, the role of the High Courts and therefore the CPCs will be more dynamic compared to Phase I. The CPCs will need two types of manpower teams for working on these two fronts that is infrastructure and software:

(a) Technical Support Team: The CPC will need a team of upto 5 Technical Personnel for 36 man-months of the Project to assist him in implementation of the infrastructure components of the Project. There will be 3 persons with hardware background being at least graduates in Computer Technology with sufficient experience and two personnel for data collection and collation activities. This assessment of technical support team for CPC will be on a need-based approach.

(b) Software Development Team: In Phase II of Project, CIS Periphery Development and other Office Automation FOSS Applications deployment exercise will one of the most important functions with High Courts team. CPC will have a team of about 5 Software Development Professionals for project duration for assisting in these activities depending upon the requirements. This team will be working in coordination with eCommittee Software Development team and CIS Core Development team of NIC.

(c) The terms of reference of Manpower: The terms of reference of the above referred manpower will be finalized by the eCommittee in coordination with DoJ/NIC. The manpower requirement at High Court will

be reviewed quarterly looking to the Project progress and utilization of the manpower for the intended purposes.

(d) Roles of CPC, Periphery Development Team and HC NIC Coordinator: The team working on the development of CIS periphery will be under the overall supervision and control of the Central Project Coordinator of the High Court and the technical aspects of the development of the periphery will be coordinated by the High Court NIC Coordinator with NIC Pune team. The role of the High Court NIC Coordinator will also be very important in order to ensure technical compatibility of the Periphery with the Core in coordination with NIC Pune team and also for the adherence to standard development best practices by the periphery development team. This team of professionals for development of periphery of CIS and its rollout will also take care of installation of Unified National Core CIS as to be made available online on secured web resources. Core-periphery implementation exercise will be governed by the CIS Guidelines to be given by the eCommittee from time to time. Thus, the CPC will be responsible to ensure CIS Periphery Development in coordination with the High Court NIC Coordinator and NIC Pune for its proper integration with CIS Core as per eCommittee guidelines.

5. Technical Manpower at Court Complexes:

(a) It is necessary to create a sustainable mechanism for continuous smooth operation of the ICT system in the courts. This requires the presence of professional technical support staff in the courts. All High Courts have already been requested to recruit permanent technical manpower funded by the respective State Governments. However, that exercise is likely to take a number of years in the light of the need to find the funds, finalize recruitment rules, undertake recruitment and eventually place selected candidates at the disposal of courts. In the meanwhile, a stop-gap arrangement is required to be put in place for the project duration so as to ensure that the necessary technical assistance continues to be available to courts. The technical personnel to be provisioned for 3 year of Phase II of the Project will perform the following functions in coordination and

cooperation with the District System Administrators (DSAs) and System Administrators (SAs) as trained by the eCommittee in Phase I.

(i) Daily uploading of data to the National Judicial Data Grid after the completion of the Project;

(ii) Resolving day-to-day technology related issues

(iii) Facilitate the District Judge in monitoring and analysis of the data uploaded in the NJDG in order to generate reports required to improve court/case management ;

(iv) Training of new staff.

(v) Day to day troubleshooting of the ICT infrastructure including the networking issues.

(vi) Any other activity incidental to ICT implementation

(b) This manpower will have to work in tandem with District System Administrator and System Administrators trained for the purpose under the overall guidance of the District Court Computer Committee (DCCC) and Nodal Officer of the Court Complex.

(c) It has been assessed that every district should have at least one professional for technical support. There should be one such support for districts having 5-14 courts, two for districts having 15-24 courts and so on. Talukas generally have less number of courts (1-4 courts) and might not need such support at each taluka court complex. However, such support, in the same ratio, needs to be provided for all talukas collectively within each district. Applying the above formula to existing courts, it has been calculated that a total of about 1600 professionals will be required for 3 years to provide such support to all the ICT enabled courts in the country.

6. Role of eCommittee in Technical Manpower Resources being provisioned from the Project: In order to ensure optimum performance and output from the manpower resources, the following measures will be necessary:

(a) Qualification and experience standards of the technical manpower: The suggested skill-set, qualifications, experience etc. of the technical

manpower to be employed at High Courts from the funds of the project, will be centrally decided by the eCommittee with inputs from NIC.

(b) Assessment of manpower requirement: As the manpower provisioning under paragraph 4 and 5 above will be need-based and subject to review of performance and output, the assessment of the same will be coordinated by the eCommittee in consultation with the High Courts.

(c) Manpower Funds Disbursement: As referred in paragraph 10 of Chapter 2 of this document, the disbursal of funds under the head Manpower Resources (Budget Head No. 8) will be on recommendation by the eCommittee for the aspects given in sub-paragraph (a) and (b) above.

CHAPTER 13

SERVICES DELIVERY

EXECUTIVE SUMMARY

1. The web resources will be extensively utilized in Phase II of the Project. Web portals will be used for e-filing; websites will be used for dissemination of information to litigants and lawyers.
2. All websites will be made disabled friendly and to the extent possible, information will also be available in the local language.
3. Mobile phone applications, SMS and e-mail will be extensively used for dissemination of information.
4. Kiosks with basic printing facility will be provided in every court complex (district and taluka).
5. Certified copies of documents will be given online with bar coding to avoid tampering.
6. ePayment gateways will be provided for making deposits, payment of court fees, fine etc.
7. Portfolio managed cause lists will be made available to facilitate a search of cases.
8. NJDG will be further improvised to facilitate more qualitative information for Courts, Government and Public.
9. All functionalities will be interoperable and compatible with the CIS, both unified core and periphery.
10. A Litigant's Charter of services has been prepared and is given below. As the Project progresses and technology develops, necessary additions will be made.

The boost, both qualitative and quantitative, that Phase II of the eCourts Project is expected to induce into the Justice Delivery System with respect to its output will be remarkable. A large number of improved and innovative service deliverables are planned in Phase II. Some of them are given below:

1. Web Portals:

(a) Efiling Portal: A portal will have to be developed to facilitate filing of cases online for High Courts, District/Taluka Courts. Hard copies of the cases filed online will have to be submitted to the Courts within a definite time-line. Initiatives for offline efiling that is filing of soft copy along with the physical copy, will also have to be taken up optimally.

(b) **eCourts National Portal:** eCourts National portal ecourts.gov.in will be further improvised to supply more meaningful and useful case related information on the website simultaneously making it more user friendly and feature rich. This portal will be the single window platform for all Litigant Centric Services to be provided from the web as referred in the Litigant's Charter given hereinafter.

(c) **National Judicial Data Grid:** Data uploading on the NJDG portal have to be further extended to all the Courts of the country and also to ensure regular data updation taking care of the connectivity issues. To achieve this and further improvising NJDG, a few of many enhancements to be taken in Phase II are given as follows:

(i) Provision of Date of uploading in the data being uploaded by the Court to facilitate reporting of chronological analysis of which Court Complex has uploaded data and when.

(ii) Automated triggers/alerts on dashboard for the Administrative Heads of the respective jurisdictions when the data uploading has been delayed beyond certain time limit e.g. two days or so.

(iii) Present functionality of NJDG provides for reports of undated (non-updated) cases in the system which needs to be further improved to be converted to auto alerts through email and NJDG dashboard.

(iv) Graphical Charts for reports of NJDG.

(v) Judicial Performance Assessment Mechanism through NJDG.

(vi) All Periodical Returns of District Judiciary to be made available through NJDG data for High Courts.

(vii) NJDG to become communication pipeline for the purpose of judicial data transmission from lowest Court upto the Apex Court of the country so as to save on hundreds of man-hours invested for preparing statements on frequently sought information by superior Courts, Legislative Assemblies and Parliament.

(viii) Pendency/Arrears and Institution/Disposal Statements: This will be based on the Act/Section, offences such as economic offences, offences against women, children, senior citizens etc.

(d) District Court Websites: Websites for rest of the District Courts will be deployed with functional integrated links to National eCourts portal Case related information. Website features for existing and new websites as given in next paragraph will be implemented.

(e) Website Standards and features: The portals referred above will have to be made compliant with the Government of India Guidelines for Websites (GIGW) and the W3C (WWW Consortium). This is important for ensuring that the websites are properly usable by the visitors anywhere on the globe having any mobile browser. The portals will also be made mobile compliant so as to support mobile browsers. The District Court websites have been built on FOSS Content Management System framework so as to ensure most user friendly updation and redesign as per pre-designed templates.

(i) Localization: It will be attempted to have the District Court website portal enabled for Localization Project Management Framework (LPMF) so as to allow the content to be accessed in local languages also. This will further make the District Court website useful to larger masses.

(ii) Disabled Friendly Portals: Features in the portal to make them disabled friendly will have to be taken up by ensuring compliance to Web Content Accessibility Guidelines (WCAG).

2. Mobile based Services:

(a) Mobile Applications - Mobile phone technology is available for furnishing relevant information to an advocate or a litigant through the use of mobile applications. It is proposed to innovate and prepare mobile phone applications on various mobile operating system platforms to make available information regarding latest judgments delivered by the Supreme Court and the High Courts, case status, case listing information and other

information as may be required by lawyers and litigants. The Mobile Apps will also be developed for similar information of District/Taluka Courts.

(b) **SMS Gateways:** Large scale integration with NIC SMS Gateway infrastructure will have to be managed so as to facilitate push and pull based SMS services to be delivered to litigants and advocates.

3. Case Information through Email: The Phase II of the Project also aims at integrating email based communication services for delivering push and as pull based case related information to the litigants and advocates as referred in the litigants charter hereinafter.

4. Information Kiosks with Printing Facility: Phase II envisages providing kiosks in all Court Complexes with a feature of printing the information being sought using the kiosk. The kiosk (with touch-screen and printer) will be a major tool for providing instant and most accessible litigant centric mechanism for service delivery. The services listed in Litigants' Charter given hereinafter have an important parameter whether the same are being provided through the kiosk installed in the Court Complex. It is therefore proposed to provide for touch-screen kiosks with printer facility for all the Court Complexes wherein apart from viewing the information on the screen, the same can also be printed on the paper by the person accessing it. The charging mechanism may be either free or on nominal reasonable charges which do not require any human intervention and can be inserted in the machine itself like coins etc.

5. Certified Copies Online with Bar-coding: As a measure of convergence of hardcopy and softcopy of certified copy of documents, online delivery of certified copy with authentication features of 2D barcode will be provided through the website to the litigants. The barcode will facilitate authentication of the judgment when produced in hardcopy format before any Court.

6. ePayment Gateways

(a) **eCourt Fees:** Online mode of payment of Court Fees that is eCourt Fees has been attempted in a couple states which can be replicated for other Courts if the respective State Government have the mechanism to facilitate the same.

(b) **For other payments:** Similarly, Payment Gateways for Courts can be commissioned which will facilitate online payment of fines, payments, receipts relating to judicial orders of the Courts. This will be possible as facilitated by the States' financial payment and receipt modes in practice for the Courts.

7. Portfolio Management System: Using the Portfolio Management System Advocates/Government departments will be able to access the case information portal with a user and password authentication whereby all the cases represented by the particular advocate or filed by or against the particular department will be visible as a portfolio along with the case related information of those cases. This will facilitate advocate/department wise cause list also in addition to other useful feature of the system.

8. Interoperability with other components of Justice Delivery System: The systems and softwares in Phase II of the Project will be so designed and deployed that they ensure smooth interoperability with Police, Jails, FSL etc. so that the communication between these stakeholders and Courts is expedited in order to curb the delays involved. Therefore, one of the major baseline requirement of the Case Information Software to be refined and re-engineered in Phase II of the Project will its be its readiness for Interoperability with the central layer to be operational in the Integrated Criminal Justice System (ICJS). The interoperability compatibility of the CIS will ensure that the CIS is able to export / transmit the requisite information to the targeted stake holder that is police, jails, FSL etc and vice versa. The information to be shared, with whom to be shared and the information that may not be shared with certain stakeholders will have to be worked out for this aspect of CIS.

9. eCourt Project Litigants' Charter: Consolidating all the new initiatives and measures proposed to be taken up and the components planned in Phase II of the Project, there will be a number of multi-platform services for the litigants which may be termed as a charter of services envisioned to be delivered to the litigants through the phase II of the Project. This charter of services will serve as a guiding baseline to make the Phase II of the project as litigant centric as possible. The Litigant's Charter conceptualized for Phase II of the project is given hereinafter. As the Project progresses and technology develops, necessary additions will be made in this charter.

eCourt Project Litigants' Charter								
Sr. No.	Service to the litigant	Platform						
		SMS Push	SMS Pull	Email	Web	Mobile App	JSC	Kiosk
1.	Case Filing Confirmation	√	-	√	√	√	√	√
2.	Case Scrutiny – Defects Notification	√	-	√	√	√	√	√
3.	Case Registration Confirmation	√	-	√	√	√	√	√
4.	Case Allocation Notification	√	-	√	√	√	√	√
5.	Case Next Date Notification	√	-	√	√	√	√	√
6.	Process Issued Notification	√	-	√	√	√	√	√
7.	Case Listing Notification	√	-	√	√	√	√	√
8.	Case Disposed Notification	√	-	√	√	√	√	√
9.	Cause List	√	√	√	√	√	√	√
10.	Case Status Information	-	√	√	√	√	√	√
11.	Daily Orders/Proceedings	-	-	√	√	√	√	√
12.	Judgments	-	-	√	√	√	√	√
13.	Online Certified Copy with 2D Barcode Authentication	-	-	√	√	-	√	√
14.	Certified Copy Application Status	√	√	√	√	-	√	√
15.	Certified Copy Ready Notification	√	√	√	√	-	√	√

eCourt Project Litigants' Charter								
Sr. No.	Service to the litigant	Platform						
		SMS Push	SMS Pull	Email	Web	Mobile App	JSC	Kiosk
16.	Certified Copy Delivered Notification	√	√	√	√	-	√	√
17.	Caveat Filed Information	√	√	√	√	-	√	√
18.	Case filed against caveator	√	√	√	√	-	√	√
19.	Appeal/Revision filed against order/judgments	√	√	√	√	√	√	√
20.	Digitally Signed Orders	-	-	√	√	√	-	-
21.	Digitally Signed Judgments	-	-	√	√	√	-	-
22.	Digitally Signed Decrees	-	-	√	√	√	-	-
23.	Digitally Signed Certified Copies of Case Record	-	-	√	√	√	-	-
24.	Process Service through Email	-	-	√	-	-	-	-
25.	eCourt Fees	-	-	-	√	-	√	√
26.	ePayment to Courts	-	-	-	√	-	√	√
27.	eFiling of Cases for SC/HC/DC	-	-	-	√	-	-	√
28.	Regional Language DC Website	-	-	-	√	-	-	√
29.	Disabled Friendly Website	-	-	-	√	-	-	√
30.	Court Complex Location	-	-	-	√	√	-	-

CHAPTER 14

COST ESTIMATION

Projected Approx Cost Estimates – eCourts Project – Phase II

Sr. No.	Component of the Project	Budget (In Cr.)
1.	Creation of JSC-CFC / NR at all Court Complexes	
2.	Hardware – Computers & Thin Clients / Laptops, Printers, Scanners, Projector with Screen, Kiosks, Display Units, Barcode Printers/Scanners etc.	
3.	Local Area Network	
4.	Wide Area Network – Last Mile Connectivity upto SWAN PoP – LeasedLine/MPLS/Wimax/VSAT	
5.	Wide Area Network – Permanent Redundant Connectivity – 3G/Broadband	
6.	NIC Data Centre (Augmentation of Resources for Courts) – National & State	
7.	Other Cloud Computing Resources at SDCs/CCs	
8.	Manpower Resources	
9.	Laptops, Printers & UPS for Judicial Officers	
10.	Power Backup – DG Set	
11.	Power Backup – UPS	
12.	Power Backup – Solar Energy	
13.	Video Conferencing for Courts and Jails	
14.	Software Development, Customization & Support	
15.	Change Management & Capacity Building	
16.	Judicial Process Re-engineering	
17.	Project Management & Monitoring	

Sr. No.	Component of the Project	Budget (In Cr.)
18.	Digital Signature Tokens, Authentication Devices for Process Servers etc.	
19.	Data Entry of Cases	
20.	Scanning, Digitization, Storage, Retrieval & Digital Preservation of Case Records	
21.	Workflow & Process Automation Tools / Measures and Judicial Knowledge Management System (JKMS)	
22.	Contingency Funds	
	Total....	

Annexire 1-I

eCourts Integrated Mission Mode Project

Activities Approved in Phase I

Sr. No.	Module
1	Creation of Computer Room at all the complexes/ Site Preparation
2	Laptops to Judicial Officers & Judges
3	ICT Training for Judges & its Staff
4	Technical Manpower
5	Computer Hardware (Servers, Clients, Printers, Scanners, Projectors etc.)
6A	Communication & connectivity- Internet connectivity to Judges/ Court Complexes
6B	Communication & Connectivity – LAN
6C	Communication & Connectivity – WAN
7A	Power backup - UPS
7B	Power backup - DG Sets
8	Upgrading ICT infrastructure of SC and HC
9	Video conferencing in approx. 500 locations
10	Development of application software
11	Process Reengineering
12	Creation & Up gradation of Centralized facility for system administration
13	Project Management, project monitoring and Change Management Consultancy
14	System Software, Office Tools etc.
15	Digital Signature
16	Smart Card Solutions
17	WiFi Facility in Supreme Court & High Courts
18	Data Entry

Annexure 1-II

The report of National policy and Action Plan for Implementation of Information and Communication Technology in Indian Judiciary, suggested the implementation of the Project in three phases as under:

Phase-I

Sr. No	Proposed Activity
1	Creation of computer room at all the court complexes with internet provisioning
2	Providing laptops to judicial officers and judges
3	ICT Training for the 1st year
4	System Software (OS, RDBMS, Office Packages etc.)
5	Creation of centralized facility for system administration.
6	Manpower development and retention cost
7	Up-gradation of ICT Infrastructure in Supreme Court and High Courts (1st year)
8	Project Management Consultancy, Monitoring and Change management
9	Extension of computer facility at process places, judges chamber, court hall filing scrutiny section and certified copy section and computer room within the court complex.
10	Upgradation of ICT and power infrastructure
11	Upgradation of centralized facility for system administration
12	Upgradation of computer facility computer room and providing scanner at the computing facility.
13	Manpower and Training Cost for the 2nd year
14	Up gradation of ICT Infrastructure in Supreme Court and High Courts (2nd year)
15	Project Management Consultancy, Monitoring and Change management.

Annexure 1-II

Phase-II

Sr. No	Proposed Activity
1	Creation of ICT Infrastructure for additional courts to be created during the project period as per the direction of the Supreme Court in *All India Judges Association v Union of India*, (2002) 4 SCC 247, pr. 25
2	Provisioning of video conferencing facility between under trail prisoners and magistrate with video monitoring.
3	Installation of Wireless Internet facility system in the Supreme court and High court complexes
4	Infrastructure upgradation for centralized facility
5	Manpower and training
6	Up-gradation of Centralized facility
7	Digital Archive of record room and library Management system.

Phase-III

Sr. No	Proposed Activity
1	Use of advanced ICT tools, intensive training, warehousing and mining tool customization to crystallize change management, Biometric facilities, Gateway interface with other agencies.
2	Upgradation of centralized facility
3	Digital Archive of record room and Digital Library Management system

Annexure 1-III

eCourts: Country wide status – 30th November, 2013									
		Site Preparation		Hardware Installed		LAN Installed		Software Rollout	
	High Court	CC	Courts	CC	Courts	CC	Courts	CC	Courts
Sr. No.	**Total**	**2649**	**14061**	**2524**	**13416**	**2427**	**13067**	**2404**	**13227**
1	Allahabad	110	2009	105	2003	94	1914	91	1964
2	Andhra Pradesh	249	885	237	829	217	776	168	678
3	Bombay	434	1908	434	1908	417	1835	464	1954
4	Calcutta	89	774	86	770	89	774	86	770
5	Chhatisgarh	60	254	37	218	32	208	14	182
6	Gauhati	70	309	65	300	63	297	64	298
7	Gujarat	228	837	207	738	208	739	249	912
8	Himachal Pradesh	38	101	38	101	38	101	37	100
9	Jammu & Kashmir	76	184	74	156	67	171	33	131
10	Jharkhand	22	479	22	479	22	479	20	444
11	Karnataka	180	820	177	768	170	756	173	754
12	Kerala	126	420	121	399	120	396	108	365
13	Madhya Pradesh	173	1151	161	1101	161	1101	160	1100
14	Madras	231	787	215	668	196	610	211	641
15	Manipur	14	34	14	34	11	21	7	24
16	Meghalaya	1	7	1	7	1	7	1	7
17	Orissa	112	423	112	423	112	423	108	411
18	Patna	49	922	44	788	44	770	44	788
19	Punjab & Haryana	102	711	95	689	95	689	91	678
20	Rajasthan	238	788	237	787	232	768	237	787
21	Sikkim	4	10	4	10	4	10	4	10
22	Tripura	13	64	12	62	8	46	9	55
23	Uttarakhand	30	184	26	178	26	176	25	174

Annexure 2-I

Note for extension of Phase I as transition to Phase II of the eCourts Project only if Phase II could not commence from 1/4/2013

The policy document for Phase II of the eCourts Project has been prepared and is under submission to the full meeting of the eCommittee to be chaired by Hon'ble the Chief Justice of India. Coordinated efforts by the eCommittee, Department of Justice and NIC have been and will continue to be made for timely approval and commencement of Phase II of the Project from 1st April, 2014.

Although the priority is to start Phase II of the Project as per the policy document from 1st April, 2014, in the event of any delay in approval/commencement thereof, an extension of Phase I is proposed as a roll-over or intermediate Phase preceding the commencement of Phase II. The objective is to avoid any gap, halt or stand-still in the activities of the Project as referred in paragraph 14 of Chapter 2 of the policy document.

The following components of Phase I are required to be continued for implementation in the intervening period, if any, between Phase I and Phase II of the Project.

1. Completion of Phase I target of 14,249 Courts:

NIC has indicated that as on 30th November, 2013 the following main activities remain to be completed to reach the target of Courts in Phase I that is 14249:

Sr. No.	Component	Accomplished	Pending
1.	Site Preparation	14061	188
2.	Hardware Installation	13416	833
3.	LAN Installation	13067	1182
4.	Software Deployment	13227	1022

A number of Purchase Orders are either issued or are in the process of being issued for taking the present status further ahead and therefore the actual number of pending figures may be less than the above said figures as on 31st March, 2014. The activity for the above components pending as on 31st March, 2014 will have to be taken up in the extended duration of Phase I alongwith all other approved components of Phase I of the Project for these Courts.

2. Additional Courts:

The target of 14249 Courts was setup in year 2010 and a number of Courts have been established since then. The number of Courts as on 30th November, 2013 is 16127 across the Country (Annexure 2-II). Therefore, in the extension period, the following number of Courts will have to be taken up for Computerization:

A. Balanace Courts of 14249	B. Total Courts	C. Additional Courts
188 for Site Preparation 833 for Hardware 1182 for LAN 1022 for Software (as on 30th November, 2013)	16127 (as on 30th November, 2013)	16127 – 14249 = 1878 rounded off to 2000 Courts including any additional Courts that may come up in the meanwhile
Total target for extension phase = A + C		

The hardware allocation for the additional Courts to be computerized will be 2 + 6 (8) systems as proposed in the Phase II policy document meaning thereby that 2000 Courts will be have to be provided with 8 systems each of hardware as given below. The hardware for all additional Courts being taken up during the extended phase will be as per the following per Court quantity:

Basic Infrastructure Requirement for a Court Room

Infrastructure Item	Quantity
Slimline PC with latest optimum configuration	2
Thin / Shared / Cloud Computing Client	6
Printers (1 MFD Printer + 1 Duplex Printer with Ethernet Port)	2
LAN Points	12
Extra Monitor + 2 port VGA Splitter/Extension/Distribution Unit	1
UPS 2 KVA with 2 hour backup	1
Display Monitor for Current Case Display Board outside Court Room with basic shared computing or thin client	1

These 8 systems can be 2 PCs with 6 thin clients as per the specifications prevalent in Phase I or 8 special configuration laptops having backup time of more than 3 hours. In case of laptops with this much backup time being provided, the UPS for the Court as given herreinabove will be omitted. In addition to the above Court Room hardware, all other approved components (except the Court Room hardware of 1 + 3 systems) of Phase I of the Project for these Courts will also be provisioned.

2(a). Additional Courts that have come up within the same Court Complex:

The Court Complexes already taken up in Phase I of the Project have been provided with Server Infrastructure in the Server Rooms which can cater to more systems in the additional Courts coming up in the same Court Complex. The additional Courts in the country which have come up within the same Court Complex, which can be covered using the already installed server infrastructure in the Court Complex, will be provided with the 2+6 (8) systems hardware as referred above in the extended period of Phase I of the Project.

2(b). Additional Courts coming up in new Court Complexes:

As Phase II of the Project is to implement Cloud Computing architecture for the eCourts Project, it is not advisable to invest more resources on purchase of server infrastructure for Courts at this stage. After assessing the additional courts that have come up in fresh/new Court Complexes, infrastructure for Judicial Service Centre/Centralized Filing Counter and Network Rooms will have to be provisioned. The hardware for Court Room will be as given above and the hardware for Court Complex will be as per the specifications/quantity of Phase I.

If the Court Complex is a single Court Complex, no server infrastructure has been provisioned in Phase I. For other Court Complexes having multiple Courts, varying quantity of servers from 2 to 10 depending upon the number of Courts in the Court Complex have been provided. In a large number of Court Complexes having multiple servers, not all the servers are utilized. Therefore, any new Court Complex that has come up, any such unutilized server infrastructure may be used for the purpose by way of reallocation and the related expenditure will have to be provisioned for the same. It is reiterated that investment on local server infrastructure is worth avoiding when the Project will be going in for cloud based computing soon

and utilization of already procured server infrastructure is already being taken care of as given in the policy document on Phase II.

2(c). Laptops & Printers for Additional Judicial Officers:

As the extension phase will target computerisation of additional 2000 Courts over and above 14249, an equal number of Judicial Officers also will have to be provided with Laptop and Printer as given to the Judicial Officers during Phase I of the Project.

3. Video Conferencing between Courts & Jails:

Presently a pilot exercise for testing of software based video conferencing solution is underway for five Court Complexes and five jails. On the basis of the outcome of this pilot exercise, the software based VC solution is intended to be deployed for 500 Courts & Jails as a part of Phase I of the Project. As the result of the pilot is expected to be clear by the end of January, 2014 and it may not be possible to roll out the solution in 495 Courts & Jails across the country by 31st March, 2014. Therefore in the extended period of Phase I, all the District Court complexes and the Central, District and Women Jails of the country will have to be taken up for providing the software based VC solution, subject to the outcome of the ongoing pilot exercise.

4. Implementation of the decisions taken in the Empowered Committee Meeting held on 28th October, 2013:

(A) Replacement of the ICT infrastructure of Capital City Court

A decision has been taken in the aforesaid Empowered Committee meeting for the total replacement of the hardware & LAN of 95 Courts and replacement of the gap hardware of 376 Courts which were part of 29 Court Complexes of the Capital City Courts Project. If for any reason the funds transfer / procurement for implementing this decision is not complete by 31st March, 2014, it will have to be taken up in the extended duration of Phase I of the Project.

(B) Additional Hardware Requirements for the High Courts

In the said Empowered Committee meeting, a decision was taken approving the additional hardware requirement of 16 High Courts. The implementation of this

decision is yet to start as the proposal is in the process of further approval by Ministry of Finance. The requirements received from High Courts of Allahabad, Bombay, Punjab & Haryana and Delhi and those of the Supreme Court will be placed in Empowered Committee soon. Thus the additional hardware requirement of 20 High Courts and the Supreme Court, which is intended to be provisioned from Phase I of the Project, will now have to be taken up in the extended duration of Phase I of the Project, if not completed by March, 2014.

(C) Requirement of technical and other skilled manpower for the office of the eCommittee:

A decision was taken in the said Empowered Committee meeting for deployment of 20 personnel at the eCommittee for a period until 31st March 2014, and provision of requisite hardware infrastructure for the office of the eCommittee. As the assessment of the resumes of personnel is under process for short listing the manpower to be deployed and the hardware as approved has also not been procured so far, the implementation of this decision, if it cannot be implemented by March, 2014, will have to be implemented in the extended duration of Phase I of the Project. The manpower for the eCommittee will be required till the extended duration of the Project.

5. Site Preparation & LAN Implementation Decentralization:

In order to expedite the completion of tasks in this extension period, the Site Preparation & LAN implementation activity which have been major contributors to delays in the Project, will be decentralized to High Courts for being completed within a preferred period of four months but not later than five months. The activities of sites preparation and LAN implementation will have to be taken up in fast tracked mode and the process of hardware P. O. Issuance etc. will follow simultaneously in order avoid any gap between site-readiness, LAN implementation and hardware delivery/installation.

The procurement of hardware will be from NIC empanelled vendors of the eCourts Project or NICSI empanelled vendors for the respective items. There will also be an option for the High Courts to procure the hardware item as per the procurement model given in the Phase II Policy and Action Plan Document.

Use of FOSS solutions only in the hardware provided and to be provided:

It is reiterated that, as given in the policy and action plan document of Phase II, all the software solutions to be deployed as part of the eCourts Project will be based on Free & Open Source Solutions (FOSS) technolgoies, which do not have any licensing or subscription charges to be paid. This policy will be strictly adhered to also in the extended duration of Phase I. This applies to the hardware already provided during Phase I and also the hardware that will be provided in the extended duration of Phase I. Hence, like Phase II proposal, no budgetary allocation for purchase of any software product will have to be made during extended period of the Phase I of the Project.

Extension Duration of Phase I and its impact on other ongoing/pending tasks of Phase I:

There are clear three months before the end of the Project. Therefore, a period of six months starting from April, 2014 will be sufficient for taking up the above referred pending tasks in the extended duration of Phase I of the Project. Consequently, the proposal for extension of Phase I, if at all necessary, is placed for not more than six months duration immediately after the present deadline of Phase I i.e. 31st March, 2014. This is vital for the reason that the implementation of the litigant friendly and reformative components of Phase II of the Project can be taken up as early as possible i.e. not later than 1st October, 2014.

The extension of the Phase I of the Project is intended to have an extension effect all on all other funding and ongoing activities already in progress in the Project. This is with reference to any funds still being utilized at High Court level for data entry, technical manpower, contingency expenses etc.

Annexure 2-II

HIGH COURT/STATE WISE COURT LIST AS ON 30.11.2013

Sr. No.	HIGH COURT/ STATE	TOTAL COURTS
1.	ANDHRA PRADESH	1018
2.	ARUNACHAL PRADESH	5
3.	ASSAM	285
4.	BIHAR	1199
5.	CHHATTISGARH	348
6.	DELHI	416
7.	GUJARAT	1036
8.	HIMACHAL PRADESH	118
9.	JAMMU & KASHMIR	193
10.	JHARKHAND	545
11.	KARNATAKA	854
12.	KERALA	426
13.	MADHYA PRADESH	1327
14.	MAHARASHTRA & GOA	2038
15.	MANIPUR	31
16.	MEGHALAYA	20
17.	MIZORAM	32
18.	NAGALAND	24
19.	ORISSA	466
20.	PUNJAB & CHANDIGARH	437
21.	HARYANA	380
22.	RAJASTHAN	928
23.	SIKKIM	14
24.	TAMILNADU & PUDUCHERRY	920
25.	TRIPURA	62
26.	UTTARAKHAND	184
27.	UTTAR PRADESH	2054
28.	WEST BENGAL AND A&N	767
TOTAL		**16127**

5

Electronic Records Capturing using eGOV-PID Standard

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Abstract—*For long term preservation of electronic records (e-records), it must be brought in preservable form called Submission Information Package (SIP) as per Open Archival Information System (OAIS). The electronic record producing agencies should implement the Digital Preservation Standard metadata eGOV-PID (e-Governance Standard for Preservation Information Documentation), duly notified by Ministry of Communications and Information Technology, Government of India. Datāntar Software helps to capture electronic records in the form of SIPs from the e-governance databases. The Preservation metadata contains basic information about the e-Record divided in several parts such as Cataloging, Enclosure, Provenance, Representation, Fixity, Digital Signature and Access Rights Information. The SIP and all files inside the SIP should be named with unique accession number which follows predefined naming convention. Then Datāntar Software transfers valid SIPs to archival system for preservation.*

WHY E-RECORD CAPTURING SOFTWARE (DATĀNTAR)?

The national and state level initiatives of e-governance, e-service delivery, computerization and digitization across various domains are producing enlarging volumes of e-records which must be preserved as per the retention rules and to fulfill various legal obligations. The e-records can be quickly lost much before the assigned retention period due to obsolescence of file format, storage media, database, software and vendor lock-in as result of dependence on proprietary solutions.

The electronic records which are going for long term preservation must be final and have some fixed object form. The preservation metadata of e-record should also be captured at the time of capturing the e-record itself. As per case studies, various kinds of e-governance systems are storing their electronic records in the Databases. So to bring the e-governance records in a fixed object form along with its preservation metadata, e-Record capturing Software (Datāntar) is required.

Background Study

The study of e-District Lucknow, AMTRON Assam, and Mission Mode Projects such as CARD (Computer Aided Administration of Registration Department) Hyderabad, and MCA21 (Ministry of Corporate Affairs) has been done. These different Projects provide multiple types of services which produce the certificates or documents in different forms. In order to make all the digital data preservable, it needs to be brought in the format which is not obsolete and follows open standard along with its metadata in the form of xml. After the study of the database, it is concluded that the database register which is the basis of creation of the e-record should also be preserved along with the e-record itself as the record can be reproduced from the database register.

Different types of e-records such as birth certificate, driving license, passport, court cases, property documents, etc are being studied in order to optimize the parameters which are usually appearing and important for the e-record to be identified and those parameters are incorporated in the eGOV-PID standard.

After the study, it is clear that the huge amount of digital data is generated which needs to be preserved. Hence, if the process for capturing of e-records is simple and automated, it is more likely that the system will reduce the risks that arise when records are not captured.

WHAT IS DATĀNTAR SOFTWARE?

Datāntar is a software used for capturing e-records according to e-Governance standard for Preservation Information Documentation (eGOV-PID) for Electronic Records. It has a capability to connect with various kinds of databases. It automatically captures the e-records (database register xml) along with preservation metadata (eGOV PID) xml from the e-governance database. It produces the valid Submission Information Packages (SIPs) with unique accession number (as per the naming convention). It also automatically transfers the SIPs to the archival system for perseveration.

DIGITAL PRESERVATION STANDARD

eGOV PID

The e-Governance standard for Preservation Information Documentation (eGOV PID) defines metadata of content information (digital object) which is categorized in following parts:

- *Cataloging:* It contains the basic details of the digital object. It is the handle of the record.
- *Enclosure:* It holds the details about the supplementary documents.

- *Provenance:* It is the origin and migration details where the digital object was produced.
- *Representation:* It stores all the hardware and software details which can be helpful to render the digital object.
- *Fixity:* It is the hash value of digital object which is used to check the integrity.
- *Digital signature:* All digital signatures associated with the object can be mentioned. It contains details about signer, issuer, etc.
- *Access rights:* It defines the degree of confidentiality and user level permissions to access the object from digital repository.

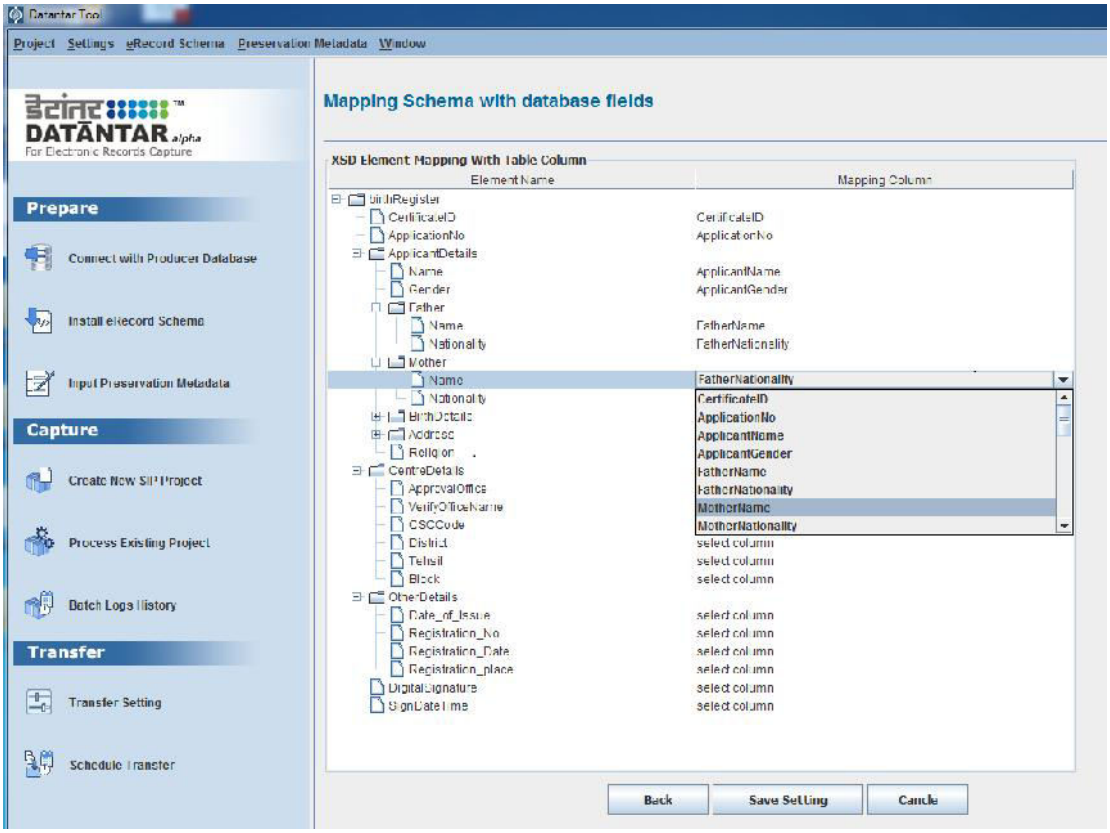

Fig. 1: Datāntar Software

eGOV PID of Electronic Records provides standard metadata dictionary and schema for describing an electronic record. Most of the preservation information (metadata) can be automatically captured using this schema after the final e-record is created, as most of the required information is already present in an e-government system. The implementation of this standard helps in producing a valid input i.e. Submission Information Package (SIP) for

archival and preservation purpose as per the ISO 14721: 2012 Open Archival Information Systems (OAIS) Reference Model. The elements of eGOV PID are shown in Fig. 2.

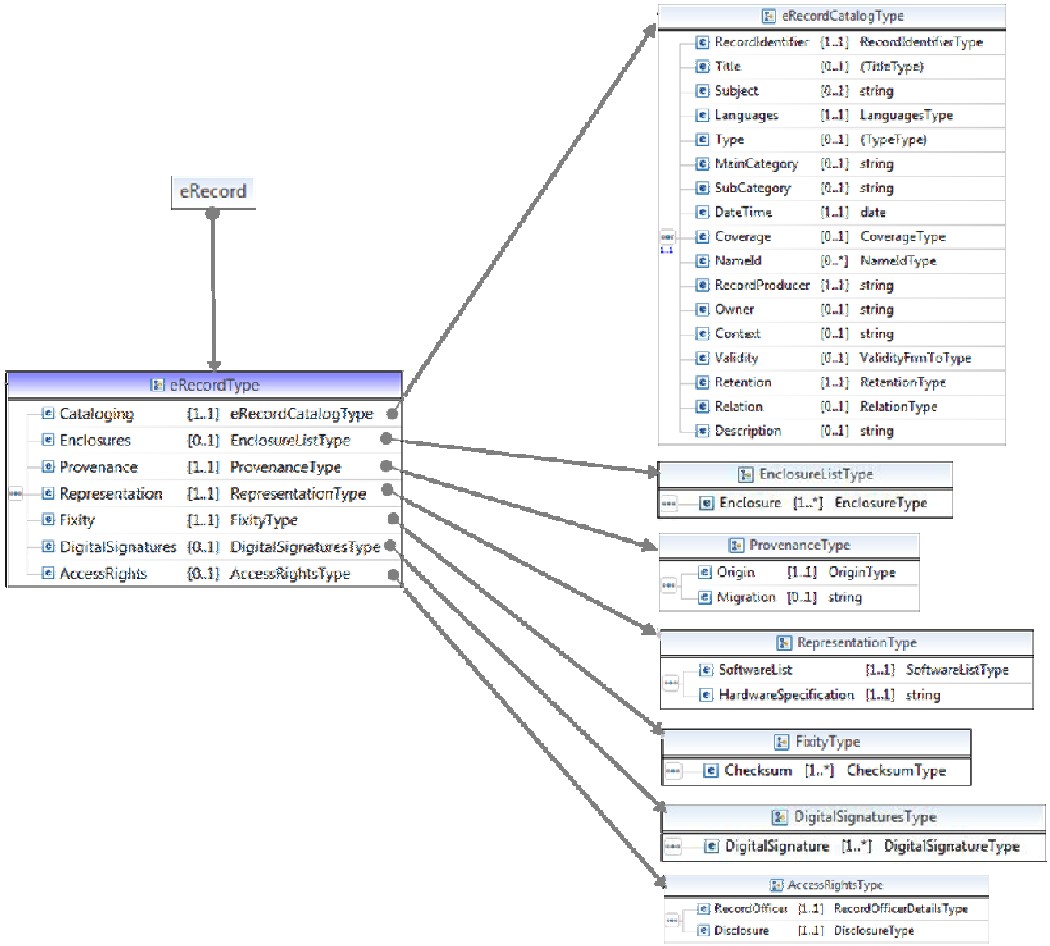

Fig. 2: eGOV PID Digital Preservation Standard

Benefits of Digital Preservation Metadata (eGOV PID)

Preservation metadata is the information about the preservable object. It is the background information that describes how and when and by whom a particular set of data or a record was created, collected or received and how it is formatted. Especially when data is computerized, without appropriate background essential information it is impossible to understand. It also tells about the migration of e-records format.

Metadata serves many important purposes, including:

- Protecting records as evidence and ensuring their accessibility and usability.
- Ensuring the authenticity, reliability and integrity of digital records.

- Enabling the efficient retrieval of digital records.
- Providing logical links between records and the context of their creation, and maintaining the links in a structured and reliable way.
- Allowing timely destruction of temporary value records when business use has ceased
- Providing information about technical and technological dependencies, to help ensure their long-term preservation and usability.
- Identifying records.
- Authenticating records.
- Capturing in a fixed way the structural and contextual information needs to be preserve the record's meaning.
- Administering terms and conditions of access and disposal.
- Linking the attachment to the records for authenticity.

WORKFLOW OF DATĀNTAR

Datāntar is e-record capturing software. It captures the e-record from e-governance system as per Digital Preservation Standard (eGOV PID). The detailed workflow is explained below.

Architecture of e-Records Capturing Software

Datāntar Software is divided into the three parts as prepare, capture and transfer:

- *Prepare:* Prepare the e-records for capturing process by connecting to database, uploading the xml schemas for citizen services and inputting the preservation metadata.
- *Capture:* Capture the e-records (database register xml) along with preservation metadata (eGOV PID) xml by mapping the specific service schema elements to the respective database table columns. The e-records are captured with unique as valid SIPs.
- *Transfer:* Transfer the valid SIPs to the respective location of Open Information Archival System(OAIS) for preservation.

Overall Functional Outline of Datāntar Software

Datāntar software offers user login with password along with biometric authentication for more controlled access to the system. It is essential as the e-governance records can contain sensitive, valuable and private information pertaining to citizens and therefore it should be accessed only by authorized persons. Datāntar software allows the user to connect with heterogonous databases as observed in various e-governance implementations. The software allows you to upload the XSDs (XML schemas) pertaining to specific types of e-records such

as birth register record, death register record, domicile record, etc. It provides access to various tables and columns in the database in order to map the existing values/ information available in the database related preservation metadata with the various sections in the standardized eGOV-PID XSD. Datāntar software also allows to input the missing information externally which has to be part of the e-record. One has to do these settings only for the first time which can be saved and reused throughout the e-record capturing process thereafter.

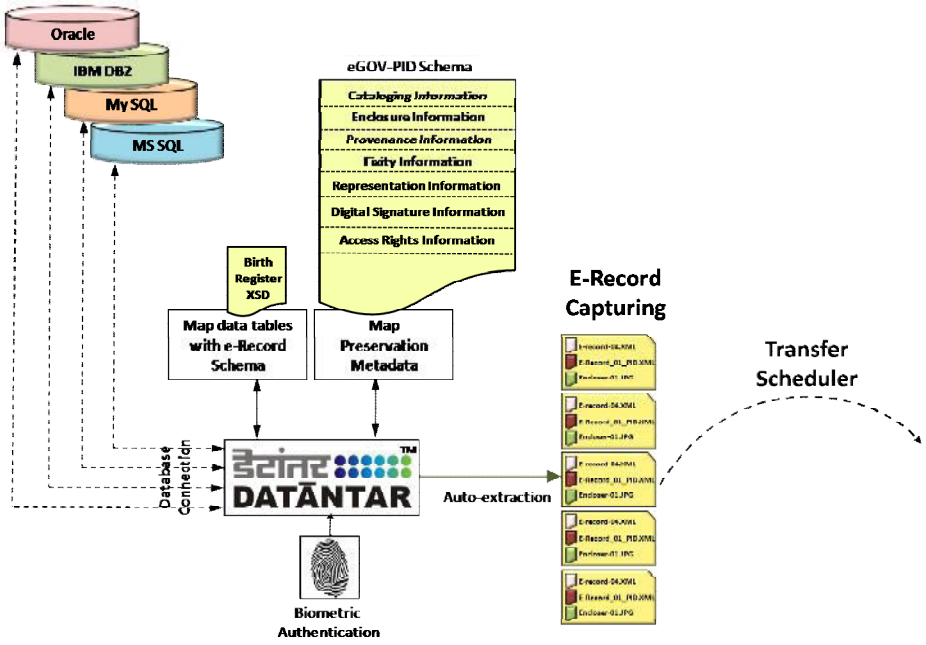

Fig. 3: Architecture Diagram of Datāntar Software

Datāntar software also allows to generate the submission information packages(SIPs) as per the standardized eGOV-PID XSD. submission information packages(SIPs) contains digital object and associated enclosures along with preservation metadata XML. If digital signature is available in e-governance databases, Datāntar software can capture and encode digital signature as base64 automatically. This software allows to transfer the submission information packages to the respective location of Open Archival Information System for preservation. Datāntar software is also capable of scheduling the electronic records to transfer as daily, weekly and monthly.

Datāntar software is capturing e-governance records as per eGOV-PID which contains cataloging information, enclosures information, provenance information, representation information, fixity information and access rights information.

Cataloging Information

Cataloging information contains the basic information of electronic records. It is the handle of the record. Almost all the information is automatically captured from e-Governance database

but the information which is not available can be inputted from the software. Some of the basic details which are covered in cataloging information are mentioned as follows. It holds the unique identifier of the record. It allows to input State Recognized Official Language Code to be mentioned for describing the languages used in the e-record as per Officer of Registrar General of India (ORGI). All the names of persons related to the e-record can be mentioned with their role and identification document no. such as UUID, PAN, Voter ID, etc.

The duration for which e-record should be retained can also be mentioned in the cataloging information as Retention through Datāntar software.

```
<eGOVPID:Retention>
 <eGOVPID:Duration measurement="year" term="10" type="Period"/>
 <eGOVPID:Comments>Upgrade to Category I if the e-record is needed for legal purpose beyond 10 years.
 </eGOVPID:Comments>
 <eGOVPID:DisposalAction>Review</eGOVPID:DisposalAction>
</eGOVPID:Retention>
```

Fig. 4: Retention Element in Cataloging Information

Enclosure Information

The final e-record (e.g. the certificates issued by e-governance systems) is generated on the basis of various documents, proofs and correspondence which are enclosed with it. The enclosure information is needed for establishing the context in which the e-record was produced. The list of enclosures can be included in the eGOV PID if applicable. The domain specific metadata not covered in eGOV PID can also be linked as a separate XML as other descriptive metadata type of enclosure. The accuracy of the final e-record can be verified and validated on the basis of the enclosed documents.

Provenance Information

It includes the office address of e-governance systems which issued the final certificate and the device address of the system where the request was processed and final certificate was issued. As per the IT act 2000/2008, Datāntar software automatically captures the device address which contains the IP address and MAC address.

```
<eGOVPID:Provenance>
  <eGOVPID:Origin>
    <eGOVPID:Organization>Sub Registrar Office</eGOVPID:Organization>
    <eGOVPID:GeographicalAddress>
      <eGOVPID:Street>Shamashabad</eGOVPID:Street>
      <eGOVPID:Village>Shamashabad</eGOVPID:Village>
      <eGOVPID:SubDistrict>Shamashabad</eGOVPID:SubDistrict>
      <eGOVPID:District>R R District</eGOVPID:District>
      <eGOVPID:State>Andhra Pradesh</eGOVPID:State>
      <eGOVPID:PIN>500123</eGOVPID:PIN>
    </eGOVPID:GeographicalAddress>
    <eGOVPID:DeviceAddress>
      <eGOVPID:IPAddress version="V4">10.208.27.81 </eGOVPID:IPAddress>
      <eGOVPID:MACAddress>70-71-BC-BE-A9-77</eGOVPID:MACAddress>
    </eGOVPID:DeviceAddress>
  </eGOVPID:Origin>
  <eGOVPID:Migration>\1520\1520-subfond-2012\1520-1-2012-1354\1520-1-2012-1354_dmig.xml</eGOVPID:Migration>
</eGOVPID:Provenance>
```

Fig. 5: Provenance Information

Digital migration is the transferring of data to newer system environments. This may include conversion of e-records from one file format to another (e.g., conversion of Microsoft Word to *PDF* or *Open Document)* or from one *operating system* to another (e.g., *Windows* to *GNU/Linux),* so the resource remains fully accessible and functional. The purpose of migration is to preserve the integrity of digital objects and to retain the ability for clients to retrieve, display, and otherwise use them in the face of constantly changing technology.

Representation Information

Representation Information holds the software and hardware details of the system where the final e-record was issued. Software details include the names, version and license information of software, operating system, compiler, API Library, application, tools, web browser, database, etc. which was used for creating the final e-record and the software necessary for reading it. Hardware details can be automatically captured by the software. Representation Information is helpful to render, understand and interpret the digital object content in future.

```
<eGOVPID:Representation>
    <eGOVPID:SoftwareList>
      <eGOVPID:Software licenseType="LGPL" name="Base64" type="API"/>
      <eGOVPID:Software licenseType="GPL" name="XMLViewer 2.0" type="Application"/>
      <eGOVPID:Software licenseType="Microsoft" name="Windows 7" type="OS"/>
    </eGOVPID:SoftwareList>
    <eGOVPID:HardwareSpecification>
    Vendor: Intel, Model: Core(TM) i7 CPU  960  @ 3.20GHz,Mhz: 3243,Total CPUs: 8,RAM: 3320MB,Total Memory:
    3479162880MB,Used Memory: 2583969792MB,Free Memory: 895193088MB,Language: 16393:English (India),OS
    description: Microsoft Windows 2008,OS name: Win32,OS arch: x86,OS version: 6.1,OS patch level: Service Pack
    1,OS vendor: Microsoft,OS vendor version: 2008,OS code name: Longhorn Server,OS data model: 32,OS cpu
    endian:little
    </eGOVPID:HardwareSpecification>
</eGOVPID:Representation>
```

Fig. 6: Representation Information

Fixity Information

It includes the checksums of the final e-record. It helps to check the integrity of the record at any point of time during or after preservation.

```
<eGOVPID:Fixity>
  <eGOVPID:Checksum algorithm="MD5">086d6f77f2faa09382497c8e4f203814</eGOVPID:Checksum>
  <eGOVPID:Checksum algorithm="SHA-1">79d935c885eba5cab21c0d0c3248dc61719bab85</eGOVPID:Checksum>
</eGOVPID:Fixity>
```

Fig. 7: Fixity Information

Digital Signature Information

The digital signature metadata needs to be captured so as to establish the authenticity of the e-record at a later date. Datāntar software automatically captures the digital signature from e-governance database if available. The Digital Signature information holds the details of the person who signed the e-record, the issuer of digital signature, certificate authority, public key, etc.

Access Rights Information

Access rights information identifies the access restrictions pertaining to the e-record. It covers the address and contact details of e-record holding agency. It allows to define the different permissions such as discover, display, review, extract, print, duplicate, delete on e-record for various kinds of users. Also the custom permissions can be added as "other permission" such as bulk sharing, republish, download, etc. It also provides the classification of disclosure for "public" or "private" e-records. The degree of secrecy associated with the e-record can be defined as confidentiality as per the e-Office Procedure.

Access Rights Information is useful when the user has to access electronic record from digital repository. The user can access e-records according to the permissions defined in the Access Rights block at the time of e-record capturing process.

```
<eGOVPID:AccessRights>
 <eGOVPID:RecordOfficer>
       <eGOVPID:Name>Departmental Record Officer</eGOVPID:Name>
       <eGOVPID:Address>
          <eGOVPID:Street>ADJ TO BANDHAN FUNCTION HALL</eGOVPID:Street>
          <eGOVPID:Village>JAFFARGUDA,RING ROAD.HYDERABAD</eGOVPID:Village>
          <eGOVPID:SubDistrict>GOLCONDA</eGOVPID:SubDistrict>
          <eGOVPID:District>HYDERABAD</eGOVPID:District>
          <eGOVPID:State>Andhra Pradesh</eGOVPID:State>
          <eGOVPID:PIN>700001</eGOVPID:PIN>
       </eGOVPID:Address>
       <eGOVPID:PhoneNumber type="Landline">04023442901</eGOVPID:PhoneNumber>
       <eGOVPID:EmailId>DRO.16102@ivrs.ap.gov.in</eGOVPID:EmailId>
 </eGOVPID:RecordOfficer>
 <eGOVPID:Disclosure disclosureClassification="PUBLIC">
  <eGOVPID:Permission userType="Citizen" discover="true" display="true" review="false"
  extract="false" duplicate="false" delete="false" print="false" other="false" />
  <eGOVPID:Permission userType="Owner" discover="true" display="true" review="false"
  extract="true" duplicate="true" delete="false" print="true" other="false" />
  <eGOVPID:Permission userType="Asistant Inspector General" discover="true" display="true"
   review="true" extract="true" duplicate="true" delete="false" print="true" other="false" />
  <eGOVPID:Permission userType="Repository Administrator" discover="true" display="true"
  review="true" extract="false" duplicate="true" delete="false" print="true" other="true"
  otherPermitType="WebPublish" />
 </eGOVPID:Disclosure>
</eGOVPID:AccessRights>
```

Fig. 8: Access Rights Information

In this way the electronic records are captured in the form of database register xml because xml is a simple, extensible, interoperable and open standard format. In the future the records' data can be regenerated from the xml. The preservation metadata file is generated as explained above. The enclosures and digital signature certificates are extracted if available. The valid SIPs are generated by Datāntar software. As shown in Fig. 9, Datāntar software transfers the SIPs to the OAIS (e-Record Digitalaya) for further process of preservation.

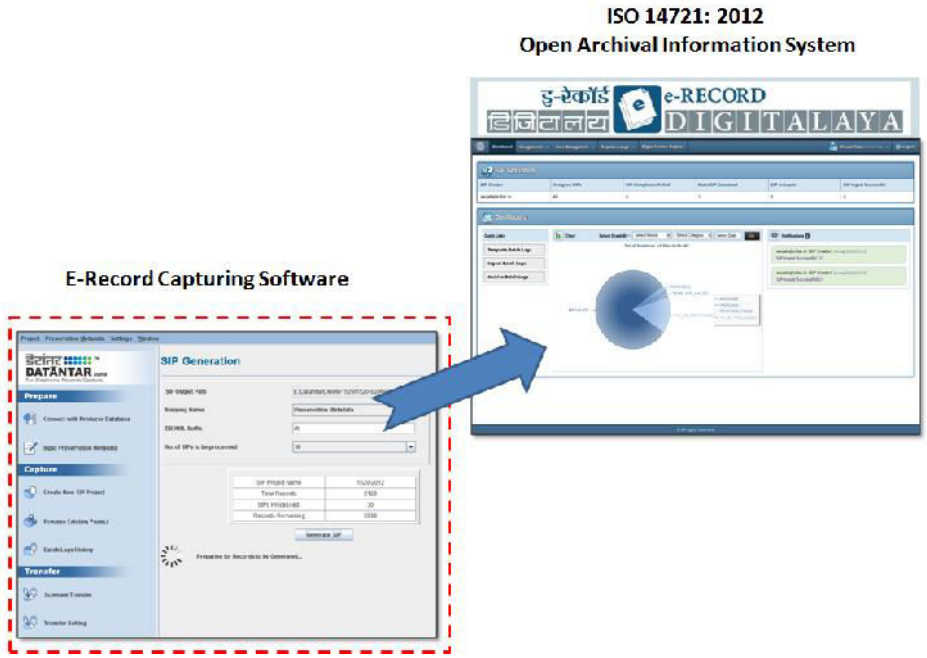

Fig. 9: Transferring e-records from Capturing System to e-Records Digitalaya (OAIS) being Developed by C-DAC Pune

CONCLUSION

The Datāntar software follows the Indian Information Technology Act 2000/2008 to ensure its legal admissibility. All the processes in the software are automated as a batch process which is helpful in capturing and transferring millions of electronic records in valid preservable form. Hence manual efforts and time consumption is reduced while accuracy and performance is increased:

- The Datāntar software captures the electronic records in the form of database register xml from the e-governance databases.
- It captures the preservation metadata xml along with the main preservation object in order to create valid Submission Information Package (SIP).
- The SIPs are created with unique accession numbers following the predefined naming conventions. The supplementary documents are captured in SIP.
- If the digital signature is available in the database then it can be extracted in the form of bas64.
- The software generates the fixity of main preservation object in order to retain the integrity.
- The valid SIPs captured in Datāntar software can be transferred to Open Archival Information system (OAIS) for further preservation.

In the current scenario Datāntar software is a prototype for legacy e-governance records. In the future it can be made generic and used for various citizen services provided by e-governance system.

ACKNOWLEDGEMENT

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Digital Preservation of Court's Disposed Case Records—A Case Study from Indian Judicial System's Perspective

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Abstract—*In India there are about 24 High Courts with large numbers of district and sub-ordinate courts. Every year thousands of cases getting disposed and correspond-ing file and evidences dispatched to record rooms for archiving. Managing and accessing large amount of documents in the form of physical records is itself a challenge for judicial system. Therefore, proper infrastructure and space is re-quired for storing and accessing large amount of disposed case records. Financial and physical resources, such as, manpower is required for handling enormous amount of records. To solve this issue Indian courts are moving towards the concept of digitization. On the other hand, only conventional and unstructured digitization dose not solve the problem completely. The challenge is to preserve the disposed case records for long term in technologically independent envi-ronment and keep information and knowledge available for the judicial fraternity. The reference model 'Open Archival Information System (OAIS ISO 14721)' can be adapted to achieve technologically independent long term preservation. In order to preserve these records we need to extract the metadata of respective disposed case records in accordance with the OAIS standard. Each and every court in India is maintaining and storing disposed case records separately in their respective manner. There is a need for metadata standardization process for the ease of preservation and archiving of records. This paper is based on the initial attempt (Proof of Concept) for metadata standardization of judiciary records.*

Keywords: *Metadata Encoding and Transmission Standard, Metadata standardization of Judicial records, Representation Information, Digital Obsolescence, Submission Information Package and Archival Information Package.*

INTRODUCTION

Legal system is one of the prominent pillar of any country as it natures society, politics and economics. It acts as a best mediator between people and institutions. In India every court is maintaining their records independently irrespective of any standardization and global access. Today, we are able to store the data, but, are faced with serious challenges when it comes to preserving the information that the data represents. Long Term Digital Preservation attempts to address these challenges. Long term preservation, basically, preserves the digitized information

along with its metadata, so that the valuable information can be used seamlessly as and when required in the future in spite of obsolescence of hardware, software, processes, format, people, etc. To preserve valuable judiciary records for future access, there is a need to standardize metadata among all courts in India.

Metadata: is data about data which is required to understand and interpret the actual data that need to be archived. There is a conceptual framework developed by NASA's Consultative Committee for Space Data Systems (CCSDS) called Open Archival Information System (OAIS- ISO 14721 standard).This paper will explain about the implementation of OAIS framework for long term technology independent preservation of Judiciary records. In India each court and its sub courts are maintaining their data independently irrespective of any standard policy. Before preservation of disposed case records, there is a need to systematize the records among all district courts in a standard manner as per OAIS standard.

CDAC: Noida developed a tool called Disposed Case portfolio Manager. This tool will collect and extract the metadata from all Delhi district courts. After, extraction this tool will standardize and encode the metadata of respective disposed case records. There is also an option to manually enter the metadata in case of missing metadata information.NIC is already doing the process of capturing the case records domain level information.To use the data generated by NIC, database administrator had written some procedures functions, views which need to run inside the oracle database, to extract and map the disposed case records data to the long term preservation application database.

Following are the concerns which can be solved by adopting this solution:

- Preservation of case records along with their metadata.
- Defined strategy is required for maintaining disposed case records.
- Centralized digital library for all decided cases at High Court is required for future reference of records.
- Standardized migration policy is required to prevent from the loss of data.
- Because of scattered information it is very difficult to search old case records.
- Online connectivity among District courts and High court for automatic case record transfer is required.

IMPLEMENTATION STRATEGY

CDAC NOIDA developed a Metadata Standards for Long Term Digital Preservation of Disposed Case Records. This document encloses the details of metadata required to preserve the electronic records of disposed cases in the judicial scenario. This metadata, acts as an input for the Open Archival Information System (OAIS- ISO standard 14721) for the digital preservation of Delhi District Court's disposed cases records. After extraction of records from different sources, normalization process will start as per the metadata standard. There will be provision of entering missing domain level metadata.

Metadata Standardization Procedure

Metadata will be divided at following levels:

1. *Domain level metadata:* Comprise all the metadata collected by the domain experts. This metadata will cover descriptive, structural and administrative metadata. For judiciary domain, metadata is standardized into following section:
    - Case Information.
    - o *General case log:* will contain all the information related to the disposed case record, such as, Unique Case Id, Case Type, language of the case record etc.
    - o *Petitioner/ complainant information:* It will contain the information related to the petitions of the disposed case, such as, petitioner name, appearance date of petitioner etc.
    - o *District court information:* This section will contain the information related district court in which the respective case was disposed.
    - o *Filing data:* Date on which the case id filed in district Court.
2. *Technical level metadata:* contains information that is required to render the data. Representation Information -The information that helps to understand and interpret the data (e-record) is called Representation Information (RI).There are two form of RI i.e. Structural and Semantic information. Structural information interprets the digital object and semantic information adds additional meaning to i.e. Document either a .pdf or .doc file can be understood with the help of technical specification. Without technical metadata it is impossible to understand and interpret data, like in the above case you will not be able to judge whether it's a .doc file or .pdf file.

Following are the benefits of Metadata Categorization:

- Metadata helps to preserve specifications about the digital object.
- Metadata needed during migration from old technology to new technology.
- Supporting and managing access, privacy and rights.
- Support Authenticity and Understandability.

Metadata Validation and Verification

Without metadata every data will be in raw form and it will require some technology which can interpret the data in readable form. To get the accurate information about the data it is very essential that metadata should be as accurate as possible. After the metadata extraction and generation procedure, one cycle of review is required to check the correctness of the metadata generated. In case of some error there should be provision to correct the metadata .Metadata for disposed case records in Delhi District Courts will be collected from various sources. There are three scenarios for collection of Case metadata & e-Files from the existing system.

1. Scanned files from Delhi District Courts.
2. Case e-Files already exist in NIC System.
3. Case e-Files with Video recordings files from Karkardooma e-Court.

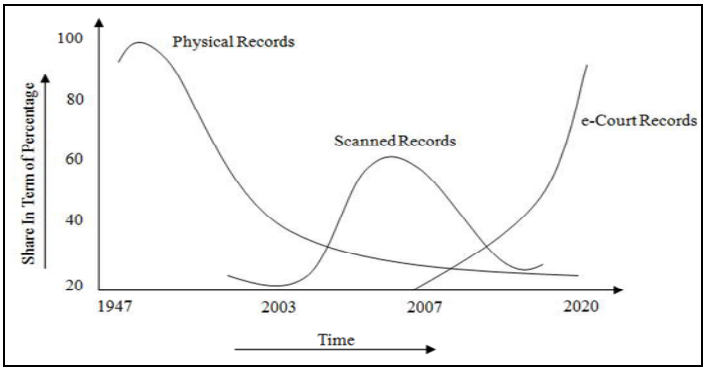

Fig. 1: e-Court Recording

After, the collection process metadata needs to be standardized based on preservation standard.

Packet Generation

Submission Information Package- is a package which will contain the data that need to be preserved and related information which will be required to preserve the data for long term period. This packet will be generated as per the OAIS framework.

- Procedure for creating Submission Information Package After the collection, extraction, standardization and verification of data and its metadata among all district courts, a package will be created by the validator known as Submission Information Package.

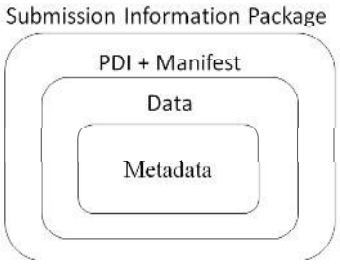

Fig. 2

- Packet Components
  - Data Section is the actual content (Disposed Case Records) that need to be preserved for long term.
  - Metadata Section will contain all the essential information required to interpret and understand the data, which will be beneficial during archival.

- Preservation Description Informationfile will contain all the essential information required to preserve the packet for long term.
- Manifest file will contain the transmission information about the SIP package.
- As per OAIS standard, SIP package will be created at Producer level and then transmitted to OAIS framework for long term storage.
- The solution developed by the CDAC Noida will be deployed in all Delhi district courts and data along with its metadata will be collected, generated and standardized in every district court. Simultaneously, SIP packet will be generated in every district court and transmitted to High Court of Delhi for object based storage.

- Disposed Case Portfolio Manager Application developed by CDAC- NOIDA assures this need in following manner:

This is a role based web application which is strictly based on the access rights applicable to respective roles. There will operator- who will do the metadata entry for respective case records and will have the facility to upload the records. There is another user called validator- who will validate the disposed case records. In case of major error he/she will revert the record to the respective operator to do the correction suggested by the validator. Validator will also have the right to do the edition in case of minor changes and can also view the records uploaded by the operator. If everything is ok, then validator will accept the record and start the activity for packet generation. The Output of a Disposed Case Portfolio Manager is a SIP packet generated as per OAIS Standard.

Following architecture adopted in Disposed Case Portfolio Manager:

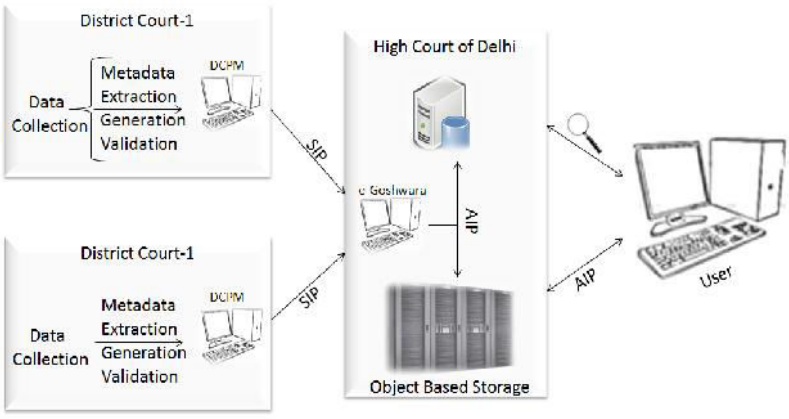

Fig. 3: Architecture Adopted in Disposed Case Portfolio Manager

There is another application named as e-Goshwara [1]which is under development in CDAC Noida. This application will be deployed in High Court of Delhi which will receive the SIP

[1]Goshwara-This word is derived from the Urdu language ,that means record and it is commonly used in northern parts of Indian courts as a nomenclature for record rooms.

packet from various Delhi district courts. As per OAIS standard, this application will verify the quality and authenticities of the SIP packet received from various sources and then reframe it as an Archival Information Package which will be send to the Object based storage system.

- Quality and Verification Procedure.

After, the SIP is transferred through transmission session between district court and high court of Delhi.

Following sequence of test will be applied to the packet:

- Antivirus Check.
- Hash Value Check.
- Format Check.
- Path Check.
- Number of files in SIP.

In case of any error, packet will be rejected and proper acknowledgment will be send to the sender. After taking necessary actions, sender will retransmit the SIP packet. If all parameters are ok then respective acknowledgement will be send to the sender and e-Goshwara application will start the process of SIP to AIP conversion.

Storage device will store the AIP packet in the form of object with unique identifier. Object based Storage will store the packets in the form of object which can be accessed using unique identifier called OID. Object metadata will contain the information about the physical location of the object. For accessing the object, as per the user request open source protocols can be used. Usage of the following protocols will add the advantage of interoperability. HTTPS, FTP, RESTFUL are some of the protocols which can help to read and write the packet from the storage device.

Packet Rendering

CDAC NOIDA is also developing Access portal which will acts as an interface between user and e-Goshwara application. User can simply search for the particular case records based on their need. There are some technical background activities which will run based on the user input to get AIP object. Based on the requested parameter access portal will hit the centralized database and fetch the AIP packet id.Based on the unique id of AIP packet, one of the process of access portal will fetch the object of respective AIP.As per OAIS standard AIP packet will be reframed as Dissemination Information Package (DIP). With the help of preserved metadata and technology individual content in the DIP packet will be displayed to the end user. With the help of object based storage we can store any type of data. In case of judiciary records, data can be a simple case file or there can be any type of data as an evidence e.g. audio, e-mails etc. which need to store in their respective manner.

RECOMMENDATIONS

- e-Record Retention, Disposition & Access Policy for digital or electronic records produced by e-courts needs to be clearly defined.
- The domain specific metadata for judicial records requires to be standardized.
- The requirements of standards with special significance for e-courts in terms of preservation of digital evidence need to be investigated and defined by involving the domain experts.
- The e-court record creation processes need to be standardized by incorporating the e-record management practices as integral part of CIS system.
- Record validation processes needs to be drafted & documented for archival purposes.
- Audit procedures are required to be framed for process validation.
- Reliable Broadband connectivity in district courts and in High Courts is required to be made available; currently NIC-net connectivity is not sufficient for the project. Availability of National Knowledge Network would be the ideal solution for courts.
- Manpower/ staff cadre to manage the digital preservation is required to be defined. Currently the available manpower and their skillset are not at all sufficient to manage digital preservation activities.
- Means of economic & financial sustainability of Trusted Digital Repository are also required to be visualized& channelized so that it could itself run for longer period of time.
- National Judicial Referral System must be built on established Trusted Digital Repository using BIG DATA, semantic web concepts and by developing domain ontologies.

CONCLUSION

The solution developed by CDAC Noida will help the Indian Judiciary System to preserve their records for longer period of time. These records are assets of the Indian Judicial fertility. Current and future Law students, lawyers and judges can refer these old records for various reasons. Even after, decades these records can be rendered because this solution is storing the records in the object form along with their metadata. This is a solution to the threat of technology obsolescence.

Besides long term storage, this solution will also gather and standardize the scattered records and its associated metadata among all district court in centralized location. The records in the form of packets can be rendered for various statistical analysis also. Standardization of metadata among all Delhi district courts will solve the following concerns:

- Maintenance of case records will become easy.
- Fast and efficient searching.

- Reduction in redundancy.
- No scattered information.

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e-Goshwara : Digital Preservation System Court Records

This is pilot project under the recommendation for National Digital Preservation Program (www.ndpp.in). C-DAC Noida is entrusted with the responsibility for creating a Digital Preservation System for the court's disposed case records under the guidance of High Court of Delhi and e-Committee Supreme Court of India.

The main aim of this project is to create Trustworthy Digital Repository (TDR) a long term digital preservation environment for the disposed case records through adaptation of Open Archival Information System [OAIS (ISO14721:2003)] developed by Consultative Committee for Space Data Systems (CCSDS).The information package containing disposed case records will be transferred to the central archive system for long term preservation. These records will be maintained and preserved for longer period of time with the appropriate preservation policies applied on them and keep them available and accessible to designated community irrespective of hardware, software & technology changes.

The objectives are as under:

- Conduct research and development in digital preservation to produce the required tools, technologies, guidelines and best practices.
- Develop the pilot digital preservation repositories and provide help in nurturing the network of Trustworthy Digital Repositories (national digital preservation infrastructure) as a long-term goal.
- Define the digital preservation standards by involving the experts from stakeholder organizations, consolidate and disseminate the digital preservation best practices generated through various projects under National Digital Preservation Program, being the nodal point for pan-India digital preservation initiatives.
- Provide inputs to Department of Electronics & Information Technology in the formation of national digital preservation policy and strategy by identifying and selecting the activities for the National Digital Preservation Program.
- Spread awareness about the potential threats and risks due to digital obsolescence and the digital preservation best practices.

e-Goshwara Online Portal

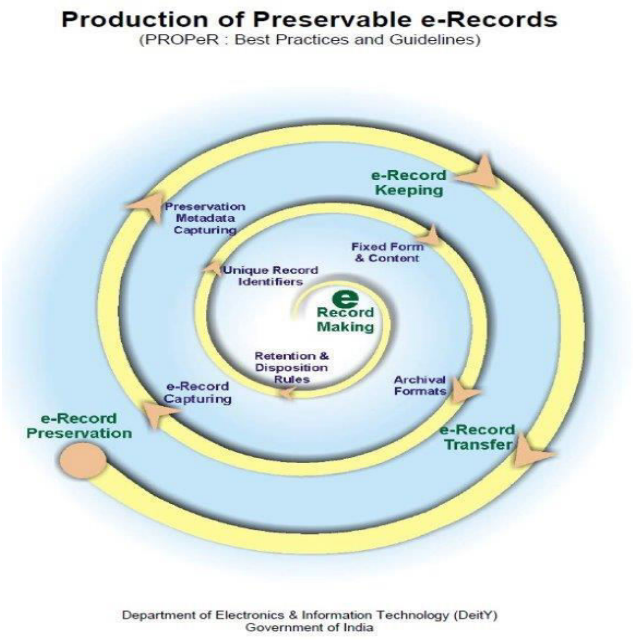
Tools Developed:

1. Disposed Case Packaging Tool (DCPT) earlier known as DCPM.
2. Disposed Case Package Injector (DCPI)
3. Disposed Case Preservation Planning (DCPP)
4. Disposed Case Dissemination & Access (DCDA)

Digital Preservation Standards

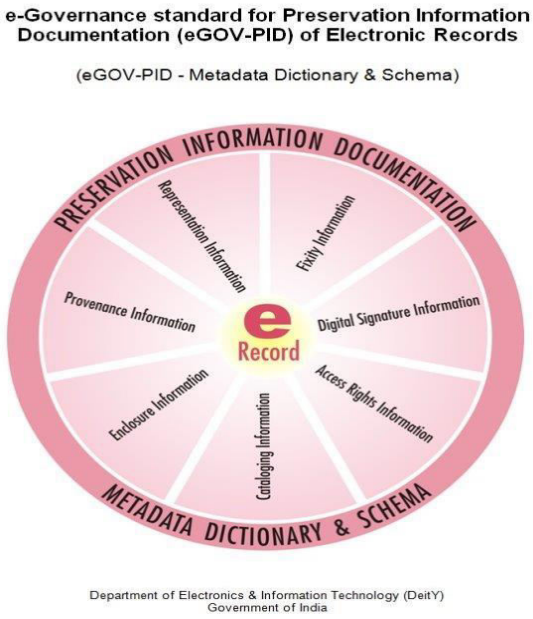
The following digital preservation standards and guidelines are developed based on the study of electronic records produced by various e-governance mission mode projects namely e-district, MCA21, e-Office, Computer Aided Registration of Documents, CBDT, etc and several international projects of similar nature. The e-Governance Standards Division, Department of Electronics and Information Technology, Government of India has approved the standards for its adoption in the e-government projects across India.

Best Practices and Guidelines for Production of Preservable e-Records (PROPeR)



This standard provides best practices and guidelines for production of preservable electronic records and its management in the context of e-governance. It is applicable for those e-records that need to be retained for long durations (e.g. 10 years, 25 years, 50 years and beyond) and the e-records that need to be preserved permanently. The core concepts of 'preservability' are based on the requirements specified in IT ACT, ISO/TR 15489-1 and 2 Information Documentation - Records Management and ISO 14721 Open Archival Information Systems (OAIS) Reference Model. It introduces 5 distinct steps of e-record management i.e. e-record making, e-record capturing, e-record keeping, e-record transfer to trusted digital repository and e-record preservation which need to be adopted in all e-governance projects.

e-Governance standard for Preservation Information Documentation (eGOV-PID) of Electronic Records



The eGOV-PID provides the standard metadata dictionary and schema for describing the preservation metadata of an electronic record. This standard proposes to capture most of the preservation information (metadata) automatically after the final e-record is created by the e-government system. Such preservation information documentation is necessary only for those e-records that need to be retained for long durations (e.g. 10 years, 25 years, 50 years and beyond) and the e-records that need to be preserved permanently. The implementation of this standard helps in producing the valid input i.e. Submission Information Package (SIP) for archival and preservation purpose as per the requirements specified in theISO 14721 Open Archival Information Systems (OAIS) Reference Model. The eGOV-PID allows to capture the preservation metadata in terms of cataloging information, enclosure information, provenance information, fixity information, representation information, digital signature information and access rights information.

Complete XSD of eGOV-PID

eGOV-PID XSD Version 1.0

Example of a complete XML with preservation metadata as per eGOV-PID

- Sale Deed

Other examples

- Cataloging, Provenance, Representation and Fixity Information

1. Court Case
2. Passport
3. Sale Deed
4. Lease Deed
5. Gift Settlement
6. Deposit of Title Deeds

- Enclosure Information

1. Enclosure

- Digital Signature Information

1. Digital Signature

- Rights Information

1. Rights

Examples of Provenance Information, Representation Information and Rights Information are not provided as this information is unavailable, which is essential for digital preservation.

2

Digital Preservation and Development of Trusted Digital Repositories: An Indian Perspective

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Abstract—*This paper presents an overview of the coordinated efforts between Department of Electronics and Information Technology and C-DAC Pune in envisaging the Indian National Digital Preservation Programme. It also presents the major milestones accomplished by the team of Centre of Excellence for Digital Preservation at C-DAC Pune, contributed towards completing the building blocks of trusted digital repositories as national digital preservation infrastructure.*

INTRODUCTION

The R&D in IT Division, Department of Electronics and Information Technology, Government of India recognized the need of digital preservation way back in 2007 and decided to involve the R&D team at C-DAC Pune in envisaging the National Digital Preservation Programme. Since then several millstones have been accomplished which are briefly reported as under.

Indo-US Workshop on International Trends in Digital Preservation, 2009

The Human-Centred Design & Computing Group at C-DAC Pune organized the Indo-US Workshop on International Trends in Digital Preservation in March 2009 in order to seek the recommendations from international experts for the Indian National Digital Preservation Programme. The workshop was organized as guided by the R&D in IT Division, Department of Electronics and Information Technology (DeitY), Government of India. The Indo-US Science and Technology Forum extended the required funding support to make this event possible, which was participated by several experts from India as well as the American National Digital Information Infrastructure and Preservation Programme (NDIIPP) and Cultural, Artistic and Scientific knowledge for Preservation, Access and Retrieval (CASPAR), UK. This workshop lead the DeitY in entrusting the author of this paper to produce the National Study Report on Digital Preservation Requirements of India in year 2010 as a sponsored time-bound project.

National Study Report on Digital Preservation Requirements of India, 2010

During this study, it was observed that with the ever increasing proliferation of Information Technology, the volume of digital information generated by the government, private and social sectors is exponentially growing. This digital content, though ephemeral and non-tangible in nature, forms a significant part of human heritage for future generations which is constantly threatened due to digital obsolescence and frequent changes in the technologies. In this context, long term digital preservation has emerged as a new interdisciplinary area of research and development to ensure that the digital information preserved in its original, readable and trustworthy form in spite of obsolescence of everything: hardware, software, processes, format, people, etc.

The study revealed that India is extremely vulnerable to loss of digital information and bitter legal consequences in the absence of national digital preservation infrastructure and policy, as Government of India is hugely investing in the computerization and digitalization of its departments at national, state and district levels through the 30 mission mode projects of NeGP. The Information Technology Act, Public Records Act, Right To Information Act and several other laws categorically specify the statutory obligation to retain or preserve the e-records and the digital surrogates produced using computer or other devices by the government organizations. In case of failing to reproduce the digital information in its original, authentic, reliable form and within stipulated time-frame it can lead to penal consequences. Therefore, Government of India must equip itself in the defense of the digital information by creating long-term digital preservation policies, techniques, tools and infrastructures for the benefit of all organizations across diverse domains

This report includes the overview of international digital presentation projects, study of legal imperatives, various technical standards, and the consolidation of recommendations given by the national expert group which included archivists, technologists and stakeholder representatives of 30 organizations from diverse domains such as e-governance, government records, audio, video and film archives, cultural heritage, health, science and education, insurance and banking, law, etc. It specifies the short term and long term action plans with specific R&D projects to be initiated under the National Digital Preservation Programme. The report provided a recommendation to establish the Centre of Excellence for Digital Preservation to develop the necessary technical competencies, pilot digital repositories and international collaborations.

Centre of Excellence for Digital Preservation, 2011

As recommended in the national study report, as a flagship project under the Indian National Digital Preservation Programme, Department of Electronics and Information Technology (DeitY) approved the Centre of Excellence for Digital Preservation project to be executed by C-DAC Pune with the following objectives.

Objectives

- Conduct research and development in digital preservation to produce the tools, technologies, solutions and infrastructures to ensure that the digital information remains discoverable, accessible, readable, usable, reliable, authentic and trustworthy on long term basis.
- Develop the digital preservation repositories and provide help in nurturing the network of Trustworthy Digital Repositories (national digital preservation infrastructure) as a long-term goal
- Define the digital preservation standards by involving the experts from stakeholder organizations, consolidate and disseminate the best practices generated through various digital preservation projects implemented across India.
- Build the technical competencies necessary for the audit and certification of trustworthy digital repositories, curriculum design and training for data managers, e-records keepers and archivists.
- Spread awareness about the potential threats and risks due to digital obsolescence, the digital preservation best practices and maintain technology watch on continuing basis.

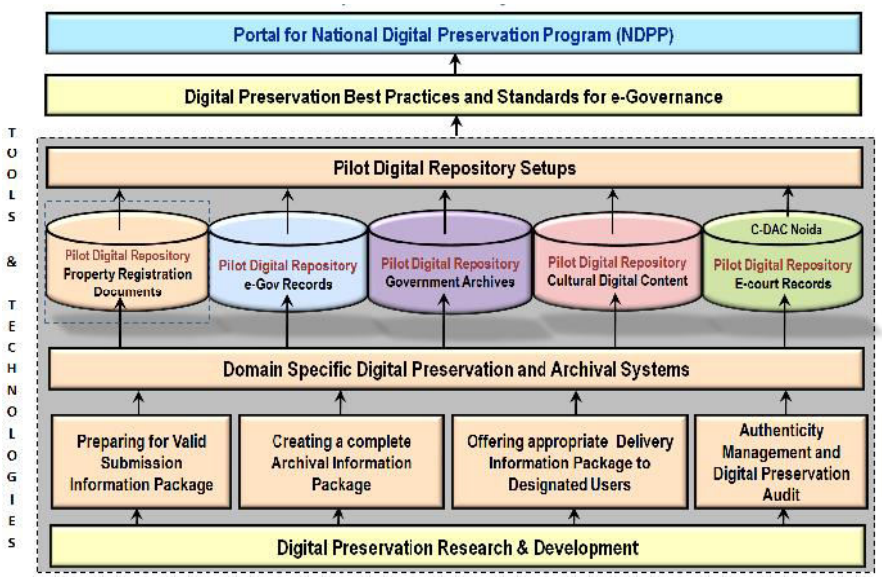

Fig. 1: Overview of Project Activities

Collaborations

In this project, C-DAC Pune has established collaborations with National Archives of India (Pilot Digital Repository of Government Archives), Computer Aided Registration of Documents (CARD) project of Stamps and Registration Department, State Government of

Andhra Pradesh (Pilot Digital Repository of CARD data), e-District Mission Mode Project of NeGP, and Indira Gandhi National Centre for Arts (Pilot Digital Repository of Cultural Digital Data). As part of this project, C-DAC Noida is also developing the pilot digital repository for e-Court Mission Mode Project.

Since 2011, a team 45 engineers is working on the Centre of Excellence for Digital Preservation project and has accomplished some of the objectives.

Digital Preservation Tools and Technologies

The team of Centre of Excellence for Digital Preservation at C-DAC, Pune has undertaken the development of following digital preservation tools and technologies:

e-Records Digitālaya™

e-Record Digitālaya™ is a specialized archival system being designed and developed for the preservation and repository management of electronic records produced through various e-governance applications. In the current scope, this system is being developed for the pilot digital repository at Computer Aided Registration of Documents (CARD), C & IGRS, Hyderabad, Andhra Pradesh, India and e-District pilot project.

Datāntar™ for Capturing of e-governance Records

Datāntar™ is a software which can connect with the e-Governance database and capture the electronic records along with preservation metadata as per the eGOV-PID standard.

Abhilekh Digitālaya™

Abhilekh Digitālaya™ is a specialized archival system designed and developed for the preservation of digital copies of government records, microfilms, cartographic maps, photographs and various types of documents available with national, state and district level archives. This system is being developed for the pilot digital repository at National Archive of India, New Delhi, India which is expected to received digital records from ministries and central government organizations.

Datāntar™ for Reformatted Digital Content

This is another type of Datāntar™ software which provides a library of best practices that can be applied for aligning and reformatting the digital content in terms of images, audio, video, PCDs etc for preservation purpose.

Sanskriti Digitālaya™

Sanskriti Digitālaya™ is a specialized archival system designed and developed for the preservation of cultural digital data in terms of images, audio, video, PCDs, 3D models etc. This system is being developed for the pilot digital repository at Indira Gandhi National Centre for Arts, New Delhi, India.

Digital Preservation Planner (PrePlanner)

Digital preservation planner software provides a searchable database of record retention rules and policies formulated by various ministries and departments of Government of India. It also allows the users to define file format specifications for images, audio and video data for estimating the digital storage requirements.

The abovementioned software tools are being developed with adequate compliance with the guidelines provided in various ISO standards. The functional prototypes of some of these tools are currently in the testing phase.

Digital Preservation Standards and best Practices, 2013

The team of Centre of Excellence for Digital Preservation at C-DAC, Pune along with the Expert Committee has developed the following digital preservation standard and best practices for e-governance to ensure that the electronic records are produced in a preservable manner. The digital preservation standard has been notified and adopted for all e-governance applications by the Ministry of Communications and Information Technology, Government of India.

Best Practices and Guidelines for Production of Preservable Electronic Records

This standard provides the best practices and guidelines for production of preservable electronic records and its management in the context of e-governance. It is applicable for those e-records that need to be retained for long durations (e.g. 10 years, 25 years, 50 years and beyond) and the e-records that need to be preserved permanently. The core concepts of 'preservability' are based on the requirements specified in IT ACT, ISO/ TR 15489–1 and 2 Information Documentation-Records Management and ISO 14721 Open Archival Information Systems (OAIS) Reference Model. It introduces 5 distinct steps of e-record management i.e. e-record creation, e-record capturing, e-record keeping, e-record transfer to trusted digital repository and e-record preservation which need to be adopted in all e-governance projects.

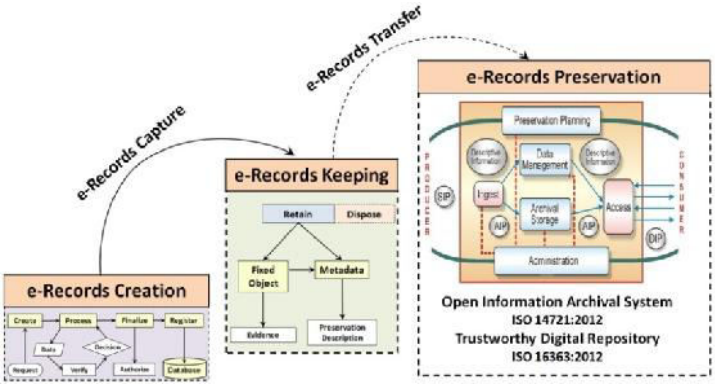

Fig. 2: Electronic Records Management Practice as Introduced in the Digital Preservation Standard for e-governance Applications

Standard for Preservation Information Documentation (eGOV-PID) of Electronic Records

It provides the standard metadata dictionary and schema for describing the "preservation metadata" of an electronic record. This standard proposes to capture most of the preservation information (metadata) automatically after the final e-record is created by the e-government system. Such preservation information documentation is necessary only for those e-records that need to be retained for long durations (e.g. 10 years, 25 years, 50 years and beyond) and the e-records that need to be preserved permanently. This standard allows to capture the preservation metadata in terms of cataloging information, enclosure information, provenance information, fixity information, representation information, digital signature information and access rights information. The implementation of this standard helps in producing the valid input i.e. Submission Information Package (SIP) for archival and preservation purpose as per the requirements specified in the ISO 14721 Open Archival Information Systems (OAIS) Reference Model.

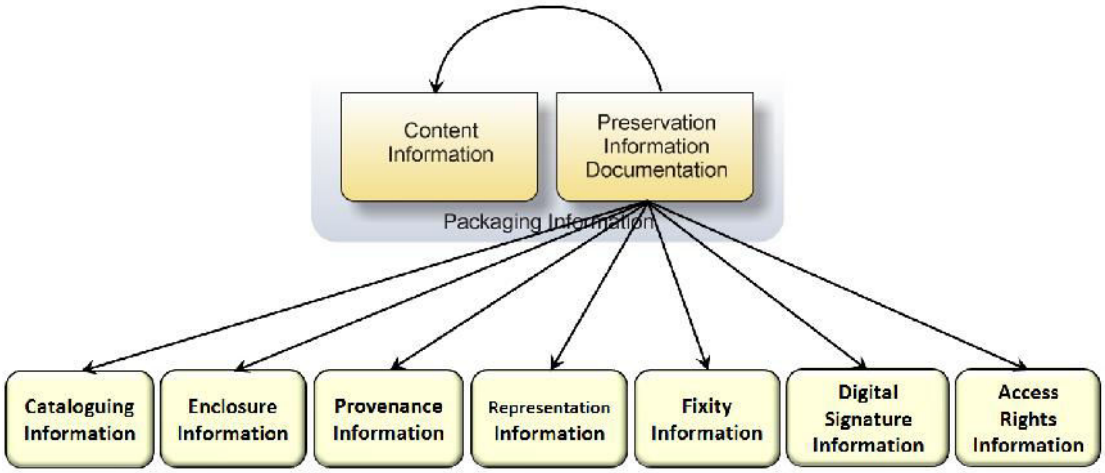

Fig. 3: Seven Sections of Preservation Metadata as Per the eGOV-PID Standard

During the public review of digital preservation standard, several suggestions are received as the next agenda items for us to pursue.

3 DRAFT NATIONAL DIGITAL PRESERVATION POLICY AND DIGITAL PRESERVATION RULES UNDER THE IT ACT 2000/ 2008

As instructed by Department of Electronics and Information Technology (DeitY), the team of Centre of Excellence for Digital Preservation at C-DAC, Pune has drafted the National Digital Preservation Policy and Digital Preservation Rules under the IT Act 2000/ 2008. DeitY is expected to organize the consultations with various experts and government departments to finalize the policy and rules.

The policy and rules are meant to offer an overarching mandate across various domains and organizations and help in developing the national digital preservation infrastructure in the form of Trusted Digital Repositories in India.

TRUSTED DIGITAL REPOSITORIES AS NATIONAL DIGITAL PRESERVATION INFRASTRUCTURE FOR INDIA

Our teams are building the various layers of Trusted Digital Repositories in terms of standards, best practices, tools, systems, audit competencies, etc. Trained human resource will be necessary for managing and auditing the repositories. ISO accreditation of the organizations for conducting the repository audits is also necessary. The national policy will drive the creation and sustenance of the Trusted Digital Repositories across India. The digital preservation infrastructure will include large scale digital storage systems and high speed gigabit network connectivity between the repositories and remote backup (disaster recovery) sites.

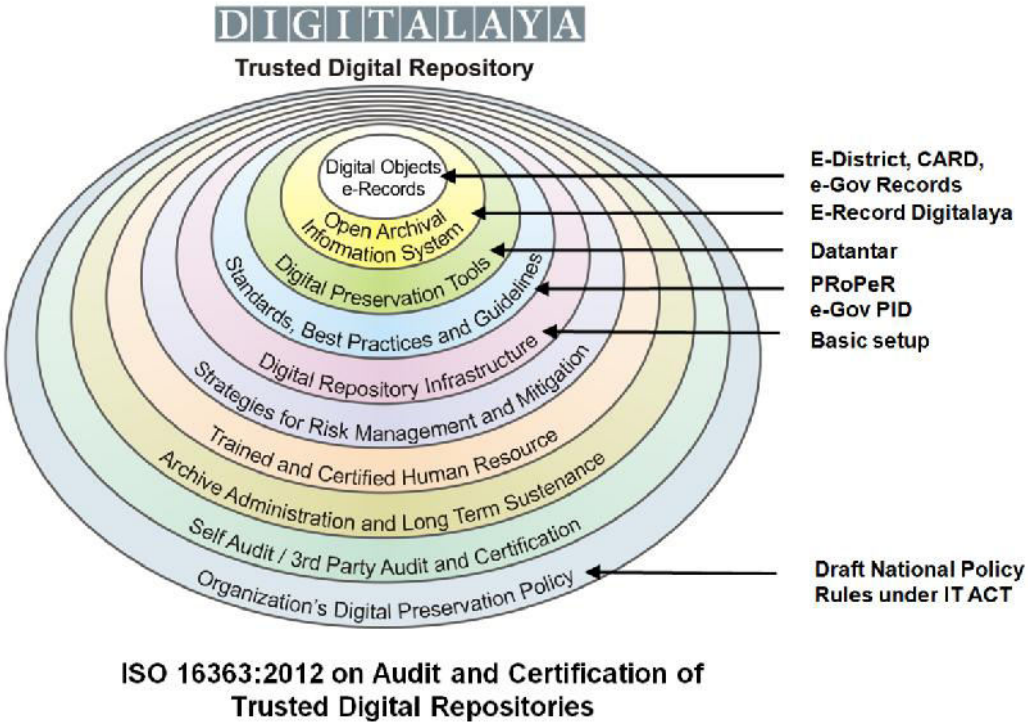

Fig. 4: Layers of Trusted Digital Repository

INTERNATIONAL COLLABORATIONS

The Centre of Excellence for Digital Preservation at C-DAC, Pune is collaborating with Alliance for Permanent Access (APA), InterPARES Trust, Canada and several experts from NDIIPP, USA in order to bring the state-of-art knowledge and best practices to India.

BENEFITS OF DIGITAL PRESERVATION

Development of trusted digital repositories for digital preservation at the national level has following benefits to offer:

Administrative Continuity

The digital information becomes inaccessible or obsolete much before its assigned retention period.

Protection of Digital Intellectual Assets

The wealth of knowledge and intellectual assets of an organization are increasingly encoded in digital formats which requires to be retained and protected. The digital information represents intellectual property which is produced with considerable amount of time, effort and money.

Reuse

Digital preservation can help in immediate, near term as well as long term usability and meaningful use of digital information beyond its primary users. Repositories of e-records and the tools to mine, analyze and re-purpose them represent a society's intellectual capital.

Long Term View

Access to e-records from the past and digital continuity is critical for planning, trend analysis, decision making and research.

Legal Obligations

Digital preservation helps in fulfilling the legal obligations of record keeping and record retention.

Protection from Litigation

The international best practices of digital preservation enable in ensuring availability of electronic records in a legally admissible manner.

Digital Heritage for Future Generations

The information, knowledge, cultural and historical artefacts in the modern digital age are being created, encoded and stored through digital means which forms the digital heritage for future generations.

CONCLUSION

- National Digital Preservation Policy and Digital Preservation Rules under the IT ACT 2000/ 2008 must be finalized on high priority.
- National Digital Preservation Infrastructure should be developed as a long term goal.

- ISO accreditation of the organizations for audit and certification of Trusted Digital Repositories should be taken up on priority.
- Training programmes for digital preservation, and audit and certification of repositories should be introduced in India.
- Pilot digital repositories across various domains should be developed.
- The Centre of Excellence should be funded on continuing basis considering the vastness of the requirements across diverse domains.

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DESIDOC Journal of Library & Information Technology, Vol. 32, No. 4, July 2012, pp. 321-326

Need of Legislation and Digital Preservation Policy Framework in Indian Context

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ABSTRACT

This paper provides a comparison between the American and Indian digital preservation programmes based on the essential building blocks such as national legislation for digital preservation, basic legal framework, national digital preservation initiative, digital preservation tools, standards and practice guidelines, digital repository infrastructure, and audit and certification. Selected digital preservation policies of the organisations from UK, USA, Canada, and Australia are also analysed. The gap analysis shows that in the Indian context, legislation on digital preservation of electronic records and institutional digital preservation policies are the missing elements, which need to be addressed on high priority. The preservation policy is a mandatory requirement for the audit and certification of trustworthy digital repositories.

Keywords: Digital preservation policy, trustworthy digital repository

1. INTRODUCTION

The objective of this paper is to identify gaps and differences in the Indian versus International digital preservation programmes, particularly the US initiative, so as to enable the Indian government in taking necessary steps towards bridging the gaps and strengthening its own National Digital Preservation Programme (NDPP). Selected institutional digital preservation policies are also studied to derive guidance on the coverage, structure and focus of the policies.

The legislation can drive the digital preservation initiatives at national level and the institutional policies can drive the digital preservation activities at the organisation level.

2. BACKGROUND

The National Study Report on Digital Preservation Requirements of India[1] of Department of Electronics and Information Technology (DeitY), Government of India, indicates the enlarging volumes of born digital information through the 27 mission-mode projects of National e-Governance Action Plan (NeGP) and digitalisation initiatives of other government departments in India. The report also highlights the unpreparedness of the record producing organisations and the potential threats to this digital information due to digital obsolescence. Therefore, the DeitY promptly took the initiative to formulate the NDPP for India. As per the recommendations in the National Study Report, DeitY has sponsored to establish the Centre of Excellence for Digital Preservation at C-DAC Pune, with a mandate to develop the pilot digital repositories for e-District Mission Mode Project of NeGP, National Archives of India, and Indira Gandhi National Centre for Arts. In this project, C-DAC is also developing various tools, standards and best practices for digital preservation.

3. COMPARISON OF DIGITAL PRESERVATION PROGRAMMES

3.1 Parallel Initiatives

Figure 1 shows the comparison based on the building blocks (middle column) of digital preservation programmes launched by USA and India. Though there may be differences in volume, scope, budget, and execution strategies, it is possible to draw the parallels between similar initiatives taken by both USA and India such as availability of basic legal framework, national digital preservation initiative, efforts on evolving standards and practice guidelines, development of digital preservation tools and digital repositories.

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USA		Building Blocks	India	
Competencies for Trustworthy Digital Repository Certification	✔	❽ Audit and Certification	Not ready as yet	-
Digital repository infrastructure development by Library of Congress	✔	❼ Digital Repositories	Digital repository development projects with NAI, IGNCA, E-district, E-court	✔
Digital preservation tools by NDIIPP partner organizations	✔	❻ Digital Preservation Tools	Centre of Excellence for Digital Preservation is developing various digital preservation tools and systems	✔
ISO standards and institutional practice guidelines	✔	❺ Standards and Practice Guidelines	e-gov digital preservation standards and best practices are being developed	✔
Digital preservation policies by libraries, archives and repositories	✔	❹ Institutional Digital Preservation Policies	Need to be defined	-
National Digital Information Infrastructure and Preservation Program (NDIIPP)	✔	❸ National Digital Preservation Initiative	Centre of Excellence for Digital Preservation, as part of the National Digital Preservation Program (NDPP) of Department of Electronics and Information Technology (DeitY)	✔
Presidential Library Act, e-Government Act, Government Paperwork Elimination Act, Information Security Act, Copyright Act, Electronic Signatures in Global and National Commerce Act, Privacy and Data Protection Act, etc	✔	❷ Legal Framework	Information Technology ACT, Public Records Act, Right To Information Act, Copyright Act, etc.	✔
NDIIPP Congressional Legislation passed in 2000	✔	❶ National Digital Preservation Legislation (National policy)	Need is recognized	-

Figure 1. Comparison between American and Indian digital preservation programmes.

3.2 Gaps in the Building Blocks

As per Fig. 1, the most notable difference or the gap between American and Indian digital preservation programmes is at its origin and the main driving force. In case of US, the National Digital Information Infrastructure and Preservation Program (NDIIPP) came into being after the US Congress passed NDIIPP legislation in December 2000[2]. The legislation empowered the Library of Congress as the lead coordinating agency to implement the program by involving the key government agencies, namely, the Department of Commerce, the White House Office of Science and Technology Policy, and the National Archives and Records Administration—and with those entities with expertise in the collection and maintenance of archives of digital materials—the National Library of Medicine, the National Agricultural Library, the National Institute of Standards and Technology, the Research Libraries Group, the OCLC Online Computer Library Center, and the Council on Library and Information Resources—as well as with the wide group of private sector institutions working in digital formats. The Presidential Memorandum on Managing Government Records[3] by Barack Obama issued on November 28, 2011 is accessible from the website of the White House. It specifies the commitments to record management reforms and the record management directives with clear time limits and deadlines. The congressional legislation on preservation of digital information being produced across a wide spectrum of domains is evidently the main driving force behind the unambiguous commitment towards digital preservation.

On the India side, the draft Electronic Service Delivery Bill[4] is ready and due to be passed by the Indian parliament, which makes it mandatory for all government agencies to offer citizen services through electronic means within next 5 years but it is silent on the digital preservation of electronic records. The legal justification for digital preservation in India largely rests upon the retention requirements or indirect/derived triggers for preservation as per the provisions in Information Technology Act, Right To Information Act, Copyright Act and the Public Records Act. Most of these laws need to be upgraded and harmonised for addressing the digital preservation requirements of electronic records. The Centre of Excellence for Digital Preservation has ensured the participation of some of the key stakeholders like National Informatics Centre, National Archives of India, Indira Gandhi National Centre for Arts, STQC, NeGP, etc.,

but is currently limited by the project duration. The active participation from Department of Culture, Department of Commerce and other ministries is equally important.

3.3 Need of Legislation on Digital Preservation of Electronic Records and Digital Information

Therefore, in the Indian context, the legal justification for digital preservation is inadequate to generate a national level momentum and a landslide change in the policies. The present initiatives can build the competencies, tools and standards necessary for developing the digital repositories but it may not be sufficient to spread the digital preservation movement across all ministries and departments at central and state level. Therefore, the Indian government must formulate and pass the legislation on digital preservation of electronic records and digital information on priority. The proposed legislation on digital preservation of electronic records and digital information and rigorous follow up action will help in propagating the digital preservation.

3.4 Need of Institutional Digital Preservation Policies

The institutional digital preservation policy framework is the next logical consequence of the national legislation. Such policy framework is meant to provide the required mandate, decisions, financial support and commitment from the authorities for the digital preservation of information produced by the institution. Numerous institutional digital preservation policy documents published by various university libraries, archives, and repositories are easily accessible from their respective websites. The digital preservation policies of selected institutions from UK, Canada, USA, and Australia have been analysed and presented in Table 1. The analysis of digital preservation policies identifies the following aspects:

- Key constituents of digital preservation policy

A comprehensive list of key constituents is prepared by integrating the points from various digital preservation policies.

- Generic statements

The presence of very generic statements in the policy are marked as (generic).

- Basic definitions

The presence of basic definitions related to digital preservation in the policy. Presence of such definitions is marked as (basic).

- Specific clauses

The presence of specific clauses which define the direction, conditions and decisions are marked as (specific). It is observed that most of the digital preservation policies are filled with basic definitions and write-ups which explain the key concepts of digital preservation. Actually, the policy is not expected to explain the technical concepts or educate the readers about digital preservation. If necessary, it can be done separately. The institutional policies are expected to convey the direction, decisions, conditions, expected actions, commitment, availability of support, and ownership. Such framework of policies has to provide adequate coverage for such activities related to digital preservation, which require to be guided and supported by the policy framework for consistency and clarity of operations. The unique characteristics of the selected policies are briefly discussed hereafter.

3.5 Digital Preservation Policy of Selected Institutions

3.5.1 Parliamentary Archives, UK

Digital preservation policy of Parliamentary Archives, UK[5] is comprehensive but sometimes it indulges in providing definitions of various technical aspects, like, authenticity, integrity, significant properties, bitstream preservation, reliability, usability, migration, audit, etc. The definitions are anyway part of the glossary of terms so the policy framework could focus purely on clauses. The most notable part in this policy is that it has been agreed by a working group of the two Houses' Information Services and Parliamentary ICT in March 2008 and subsequently endorsed by both Management Boards. The interesting aspect of this policy is that it is directly linked with the knowledge management (KM) and information technology (IT) strategies. It also specifically mentions that the parliament may use the services of external contractors or partners or other nominated third-party in the section on custody and hosting.

3.5.2 Library and Archives of Canada (LAC)

The digital preservation policy of Library and Archives of Canada (LAC)[6] is simple, clear and offers the best combination of technical and administrative clauses. This policy clearly specifies that their primary objective is to become the Trusted Digital Repository. In the section on challenges, the limitations of digital preservation due to unavailability of established standards and ambiguity related to digital rights are clearly stated. The section on Principles and Commitments mentions that LAC ensures a financial commitment to acquisition, description, accessibility, and preservation programme for digital materials. The commitment to review and audit of the LAC's Trusted Digital Repository Services on a regular basis is also mentioned. Standards and quality control section specifically mentions the technical specifications, accepted file formats, metadata

Table 1. Analysis of selected digital preservation policies of institutions from UK, Canada, USA and Australia

Constituents of digital preservation policy	Parliament of UK	Library and Archives of Canada	H-Net electronic mailing list	National Library of Australia
Authorisation, ownership	Specific	Specific	Specific	Specific
Purpose	Specific	Specific	Specific	Basic
Challenges and risks	Basic	Specific	Specific	Basic
Mandate	-	Specific	Specific	-
Objectives	-	Specific	Specific	Basic
Scope	Generic	Specific	Specific	Basic
Legal framework	-	Specific	-	-
Operating Principles	-	Specific	Specific	Basic
Commitments	-	Specific	Specific	-
Financial sustenance	-	Specific	Specific	-
Technological and procedural suitability	-	-	Specific	-
Selection and acquisition criteria	-	Specific	Specific	Basic
Acquisition Methods	-	Specific	-	Basic
Collection development	-	Specific	-	Basic
Record management	-	-	-	-
Technical guidance on digitisation, metadata, authenticity, integrity, SIP, AIP, DIP, storage guidelines	Basic	Specific	Specific	-
Strategies	Basic	Specific	Specific	-
Standards	Basic	Specific	Specific	Basic
Quality control	-	Specific	Specific	-
The policy requirements	Basic	Specific	-	-
Business continuity planning	Basic	-	-	-
Preservation planning	Basic	-	-	-
Preservation action	Basic	Specific	-	-
Skills and training	Basic	-	-	-
Cooperation and collaboration	Basic	Specific	Specific	Basic
Role and responsibilities	Basic	Specific	Specific	-
Access and use	-	Specific	Specific	-
Digital rights/copy right	-	Specific	Specific	-
Custody and hosting	Specific	-	-	-
Disaster recovery plan	Basic	-	-	Basic
Communication of the policy	Specific	Specific	-	-
System/Information security	Basic	-	Specific	-
Appraisal/audit	Basic	Specific	Specific	-
Policy review	Basic	Specific	Specific	-
References to related policies	-	Specific	Specific	-
Glossary of terms	Basic	Basic	-	-

standards, etc. The LAC's digital preservation policy does not mix clauses with definitions.

3.5.3 H-Net Electronic Mailing List

The digital preservation policy of H-Net electronic mailing list, Michigan State University[7] is also one of the best policy frameworks available. H-Net is committed to long-term preservation of discussion logs, academic discourses through more than 180 academic networks and public electronic mailing lists. The e-mail list conformance to OAIS section of their policy provides technical specifications of the submission information package (SIP), archival information package (AIP) and delivery information package (DIP). The technological and procedural suitability section provides technical policies for message ingest, storage, and retrieval. H-Net also expresses its commitment to audit and certification process and aims at becoming a trustworthy digital repository.

3.5.4 National Library of Australia

The policy of National Library of Australia[8] provides a broad approach to digital preservation. The ownership of the policy is entrusted with the Director of the National

Library's Web Archiving and Digital Preservation Branch. The policies become abstract or concrete depending on the focus, e.g., H-Net's preservation policy is extremely focused if compared with the policy of National Library of Australia or the Parliamentary Archive of UK. Several guidelines are already available to help in formulating the preservation policy[9,10], but it is believed that study of actual preservation policies can give more clarity.

The Indian record producing institutions are yet to define their policies for digital preservation of born digital or electronic records. The proposed legislation on digital preservation is a tedious and long process. In that case, it will be most appropriate if NeGP prepared its own digital preservation policy framework for the preservation of electronic records produced through its 27 mission-mode Projects. Similarly, the National Archives of India, Indira Gandhi National Centre for Arts and Delhi Court must define their own digital preservation policies and get them authorised from the respective parent ministries.

4. AUDIT AND CERTIFICATION OF TRUSTWORTHY DIGITAL REPOSITORIES

As per the ISO 16363:2012 on Audit and Certification of Trustworthy Digital Repositories[11], the preservation policy is a written statement, authorised by the repository management, that describes the approach to be taken by the repository for the preservation of objects accessioned into the repository. It also specifies the need of procedural accountability and preservation policy framework. In the Indian scenario, the technical requirements of the Trustworthy Digital Repository are being addressed.

Figure 2 shows that the ecosystem of trustworthy digital repositories[12] include national legislation, basic legal framework, policy and the all support systems such as administration, manpower, standards and tools. All libraries, archives and repositories converge[13] in terms of the need of such ecosystem.

5. CONCLUSIONS

Based on the comparison of digital preservation programmes between US and India, it is observed that the Indian government needs to formulate the legislation on preservation of electronic records and digital information on high priority. The institutional digital preservation policy is a result of the mandate, objectives and legal obligations of the organisation. The Indian archival institutions and record producers need to formulate their digital preservation policies to fulfill the primary need specified in the ISO for audit and certification of trustworthy digital repositories[11].

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Legislation on preservation of electronic records and digital preservation

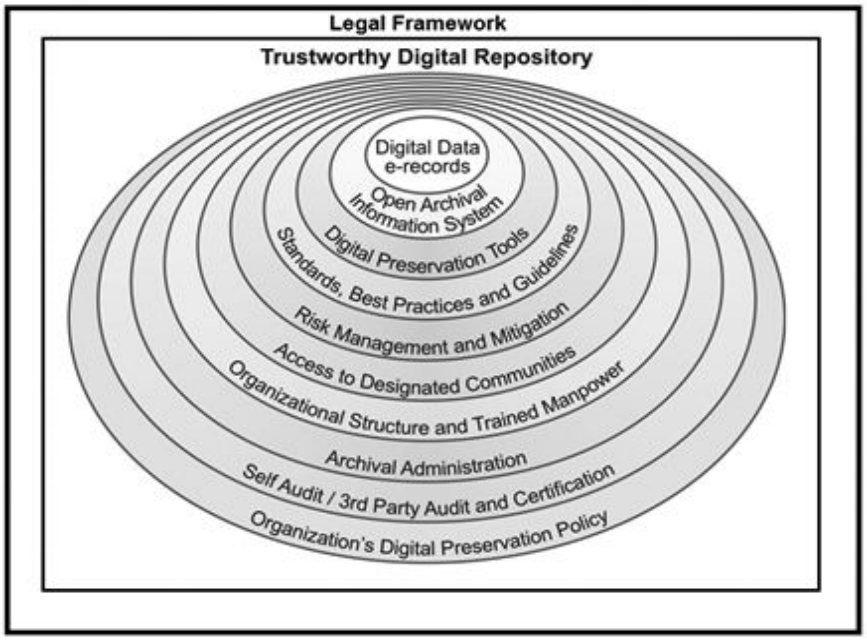

Figure 2. Overall ecosystem for trustworthy digital repository.

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Role of Digital Forensics in Digital Preservation as per the Indian Legal Requirements

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Abstract—*As per the Indian Information Technology Act 2000/2008 it is necessary to capture and preserve the digital evidences of digital information and electronic records to ensure its legal admissibility. Therefore, the authors of this paper have explored the digital forensics for e-mail, hard disk, and Android cell phone for capturing various digital evidences. The findings of this process are corroborated to infer and ascertain the provenance, integrity, authenticity and reliability which are key aspects of digital preservation as per the OAIS. It is found that digital forensics can be used as a part of the digital preservation process to meet the Indian legal requirements.*

INTRODUCTION

Digital preservation of e-government records or any form of digital information stored on storage media or court case evidence such as mobile data requires to establish its provenance, integrity, authenticity and reliability [1,2,3,5] for legal admissibility. Same parameters are also important for digital preservation in addition to the parameter of "long term usability" of the digital information, as stated in the ISO 14721:2012 Open Archival Information System (OAIS) Reference Model. The legal requirements and digital preservation requirements are also defined in the institutional digital preservation policies [18]. Digital signatures, which are normally used for establishing the authenticity of digital information, have limited validity. Therefore, supplementary digital evidences become useful in establishing the authenticity which can be captured, preserved and corroborated when that can help in inferring or establishing the provenance, integrity, authenticity and reliability of the digital information and thus it can become legally admissible too. Therefore, in the next sub-section, we briefly discuss the requirements for preservation and legal admissibility in the Indian Information Technology Act 2000/2008.

Information Technology Act 2000/ 2008

The IT Act 2000/2008 provides very encompassing definitions for data, information and electronic records which covers various forms of electronic inputs and outputs. It also encompasses the digital information producing devices in generic terms and the medium of carriers and transmission in terms of networks and storages. In section 7, it specifically highlights the need to retain the electronic records or data or information as per the retention schedules and along with the details which will facilitate the identification of the origin, destination, date and time of despatch or receipt of such electronic records, data or information. The IT Act also requires that the electronic record is retained in the format in which it was originally generated, sent or received or in a format which can be demonstrated to represent\ accurately the information originally generated, sent or received. Section 65B of IT Act defines the conditions for legal admissibility of electronic records. It specifies the need to prove that the computer output containing the information was produced by the same computer during the period. There is also need to establish that the person who used the said computer and was having lawful control over it. Therefore, it is necessary to capture such evidences and preserve it along with digital information that requires to be retained for long durations.

INTERNATIONAL TRENDS

As per the DPC Technology Watch Report on Digital Forensics for Preservation, digital forensics is an important part of digital curation process and digital archeology [7]. University of British Columbia in Canada has introduced the subject of digital records forensics for their archival and information science curriculum [8]. The Guidelines on Cell Phone Forensics by NIST, provides specific guidelines for preservation of forensic evidence which includes securing, documenting, evaluating the scene and capturing, storing, packaging, and the custody of such digital evidence [9]. In India, digital forensics is increasingly being used for investigation of cyber crimes but its application for digital preservation is a new concept.

METHODOLOGY

Therefore, to capture various digital evidences using the forensics tools, we have taken up three different scenarios or case studies namely e-mail forensics, disk forensics and cell phone forensics. Our main purpose of investigation in this research paper is to find the digital evidences, metadata and all extractable information that can help in preservation. Our approach is broadly defined as under:

- Apply open source digital forensics tools on the sample device / data to capture various evidences.
- Analyze and corroborate the evidences to establish the aspects of preservation in terms of provenance, integrity, authenticity and reliability of the digital information.

DIGITAL FORENSICS FOR E-MAIL PRESERVATION

Evidences in e-mail Header

As per the Indian Right To Information Act [4], the government organizations will also require to preserve the e-mail transactions within an organization so that the specific e-mails could be searched and reproduced in legally admissible manner to fulfill the right to information where required. Department of Electronics and Information Technology (DeitY), Government of India is already formulating the e-mail policy for all central and state government organizations in India for the purpose of e-mail data protection, which will also be subjected to preservation in various cases. E-mail messages consists of two major sections namely Header and Body, formats for which are standardized in RFC5322 [6]. As per the IT ACT, it is necessary to establish the origin, destination, date and time of despatch or receipt of an e-mail. The traces pertaining to these aspects are found in the header of the e-mail.

Origin, Date, Time, Destination and Identifier

It is a common knowledge to most of the users that an e-mail header captures the details such as from (sender), to (receivers), and date (time). If every e-mail is considered as a record then it must have a unique record identifier, a unique number by the specific e-mail could be identified. The header of an e-mail also includes the "Message-ID:" an automatically generated unique ID of the message. The sending email server generates a globally unique ID for each email going out from it, which generally depends on the algorithm used by the server. An example of the "Message-ID:" is shown below-

```
Message-ID: <52690F8F.6090308@cdac.in>
```

Trace Information

Further SMTP defines the trace information of the message, which is saved in header using following two fields. "Received:" when an SMTP server or Mail Transfer Agent (MTA) accepts or forwards an email message, it inserts trace information here, these field information is used in tracing the email back to the sender. This field generally includes name of MTA from which the email is received, IP address, the name of receiving MTA, protocol used in transfer and the time stamp of the transaction.

```
Received: from mailhub.pune.cdac.in (mailhub.pune.cdac.in [10.208.1.7])
        by mailhub2.pune.cdac.in (8.14.4/8.14.4) with ESMTP id r9OCJg1g009464
        for <yogendra1911@gmail.com>; Thu, 24 Oct 2013 17:49:42 +0530
```

"Return-Path:" when the receiving SMTP server (Mail Delivery Agent – MDA) makes the final delivery of the email (to client), it inserts this field generally on the top of header.

```
Return-Path: <chandrakants@cdac.in>
```

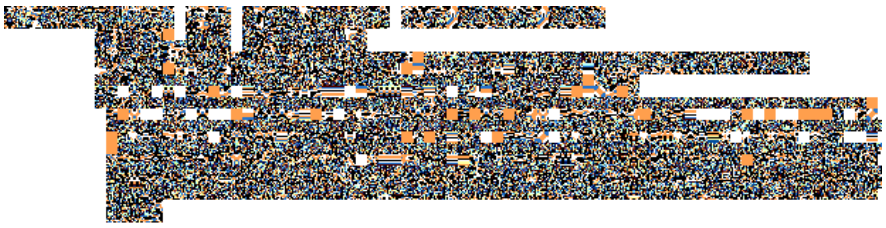
Integrity

"Content-MD5:" MD5 checksum of the content, 128bit digest converted in base64 helps in checking the integrity of the email body data. The checksum is helpful in proving the integrity of the email.

```
Content-MD5:  Q2hlY2sgSW50ZWdyaXR5IQ==
```

Domain Authentication

"DKIM-Signature:" A domain of the sender can sign the email with its private key, claiming the originating domain of the email document. Used in verifying the domain of the sender. Not all the email services provide DomainKeys Identified Mail (DKIM) signature. Currently Yahoo, Gmail, AOL and Fastmail have implemented this feature. Any mail from these organizations should carry a DKIM Signature in the header of the email.



User Authentication

It is possible to digitally sign the outgoing messages which authenticates the identity of the sender. Digital signatures is mainly used for *authentication of the source* of the messages (i.e. the sender), along with *integrity check of the message,* and *non-repudiation.*

Capturing e-mail for Preservation

Single e-mail

EML which is basically ASCII text file, typically stores each message in a single file, and attachments may either be included as MIME content (base64 encoding) in message or saved in a separate file, referenced from a marker in the EML file. The EML format considering its open specification is suitable for e-mail preservation. XML is also another suitable file format for preservation of e-mail, which allows self-description. However, the preservation of attachments cannot be guaranteed unless the attached files are in compliance with open and standards based file formats. It is necessary to alarm the gulf which surrounds the attachments of the e-mail, which entirely depends on the sender.

e-mail Account

Most of e-mail clients support MBOX file format in which the e-mail account can be stored. MBOX saves all the mails in single file with MIME contents stored directly in the file in base64 encoding. The problem with MBOX file is that the corruption in file may harm clients' ability to read individual email or even entire folder.

Single e-mail can be preserved in XML, EML, TXT and PDF/A file formats. PDF/A provides an advantage of fixing the information contained in the e-mail, which prohibits editing or modification. However, for preservation of entire e-mail account MBOX is useful.

DIGITAL FORENSICS FOR DISK PRESERVATION

Digital Forensics Aspects of Disk Image Capturing

The digital repositories often receive miscellaneous electronic records, unorganized data from organizations for preservation purpose, which is deposited in the form of digital storage media like hard disks, flash drives, CD/DVDs, etc. In such cases, it is not possible to ingest the electronic records or data individually in an Open Archival Information System (OAIS) considering the unstructured or unorganized or miscellaneous s nature of the data stored in the disk. In such situations, due to the obligations and need of preservation, it is often considered to capture the disk image of the storage media as is and then ingested into an OAIS. The digital forensics aspects of this process are discussed below -

Disk Image

Bit stream copy of storage media in forensics disk imaging format either in raw (dd) or advance forensics format (AFF) is used to prove reliability of storage media. A disk image is an exact replica of the source media which contains any slack space, unallocated space, and other metadata of the disk volume. Before taking bit stream images using any tools, care should be taken that the device is write protected to prohibit any changes.

Serial Number

The serial number of the storage media like hard disk or flash drives is extremely important for proving the source of the disk image, which is captured in the metadata.

Hash Values

Fixed size hash value derived from original disk image using irreversible hashing algorithms like MD5, SHA1 or SHA256 can be used to prove the integrity of the original source of information.

Chain of Custody Information

Most of the forensic disk image capturing tools, allow you to allocate a case number, which a unique identification number is given to disk image as an evidence. It maintains the list of tools used to collecting the digital evidences, examiner name, short description of evidence, the path where the evidence is stored initially, time of acquisition of evidence, and MAC times (b, m, a, c times) which is latest modification time of the file, last access time of the file, change time means metadata was changed like the file's permissions or ownership were modified and birth or creation time means the time the image file was created. This information is very vital in proving the provenance, ownership of disk image which is being preserved.

Examples of Open Source Disk Imaging Tools

There are several open source forensics disk imaging tools available. Guymager is one of the open source tools used for media acquisition, which runs under Linux and it supports Multi-threaded and pipelined design. It can generate disk image in raw (dd), EWF (E01) or AFF formats.

Fig. 1: Screenshot of the AFF Image Metadata Captured by Guymager. As Part of the Notes Seen in the Screenshot, the Serial Number of Storage Media is Visible. Chain of Custody Information as Image Metadata and MD5 Hash Value is also Seen

Fig. 2: Screenshot of DFXML Output from Fiwalk. MAC Time, File and Partition Information, Its Hash Value and Other Metadata Related to Particular File is also Visible

Fiwalk is a library to extract file-level metadata from disk images which facilitates the identification of the origin, its MAC time values, etc. and output result in DFXML or key/ value pairs which can be directly preserved in archive.

Raw format (dd) images are simple copies of storage media but it does not include metadata, we have to collect metadata separately but transportation of this format image is simple, we can use piping over netcat or ssh to transfer this kind of file over network. Advanced Forensic Format (AFF) is an extensible open format which includes the raw bit stream disk image and metadata. It also allows disk images to be compressed with a variety of algorithms [15,16,17].

It is important to note that there is no standardized format for forensics disk images. Disk imaging process is very time consuming and costly due to additional storage space requirements for copying and replicating, etc.

DIGITAL FORENSICS FOR CELL PHONE PRESERVATION

The cell phone device contains born digital information such as Contacts, Call History, SMS, MMS, e-mail, Device info, photographs, audio, video, passwords, address book, browser's data, social networking information, etc. The cell phones are prone to misuse due to increasing computational power. For example, such mobile device can be hardened and used for criminal and destructive purposes [11] like data gathering of credit card scanning and for trigger bombs. In such criminal cases, the cell phones used in the crime need to preserved as a vital evidence for several years. Therefore, in this case study, we have used Android cell phone for forensic application.

Digital Forensics for Android Cell Phones

In Android cell phones the data can be found in number of locations such as NAND flash, removable storage and SIM cards. Not all phones are created equal, and what is extractable from a device is dependent on its capabilities [13]. Hence there are different methods and tools that can be used to forensically examine the device and extract the information. One of the essential step is to root the android device if it is not rooted. Root means to get root or super user access to that device. There are different methods or some exploits available for different device but it is riskier to root the device because of integrity issue. The forensic acquisition process has no standard method, but using multiple methods or combinations of different tools one can achieve it. So, only method we can say as manual extraction. This acquisition and extraction of forensics image of mobile phone can be scripted for desired use and application to fulfill the requirements using scripting language.

Process

Android device stores data into NAND flash memory. This memory contains logical block partitions for different purposes. These NAND memory uses YAFFS (Yet Another Flash File System), that is also open source and fully supports flash memory [12]. Android uses MTD(Memory Technology Device) to address different partitions on single chip of memory. Mtd is generally stored in/proc/mtd, and returns existing partition table of system. It depends on Version and device manufacture also. So aim is to locate the mount point and get image

of that device. There are different mount points such as system, cache, data or userdata, sdcard or extsd, etc. Among of these, userdata contains useful information. Using adb and dd tools this image can be captured and stored for preservation. Later this dd image can be used to extract useful information, and also this extracted information can be ingested along with image for preservation. Android provides rich and powerful API for development. There are some open source forensics applications which provide automated extraction from android mobile and generate well formatted report. AF Logical Open Source Edition is a free version, which pulls all available MMS, SMS, Contacts, and Call Logs from the given Android device. There are also other methods by which these details can be extracted and that can be converted in xml format for preservation.

Process Outcome

Bulk Extractor extracts information such as Email addresses, credit card numbers, exif information from jpeg, phone numbers, search history, urls, etc that might be useful for law enforcement authority. Bulk extractor also shows histogram for each search result that helps analysis of large amount data. AF Logical OSE gives trustworthy and well formatted information. It also produce one info.xml file that stores metadata. CSV file contains call numbers, call log, sms, mms, etc. that acceptable for preservation. Here as described in figure 3 we can prove identification of device for further related work with evidence. It can yield IMEI or MEID number, which is unique to device. ICCID is SIM card's unique number, which is links to service provider and related useful information. Apart from that Device's information such as maker, model, etc can be yield.

As the mobile industry is emerging in nature and hence limited number of tools that supports forensics for preservation. Also root the device is one biggest challenge. There are also some proprietary tools such as FTK MPE+, viaForensicsviaExtract, Oxygen Forensic Suit, etc. Also AF Logical has Law Enforcement version that gives more features than OSE version and it is only be used for Law Enforcement agency.

In Android phone, for extraction different methods are there and each method yields different data. Android stores every information in SQLite database. This database can be used to extract useful information, and if multiple source of information yield same result then we can rely on such evidence. Such extracted data including DFXML [10,14], metadata, and related information, can be used for producing an Archival Information Package of the mobile data (AIP) preservation purpose as part of the ingest procedure in the OAIS.

Fig. 3: Info.xml File Captured from AF Logical OSE. Different Marked Elements Shows Date, Time, IMEI, ICCID and Model Numbers of Device which Proves Provenance of Device Identity

CORROBORATING THE FORENSIC INFORMATION WITH PRESERVATION REQUIREMENTS

In this section, we have tried to corroborate the captured digital evidences for legal and digital preservation requirements. The metadata extracted using the forensic tools can also be processed for search, retrieval, sorting of digital information.

CONCLUSION

- As shown in Table 1, it is possible to capture various digital evidences by applying digital forensics methods to infer the provenance, integrity, authenticity and reliability of e-mail, disk, and cell phone.
- It is necessary to standardize the file formats for storing / preserving e-mail, forensic metadata and disk images.

- The forensic metadata will also be useful in identifying the obsolete or proprietary file formats, certain (limited) aspects of representation information related with the digital objects in the disk images for digital migration, representation or emulation if required. The future usability of all the data stored in the disk images cannot be guaranteed as it may be using several proprietary formats unless it is migrated into open and standardized file formats.
- Digital forensics should be incorporated in the procedures for preserving the electronic records of evidentiary value to meet the requirements of IT Act 2000/2008.

Table 1: Summary of the Findings from Digital Forensics of E-mail, Disk and Cell Phone from Preservation Perspective

Aspects of Preservation	e-Mail Forensics	Disk Forensics	Android Cell Phone Forensics
Provenance	IP Addresses	Serial number of the storage media	IMEI or MEID number, Product details (handset) ICCID (SIM card's unique number)
Authenticity	Sender's Digital Signature		SIM Card details
Inferential authenticity (date, time, provenance, actions)	Time stamp, Message-ID, Trace information, Information about sender, receivers	Time stamp, Message-ID, Trace information, Information about sender, receivers	Text file containing e-mail addresses, credit card numbers, exif information from jpeg, phone numbers, search history, urls, CSV file containing call numbers, call log, sms, mms Corroborate the records from the mobile service provider
Reliability	DKIM-Signature	Same information can be extracted using different methods and compared	Same information can be extracted using different methods and compared

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Xena Digital Preservation Software, http://xena.sourceforge.net/
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UNIX tool that copies data from one file to another.
[21] AF Logical OSE
https://viaforensics.com/resources/tools/android-forensics-tool/
[22] ADB (Android Debug Bridge)
http://developer.android.com/tools/help/adb.html
[23] Fiwalk
http://www.forensicswiki.org/wiki/Fiwalk
[24] Bulk Extractor
http://www.forensicswiki.org/wiki/Bulk_extractor viaForensics viaExtract
https://viaforensics.com/products/viaextract/
[25] guymager
[26] http://guymager.sourceforge.net/

Implications of National Knowledge Network (NKN) for Judiciary in India

The National Knowledge Network (NKN) is a state-of-the-art multi-gigabit pan-India network.[1] NKN is meant for providing unified high speed connectivity to all knowledge related institutions throughout India. The purpose of such a knowledge network goes to the very core of the country's quest for building quality institutions with requisite research facilities and creating a pool of highly trained professionals.

The Article "*Towards a Best Use of National Knowledge Network for the Knowledge Sharing*"[2] talks about the architecture of National Knowledge Network and the services it may render which are broadly Generic Services, Community Services and Special Services. It further talks about main applications of NKN which are Countrywide Virtual Classroom, Collaborative Research, Virtual Library, Sharing of Computing Resources, Grid Computing, Network Technology Test-bed, e-Governance and Cloud Computing. The paper further proposes employability of the Network Infrastructure and Application framework setup that an Institute could have for best utilization of NKN. The writers have also identified critical security issues and have also proposed a model which can be implemented by the Institutes for securing high speed networks.

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[1] http://www.nkn.in/ 2

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Towards a Best Use of National Knowledge Network for the Knowledge Sharing

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ABSTRACT
National Knowledge Network (NKN) is a project of Government of India, which will connect Educational Institutes, R&D institutions, Health service facilities, Agricultural institutions, Libraries of India and a future plan of collaboration with the International research organizations. This paper presents detail proposed Network Infrastructure and Application framework setup that an Institute need to have for the best use of NKN. It also describes the services and other features of the NKN. Critical security issues have been identified and a model is proposed which can be implemented by the Institutes for securing such high speed networks.

General Terms
National Knowledge Network, Knowledge Sharing, Proposed Solution

Keywords
NKN, Network Architecture, Security, Services, Application framework

1. INTRODUCTION
The main objectives of all the Institutes are to impart education in their offering courses, interdisciplinary courses, to conduct research in the relevant fields, and also to do further innovation and planning for advancement of learning and dissemination of knowledge. ICT plays a very important role for the knowledge sharing and research activities. National Knowledge Network (NKN) [1] is a high speed network which aims to connect all the higher educational institutes, universities and research organizations so that they can work together, share the knowledge resources and can do the collaborative research work. NKN is bridging the gap between the various research organization & education Institutes and also facilitating advanced distance education in India. The National Informatics Centre (NIC) is the implementing unit of the NKN.

For the best use of NKN i.e. easy access of knowledge, better knowledge services and dissemination of knowledge, all the Institutes need to have their own scalable campus wide local area network, set of servers, network security components, and set of applications.

NKN network design and architecture, which is based on distributed networking approach is shown in fig1..NKN comprises 3 Layer of distribution: Core , distribution Layer in different states of the country and Edge Distribution connecting to various Institutes and research organizations. Detail of the architecture is given in section 2.1 of this paper.

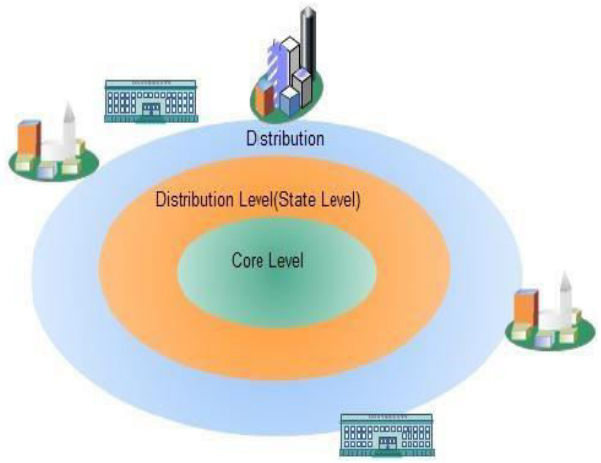

Fig1. NKN Design and Architecture [2]

The paper is organised as follows. Section 2 reports the state of art of National Knowledge Network that includes its Infrastructure, Services, and Future Plan. Section 3 briefly describes Proposed Campus Network Architecture of the Institutes. Section 4 outlines the security measures needs to be taken by the Institutes. Section 5 describes proposed framework of Applications needs to be developed on top of NKN by the connected Institutes. Section 6 draws the main conclusions derived from this work.

2. NKN (National Knowledge Network)
The NKN is a state-of-the-art multi-gigabit pan-India network [1].NKN provides a unified high speed and low latency network backbone for all connected institutions in the country. NKN has provided a platform for scientists, researchers and students from different backgrounds and diverse geographical location so that they can work together for advancing research & development in critical and emerging areas. NKN has already driven the research activities across the country. Most of the Institutes connected by NKN today are sharing their information and resources for innovation, invention and research work.

National Knowledge Commission [3] in its proposal to the Govt. of India has clearly stated that the main objective of NKN implementation is to build quality Institutions across the country by facilitating them with advance high speed, low latency network support. In future this network will connect districts, villages, gram panchayat, and primary education schools in remote area for their education, training and egovernance.

2.1 NKN Architecture

NKN network comprises 3 layer of distributed network Architecture as shown in figure2 [7]:

1. Core (multiple of 10 Gbps support)
2. Distribution(multiple of 2.5/10 Gbps)
3. Access (100 Mbps - 1 Gbps)

The backbone of the NKN network has connectivity to 7 fully meshed Supercore. The network is further distributed through 26 Core locations (distribution) partially meshed connectivity with Supercore locations. The distribution layer connects entire country to the core of the network using multiple links at speeds of 2.5/10 Gbps. The end users or connecting Institutions presently eight hundred twenty three are being connected upto a speed of 1 Gbps.

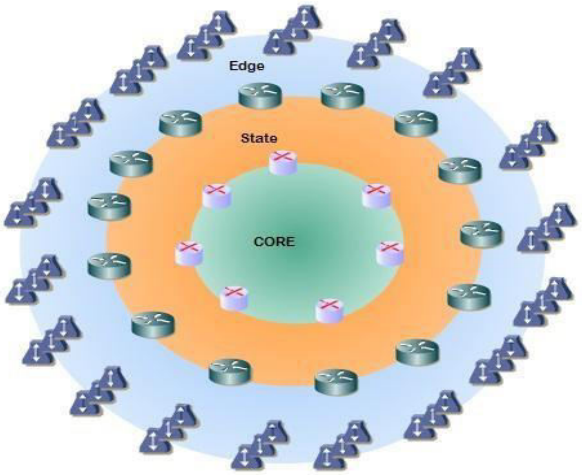

Fig2. Three Layer Routing Architecture of NKN [7]

2.2 Services & Applications

NKN provides three main services [5] and these services are Generic Services, Community Services and Special Services.

Main service under Generic service is Internet, in addition to this NKN also helps connecting nodes to provide mail, messaging, DNS, Video portals and streaming etc. Under Community services NKN provides storage, grid computing, collaboration, authentication and applications. Special services provided by NKN mainly include VPN services at different layer and its stitching services.

NKN has recently launched following product & services under generic services [6]: LDAP, PaaS, BitAmbulator, Open Source IP Registrar (OSIR), Bandwidth Monitoring Service, Mail & Messaging Service, Smart Class Service, DNS service.

2.2.1 Applications of NKN

Main applications of NKN are [7]: Countrywide Virtual Classroom, Collaborative Research, Virtual Library, Sharing of Computing Resources, Grid Computing, Network Technology Test-bed, e-Governance and Cloud Computing.

2.3 Future Plan

Future plan of NKN is to have presence in more than 500 districts of India with connectivity to over 1500 Institutions / Organisations / Laboratories under various categories throughout the country [8].

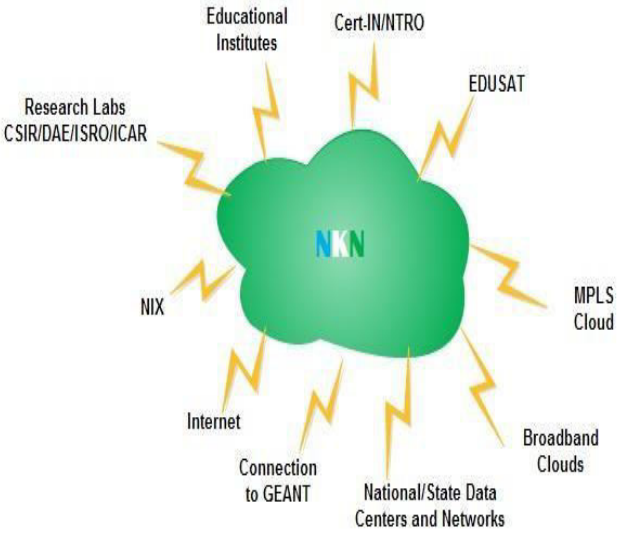

Fig3. NKN Connectivity Plan [8]

NKN provides national & international connectivity to its users for collaborative research work few of those are mentioned below [9 to 14]:

i. BARC : Bhabha Atomic Research Centre India
ii. GARUDA: National Grid Computing initiative by CDAC, India, iii. TEIN3(Trans Eurasia Information Network): The research and education network for Asia-Pacific, Linking Asia-Pacific to Europe and beyond
iv. GLORIAD: Global Ring Network for Advanced Application Development
v. EU-India Grid: Global networks connecting Scientific Research Communities around the world. Networks such as GÉANT (The Pan-European Education and Research Network), TEIN3 (The Trans-Eurasia Information Network) and the NKN (National Knowledge Network of India).
vi. Connectivity to ESRF, Grenoble, France for Remote Physics Experiment

3. PROPOSED CAMPUS WIDE LAN ARCHITECTURE

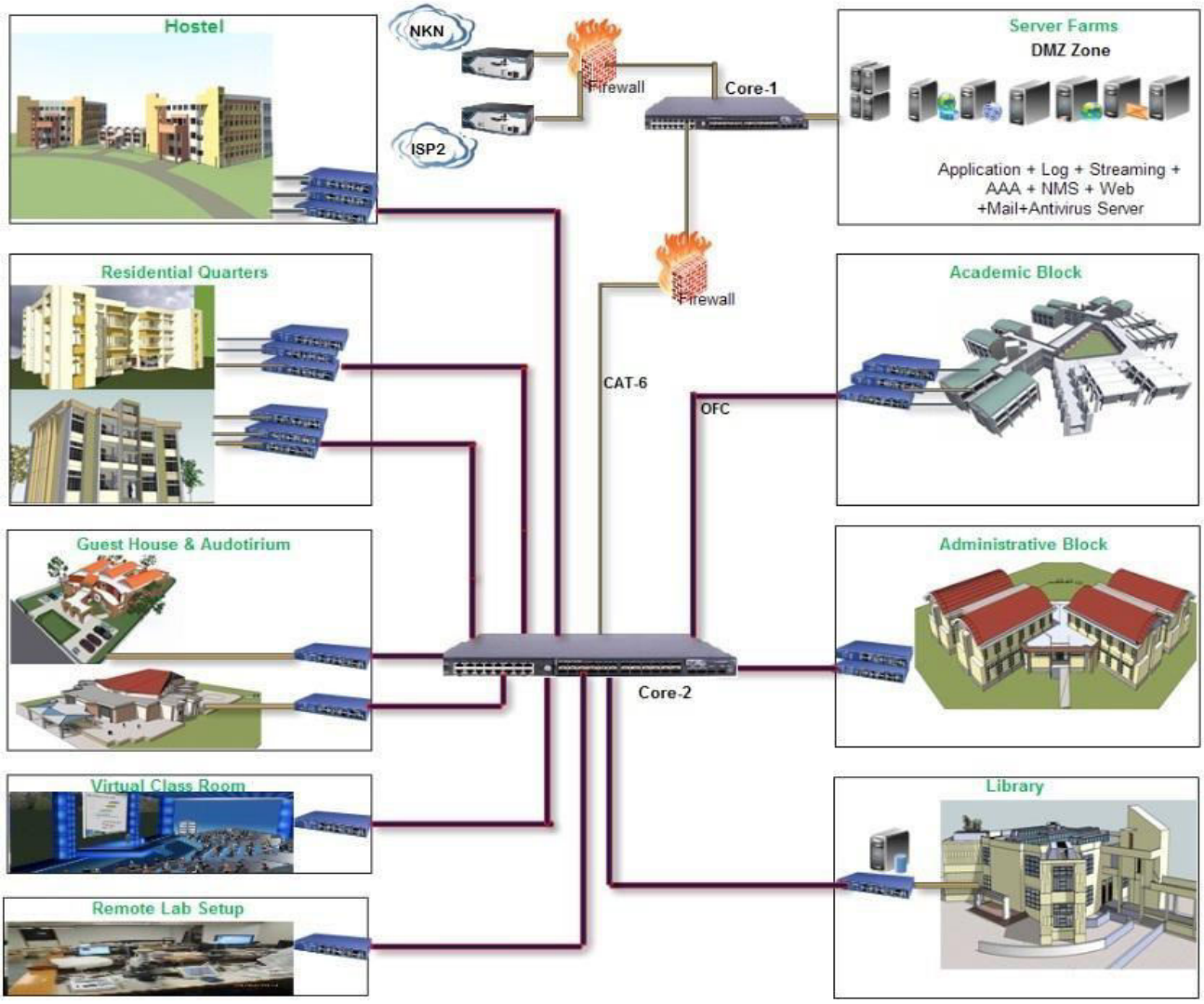

Fig4. Campus Wide LAN Architecture

Network Architecture is broadly categorized in four Zones 1**. Internet:** Internet is basically outside world or WAN connectivity (e.g. NKN and other ISPs)

2. **DMZ (Demilitarized Zone):** External Firewall, Here all the publicly accessible servers are placed within firewall policy of DMZ to make it highly secured zone

3. **Internal Firewall**, We have proposed additional firewall for securing the Local Servers from internal threats kept in Private LAN.

4. **LAN:-** Here all the departments are connected with the L2 Switches(Access) which in turn is connected to L3 Switch(Core) in VLAN. In this proposed architecture the detail specifications and configurations for the devices (Firewall + Servers + Switches L3 & L2) are not given but we suggest that the devices must be purchased , configured and installed with proper planning and study so that it can be easily migrated to any possible future changes in network technology, topology, protocols, standards and other performance metrics. Firewall configuration must be done properly that includes Firewall Rules, NAT, Web filtering, Application filtering, Intrusion Prevention System, Gateway Anti-Virus and Anti-Spyware, Bandwidth Management, VPN, and Anti Spam etc.

As suggested by Prof. H. Krishnamurthy, Chief Research Scientist, IISc Bangalore in [8] that while designing a network & services we should always take care of five important metrics given as:-

1. Performance Scalability
2. Availability & fault tolerance
3. Robust & Maturity
4. Security & Access Control
5. Performance Standard & Interoperability.

4. PROPOSED APPLICATION FRAMEWORK

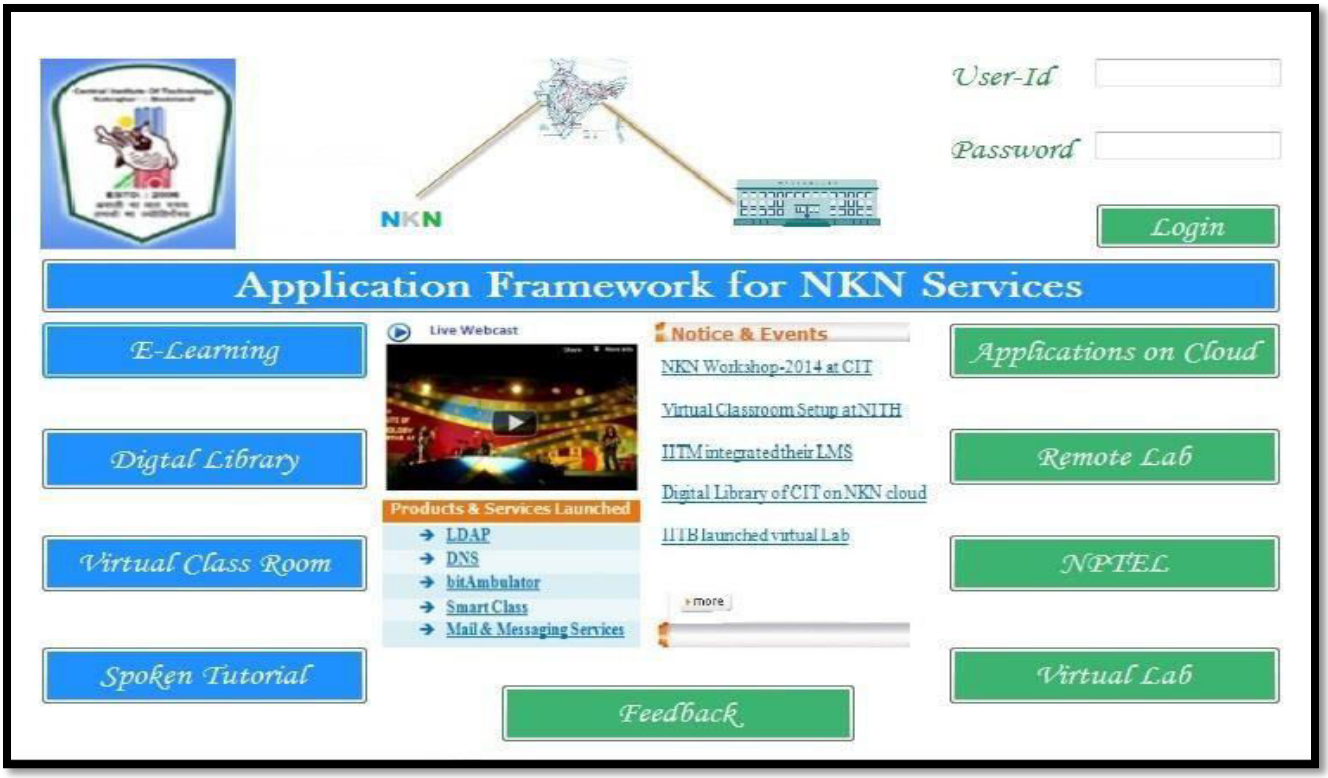

Fig5. Web based Application framework for NKN Services

User Privileges	**Services**	**User Action & Characteristics**
Teacher & Student	E-learning	This module will help the Institutes to participate and use e-learning platform developed by various institute and Universities such as their LMS on MOODLE . ***Click event of E-learning will enable the users to see the list of Institutes offering e-learning courses and its availability for the use***. After successful login User can select choice and can use this service if it is allowed to that particular Institute from which the User belongs.
Teacher & Student	Digital Library	***Click event on digital Library will generate the list of Institutes connected to NKN and who's digital libraries are available including list of books, research papers, videos etc for various departments and subjects.*** IITB in their e-foundry subjects has made available their digital library. http://efoundry.iitb.ac.in/Academy/index.jsp
Teacher & Nodal officer	Virtual Class Room	***Click event on Virtual Classes will generate the list of Institutes connected to NKN and whose Virtual Classes are available with their Schedules and other detail.*** Only Teachers are allowed to start this service after authorization taken from the system or Nodal officer at their VC setup place. NIC has offered this service using NKN on http://virtualclassroom.nic.in/
Teacher & Student	Spoken Tutorials	***Click event on Spoken Tutorial will generate the list of Institutes connected to NKN and offering this Service i.e.*** Institutes who provides spoken tutorial on various topics. spoken-tutorial.org is one of the services offered by IITB and is available for use.

Teacher & Student	Applications on cloud	***Click event on this Menu will generate the list of all the open source applications available on cloud for use of their choice.*** Scilab [19] is one of the examples available on cloud.scilab.in for practice and use.
Teacher & Nodal officer	Remote Lab Access	***Click event on this Menu will generate the list of the connected lab at different geographic location and its availability for its remote use.*** Remote laboratory will use NKN to remotely conduct real (as opposed to virtual) experiments, at the physical location of the operating technology; It will allow the scientist and researchers to utilize technology from a separate geographical location. Remote Physics Experiment at ESRF (Experimental Synchrotron Research Facility), Grenoble, France on NKN is one example.
Teacher & Student	NPTEL	***Click event on this Menu will simply connect to NPTEL [15] on NKN*** that Provides E-learning through online Web and Video courses in Engineering, Science and humanities streams.
Teacher & Nodal officer	Virtual Lab Classes	***Click event on this Menu will list the offered lab classes with their details.*** Students can watch and interact in live demonstration of the lab but they cannot control the lab equipments like remote lab. Use policy is same as of Virtual Class Room.
Teacher & Student	Feedback to Nodal officer	***Using this button Teachers and students can submit their feedback to Nodal officer regarding services request, its usage or any other queries.*** Nodal officer can forward same to NIC, NKN and other concerned Institutes for request of services, integration and implementation.
Nodal officer	Notice & Event	***Nodal officer can update any News, Notice & Event send to participating Institute on the Interface using this tool.***
Nodal officer	Live Webcast	This tool will scroll the list of live webcasting currently running in various Institutions. Nodal officer can update the list receives from various NKN portals.
Nodal officer	Products & Services offered	***This interface will give the details of products and services launched by various Institutes, NKN, Research organization and NIC.*** Nodal officer will give detail of this information on web application framework.

5. PROPOSED IT SECURITY FRAMEWORK

The IT infrastructure comprising both Network and Automation Solution or set of applications which needs to be secured and there should be well designed security framework that will ensure the availability, integrity, and confidentiality of information infrastructure.

A very nice quote by Alan Cox suggest that ***Poor Security***
can be worse than no security
"There is a ton of evidence both in computing and outside of it which shows that poor security can be very much worse than no security at all. In particular stuff which makes users think
they are secure but is worthless and very dangerous indeed."

Security threats External and Internal Risk which are identified for an IT infrastructure are given in table1.

Today many organizations including Institutes where security for Information Infrastructure is basically

having a firewall and updating the antivirus software regularly, the security model of the IT needs to have strategic policies, security services, relevant technologies, best practices, guidelines, audit and other standards.

Table1. External Security threats and Internal Risks

External Threats	Internal Risks
1. Malware include:– Viruses, worm, Trojan horse	1. USB Flash Drives
2. Distributed denial-ofservice (DDoS)	2. Laptops
3. Eavesdropping attacks	3. P2P
4. Collateral damage	4. Web Mail
5. Unauthorized access attacks	5. Wi-Fi
6. Unauthorized use of resources and information	6. Smart Phones
7. Spoofing	7. Collaboration Tools & Hosted Software
8. Application-specific hacks e.g. SQL injection	8. Social Networks
9. Phishing attacks	9. Unauthorized Software Updates

Four levels (Administrative level, workflow level, information level, and technical level) of security model are proposed and are shown below in the figure6 and related security services are given in table2.

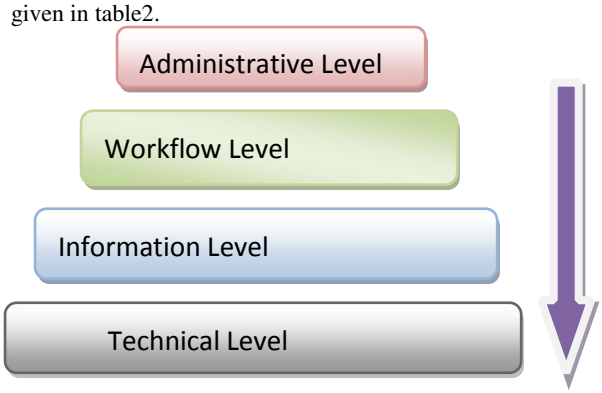

Fig6. Proposed Security Framework

Table2. Security Level & its related Services

Proposed Security Level	Related Security Services
Administrative Level	Administration, Identification of Problems, Proper Audit, Decision making under uncertainty, Disaster Management, IT-security strategies and formation of policies.
Workflow level	Work Flow Level must work towards Integration of standardized security framework, applications, protocols and technologies.
Information Level	This level must provide services like Authentication, Authorization, User Rights, Access Control, Back-Up & Recovery.
Technical Level	At the lowest layer following security [16] needs to be implemented. **Physical Security**: This limits physical access of areas and control rooms to authorized personnel. **Network Security:** - Firewalls with IPS/IDS, and other QoS policies. **Computer Hardening: -** Removal of unused applications protocols & services. **Application Security:-** Authentication & Authorization of Application usage. **Device Hardening:-** Migration and restrictive access

6. CONCLUSION

In this paper three frameworks are proposed for the best use of NKN services including Network, Application and Security. This paper is written with the objective to help the connected institutes at edge to deploy their Network who have not. Institutes who have their well designed network architecture for them there is need to work for implementation of Application and Security. All the stakeholders of NKN including Institutes, NIC, Research Organizations, and Universities have to work together for implementation and integration of NKN services and bringing to one user friendly

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& interactive web interface for its better utilization as proposed in this paper.

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Use of Information and Communication Technology in Governance - Experiment in Maharashtra Judiciary

Justice R.C. Chavan[1]

1. Introduction

Computerisation of Courts in Maharashtra is an example of a successful e-governance project reaping rich dividends. The project touches 365 Taluka and District Courts, utilises 450 servers, 4000 client, machines across the State, and is implemented by 8000 Court employees, working without any additional remuneration as system administrators or data entry operators. Data of a staggering 44 lakh cases fed into the system has been made accessible to public on the website "court.mah.nic.in." and touch screen kiosks installed in most of the District Courts. This website has average 5 Lakh hits per month. This achievement has cost the State less than Rs. 28 Crores, including cost of hardware networking, electrification, site preparation, even furniture, and a very small negligible fraction spent on development of application software. The browser based application software developed on LAMP (Linux Apache MySQL PHP) architecture on open source by a team led by Shri Ashish Shiradonkar, Principal System Analyst at NIC, Pune involves zero licensing costs. Spectacular success of the project led several other States to seek to have application software installed and project implemented in Courts in those States.

This is what went into the implementation of this project.

2. Why?

Growing frustration of common man about the efficiency of the system has been a cause for concern for the administration. The litigants are generally clueless as to why their cases languish for years together. They find it difficult to understand why Courts require their presence on several dates without any business being transacted on those dates. A common man was always bewildered by being sent back after wasting a day in the Court with the case making no progress. This led to weariness even on the part of responsible officers in attending courts when called, which led to further delays. A lot of valuable judicial time is also wasted in purposeless adjournments of a large number of cases listed in any Court on any day. Uncertainty about a case listed making progress led to listing more cases, resulting in loss of more time in mere adjournments.

While the administration does feel the need to have more courts, it felt that it would be irresponsible to wait till this long term solution was worked out. A study of pendency and disposal also showed that courts with near ideal pendency did not necessarily produce maximum disposal. Increasing judge strength at any judicial station did not necessarily increase disposal or reduce pendency in the same proportion. However, apart from this, the Judicial Administration was also clueless as to what were the actual bottlenecks which obstructed the course of justice and guesswork did not provide accurate information to remedy the causes. It was therefore, felt that an endeavour to optimally use the resources available had to be urgently made. Computerisation, as a tool of office automation was obviously expected to inject speed in the system. But

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more importantly, it was expected to provide information which would enable the administration to deploy human and other resources to derive maximum output.

It was realised that the system depended on rudimentary markers to evaluate itself and, in the absence of proper bench marking, appraisal of performance of the system was skewed. Difficulties for the stakeholders in peeping into the working of system led to unwarranted suspicions, which had to be dispelled by opening up entire information not only to stakeholders, but also for scrutiny by researchers. Therefore, the principal objective in achieving computerisation was to make the system more transparent while at the same time reducing the burden on employees of the Court so that their efficiency could be increased in order to inject speed in the system. It was felt that evolution of a Litigant Centric System while computerising Courts would demystify the working of Courts and ensure transparency. With these goals in view, the High Court of Bombay embarked upon this massive project.

3. The Beginning

Ordinarily computerisation in any organisation begins with a system study, determination of objectives, review of available resources followed by planning and implementation of the project. This Project was kicked off without a regular system study, principally because system study would have consumed time and experience showed that system needs go on getting redefined during implementation of such a project. An old text based and fairly well developed district court information system, already working in almost all District Courts in Maharashtra, provided the starting point for evolution of the new GUI based application.

4. Evolution

While cost was an important consideration in opting for open source, the principal reason for choosing open source was to avoid dependence. It was found that proprietary systems came with a promise of support which was rarely fulfilled. Rather than pay for assistance which is never provided, it was felt that risk of evolving a system without any outside support was worth taking. Apart from savings in terms of money, resort to open source ensures total freedom. Since not a single proprietary software is used on servers or client machines, scalability, flexibility, customisability is possible without any restraints. The spirit of self-reliance drove not only the team evolving the application, but also the teams of District System Administrators (two clerks from every District Court are trained to work as District System Administrators) and other at various places who are actually successfully running the system for the last three years. District System Administrators takes care of network management, logistic management, database administration and data transfer. They acquired necessarily skills on their own trained themselves, and a few even cleared Red Hat Certified Engineer's tests, mastering open source technology. It is this spirit which ensures that undaunted by the any obstacle the system works even in remote Naxalite infested taluks in Gadchiroli and Chandrapur districts as efficiently as in Pune, the I.T. hub.

A modular approach was adopted in evolution and implementation, which were simultaneously executed. Rather than have all aspects of work in Courts being computerised in one go, one aspect was evolved and implemented at a time so that the employees did not feel the burden. Upon consolidation of the first step, the next step was taken. The Application Software was constantly revised on the basis of redefined needs. For this purpose, apart from feedback from all the users, a few select core officials were required to constantly examine relevant aspects, test the software and suggest modifications. The suggestions were vetted by a committee in the High Court and then implemented in revised versions released every 6 months. This ensured that there was a continuous evolution and simultaneous build up of data base.

5. Implementation

Change is always difficult to implement. Additional manpower is invariably required for creating a data base. Experts in I.T. Sector can venture a guess as to the quantum of additional manpower that would have

been required for creating a data base of this size. Yet this was done without shelling out as extra rupee of tax payers' money. Option of outsourcing for creating the data base was ruled out due to financial and other constraints. Unlike ledgers which are kept in banks the data to be fed in order to create data base, was not in one place. The data had to be gathered from registers as well as records of cases themselves which only experienced Court staff, rather the staff actually handling those cases, could have located. Outsourcing would have necessitated first, a training to data entry operators to locate the relevant bits of information from the files, then, to depend upon their ability to enter the data faultlessly, and lastly to wait for a mistake in data entry to surface years afterwards, with outsourcing agency having already vanished after receiving the money. Outsourcing was therefore ruled out. Engaging Court employees in data entry ensured accuracy. Therefore, they had to be motivated to undertake this task, which was achieved by ensuring that it eventually reduced the burden of their work. No formal training was given to the Data entry operators on use of computers. They were trained as they worked by the District System Administrators of respective districts. Since entire training on use of computers was given by their own colleagues, who had taken up challenge of implementation, whole staff got motivated and got trained in short time. After 6 months, the staff was required to enter only data in respect of new cases being filed and the daily proceedings of old cases. Its entire burden to prepare cause lists, fill up various Registers and prepare various statistical returns required to be sent to the High Court, was eliminated.

Rural Maharashtra has power cuts for over 6 hours a day in many areas. At many places, during the Court hours, there is no power supply to the Courts. Yet, the benefits from the system makes the Court employees complete the data entry whenever power is available to and upload the data to the central server as and when Internet link is available. They take this trouble though they do not have any material incentives in form of higher salaries, cash rewards etc. because they have realised that the system has reduced their burden.

6. Results

Results of this project are spectacular. The litigants, who did not at all know as to how their case was progressing, have access to the entire case history, not only on the net but also on the kiosks installed in various District Courts. This enables them to know whether their case is receiving due attention from the Court. Misgivings about efficiency of the system and resultant level of dissatisfaction gets reduced and litigants come to realise the real reasons for cases to lag behind.

Litigants, lawyers and researchers can access on the website Judgments and orders passed without begging before any one. Judgments and orders which are stored in portable document format (pdf) can be searched easily by key words. This value addition comes to the common man free as compared to high costs of proprietary judgment data bases. Judgments from various talukas and District Courts of Maharashtra are now accessible on the web site. Some judgments which are delivered in Marathi, the local language of Maharashtra are also available. Currently more than 1.5 Lakh judgements are available on the server and are regularly growing.

“The Application Software provides for a unique 15 digit “Case Identification Number.” This number was devised with the object of tracking a proceeding through hierarchy of the Courts. Once this case identification number is allotted, the litigant would be able to track his case even after disposal in the Court where it was instituted, through its journey in the hierarchy of Court. A litigant is really not bothered as to whether his case is called a civil suit or civil appeal or a second appeal or whether different numbers are assigned to it at the different stages of its life. He is concerned with finding out as to what has happened and that he could do with the help of this unique case identification number fashioned on the lines of PNR of Rail-ways, to facilitate enquiry over a telephone using Interactive Voice Response System.” This low cost solution of IVRS is developed on complete open source (PERL) and is simple modem based. It is

working in several District Courts of Maharashtra.

Lawyers as a major stakeholders are benefited since they come to know of all the cases that they have in various Courts without being required to maintain diary. This enables them to monitor and manage their work in their offices efficiently. For institutional litigants like Industrial Development Corporations etc. facility has been provided to have their entire "portfolio" managed centrally. Thus, a Director in-charge of litigation, in say, an Industrial Development Corporation, would be able to know day to day progress in all cases of the Corporation in whichever Court in the State in his portfolio, without being required to make a search from the entire data base and without waiting for communication from Lawyers. This facility would ensure a closer watch over the progress of cases by bulk litigants like institutions, which would, in turn, inject speed in disposal of cases, and help in reducing the average time for disposal of cases by simply proper monitoring.

The Government of Maharashtra has launched a scheme of "Litigation Free Village". The data base was extremely useful for police and revenue authorities in the State to target the cases, which were pending in several Courts. But for the availability of this data base, it would have been impossible for the authorities to find out how many cases of which parties are pending in which Courts. A door to door survey would have been as time consuming and as costly as a census. Cases from over 42,000 villages can be accessed from the web site. This scheme of making villages litigation free has yielded rich dividends and thousands of cases are settled through this scheme by the initiatives of the authorities of the State and local citizens, thus reducing the burden on judicial system.

7. What Next ?

Most disappointing aspect of our Judicial System is that when a litigant approaches a Court, he never knows as to when he would get the result. It is indeed difficult for a manually managed system to be able to assure the litigants as to when he should expect results, but the absence of any time limit for disposal leaves the society with no measure of examining the efficiency of the system. The system does not have any bench marking, or fixed norms, or standards about the time, by which particular stages in a lis should be crossed or the quantum of the time, which they ought to take. A module in the application software, which is in advanced stage of development, aims to evolve a schedule for progress of every case, which the litigant would be entitled to know. This would enable him to monitor the progress of his case and to make a grievance if the progress is not as per the schedule. This will also enable the Judicial Officers, Court Officers and the Judicial Administration to monitor their own work.

Police is a major partner in Administration of Justice. In fact more than half of the total cases pending are police cases. Police are statutorily required to report every offence registered, every arrest and every seizure made and submit a final report in respect of every investigation to the Criminal Courts. The Police have also started computerisation of their work. Integration between police data base and the Court data base would substantially eliminate the paper work in both these wings and would inject speed in the system by eliminating duplication in data entry.

The system aims at eventually enabling electronic filing of cases, pleadings, and virtually everything that is currently filed in Courts in a paper format. This would ensure a complete digitization of record, facilitate quick search for any document, and open up space worth thousands of crores in the central areas of various cities and towns for being used for adjudicatory work by eliminating vast record rooms. The costs of the space that would become available, would itself justify 10 times the amount that may have to be spent on digitisation.

It is proposed to integrate the activities in various tiers of Courts. While email is used for communication

between various tiers of Courts, transmission of record is still done manually. Now, when most of the judgments and orders are stored in electronic format, there is no reason why at least these should not be transmitted electronically.

Computerisation aims at ushering a concept of 24x7 working. Physically, the Court or its office may have fixed working hours but since computer system works round the clock, even if the Court has closed, it should be possible for the litigants and Lawyers to access the system in order to make compliances, which otherwise are done during the Court hours. Thus, if a lawyer is required to file a list of witnesses, or a litigant is required to pay process fees, they could do so even outside the regular court hours electronically. Rather than hassle over confusion of dates before the Judge in the Court, consuming precious judicial time, both the parties and their lawyers would be able to see the Court calendar on the web site, consider each others' engagements, and come up with an agreed schedule or at least reduce the area of disagreement in fixing a schedule.

The Case Information System aims at providing a comprehensive management tool to the Judicial Administration to exploit available human resources fully. For this purpose, a personnel resource information system is integrated with the case information system. Performance appraisal, which is now based on only number of cases disposed of, could change. All other dimensions of the work of the Judicial Officer would be open to scrutiny for the Administration, to ascertain training needs, identify skills and match those with localised needs. Availability of the entire information on the website is expected to enable various stakeholders in various jurisdiction to adopt best practise and inject speed in the system. And this will mark a new beginning, the beginning of an effort and a resolve to takeoff, rather than rattle in an aircraft on a weather beaten cart track.

Once this phase is over, it is aimed to carry out a massive exercise of business process re-engineering to cut down all redundancies in the system. Standardisation of various stages in the proceedings in various Courts in different jurisdictions may have to be undertaken.

JUSTICE THROUGH ELECTRONIC GOVERNANCE

By
PRAVEEN DALAL*

The aim of this article is to analyse the use of information technology by the Apex Court for the purposes of delivering justice in its true and practical perspective. A special reference of the Information Technology Act, 2000 has been made to provide an insight of the possible uses of e-governance for a sound justice delivery system. This analysis is equally applicable to all judicial and quasi-judicial authorities functioning in that capacity. The recently enacted Right to Information Act, 2005(RTIA-05) can be effectively and judiciously applied if these principles are followed in their true letter and spirit. The Central Information Commission can also use these principles for the effective implementation of the RTIA-05.

I. Introduction

The World Bank defines e-governance as the use of information and communication technologies by government agencies to transform relations with citizens, business world and other arms of the government. Ever since the creation of Ministry of Information Technology in the Union Government, State and union Territories expressed commitment for providing effective, responsive and transparent citizen governance through the use of Information Technology. E-governance is used as a synonym for an Information Technology driven system of governance that works better, costs less and is capable of servicing people's needs. It is also broadly defined as the use of Information Technology for efficient delivery of Government services to the people, business world and industry. The term e-governance involves the computerization and networking of all government departments and linking each district and taluka, with the State headquarters. The objective of e-governance in India goes beyond mere computerization of government offices. It fundamentally means changing the way the government operates and implies a new set of responsibilities for civil servants, business world and the public. Plans such as online services will give an average citizen access to Government services, with faster responses at more convenient hours. These services include providing information, collecting taxes, granting licenses, administering regulations and paying grants and benefits. The aim of e-governance is to eliminate middlemen and corruption. Once people know that information could not be monopolized, they would demand access to it[1].

II. E-governance and the justice delivery system

The first duty of a court is to do justice. If the "rule of law" has been declared to be a "basic feature" of the Constitution, which cannot be taken away even by exercising the constitutional power of amendment, then "rule of justice" is definitely above it and deserves

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[1] Anupama Katakam; 'Information Technology: Towards EGovernance', The Frontline 78, 10th December 1999.

the status of the basic feature of the constitution. This is so because the concept of justice is wider and is of greater importance than the rule of law because:

(1) The express incorporation of Article 142 in the Constitution of India assures this guarantee. The Supreme Court in exercise of its jurisdiction can pass such decree or make such order as is necessary "for doing complete justice" in any cause or matter pending before it. For instance, the Supreme Court can extend the benefit of its judgment to a case not in appeal[2]. **In D.D.A v Skipper Construction Co (P) Ltd**[3] the Supreme Court observed that it is advisable to leave this power undefined and uncatalogued, so that it remains elastic enough, to be moulded to suit the given situation.

(2) There may not be any law governing any particular situation, but the justice may require taking of an immediate and inevitable action.

(3) There may be a law, which does not satisfy the present demands and requirements of the society at large.

(4) The mandates of morality require taking of an action, which is normally not taken.

(5) The concept of justice, equity and good conscience may be applicable in a given situation where the law has left a vacuum or is not addressing the problem in hand in an appropriate manner.

Thus, the courts in India to do complete justice invoke the concept of "rule of justice". This does not mean that one can ignore the concept of rule of law. It must be appreciated that both rule of law and rule of justice must go hand in hand to make the justice system just, fair and reasonable. In today's world we cannot afford to say that "justice must not only be done but it must also be seemed to be done". The concept of justice requires that:

(1) it must firstly be done in a just, fair and reasonable manner,

(2) it must be seemed to be done, and

(3) it must be "felt" to be done.

Thus, unless this third element of "felt to be done" is satisfied, the concept of justice is not complete because this third element is the most important component of justice delivery system. The public at large in India has a great faith in Indian judiciary and this third element is absolutely essential to maintain and preserve that faith and confidence. A court of law cannot render justice unless the ultimate decision is based on the contemporary law as prevailing in the society. A decision based on an old law, which does not satisfy the requirements of the present situation, and environment should be avoided. In such a situation the efforts of the courts should be to give the law a "purposive, updating and an ongoing interpretation". This position makes the interface of justice delivery system with the information technology inevitable and unavoidable. We cannot allow the dead hand of the past to stifle the growth of the living present. Law cannot stand still; it must change with the changing social concepts and values. If the bark that protects the tree fails to grow and expand along with the tree, it will either choke the tree or if it is a living tree, it will shed that bark and grow a new living bark for itself. Similarly, if the law fails to respond to the needs of changing society, then either it will stifle the growth of the society and choke its progress or if the society is vigorous enough, it will cast away the law, which stands in the way of its growth. Law must therefore constantly keep on adapting itself to the fast changing society and not lag behind[4]. Justice is supreme and justice ought to be beneficial for the society so that the society is placed in a better-off situation. Law courts exist for the society and ought to

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[2] *Manganese Ore v Chande, AIR 1991 SC 520.*

[3] AIR 1996 SC 2005.

[4] **Justice Bhagwati** in *National Textile Worker's Union v P.R.Ramakrishnan, (1983) 1 SCC 228, at p. 256.*

rise up to the occasion to do the needful in the matter, and as such ought to act in a manner so as to sub serve the basic requirement of the society. It is a requirement of the society and the law must respond to its need. The greatest virtue of the law is its flexibility and its adaptability; it must change from time to time so that it answers the cry of the people, the need of the hour and the order of the day. Thus, the justice delivery system cannot afford to take the information technology revolution lightly.

III. Legislative efforts to bring technology revolution

To meet the challenges posed by the information technology, the Parliament has enacted the Information Technology Act, 2000. The aim of the Act is to provide a sound base for e-governance and e-commerce. It must be noted that the e-governance base can be effectively utilized for maintaining a sound justice delivery system. The various requirements, which are inevitable for the smooth functioning of the justice system, are adequately, economically and safely taken care of by the e-governance. For instance, electronic records are legally recognised, digital signatures have been given the status of signature in writing, a notification in electronic gazette is considered to be a valid notification, etc. The following provisions of the Act reflect India's determination to utilize the benefits of e-governance for judicial purposes:

(1) Legal Recognition of E-Records - Section 4 provides that where any law requires that information or any other matter shall be in writing or type written or in printed form. Such requirement shall be deemed to have been satisfied if such information or matter is rendered or made available in an e-form and accessible so as to be usable for a subsequent reference. The term e-record means data, record or data generated, image or sound stored, received or sent in an e-form or microfilm or computer generated microfiche[5]. The term e-form, with reference to information, means any information generated, sent, received or stored in media, magnetic, optical, computer memory, microfilm, computer generated microfiche or similar device[6]. Thus as an alternative to paper based record, e-record has been recognised as a medium of communication and storage of information. Further, if an e-record is authenticated by digital signature, it can be produced as evidence for the inspection of the courts. This arrangement is definitely hassle free and more transparent as compared to traditional methods of record keeping. Further, it is not prone to tampering unlike paper-based record, which is difficult to maintain and has its own limitations.

(2) Legal Recognition of Digital Signatures- Section 5 of the Act mandates that if any information or any other matter is required by law to be authenticated by affixing the signature, then such requirement shall be deemed to have been satisfied if such information or matter is authenticated by means of digital signature affixed in the prescribed manner. The type of digital signature that shall be used to authenticate an e-record shall be as per the rules that may be framed by the Central Government. The rule may prescribe the manner or procedure to facilitate identification of the person affixing the digital signature. It may also prescribe the safeguards to ensure integrity, authenticity and confidentiality of e-records.

[5] Sec.2 (1) (t) of IT Act, 2000
[6] Sec.2 (1) (r) of IT Act, 2000

Further the rule may provide any other matter, which is necessary to give legal effect to digital signatures[7].

(3) Use in Government and its Agencies- Section 6 of the Act recognises use of e-records and digital signatures in government and its agencies for filing, issue, grant, receipt or payment of money as an acceptable mode. The Central Government as well as the State Governments is empowered to prescribe the manner and format in which the e-records shall be filed, created, retained or issued. They may prescribe the manner or method of payment of any fee or charges for filing, creation or issue of any e-record.

(4) Retention of E-Records- Section 7 is an enabling section, which provides that if any law mandates that documents, records or information are required to be retained for any specific period, then, that requirement shall be deemed to have been satisfied if the same is retained in e-form.

(5) Electronic-Gazette- Publication of official gazette in e-form is permitted by Sec.8 of the act. Accordingly, where any law requires publication of rule, regulation, order, byelaw, notification or other matter in the gazette, publication thereof in e-form is permitted. If such publication is made in the e-form, the requirement of publication in the official gazette is deemed to have been fulfilled. When an official gazette is published in printed form as well as electronic gazette, the date of publication shall be the date on which the gazette was first published in any form.

(6) Non-Absolute Right- The provisions of Sec.9 mandates that e-governance, as envisaged in the Information Technology Act, does not confer a right upon any person to insist any Ministry or Department of the Central or State Government or any authority or body to accept, issue, create, retain or preserve any document in the form of e-records or to participate in any monetary transaction in the e-form. Thus, sufficient safeguards have been taken to establish a proper and timely e-governance base.

(7) Possible Uses of E-Governance- The future of e-governance is very bright. With the help of information technology, the daily matters can be effectively taken care of irrespective of the field covered by it. For instance, the Delhi Police Headquarter has launched a website, which can be used for lodging a First Information Report. Similarly, the Patna High Court has taken a bold step of granting bail on the basis of an online bail application. The educational institutions, including universities, are issuing admission forms electronically, which can be downloaded from their respective websites. The results of examinations of various educational institutions, both school level and university level, are available online, which can be obtained without any trouble. These are but some of the instances of the use of technology for a better e-governance. The beneficial concept of e-governance can be utilized for the following purposes:
(1) To have access to public documents.
(2) For making online payments of various bills and dues.
(3) To file statutory documents online[8].

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[7] Sec.10 of IT Act, 2000

[8] Recently the SEBI has allowed filing of specified documents online by the listed companies vide, SMD/Policy/Cir-17/02 dated 3rd July 2002.

(4) To file the complaints, grievances and suggestions of citizens online.
(5) The online facility can be used to enter into a partnership the appropriate government in cases of government contracts.
(6) The citizens can use the online facility to file their income tax returns[9].
(7) The citizens will enjoy the facility of online services.
(8) The various departments of the government can be computerized and centralized and the responsibility for its proper maintenance can be fixed on an agency like National Informatics Centre.

It must be noted that to give effect to these provisions appropriate amendments have been made in the I.P.C, 1860, the Indian Evidence Act, 1872, the Bankers' Books Evidence Act, 1891 and the Reserve Bank of India Act, 1934.These amendments have made these statutes compatible with the "e-justice system".

IV. Judicial reception of information technology

The judicial response vis-à-vis information technology is positive and technology friendly.

In **M/S SIL Import, USA v M/S Exim Aides Silk Exporters**[10] the words "notice in writing", in Section 138 of the Negotiable Instruments Act, were construed to include a notice by fax. The Supreme Court observed: "A notice envisaged u/s 138 can be sent by fax. Nowhere is it said that such notice must be sent by registered post or that it should be dispatched through a messenger. Chapter XVII of the Act, containing sections 138 to 142 was inserted in the Act as per Banking Public Financial Institution and Negotiable Instruments Laws (Amendment) Act, 1988.Technologiacl advancements like Fax, Internet, E-mail, etc were on swift progress even before the Bill for the Amendment Act was discussed by the Parliament. When the legislature contemplated that notice in writing should be given to the drawer of the cheque, the legislature must be presumed to have been aware of the modern devices and equipments already in vogue and also in store for future. If the court were to interpret the words "giving notice in writing" in the section as restricted to the customary mode of sending notice through postal service or even by personal delivery, the interpretative process will fail to cope up with the change of time. So **i**f the notice envisaged in clause (b) of the proviso to section 138 was transmitted by Fax, it would be compliance with the legal requirement".

Thus the requirement of a written notice will be satisfied if the same is given in the form of a fax, e-mail etc, using the information technology. It must be noted that a notice by e-mail can be send instantaneously and its delivery is assured and acknowledged by a report showing the due delivery of the same to the recipient. This method is more safe, accurate, economical and lesser time consuming as compared to its traditional counterpart, popularly known as "Registered A.D".

In **Basavaraj R. Patil v State of Karnataka**[11] the question was whether an accused need to be physically present in court to answer the questions put to him by the court whilst recording his statement under section 313. The majority held that the section had to be considered in the light of the revolutionary changes in technology of communication and

[9] Assessment year 2002-03, the bulk filing of returns of the employees by the employer on computer readable medium has been recognised by Sec.139 (1A) of the Income Tax Act.1961.
[10] AIR 1999 SC 1609.
[11] (2000) 8 SCC 740.

transmission and the marked improvement in the facilities of legal aid in the country. It was held that it was not necessary that in all cases the accused must answer by personally remaining present in the court. Once again, the importance of information technology is apparent. If a person residing in a remote area of South India is required to appear in the court for giving evidence, then he should not be called from that place, instead the medium of "video conferencing" should be used. In that case the requirements of justice are practically harmonised with the ease and comfort of the witnesses, which can drastically improve the justice delivery system.

In **State of Maharashtra v Dr.Praful.B.Desai**[12] the Supreme Court observed: "The evidence can be both oral and documentary and electronic records can be produced as evidence. This means that evidence, even in criminal matters, can also be by way of electronic records. This would include video conferencing. Video conferencing is an advancement in science and technology which permits one to see, hear and talk with someone far away, with the same facility and ease as if he is present before you i.e. in your presence. Thus, it is clear that so long as the accused and/or his pleader are present when evidence is recorded by video conferencing that evidence is recorded in the "presence" of the accused and would thus fully meet the requirements of section 273, Criminal Procedure Code. Recording of such evidence would be as per "procedure established by law". The advancement of science and technology is such that now it is possible to set up video conferencing equipments in the court itself. In that case evidence would be recorded by the magistrate or under his dictation in the open court. To this method there is however a drawback. As the witness is not in the court there may be difficulties if commits contempt of court or perjures himself. Therefore as a matter of prudence evidence by video conferencing in open court should be only if the witness is in a country which has an extradition treaty with India and under whose laws contempt of court and perjury are also punishable".

This judgment of the Supreme Court is a landmark judgment as it has the potential to seek help of those witnesses who are crucial for rendering the complete justice but who cannot come due to "territorial distances" or even due to fear, expenses, old age, etc. The Courts in India have the power to maintain anonymity of the witnesses to protect them from threats and harm and the use of information technology is the safest bet for the same. The testimony of a witness can be recorded electronically the access to which can be legitimately and lawfully denied by the Courts to meet the ends of justice.

Once again the safety of victims and the witnesses through the use of information technology was recognised by the Supreme Court in **Sakshi v U.O.I**[13]. The Supreme Court in this case observed: " The whole inquiry before a court being to elicit the truth, it is absolutely necessary that the victim or the witnesses are able to depose about the entire incident in a free atmosphere without any embarrassment. Section 273 Cr.P.C merely requires the evidence to be taken in the presence of the accused. The section, however, does not say that the evidence should be recorded in such a manner that the accused should have full view of the victim or the witnesses. Recording of evidence by video conferencing has already been upheld. Moreover, there is a major difference between substantive provisions defining crimes and providing punishment for the same and procedural enactment laying down the procedure of trial of such offences. Rules of procedure are handmaiden of justice and are meant to advance and not to obstruct the cause of justice. It is, therefore, permissible for the court to expand or enlarge the meanings of such provisions in order to elicit the truth and do justice with the

[12] 2003 (3) SCALE 554.
[13] (2004) 5 SCC 519.

parties. Thus, in holding trial of child sex abuse or rape a screen or some arrangements may be made where the victim or witness (who may be equally vulnerable like the victim) do not see the body or face of the accused. Recording of evidence by way of video conferencing vis-à-vis Section 273 Cr.P.C is permissible".

The above discussion shows that the judiciary in India is not only aware of the advantages of information technology but is actively and positively using it in the administration of justice, particularly the criminal justice.

V. Conclusion

The advent of information technology has changed the mode of working of almost all the spheres of the life. The justice delivery system has also been benefited by this technological revolution. It must be noted that one of the cardinal rule of interpretation is that the Parliament intends the Courts to apply an ongoing Act a construction that continuously updates its wordings to allow for changes since the Act was initially framed. An enactment of the former days is thus to be read today, in the light of the dynamic processing received over the years. The Constitution is organic and living in nature. It is also well settled that the interpretation of the Constitution of India or statutes would change from time to time. Being a living organ, it is ongoing and with passage of time, law must change. New rights may have to be found out within the constitutional scheme. It is established that fundamental rights themselves have no fixed content; most of them are empty vessels into which each generation must pour its contents in the light of its experience. The attempt of the court should be to expand the reach and ambit of the fundamental rights by process of judicial interpretation. There cannot be any distinction between the fundamental rights mentioned in Chapter III of the Constitution and the declaration of such rights on the basis of the judgments rendered by the Supreme Court[14]. This valuable and golden rule of interpretation has been properly appreciated and adequately applied by the Indian judiciary in the context of information technology. Thus, it can be safely concluded that the "E-justice system" has found its existence in India.

[14] *P.U.C.L v U.O.I, (2003) (3) SCALE 263.*

Comparative Analysis of Online Legal Information Sources in Indian Environment: A Proposed Model for the Legal Community in India

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Abstract

Legal information production by lawyers, judges and research scholars is forcing the judiciary to switch its operations from traditional to online mode. The present study proposed a model online legal information system for Indian environment. The study compared the existing legal e-resources available in Indian environment with proposed online legal information system. It is found in the study that open access resources are far inferior compared to commercial one. The latest Web 2.0 tools are not integrated in these resources. Besides this, mobile based view is not available in majority of resources. Majority of user interface in open access resources are not user-friendly. Therefore, funding agencies of these resources must take an initiative to make these resources more user-friendly and robust. Besides this, databases of these resources do not adhere to standards such as, Machine Readable Catalogue code (MARC), Open Access Initiate-Protocol Metadata Harvesting (OAI-PMH) and Z39.50. The proposed online legal information system have integrated better help features and embedded the Web 2.0 tools. All these legal e-resources need to be improved to provide effective access of information to legal community in India.

Keywords: *India, Legal e-resource, Legal information system, Open access resource*

1. Introduction

In India, the boom in legal information production by lawyers, judges and research scholars is forcing the judiciary to switch its operations from traditional to online mode. The organizations of legal information resources are important for the legal community as well as the masses. A lawyer's success depends largely on the latest information on a case, and the relevant case laws related to the problem. Therefore, a lawyer has to keep in touch with the latest happenings in the relevant field, and information explosion in the field of law attracts legal information system towards computerization so that legal fraternity could get specific information expeditiously. The rapidly increasing numbers of statutes and exponential growth of case laws call for rapid growth of a computerized legal information system. Overall, the main aim of legal information retrieval systems is to locate the relevant documents related to the search query as defined by the user. In all types of cases, information and communication technology (ICT) can be crucial in providing speedy mechanism to decide upon disputes, subsequently speeding up the justice delivery system. Electronic tracking of cases can be useful for easy search and retrieval, grouping of cases, information processing and judicial record processing. It also helps in the disposal of cases in a transparent manner. A database of court cases is required so that a case registered initially in the trial court could be traced till the final judgment in the higher judiciary.

Judges would also be able to track the cases, which will result in delivery of justice to citizens of India (Kalam, 2012).

Although, legal information services are provided to the citizens by Government organizations, people also use search engines such as Yahoo, Google, AltaVista etc. to seek information about persons, places, things and other general information (Balleste, Luna-Lames and Smith Butler, 2007). However, these search engines lack reliability and depth in solving legal and governmental related queries. In order to conduct legal research in their respective areas, lawyers and research scholars need more refined tools. The major requirement of a legal researcher is to identify the primary law. However, the researcher cannot initiate the research with a primary source and needs a guide to find the law (Tucker and Lampson, 2011).

Besides this, the amount of legal information is growing at an enormous pace, and legal professionals no longer memorize such large amounts of knowledge. Law has to deal with a variety of problems; therefore the researcher and advocate have to be trained to meet the challenges in the context of globalization. Legal education establishes the quality of the judicial system, which has a significant bearing on the rule of law and the socio economic development of the country (Mukhija, 2012). Thus, the Online Legal Information System (OLIS) is designed and developedas model for the legal community and the common masses in India. Moreover, various sources of information can be accessed at different websites; it is very cumbersome for users to locate these valuable contents.

Apart from this, limiting the legal information search to Google and Yahoo, etc. means that a great deal of useful information is likely to be missed. Hence, it was the need of the hour to propose a model online legal information system so that valuable time of the users could be saved. The model is developed after need assessment survey carried out in National Capital Region (NCR), Delhi.

2. Literature review

The primary aim of the legal information system is to retrieve relevant documents in relation to the search query as defined by the user. Any litigation consists of three stages: pre-trial, trial and appeal. The information sought by the litigant is similar in nature at each stage. The pre-trial stage involves intensive document discovery while in the trial stage the main focus is on providing fast retrieval and tracking of various documents that have been introduced in evidence. During appeal, the focus remains on the records of trial court and case law. In the digital era various search techniques are used to explore the legal databases and these are different from other conventional search techniques. This inference flows from the scrutiny of the following:

Greenleaf, Chung, and Singh et al. (2012) observed that the Indian judicial system is complex, and public legal information must be freely available to all. This would surely make for a legally egalitarian social structure. Current legal resources from government have grave limitations for access. Moreover, free access to legal information system can have a special significance for lawyers, law students and research scholars because a large number of people do not have access to commercial online services for legal information. The authorities quoted above advocated that legal scholarship, including legislation, case laws, treaties, reports related to law reforms must be freely available to public. Bhardwaj (2012) revealed that 33.70 percent of the respondents use online databases for case law searching, while only 21.34 percent use it for research and development activities. Only 11.23 percent of respondents revealed that they used these databases for their studies and for updating themselves in the area of their legal research. Interestingly, only 48 percent frequently used these legal databases. Besides this, 26.02 percent of the respondents used these resources occasionally while 16.30 percent stated they used them sometime.

Yates and Shapiro (2010) describe that proper planning, development and implementation strategies are utmost needed to build a sustainable legal information system. Three major

considerations in designing a legal information system are: (i) creating, (ii) compiling, and (iii) dissemination of governing laws in electronic format. It was suggested that need assessment should be carried out at every phase of legal information system, which is finally to be implemented on the basis of findings and conclusions. The need assessment survey is significant in understanding every technical, functional and performance detail to build the legal information system. Chieze, Farzindar, and Lapalme (2010) elaborated a legal information system that included natural language processing (NLP) technologies. The major purpose was to organize the linguistic cues and semantic rules to achieve accurate information extraction in legal information system. Cheng (2008) stated that to symbolize the various laws and precedents, an apt fundamental logic system is required with logic validity standard of logic reasoning in legal information system. Alemu (2007) described the development and maintenance of Ethiopian legal information website. A detailed action plan is prepared to include regional laws, amendments in statutes, case laws of higher courts of Ethiopia to make website a comprehensive source of legal information. Boszormenyi, Horváth, Kövéret. et al. (2006) reviewed the Hungarian legislative information system. The author revealed that unavailability of law in the public domain makes it is cumbersome to understand changes in law. No open access databases maintained by the Government or other organizations were available to access legal and legislative information. Therefore, the Hungarian Parliament passed the Act on electronic freedom of information in July 2005. Under the Act, it was made compulsory in public interest to make available legal and legislative documents online including bills, laws, and courts decisions.

3. Methods

The main objective of the study was to compare the features of online legal information sources in India with proposed model online legal information system (OLIS). However, the objectives of the study limited to the following:

- Identify the diverse features of online legal information sources in law libraries in India;
- Designing special criteria for evaluation of legal information resources;
- Evaluate the legal information resources with the help of specially designed criteria with proposed model OLIS for Indian environment;
- To rank the features of legal information resources under study.

The scope of the study is limited to commercial legal information database subscribed in Indian Law libraries; it includes the Supreme Court Cases (SSC) Online, All India Reporter (AIR) database, Manupatra.com, Grandjurix, Chawla Online and international repute multinational company database Lexis - Nexis and Westlaw India covering the Indian law. The study aim is to evaluate and compare the legal information database covering the Indian law available in numerous law libraries in India. Further to know the users' success in fulfilling their legal information needs. A check was prepared to evaluate the legal database systems in law libraries in India.

The methodology followed in this study is "*Evaluation Method*" with the help of specially designed checklist for e-resources in the field of law in India. The data of e-resources was collected through a survey from law libraries in National Capital Region, Delhi. The e-resources being used by legal community in the region are selected for the study. The structured checklist was designed keeping in view of the objectives and available literature to examine the various features of e-resources available in Indian environment, comprising of 122 dichotomous questions with 174 features, categorized as twelve broad categories, viz. coverage, general features, search fields, citation search, Web 2.0 tools integration, user interface, bibliographic display, text display, session filtering, output services, online help features, provision to contribute contents by users.

Law libraries have difficult task to satisfy their stake holders in terms of legal research with printed resources. However, the commercial electronic resources are costly and open access resources in public domain are not organized appropriately. In order to design an open access legal information system, its functions, ontological system, evaluation model need to understand.

4. Design and development of model OLIS for Indian environment

Web based information system deliver varied contents to a large number of heterogeneous users groups. The integration between interface and its back-end has also become more complex. In recent days because of web based information system expectations of users' have increased many folds. Therefore, design and development of online legal information system has become more complex and cumbersome.

Hybrid approach adopted using combination of existing models including commercial and open access resources and feedback of respondents under need assessment was conducted on users (lawyers, expert users, LL.M students, teachers and research scholars) in eight law libraries in Delhi for designing model online legal information system. OLIS model research approach begins with identification of problems and identification of requirement. Subsequently, other phase such as planning, designing and development was started. In the implementation phase the coding work was carried out. In addition, number of open access legal information resources has been identified. The numbers of testing techniques are also conducted. The system workflow continues which includes feedback mechanism to enhance the functionalities of system. Figure 1 shows the workflow of model OLIS.

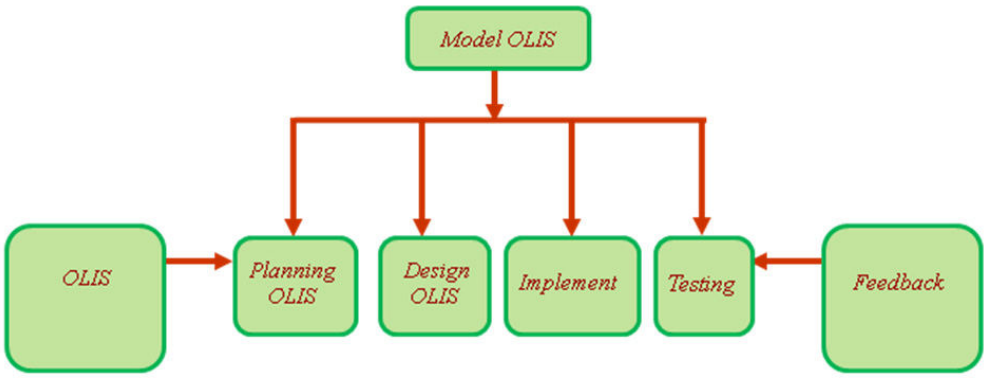

Figure 1. Workflow of proposed OLIS

Legal information database by commercial publishers are expensive and incomplete. Open access resources are unorganized. Both types of resources are less user-friendly. Therefore, OLIS will be a handy tool for the legal community in India. The model OLIS system for Indian environment (Figure 2) was categorized in three broad categories: (i) Judicial Information (ii) Legislative Information (iii) Open access online resources and services. The judicial information in proposed model contains case laws of Supreme Court of India, High Courts, Trail Court and Tribunals. In addition, it contains the legal articles, press release, evidences, article, forms, speeches of eminent legal personalities, audio-video contents, commentaries. The legislative information covers acts (Central and State), Parliament bills, Lok Sabha debates, Rajya Sabha debates, circulars, treaties, trade notices, press release, notifications, rules and regulations. In addition, number of open access resources such as, journals, dictionaries, encyclopaedias available in public domain is also linked.

Figure 2. Homepage of online legal information system (http://www.olisindia.in)

5. Comparative analysis of online legal information sources

A comparative analysis of features in all databases (Commercial & Open access) was performed with model OLIS with the help of specially designed evaluation checklist based on coverage, bibliographic details, labels, open access resources links, application of social networking tools, etc. Table 1 lists the popular online legal information sources being used by legal community in India.

Table 1. Popular online legal information sources in Indian libraries

Electronic Resources	Uniform Resource Locator
I Kanoon (Indian Kanoon)	http://indiankanoon.org/
JUDIS (Judgment Information System)	http://judis.nic.in/
LIIof INDIA (Legal Information Institute of India)	http://liiofindia.org/
SUPLIS (Supreme Court Library Information System)	http://supnet.nic.in/suplis/main.html
OPEN JUDIS (Open Judgment Information System)	http://judis.openarchive.in
I CODE (India Code)	http://indiacode.nic.in/
Westlaw India	http://www.westlawindia.com/
LexisNexis India	http://www.lexisnexis.co.in/en-in/home.page
SCC Online (Supreme Court Cases Online)	http://www.scconline.com/
Manupatra	http://www.manupatra.com
e-Jurix	http://www.ejurix.com
AIR (All India Reporter)	http://www.allindiareporter.in/
IL (Indlaw)	http://www.indlaw.com
Chawla's Law Finder	Available in CD-ROM
L.P (Legal Pundits)	http://www.legalpundits.com/
OLIS : A Model (Online Legal Information System)	http://www.olisindia.in

5.1 Coverage

Maximum databases cover the Supreme Court case law except India code. A numbers of e-resources contain High Court Case laws excluding SUPLIS, India code, e-jurix. Tribunals' cases are covered by Indian Kanoon, JUDIS, Westlaw India, SCC Online, Manupatra and Legal Pundits only. The proposed online legal information system has provision to incorporate all types of judgments. In OLIS, 21 High Courts, Supreme Court Judgments, Tribunal and Trial Court judgments can be searched in a single shot. Bench strength is clearly defined in OLIS. Subsequently, case laws results can be refined using full bench, constitutional bench, bench with chief justice, double bench and single bench. This facility is not available in other databases. In addition, majority of databases have coverage of central acts except JUDIS, SUPLIS and OPEN JUDIS. However, only OLIS has provision of state acts. OLIS has provision for the coverage of both central and state acts. These can be searched simultaneously or individually. Parliamentary bills are included in Legal pundits and OLIS only. Rules and regulations contents are available in LII of India (Sample Collection), SCC Online, Manupatra, e-jurix, Indlaw and OLIS. Amendments under the acts are contained in India Code, Westlaw India, SCC Online, Chawla's Law Finder and OLIS. Notifications are included in SCC Online, Manuptra, e-jurix, Indlaw and Legal Pundits. Circulars are available in Manupatra, Indlaw, legal Pundits and OLIS. Lok Sabha and Rajya Sabha debates are covered by OLIS only, while commentaries are included in LexisNexis India, Manupatra and OLIS. Speeches, evidences, video, audio are contained in OLIS only. Research articles in the field of law are covered by SCC Online and OLIS, while latest legal news are listed in Westlaw India, Indlaw, legal pundits and OLIS. Legal forms are available in Manupatra, legal pundits and OLIS. Press release contents are covered by legal pundits, Indlaw and OLIS. Citation search facilities of case laws are available in OLIS, SCC Online, Manupatra and legal pundits. Interestingly, only OLIS has facility to incorporate website related to the field of law. Table 2 shows that OLIS contains all the 24 resources listed resulting in 96 percent mean, followed by Legal pundits and manupatra which contains 10 (40 percent) each out of the listed resources. The SCC Online cover the 9 (36 percent) resources, followed by Indlaw 8 (32 percent), west law 6 (24 percent). The least number of resources covered in SUPLIS and OPEN JUDIS 1 (4 percent) each.

5.2 General features

General features were explored (Table 3) and it was found that mail the search results option is given in Westlaw India, LexisNexis India, Manuptra and OLIS. Equal citations in law are given in LII of India, SUPLIS, LexisNexis India, SCC Online, Manupatra, e-Jurix, and OLIS. Users can identify overruled judgments in SCC Online, Chawla's law finder, and OLIS. Similarly, dissent judgment can be identified in Manuptra, Chawla's law finder and OLIS. Notes of cases are given in Westlaw India, Lexis-Nexis India, SCC Online, Manupatra, All India Reporter, Legal Pundits and OLIS. Results retrieved can be saved in following databases: Westlaw India, Lexis-Nexis India, Manupatra, e-Jurix and OLIS. However, no database except OLIS has linked the statistical sources of information, dictionaries, encyclopedias, Indian reference sources, educational sources of information, current information sources, patents and standards, biographical reference sources, indexing and abstracting sources, geographical sources of information, e-books link, theses and dissertations, discussion forums, case status etc. Table 3 clearly shows that OLIS contains the maximum features 21 (100 percent). Out of the reaming databases none has obtained more than 4(19.0 percent) points. Overall, five legal electronic resources i.e. Indian Kanoon, JUDIS, Open JUDIS, India Code and Indlawhave not obtained any of the general features listed in table 3. Four resources (LII of India, SUPLIS, AIR and legal pundits) have only 1 (5.0 percent) point. LexisNexis and Manupatra have 4 (19.0 percent) general features.

5.3 Search fields

Table 4 shows that only OLIS has basic, advance and additional search. Moreover, field specific search form is also listed in judicial and legislative search. No database has all the four search types. In addition, OLIS has search descriptors such as: Appellant (s), Respondent (s), case no, date of judgment, judge name, subject, sub-subject, range of date, case note, head-note, court-wise, bench strength, Acts/ Statutes, Section Wise, advocate wise, history of case no, state of applicant etc. Besides this, OLIS has 127 search fields. It has an exhaustive search system. However, no database contains such a wide range of search fields. The search features of these legal resources were compared and presented in the table 4 below. Table below illustrate that OLIS contains maximum 33 (97.1 percent) points, followed by Manupatra 22 (64.7 percent) points, SCC Online 18 (52.9 percent), Indlaw 17 (50.0 percent), e-Jurix 16 (47.1 percent) points. The lowest number of search features were found in LII of India 4 (11.8 percent) and India Code 1 (2.9 percent).

5.4 Citation search

A good citation search must have court name, year of publication, volume no and page no. It was found that only SSC Online, Manupatra, e-Jurix, Indlaw and OLIS have all these citation search parameters (Table 5). Table 5 depicts that Out of the sixteen legal information resources five have all the four citations search parameters. These resources are SCC online, Manupatra, e-Jurix, Indlaw and OLIS. Six e-resources have not included the citation search facility to retrieve the contents. Overall, 5 resources have citation search facility with year, volume and page number.

5.5 Web 2.0 tools integration

OLIS has integrated Facebook, Twitter, LinkedIn, Google+, and DISQUS. Users can discuss the contents using DISQUS panel embedded with metadata record**.** Besides this, several discussion forums are created and linked to OLIS which facilitate the users to share ideas among other members on discussion forums. A blog is also created and linked on OLIS home page. No other database has integrated these tools with contents (Table 6).

Table 6 below depicts that 81.3 percent of the legal e-resources do not integrated Web 2.0 tools. Out of the remaining, the proposed OLIS has maximum 6 (60 percent) points, followed by SCC online and legal pundits with 1 point each.

5.6 User interface

User interface comparison (Table 7) shows that commercial database has provision to select single and multiple records for print. Three commercial systems have provision to export the print list in text file. However, latest articles are listed only on the home page of OLIS. In OLIS all abbreviations are given in full. Some commercial systems along with OLIS have drop down and pull down search menus. OLIS is the only system which contains all such facilities in user interface. Therefore, it may be concluded that OLIS has the best user interface. Total 4 (25 percent) of the resources 4 or more points listed in Table 7. The Table 7 below highlighted that the highest point related to user interface found in OLIS i.e. 8 (100 percent), followed by SCC online 5 (62.5 percent)points, Manupatra and LexisNexis 4 (50.0 percent).Besides this, e-jurix, Indlaw, Chwala's law finder and legal pundits accumulated the 3 (37.5 percent) points each. Indian Kanoon, JUDIS and AIR have only one feature, while LII of India, SUPLIS, OPEN JUDIS, India Code do not integrated any of the feature.

5.7 Bibliographic display

Other databases compared with OLIS (Table 8) with respect to bibliographic display shows that OLIS is the only system which has provision of bibliographical display in alphabetical, ascending and descending order. It has included succinct display, long head-note along with hyperlinks of acts, bills, rules and related contents referred in note section. Total number of results also display at top of page. OLIS also displays results in cluster. OLIS is the only system which embeds all such features. The mean score was calculated and found that OLIS has maximum points 9 (90.0 percent), followed by SCC Online 8 (80 percent), Manupatra 6 (60 percent), Westlaw and LexisNexis 5 point each. Interestingly, only four resources have 50 percent of the bibliographic features listed in the table 8. The open source resources such as, Indian Kanoon, SUPLIS and Open JUDIS have lack of bibliographic display facility with 2 (20 percent) points each.

5.8 Text display

It was identified that OLIS is the only system which display all results on a single page. Total number of items displayed can be specified. Besides this, redundant /repeated text is avoided. Text in metadata record is hyperlinked in OLIS. Three commercial systems also have such provisions. However, only OLIS contains all the four features (Table 9). It is apparent in the Table 9 illustrated below that commercial resources has better text display features compared to open access resources. However, the proposed online legal information system (OLIS) contains the maximum 4 (100 percent) points, followed by Westlaw India, LexisNexis and SCC Online 3 point each. Overall 28(43.8 percent) points are accumulated by the 16 e-resources on text display. Three resources (Indian Kanoon, SUPLIS, OPEN JUDIS do not embedd any of the features related to text display.

5.9 Session filtering

Filtering facility in databases/ systems was compared (Table 10). It was found that Manupatra has seven filtering parameters. Lexis-Nexis has three filtering parameters. Westlaw and SCC Online haves three and two filtering parameters each. Chawla's law finder has two refining parameters. However, OLIS embeds the strongest filtering service with 23 fields. Table 10 shows that maximum features are available in OLIS i.e. 23 (100 percent) points, followed by Manupatra 8 (34.8 percent), Westlaw India 3 (13.0 percent) points. Interestingly, four open access legal resources do not have provision for session filtering. The six open access resources account for 2 points only compared to 22 points of commercial resources. Therefore, commercial resources have well received and integrated session filtering

5.10 Output service

SCC Online, Manupatra and Westlaw have good output services such as: sorting, sending the record through e-mail, adding results to user's account (Table 11). However, OLIS facilitates the users with the maximums output service compared to other systems. Table 11 compared the output service being provided by 16 resources. It is revealed that open access resources are inferior in providing output services compared to commercial resources. Overall, six open access resources collectively have 10 points compared to 60 points of commercial resources. In contrary to this, OLIS has obtained maximum 34 points, followed by Manupatra 13 (38.2 percent), LexisNexis and SCC Online 10 (29.4 percent) points each. Westlaw India has obtained 8 (23.5 percent) and e-Jurix 6 (17.4 percent) points. The least number of features are found in LII of India, SUPLIS, Open JUDIS, and Chwala's law finder which attained one features for output service.

5.11 Online help features

Table 12 shows that OLIS has the best help features in comparison to all the systems. It has four video tutorials to learn the knowhow in its use. It has online chat facility. Besides this, discussion forum and query submission facilitate maximum help. User can send e-mail and refer frequently ask questions (FAQ). No online legal information system provides such wide ranges of help services. It is clear from the Table 12 that open access legal information resources completely ignored to provide help services to users. None of the open access resources have online help features. Besides this, all the commercial resources have e-mail help facility.

5.12 Provision to contribute contents by users

Table 13 illustrate that OLIS is the only system which allows users to submit contents. OLIS users can submit articles, speeches, legal forms, audio-video contents and useful websites. No other system provides such a service to users.

5.13 Comparative feature-wise analysis of legal e-resources

The features available in all the legal e-resources were calculated and presented in the Table 14 as per comparison checklist obtained from Table 2 to 13. The features of each database were calculated and presented in Table 14. The data of each feature was analyzed and found that proposed model OLIS has the maximum feature 182 (96.3 percent), followed by Manupatra 75 (39.7 percent), SCC Online 65 (34.4 percent), LexisNexis India 52 (27.5 percent).

Table 14 reveals that lowest number of features found in India Code 9 (4.8 percent). The mean, minimum and maximum percentages of desirable features are analyzed in Table 15. Overall, the twelve categories in desired features are analyzed. It is reveled from the Table 15 below that output service witnessed the highest average score 59.1 percent, followed by citation search average score 54.7 percent, text display 43.8 percent, bibliographic display 41.3 percent. The lowest average score (5.0 percent) was calculated on Web 2. tools integration. All the legal e-resources accounted the 27.7 percent average score. The score accumulated by all these resources are found less than fifty percent. Therefore, ample scopes of improvement are available in all categories

5.14 Ranking of study online legal information sources in India

Table 16 presents the ranking of online legal information sources being used Indian Libraries based on scores calculated. It is reveled in the table below that ranking of the e-resources. The ranking of the resources are based on the parameters described in tables 2 to 13. Table 16 below revealed that proposed online legal information system (OLIS) has rated the number one among all sixteen resources with 182 (96.3 percent) features, followed by Manupatra 75 (39.7 percent), SCC online 65 (34.4 percent), LexisNexis 52 (27.5 percent). Interestingly, none of the open access resources ranked in the list of top ten other than proposed OLIS. Besides this, average percentages of features in open access resources are inferior compared to commercial resources. It is need of the hour to revamp the open access resources in India so that common mass could be benefited.

6. Conclusion

The study of comparison between sixteen resources clearly shows that electronic resources in the field of law in India need to improve. The open access resources are far inferior compared to commercial one. The latest Web 2.0 tools are not integrated in these resources. Besides this, mobile based view is not available in majority of resources. Majority of open access resources user interface are not user-friendly. Therefore, funding agencies of these resources must take an initiative to make these resources more user-friendly and robust. Besides this, databases of these resources do not adhere to standards such as, machine readable catalogue code (MARC), open

access initiate- protocol metadata harvesting (OAI-PMH) and Z39.50. These resources lack to provide suitable online help features to users.

On the other side, proposed online legal information system have integrated better help features and embedded the Web 2.0 tools. In addition, proposed system has provision to contribute the contents by user any time irrespective of location. It is expected that open and commercial resources shall be updated keeping in mind the features incorporated in proposed model i.e. OLIS. Overall, all these resources still need to be improve to provide effective access of information to legal fraternity and common mass in India.

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Table 2. Coverage of databases

	OPEN ACCESS LEGAL INFORMATION DATABASES							COMMERCIAL LEGAL INFORMATION DATABASES									
No	**Features**	**Indian Kanoon**	**JUDIS**	**LII of INDIA**	**SUPLIS**	**OPEN JUDIS**	**INDIA CODE**	**Westlaw India**	**Lexis Nexis India**	**SCC Online**	**Manupatra**	**e-Jurix**	**AIR**	**IL**	**Chawla's Law Finder**	**L.P**	**OLIS : A Model**
(A)	**COVERAGE**																
1.	Case laws																
	SC Case laws	✓	✓	✓	✓	✓	×	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	High Courts Case laws	✓	✓	✓	×	×	×	✓	✓	✓	✓	×	✓	×	×	×	✓
	Tribunals Judgments	×	✓	×	×	×	×	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Trial Court Judgments	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
2.	Acts																
	Central	✓	×	✓	×	×	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	State	×	×	×	×	×	×	×	×	×		×	×	×	×	×	✓
3	Parliamentary Bills	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓	✓
4	Regulations	×	×	✓	×	×	×	×	×	✓	✓	✓	×	✓	×	×	✓
5	Amendments	×	×	×	×	×	✓	✓	×	✓	×	×	×	×	×	✓	✓
6	Notifications	×	×	×	×	×	×	×	×	✓	✓	✓	×	✓	×	✓	✓
7	Circulars	×	×	×	×	×	×	×	×	×	✓	×	×	✓	×	✓	✓

Continued…..

No	Features	Indian Kanoon*	JUDIS	LII of INDIA	SUPLIS	OPEN JUDIS	INDIA CODE	Westlaw India	Lexis Nexis India	SCC Online	Manupatra	e-Jurix	AIR	IL	Chawla's Law Finder	L.P	OLIS : A Model
8	Parliamentary debates-Rajya	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
9	Parliamentary debates-Lok	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
10	Commentaries	×	×	×	×	×	×	×	✓	×	✓	×	×	×	×	×	✓
11	Speeches	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
12	Evidence	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
13	Video	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
13a	Audio	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
14	Research articles	×	×	×	×	×	×	×	×	✓	×	×	×	×	×	×	✓
15	Legal news	×	×	×	×	×	×	✓	×	×	×	×	×	✓	×	✓	✓
16	Forms	×	×	×	×	×	×	×	×	×	✓	×	×	×	×	✓	✓
17	Press Release	×	×	×	×	×	×	×	×	×	×	×	×	✓	×	✓	✓
18	Citations	×	×	×	×	×	×	×	×	✓	✓	×	✓	×	×	×	✓
19	Websites	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
20	Reviews	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
	Score (maximum 25)	3	3	4	1	1	2	6	5	9	10	5	5	8	3	10	24

Table 3. General features

	OPEN ACCESS LEGAL INFORMATION DATABASES							COMMERCIAL LEGAL INFORMATION DATABASES									
No	**Features**	**Indian Kanoon***	**JUDIS**	**LII of INDIA**	**SUPLIS**	**OPEN JUDIS**	**INDIA CODE**	**Westlaw India**	**LexisNexis India**	**SCC Online**	**Manupatra**	**e-Jurix**	**AIR**	**IL**	**Chawla's Law Finder**	**LP**	**OLIS: A Model**
1.	Mail the search results	×	×	×	×	×	×	✓	✓	×	✓	×	×	×	×	×	✓
2.	Equal Citation in law reports	×	×	✓	✓	×	×	×	✓	✓	✓	✓	×	×	×	×	✓
3.	Overruled Judgments	×	×	×	×	×	×	×	×	✓	×	×	×	×	✓	×	✓
4.	Dissent Judgments	×	×	×	×	×	×	×	×	×	✓	×	×	×	✓	×	✓
5.	Notes	×	×	×	×	×	×	✓	✓	✓	✓	×	✓	×	×	✓	✓
6.	Save the search results into account	×	×	×	×	×	×	✓	✓	×	✓	✓	×	×	×	×	✓
7.	Statistical Sources of Information Link	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
8.	Dictionaries Link of Database	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
9.	Encyclopedias Link	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
10.	Indian Reference Sources	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
11.	Educational Resources Link	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
12.	Current Information Sources Link	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
13.	Patents and Standards Link	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
14.	Biographical Reference Sources	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
15.	Indexing and Abstracting Sources Link	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
16.	Geographical Information Sources Link	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
17.	E-Books Link	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
18.	Theses and Dissertation Links	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
19.	Discussion Forums	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
20.	Case Status	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
21.	Recent Orders in Case	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
	Score (maximum) 21	0	0	1	1	0	0	3	4	3	4	2	1	0	2	1	21

Table 4. Search fields in legal information databases

No.	Particulars	Indian Kanoon*	JUDIS	LIIofINDIA	SUPLIS	OPEN JUDIS	INDIA CODE	Westlaw India	Lexis Nexis India	SCC Online	Manupatra	e-Jurix	AIR	IL	Chawal's Law Finder	LP	OLIS: A Model
1.	**Search Type**																
	i) Basic search	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ii) Advance search	✓	✓	✓	×	×	×	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	iii) Additional Search	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
2.	**Search descriptors on access points**: i) Appellant	×	✓	×	✓	✓	×	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ii) Respondents	×	✓	×	✓	✓	×	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	iii) Case No.	×	✓	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
3.	Date of Judgment	×	✓	×	✓	✓	×	✓	✓	×	✓	×	✓	✓	✓	×	✓
4.	Judge Name	✓	✓	×	✓	✓	×	×	✓	✓	✓	✓	×	✓	✓	✓	✓
5.	Subject	×	×	×	✓	×	×	✓	×	×	✓	×	×	×	×	×	✓
6.	Sub-subject	×	×	×	×	×	×	×	×	×	✓	×	×	×	×	×	✓
7.	Range of date	✓	×	×	✓	✓	×	✓	✓	✓	✓	✓	×	✓	✓	✓	✓
8.	Case Note/ Head Note	×	×	×	×	×	×	✓	✓	✓	✓	✓	×	×	×	×	✓
9.	Court Wise	×	✓	×	×	×	×	×	×	✓	✓	×	✓	✓	✓	×	✓
10.	Bench Strength	×	×	×	×	×	×	×	✓	×	×	×	×	×	✓	✓	✓
11.	Acts/ Statutes	×	×	×	✓	×	×	×	✓	✓	✓	✓	✓	×	✓	×	✓
12.	Section Wise	×	×	×	✓	×	×	×	✓	×	×	✓	✓	×	✓	×	✓
13.	Advocate Wise	×	×	×	×	×	×	×	✓	×	×	×	×	✓	×	×	✓
14.	Facility of Boolean operators	✓	✓	✓	×	✓	×	✓	✓	✓	✓	×	✓	✓	✓	×	✓

Table 5. Citation search in legal information databases

No.	Citation Search :law reports : Indian & International	Indian Kanoon	JUDIS	LIIofINDIA	SUPLIS	OPEN JUDIS	INDIA CODE	Westlaw India	Lexis Nexis India	SCC Online	Manupatra	e-Jurix	AIR	IL	Chawla's Law Finder	L.P	OLIS : A Model
1.	Year of publication	✓	×	×	✓	✓	×	×	×	✓	✓	✓	✓	✓	×	✓	✓
2.	Volume no.	✓	×	×	✓	✓	×	×	×	✓	✓	✓	✓	✓	×	✓	✓
3.	Page no.	✓	×	×	✓	✓	×	×	×	✓	✓	✓	✓	✓	×	✓	✓
4.	Court	×	×	×	×	×	×	×	×	✓	✓	✓	×	✓	×	×	✓
	Score (maximum) 4	3	0	0	3	3	0	0	0	4	4	4	3	4	0	3	4

Note: ✓means Yes and × means No

Table 6. Web 2.0 tools integration with contents

OPEN ACCESS LEGAL INFORMATION DATABASES								COMMERCIAL LEGAL INFORMATION DATABASES									
No.	**Features**	**Indian Kanoon***	**JUDIS**	**LIIofINDIA**	**SUPLIS**	**OPEN JUDIS**	**INDIA CODE**	**Westlaw India**	**LexisNexis India**	**SCC Online**	**Manupatra**	**e-Jurix**	**AIR**	**IL**	**Chawal's Law Finder**	**LP**	**OLIS: A Model**
1	Blog	×	×	×	×	×	×	×	×	✓	×	×	×	×	×	✓	✓
2.	Face Book	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
3	Twitter	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
4	LinkedIn	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
5	Google+	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
6	DISQUS (for comments)	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
7	Whats App	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
8	Second Life	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
9	Wiki	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
10	Podcasting	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
	Score (maximum) 10	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	6

Table 7. User interface in databases

No.	Particulars	Indian Kanoon*	JUDIS	LIIofINDIA	SUPLIS	OPEN JUDIS	INDIA CODE	Westlaw India	Lexis Nexis India	SCC Online	Manupatra	e-Jurix	AIR	IL	Chawla's Law Finder	LP	OLIS: A Model
1.	Navigation help on the screen of database are simple, clear and	×	×	×	×	×	×	✓	×	✓	×	×	×	×	×	×	✓
2.	Provision of select the record for print (single and multiple record)	×	×	×	×	×	×	×	✓	✓	✓	✓	×	×	×	×	✓
3.	Provision of export of print list in textfile	×	×	×	×	×	×	×	✓	✓	✓	×	×	×	×	×	✓
4.	Latest cases label on the home page	✓	×	×	×	×	×	×	×	×	✓	✓	×	✓	✓	✓	✓
5.	Latest articles label on homepage	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
6.	All field are labeled	×	×	×	×	×	×	✓	✓	✓	×	×	✓	✓	✓	✓	✓
7.	All label are in full words not in the form of abbreviations	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
8.	Provision of drop-down or pull down menu	×	✓	×	×	×	×	✓	✓	✓	✓	✓	×	✓	✓	✓	✓
9.	Total (maximum) 8	1	1	0	0	0	0	3	4	5	4	3	1	3	3	3	8

Note: ✓means Yes and × means No. *For abbreviations of the e-resources mentioned in table, pl. refer Table 2.

Table 8. Bibliographic display in databases

No.	Particulars	Indian Kanoon*	JUDIS	LIIof INDIA	SUPLIS	OPEN JUDIS	INDIA CODE	Westlaw India	Lexis Nexis India	SCC Online	Manupatra	e-Jurix	AIR	IL	Chawla's Law Finder	LP	OLIS: A Model
1.	Only bibliographic succinct display	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bibliographic long with head note	×	×	×	×	×	×	✓	×	✓	✓	×	×	×	×	✓	✓
2.	Provision of the order																
	Alphabetical	×	×	×	×	×	×	×	✓	✓	×	×	×	×	×	×	✓
	Date – ascending	×	×	×	×	×	✓	×	×	✓	×	×	×	×	×	×	✓
	Date – descending order	×	✓	✓	×	×	×	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3.	Total number of hits display	×	×	×	×	×	×	×	×	✓	×	✓	×	×	×	×	✓
4.	Use of upper and lower case in search	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
5.	Clustering results using Bibliography items	×	×	×	×	×	×	×	✓	×	✓	×	×	×	×	×	✓
6.	Section, Act, Bill, Rules are hyperlinked	×	×	×	×	×	×	✓	×	✓	✓	×	×	×	×	×	✓
7.	Support for MARC format	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
	Score (maximum) 10	2	3	4	2	2	3	5	5	8	6	4	3	3	3	4	9

Note: ✓means Yes and × means No. *For abbreviations of the e-resources mentioned in table, pl. refer Table 2.

Table 9. Text display in databases

No.	Features	Indian Kanoon*	JUDIS	LII of INDIA	SUPLIS	OPEN JUDIS	INDIA CODE	Westlaw India	Lexis Nexis India	SCC Online	Manupatra	e-Jurix	AIR	IL	Chawla's Law Finder	LP	OLIS: A Model
1.	Total number of items displayed is identified	×	✓	✓	×	×	✓	✓	✓	✓	✓	✓	✓	✓	×	✓	✓
2.	Provision to display all results in one page	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
3.	Hyper linking of text in the record	×	×	×	×	×	×	✓	✓	✓	×	×	×	×	×	×	✓
4.	Redundant/repeated text avoided	×	✓	×	×	×	×	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Score (maximum) 4	0	2	1	0	0	1	3	3	3	2	2	2	2	1	2	4

Table 10. Session filters in databases

Sr. No.	Sorting Particulars	Indian Kanoon*	JUDIS	LIIofINDIA	SUPLIS	OPEN JUDIS	INDIA CODE	Westlaw India	Lexis Nexis India	SCC Online	Manupatra	e-Jurix	AIR	IL	Chawla's Law Fin.	LP	OLIS: A Model
1.	Judge Name	×	×	×	×	×	×	×	×	×	✓	×	×	×	×	×	✓
2.	Date of judgment filter	×	×	×	×	×	×	✓	×	×	✓	×	✓	×	✓	×	✓
3.	Court wise filter	✓	×	×	×	×	×	×	✓	✓	×	✓	✓	×	✓	×	✓
4.	Acts/ statutes wise filter	×	×	×	×	×	×	✓	✓	✓	✓	✓	×	×	×	×	✓
5.	Advocate wise filter	×	✓	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
6.	Subject wise filter	×	×	×	×	×	×	✓	×	×	✓	×	×	×	×	×	✓
7.	Bench Strength	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
8.	Case Type	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
9.	Statutes	×	×	×	×	×	×	×	×	×	✓	×	×	×	×	×	✓
10	Article Subject	×	×	×	×	×	×	×	×	×	✓	×	×	×	×	×	✓
11	Acts – State	×	×	×	×	×	×	×	×	×	✓	×	×	×	×	×	✓
12.	Bill Category	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
13.	Bill Status	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
14.	Lok Sabha Debate Type	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
15.	Lok Sabha Session	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
16.	Circulars - State	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
17.	Treaties-Ministry	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓x
18.	Treaties State	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
19.	Trade Notice - State	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
20.	Press Release- State	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
21.	Notification-State	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
22.	Rules-Regulation State	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
23.	Year	×	×	×	×	×	×	×	×	×	✓	×	×	×	×	×	✓
	Score (maximum) 23	**1**	**1**	**0**	**0**	**0**	**0**	**3**	**2**	**2**	**8**	**2**	**2**	**0**	**2**	**2**	**23**

Table 11. Output services in databases

No.	Output Services	Indian Kanoon*	JUDIS	LIIof INDIA	SUPLIS	OPEN JUDIS	INDIA CODE	Westlaw India	Lexis Nexis India	SCC Online	Manupatra	e-Jurix	AIR	IL	Chawla's Law Finder	LP	OLIS : A Model
1.	Sorting by Party Name	×	×	✓	×	×	×	×	✓	✓	✓	×	×	✓	×	✓	✓
2.	Sorting Judge name	×	×	✓	×	×	×	×	×	✓	✓	×	×	×	×	×	✓
3.	Sorting by Advocate	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
4.	Sorting by Date of Judgment	✓	✓	✓	×	×	×	✓	✓	×	✓	×	×	×	×	×	✓
5.	Sorting by Act/ statute wise	×	×	×	×	×	×	×	×	✓	✓	×	×	×	×	×	✓
6.	Sorting by Case Type	×	✓	×	×	×	×	×	✓	✓	✓	✓	×	×	×	×	✓
7.	Sorting by Case No	×	✓	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
8.	Sorting by Witness Name	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
9.	Sorting by Title, Author, subject, Abstract of Articles	×	×	×	×	×	×	×	×	✓	×	×	×	×	×	×	✓
10.	Sorting of forms by Form no, agency, Subject	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
11.	Sorting of Speech title, speaker, event place, statute, Subject	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
12.	Sorting of Acts by Act title, No, Law, Industry, State	×	×	×	×	×	×	×	×	✓	×	×	×	×	×	×	✓
13.	Sorting of Circulars by title, No, file no, Subject, Ministry & State	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
14.	Treaties sorting by title, country, subject, ministry, state	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
15.	Trade Notices sorting by Title, Notice No, File no, subject, Ministry	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓

16.	Sorting by Press release title, subject, laws & state	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
17.	Sorting of Notification title, No, statutes, Ministry, state	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
18.	Sorting of Rules by title, number, Subject, Industry, state	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
19.	Sorting A to Z	×	×	×	×	×	×	×	×	✓	✓	×	×	×	×	×	✓
20.	Sorting Z to A	×	×	×	×	×	×	×	×	✓	✓	×	×	×	×	×	✓
21	Sorting Latest to Oldest	×	×	×	×	×	×	×	✓	✓	✓	×	×	×	×	×	✓
22.	Sorting Oldest to Latest	×	×	×	×	×	×	×	✓	✓	✓	×	×	×	×	×	✓
23.	User can Select One record out of search results	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×	✓	✓
24.	Multiple record selection out of Search results	×	×	×	×	×	×	✓	✓	×	✓	✓	×	✓	×	✓	✓
25.	Selection of a range of record for display	×	×	×	×	×	×	✓	✓	×	×	×	×	✓	×	×	✓
26.	Provision of selection which record to download or print	×	×	×	×	×	×	✓	✓	✓	✓	×	×	×	×	×	✓
27.	Provision of adding search result to print list	×	×	×	×	×	×	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
28.	Provision of sending search result to e-mail ID	×	×	×	×	×	×	✓	✓	✓	✓	✓	×	×	×	×	✓
29.	Result can be added to user's account	×	×	×	×	×	×	✓	✓	×	✓	×	×	×	×	×	✓
30.	The user's detail	×	×	×	×	×	×	×	×	✓	✓	✓	✓	×	×	×	✓
31.	User's Log-in and Log-out facility	×	✓	×	×	×	×	✓	✓	✓	✓	✓	×	✓	×	✓	✓
32.	Online mailbox for user comments or suggestions	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
33.	Links to external sources such as (i) websites of Supreme Court & High Courts	×	✓	×	×	×	✓	×	×	×	×	×	×	×	×	×	✓
34.	Hyperlinks to source such as dictionary etc	×	×	×	×	×	×	×	×	×	✓	×	×	×	×	×	✓
	Score (maximum) 34	2	3	1	1	1	2	8	10	10	13	6	3	5	1	4	34

Note: ✓means Yes and × means No. *For abbreviations of the e-resources mentioned in table, pl. refer Table 2.

Table 12. Help features in databases

No.	Particulars	Indian Kanoon*	JUDIS	LIIofINDIA	SUPLIS	OPEN JUDIS	INDIA CODE	Westlaw India	Lexis Nexis India	SCC Online	Manupatra	e-Jurix	AIR	IL	Chawla's Law Finder	LP	OLIS: A Model
1.	Online video tutorials	×	×	×	×	×	×	×	×	×	✓	×	×	×	×	×	✓
2.	Help messages	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
3.	Display system messages	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
4.	Instructional information free of jargon	×	×	×	×	×	×	×	✓	✓	✓	×	×	×	×	×	✓
5.	Abbreviation avoided in textual information	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
6.	System direction to user about additional help	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
7.	Query Submission	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓	✓
8.	Frequent ask Questions	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
9.	Online chat	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
10.	E-mail help	×	×	×	×	×	×	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
11.	Discussion forum	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
	Score (maximum) 11	0	0	0	0	0	0	1	2	2	2	1	1	1	1	2	11

Note: ✓means Yes and × means No. *For abbreviations of the e-resources mentioned in table, pl. refer Table 2.

Table 13. Provision to contribute the contents by users

No.	Contents	Indian Kanoon*	JUDIS	LIIofINDIA	SUPLIS	OPEN JUDIS	INDIA CODE	Westlaw India	Lexis Nexis India	SCC Online	Manupatra	e-Jurix	AIR	IL	Chawl's Law Finder	LP	OLIS: A Model
1.	Articles	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
2.	Speech	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
3.	Forms	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
4.	Audio & Video	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
5.	Websites	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
	Score (maximum) 5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5

Table 14. Comparative feature-wise analysis of online legal information sources

Table No.	Library OPAC Category	Indian Kanoon*	JUDIS	LII of INDIA	SUPLIS	OPEN JUDIS	INDIA CODE	Westlaw India	Lexis Nexis India	SCC Online	Manupatra	e-Jurix	AIR	IL	Chawla's Law Finder	LP	OLIS: A Model
02	Coverage	3	3	4	1	1	2	6	5	9	10	5	5	8	3	10	24
03	General Features	0	0	1	1	0	0	3	4	3	4	2	1	0	2	1	21
04	Search Fields	7	9	4	12	8	1	15	17	18	22	16	11	17	13	10	33
05	Citation Search	3	0	0	3	3	0	0	0	4	4	4	3	4	0	3	4
06	Web 2.0 tools integration	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	6
07	User Interface	1	1	0	0	0	0	3	4	5	4	3	1	3	3	3	8
08	Bibliographic Display	2	3	4	2	2	3	5	5	8	6	4	3	3	3	4	9
09	Text Display	0	2	1	0	0	1	3	3	3	2	2	2	2	1	2	4
10	Session Filtering	1	1	0	0	0	0	3	2	2	8	2	2	0	2	2	23
11	Output Services	2	3	1	1	1	2	8	10	10	13	6	3	5	1	4	34
12	Online Help Features	0	0	0	0	0	0	1	2	2	2	1	1	1	1	2	11
13	Provision to Contribute Contents by Users	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
	Score (maximum 189)	19	22	15	20	15	9	47	52	65	75	45	32	43	29	42	182
	Percentage	10.1	11.6	7.9	10.6	7.9	4.8	24.9	27.5	34.4	39.7	23.8	16.9	22.8	15.3	22.2	96.3

Note: *For abbreviations of the e-resources mentioned in table, pl. refer Table 2.

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Table 15. Feature-wise analysis of onlie legal information sources

Table No.	Online information source	Total Score	Percentage
02	Coverage	99/400	24.8%
03	General Features	43/336	12.8%
04	Search Fields	213/554	38.4%
05	Citation Search	35/64	54.7%
06	Web 2.0 tools integration	8/160	5.0%
07	User Interface	39/128	30.5%
08	Bibliographic Display	66/160	41.3%
09	Text Display	28/64	43.8%
10	Session Filtering	48/368	13.0%
11	Output Services	104/176	59.1%
12	Online Help Features	24/80	30.0%
13	Provision to Contribute Contents by Users	5/80	6.3%
	Score:(maximum 2570)	712/2570	27.7%

Table 16. Ranking of online legal information sources in Indida

Online legal information source	Total Score	% of Features	Rank
OLIS-Proposed Model	182/189	96.3%	1
Manupatra	75/189	39.7%	2
SCC Online	65/189	34.4%	3
LexisNexis India	52/189	27.5 %	4
Westlaw India	47/189	24.9%	5
e-Jurix	45/189	23.8%	6
IL	43/189	22.8%	7
L.P	42/189	22.2%	8
AIR	32/189	16.9%	9
Chawla's Law Finder	29/189	15.3%	10
JUDIS	22/189	11.6%	11
SUPLIS	20/189	10.6%	12
I Kanoon	19/189	10.1%	13
OPEN JUDIS	15/189	7.9%	14
LIIof INDIA	15/189	7.9%	14
India Code	9/189	4.8%	15

Note: *Forabbreviations of the e-resources mentioned in table, pl. refer Table 2.

Application of Information and Communication Technology in Judicial Library System

Awadhesh Kumar Patel Bhupendra Kumar Singh

Abstract

Describes the Indian judiciary is in urgent need of reengineering its process, optimize the use of its human resources, and bring about change management by harnessing the potentiality of the available Information and Communication Technology (ICT) to its fullest extent. The objective of this exercise is to enhance judicial productivity both qualitatively and quantitatively as also make the justice delivery system affordable, accessible, cost effective, transparent and accountable. Information and Communication Technology can help us change this impression and Courts can became more efficient, fast, responsible and user friendly.

Keywords : ICT, Information System, Judicial Information System, Librarianship

1. Introduction

Law librarianship, especially the librarianship in Judicial Institution, is different from librarianship in any other organisation. What makes it different is the degree of urgency. This aspect is more fully explained by Prof. Iger I. Kavass that "the reason for law libraries being different from other types of libraries is that they serve a profession which is literally unable to exercise its work without the use of books."[1]

While Librarians in other organisation may convince their users to give them some time for catering to their information requirements, a Court Librarian has to furnish the desired information at once because the case is being argued in the Court and desired information is needed in the course of the argument. So a law Librarian has to provide the information instantly without any excuse. It is because of this reason; a law librarian has to be a very alert professional and must develop his/her own tools and expertise to provide the desired information instantly.

2. Types of Law Libraries

Law Librarianship is a challenging profession and information requirements of the user in this field vary much. "The Law Library is truly a vital factor in the administration of justice, an institution of extra-ordinary social significance in a free society." Users of law libraries may be law students, teachers, practitioners, judges, civil servants, local government officials, legislators, jurist, research scholars and public. Hence, their information requirements also vary with the purpose of using the library and a law librarian has to develop his library collection in accordance with the needs of their sers. On the basis of different type of users, law libraries could be categorized as under:

S.No	Type of Library	Clientele/Patrons
1	Academic Law Libraries	Law students, Research Scholars and teachers
2.	Judicial Libraries attached to Courts	Judges, Jurist
3.	Government departments Law Libraries	Civil servants and Government Officials
4.	Legislative Libraries	Legislators
5.	Bar Association Libraries	Legal Practitioners
6.	Practitioner's Libraries	Practitioners

3. Use of Legal Literature

The theory of binding force of precedent is firmly established in England. A Judge is bound to follow the decisions of any Court recognized as competent to bind him, and it becomes his duty to administer the law as declared by such a Court. The system of precedent has taken a powerful factor in the development of common law in England. As the Indian legal system had its roots in the British system, a similar theory has come to prevail in India and the binding force of precedents is firmly established. The theory of precedents brings in its wake the system of law reporting as its necessary concomitant. Publication of decisions is a condition precedent for the theory to operate. It is because of this reason; legal practitioners have to depend on the "Law Reports" for identifying the decisions having similar issues with the case in hand. A law library, therefore, has to acquire all reliable and authentic reports of Courts containing precise records of what they lay down and it is only then the doctrine of Stare decisis can function meaningfully.

A law library contains highly specialized materials, and this requires special skills to handle. Basically legal material consists of statutory law and reports of decided cases. Both these types of legal materials relate to the "authority" and "precedent" respectively. Legal fraternity may need different types of information such as case laws, Statutory Provisions, rules framed under any Act, object and reasons of any Act, Amendment of any Act, Notifications issued under any particular statute, debates in Parliament at the time of enactment of any particular Act or academic Articles on a given topic in different situations.

Types of Legal Literatures

- Bare Acts
- Commentaries on specific Laws
- Manuals/ Local Acts
- Reports
- Law Commission Report
- Committee/ Commission Reports
- Annual Reports

- Parliamentary Committee Reports
- Joint Committee
- Select Committee
- Standing Committee
- Gazettes
- Central Government
- State Government
- Parliamentary Debates
- Constituent Assembly Debates
- Lok Sabha Debates
- Rajya Sabha Debates
- Parliamentary Bills
- Lok Sabha Bills
- Rajya Sabha Bills
- State Legislative Bills
- Law Journals
- Academic Journals (Containing only Articles)
- Law Reports (Containing Full text of case laws only)
- Hybrid Journals i.e. combination of both containing Articles and case Laws. Some of the Journals also publish Statutory material such as Acts, Amendments Rules etc.
- Journals containing only Legislative materials such as Acts, Rules, Notifications etc.
- Digests
- Legal Dictionaries/ Law Lexicons
- Legal Encyclopaedic Works
- American Jurisprudence
- Corpus Juris Secundum
- Halsbury Law of England
- Halsbury Law of India

Different type of legal literature is to be consulted for different type of information needs. In order to develop an appropriate and proportionate collection; a Law Librarian has to acquire each type of legal literature in his library. Besides, acquiring legal literature of different types, a law librarian has to develop many indigenous tools to cope up with the information requirements of the users, for example:-

- Alphabetical Index to all Acts including details of amendments
- Topical alphabetical index to important landmark cases
- Topical bibliographies on important legal aspects

- Union catalogue of current periodicals
- In house Databases of case laws
- In house Databases of articles published in journals subscribed in the library
- Indexing of Government Gazettes

4. Library and Information System of High Court Judges Library

The High Court Judges Library was established in 1866 then known as N.W.P. High Court Library. In 1869 High Court shifted from Agra to Allahabad. Library contains significant legal literature to support the need of Hon'ble Courts and Judges. It has a collection of about more than 2,50,000 legal documents, which includes books, monographs, commission reports, government publications, Centre and State legislations and other legislative materials. It subscribes to about 60 Indian and foreign legal journals, both academic and reporting, magazines, newspapers and CD-ROM databases. The Library has staff strength of 25 including 4 professional librarians.

The High Court Judges Library is a grid of libraries. In addition to Library, it also maintains workable collection in Court libraries and residential libraries of Hon'ble Judges. The High Court Judges Library is essentially a reference of Court. It has to keep close watch over the multifarious literature requirements of Hon'ble Judges and Court functionaries. It functions as throbbing heart of the Court.

High Court Judges Library subscribes to many computerized legal databases, namely, SCC-ONLINE, MANUPATRA, and All India Reporter.

High Court Judges Library has also developed many indigenous Legal databases of Case Laws, Articles, Books, Legislative Materials, and Law Commission Reports, respectively to provide pinpointed, exhaustive and expeditious information services. Foreign Case Laws and other legal information is readily provided through use of "Internet".

High Court Judges Library has also developed many useful reference tools for internal use such as "Indexes to Central and State Acts" list of periodicals subscribed in the Library for providing efficient services to the Hon'ble Courts and Judges.

For the current awareness purposes, Library provides "Press Clippings" from leading National Dailies. Selective Dissemination of Information on legal subjects is a regular Service for Hon'ble Judges. The High Court Judges Library has developed some very important indigenous databases.

4.1 Database of Case laws

This case indexing database contains reported cases decided by the High Court from 1975 onwards. Case laws can be retrieved by date of judgment, Party Name, Citation, Judge Name, Petition Number, Famous Case Name and Subject. Retrieval of any case law through provision to find out all equivalent citations of a Case Law is unique feature of this database.

4.2 Database of Legal Articles

This database contains more than 10,000 articles from Indian and Foreign Journals subscribed in the library of the High Court Articles on a given topic or subject could be retrieved instantly with the help of this database.

4.3. Legislation Information System

This database contains bibliographic details of State Acts/ Amending Acts and other statutory materials such as Rules, Bills etc. This database is very useful for tracing the complete legislative history of any particular State Act. Sources/Citations of any Act/Amendments or Rules framed under any particular enactment could be readily identified and retrieved.

5. Judgment Information System

It consists of the judgment of the Allahabad High Court. In the case of the Allahabad High Court it provides free text base retrieval system of the decided cases from 2004 onwards. It provides retrieval through various fields such a Title, Judge, Time, Act & free text. It is a comprehensive online case law database, which can be access through the website of the Allahabad High Court i.e. www.allahabadhighcourt.in

6. Computer Infrastructure of Court Libraries in India

Computerization of library operations and development of indigenous databases may be very useful to law librarians to record, store, process and retrieve the huge amount of legal information scattered in variety of sources. But application of information technology in law libraries for house keeping activities is still not up to the mark.

Though most of the court libraries are having needed computer infrastructure for automation of library operations and some of them are also having library automation software but use of computer for house keeping activities is initial stage. Lack of provision for in-service training in computerization activities resulting in inadequate professional skill to use the computers for house keeping activities may be one of the reasons for this.

7. Development of Information and Communication Technology

Developments in the field of Information and Communication Technology and its application for information storage, processing and retrieval have also resulted in development of many useful information technology products. Many CD-ROM legal databases are on-line legal portals have been developed and are being used by the law libraries in the country. Some of the most used legal databases by court libraries in India are:

- SCC Online
- AIR Online
- Manupatra

8. Library and Information Services in Court Libraries

Library and Information Services in Court Libraries that lending, literature search, newspaper clippings, information retrieval by intranet, current awareness search in one form or the other and case law retrieval by CD-ROM databases are provided by most of the Court libraries in India. It is gratifying to note that most of the Court libraries using computers for providing information to their users through various IT products such as CD-ROM databases, e-journals, e-books etc. and are also using internet as an effective tool for providing the desired information to the users.

9. Computerisation in Indian Judiciary System

As early in the year 1998, the Law Commission of India felt the necessity of computerization in Library & Information Centres in the Courts due to the explosion of legal literature and recommended that "Computerisation of Library is a high priority necessity. The Court's time is wasted in collecting judgments bearing on the same subject. A push button system should be available to make handy all judgments on the subjects".

Chief Justice's conference held in 1991 took a decision to request National Informatics Centre (NIC) to take up the project of computerisation of Supreme Court and High Courts & inter connect them through NIC-NET. Since then National Informatics Centre (NIC) A nation wide satellite based computer communication Network, is looking after the computerization of various activities in the Supreme Court and The High Courts. The two information systems namely COURTNIC & JUDIS had been conceptualised by the NIC. COURTNIC is now renamed as "Case Status".

JUDIS (Judgment Information System) consists of the judgment of the Supreme Court of India and several High Courts. In the case of the Supreme Court of India it provides free text base retrieval system of the decided cases from 1950 onwards. It provides retrieval through various fields such a Title, Judge, Time, Act & free text. It is a comprehensive online case law database, which can be access through the website of the Supreme Court of India i.e www.supremecourtofindia.nic.in or the other website namely Indian Courts i.e www.indiancourts.nic.in

Another important legal website developed by the NIC is "Indian Courts" (www.indiancourts.nic.in). The 'Indiancourts' is a bouquet of Web Sites of the Supreme Court and all 21 High Courts and their Benches in India. It provides a single point access to information related to the Supreme Court and any High Court in India. The Web Sites of the Supreme Court and High Courts provide litigant centric dynamic information like judgments, Cause lists, Case status, etc. as well as static information such as History, Jurisdiction, Rules, past and present Judges, etc.

Cause lists are scheduling of cases to be heard by the Courts on the following day. The cause lists of Supreme Court and almost all High Courts are available on this site. As the Supreme Court of India and all the 21 High Courts and their 10 Benches are fully computerized, all these Courts

generate Daily and Weekly cause lists from the computer servers. As soon as they generate the cause lists immediately they are made available on this website.

Daily orders of the Supreme Court of India and many High Courts can be accessed through this site. These orders are available as soon as the orders are signed by the Court.

Case status site provides the latest status of a case either pending or disposed by the Supreme Court or any other High Court in the Country. The required information is derived from the databases of the concerned Courts.

India Code Information System contains all Central Acts of Parliament right from 1834 onwards. Each Act includes: Short Title, Enactment Date, Sections, Schedule and also Footnotes. Besides this, Statement of Objects and Reasons (SOR), Table of contents and Status of an Act is also available in India Code.

Efforts are being made to make JUDIS more user friendly by incorporating new retrieval options so as to bring it at par with other commercial legal databases. It is being ensured that all the reportable Judgments of the Supreme Court along with the "Head Notes", as had been published in the official Report of the Supreme Court namely "Supreme Court Reports" since 1950, should be made available in JUDIS.

9.1 Level of Judicial System

Judicial Library System consists of:

- Libraries established by the court to serve the judges & officer of the court – funded by the state exchequer
- Bar Associations' Libraries for the practitioners in the court – managed by the fund available with the respective Bar Association

10. Status of Law Librarianship in India

Law librarianship in India is still a virgin field and much needs to be done for development of law libraries in a co-coordinated manner in the country. Though there are approximately 600 law schools, 430 sub-ordinate courts, 21 high courts, along with their 14 benches, a supreme court, national/ state judicial academies and many legal research institutions and except sub-ordinate courts, many of them are having good libraries but there is no co-ordination among them.

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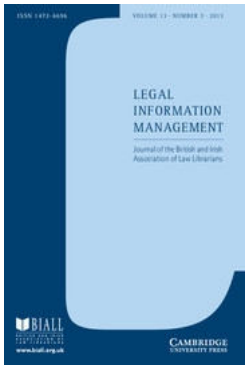

The Indian Judicial System: Transition from Print to Digital

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INTERNATIONAL PERSPECTIVES

The Indian Judicial System: Transition from Print to Digital

Abstract: In this, the third of a trilogy of articles for LIM written by Raj Kumar Bhardwaj, the author addresses the move from print to digital legal information within the Indian judicial system. He describes briefly the historical development of the legal system and the enormous backlog of cases that are pending throughout the court structure, before turning attention to the role of ICT in the legal system and the moves under way to create a more efficient electronic administration for the judiciary in India.
Keywords: court administration; legal systems; information technology; India

INTRODUCTION

The court system in India is divided into three stages: (i) Trial and Session Courts (ii) the 21 High Courts at State level and (iii) the Supreme Court. Supreme Court Judgments are binding on the High Courts of various states and the lower judiciary. Overall, the court system in India, whilst maintaining an independent judiciary, has tended to be inefficient and has also suffered from corruption. A very serious backlog of pending cases in the courts has led, at various points, to calls for reform and has invited the greater incorporation of information and communication technology (ICT) to assist with making the necessary improvements throughout the judiciary and across the legal system in India.

BRIEF HISTORY OF THE INDIAN JUDICIAL SYSTEM

The history of law in India has layers of complexity and many influences. Courts did not exist in the early societies of India and the mode of justice was in the form of revenge, which was a private matter. During the Vedic and pre-Mauryan periods (more than 2,000 years ago), kings presided over the law courts and decided cases by relying on law codes or smritis (codes of Hindu customary law). The laws of Manu and the writings of Indian jurists refer to the existence of peoples' courts at the village level. At that time codes of conduct for Judges, and procedures for dispensing justice, existed in order to allow of the legal system to function. Justice was dispensed on the basis of norms laid down in the scriptures in the Vedas, Dharma sutras, Vedangas, Purans as well as the customs and usage of communities. (Khanna, 2008). The Mughal period brought with it the domination of Islamic jurisprudence which was laid down by the Quran and the Muslim law of Shariat. There were mainly three kinds of court in that period: (i) Court of religious law (ii) Court of secular cases (iii) Court for political cases (Khanna, 2008).

During the British period, the power to dispense justice rested with East India Company and later the English common law system was introduced. Under the earlier period, the East India Company had sole responsibility for the judicial system. The company was granted a charter by King George I in 1726 to establish 'Mayor's Courts' in three metropolitan cities – Madras, Bombay and Calcutta–and the functions of the company increased considerably after the victory in the Battle of Plassey in 1757. After that, the courts expanded to other parts of the country. After 1857, the power of the company's territories in India passed to the British Crown. Subsequently the Supreme Courts were established and these courts were transformed to the first High Courts by the Indian High Courts Act passed by the British Parliament in 1862. In the same year the Law Commission, under the chairmanship of Thomas Babington Macaulay, prepared the Indian Penal Code (the main criminal code of India) which was subsequently enacted into force.

Today, in independent India, the Constitution of India is the guiding light in all matters including with the legislature and concerning the judicial system in the country. In India, the union and the states have their own executive and legislative branches. The union territories are governed by the National Government. The law generated by the Union is binding to all the States. India has a bicameral Parliamentary system, whose upper house is the Council of States (Rajya Sabha) and lower house is the House of People (Lok Sabha). (Thanuskodi, 2010). The judiciary remains independent within the country.

The E-Committee, which is mentioned later in this article, and was constituted by Supreme Court of India,

has indicated that at present 2,066 towns have District Courts but in all probability, in some of the towns, the court complexes may be more than one. The number of court complexes is 2,500.[1] India has One Supreme Court and twenty one High Courts. The Union Government has approved an increase in the number of judges over the next five years to reach 37,000 judges to deliver more speedy disposal of pending cases in the lower and higher judiciary[2]. The present strength in terms of numbers of judges is: 25 in the Supreme Court, 626 High Court Judges, 14,275 Judges in the Lower Judiciary[3].

BACKLOG OF CASES

Having briefly explained, for the purposes of context, the historical development of the legal system in India, it is now useful to understand some of the difficulties of such a large and complex court system. In 2011 it was reported by the Law Minister, Salmon Khurshid, that there were 57,179 cases pending in the Supreme Court. The Government had approved the establishment of the National Mission for Justice Delivery and Legal Reforms. "The major goals of this body would be to increase access by reducing delays and arrears in the system, enhance accountability through structural changes and by setting performance standards and capacities."[4] Overall, there are some 30 million cases that are pending in 21 high courts and lower judiciary[5]. This figure is in addition to the number of pending cases in the Supreme Court of India.[6] Described below are some of the recent improvements that have been made using ICT to begin to improve court efficiency in India.

DEVELOPMENTS IN THE ROLE OF ICT IN INDIA

Malik (2002) stated that the objectives of the ICT models were to offer integrated support to judicial and administrative functions, to form an interconnection of internal and external judicial institutions and develop a medium to monitor and control legal services. In a more recent study, L. Philemon found that there was a considerable disconnect between information and communication technology and the nature of legal services and this was caused by a lack of knowledge about the application of information technology where legal systems were concerned. This was a common scenario, not just in India but in many parts of the legal world. (Philemon, 2007).

In 2009 Mr. C. P. Gurnani, CEO of Tech Mahindra, stated that with information and communication technology, India's case backlog could be reduced to three years. Since then, a new e-justice system has been established and includes the use of video hearings (reducing transportation costs), case filing operation systems, RFID (Radio-frequency identification)-based file tracking and a searchable e-library.

National Action Plan for the Implementation of ICT in the Indian Judiciary

Back in the mid-2000s a proposal was submitted to the Minister of Law and Justice in the Union Government for the creation of an E-Committee to formulate a national policy on computerisation of the Indian Judiciary and to advise the judiciary on technological, communication and management-related changes. The Union Cabinet approved the constitution of an E-Committee under the Chairmanship of Dr. Justice G.C. Bharuka, a retired Judge of the High Court of Karnataka, with three other specialist members. As a result a national policy was prepared, and published, by the E-Committee of the Supreme Court of India in 2005.

The objective of ICT implementation was to enhance judicial productivity both qualitatively and quantitatively as well as make the justice delivery system affordable, accessible, cost effective, transparent and accountable. The project has been divided into three phases

(i) Initiation of the ICT Implementation in the Judicial System;
(ii) Coordination of ICT infrastructure for the Judicial System;
(iii) ICT coverage of the judicial process from filing to execution and all administrative activities.

The E-Committee is the apex body in ICT implementation. A Group of National Advisors were formed which comprise of members from the National Informatics Centre (NIC), Indian Institute of Technology (IIT), Indian Institute of Science (IISc), the Judicial sector as well as the ICT sector.[7]

Developing the ICT infrastructure has primarily involved the following:

- A Network Planning and Feasibility Study;
- Site Preparation;
- A Communication infrastructure;
- ICT Hardware and System Software;
- An infrastructure for E-Committee.

In the process of building the ICT infrastructure in India in recent years at a practical level some 12,840 laptops were supplied to over 9,000 judges with internet connectivity.

E-JUDICIARY IN INDIA

Dr. APJ Abdul Kalam Azad (2007), the former President of India, initiated the e-Judiciary system as a national policy and an action plan for the embedding, and implementation, of ICT within the entirety of India's judiciary. Tere (2008) described an e-judiciary as an electronic representation of the usual (more traditional) judicial system. Such a system supports all operations of the judiciary by utilising technology, such as the recording and storing of legal judicial data. He further defined the

e-judiciary as a digitisation of judicial information in a safe environment in order that legal proceedings could be exchanged between different investigating authorities. It also meant that legal information could be made accessible online to the public.

Dr. Kalam (2010), at the special convocation function of the National University of Advanced Legal Studies (NUALS), emphasised that the Supreme Court should transform the present system into an e-judiciary and proposed action for connecting all the 15,000 courts in the country, from the district courts to the apex courts, through a wide area network. The scope of the project was to develop and implement the relevant ICT technology in 700 courts of Delhi, Mumbai, Chennai and Kolkata and 900 Courts in the 29 capital city courts of the states and union territories (UTs) as well as in 13,000 district, and subordinate, courts (Pandurangan, 2009). These projects have the following objectives:

a) To assist the judicial administration of the courts in streamlining their daily activities;
b) To make available the transparency of information to the litigants;
c) To provide a legal and judicial database to judges;
d) To reduce the pendency cases in the courts.

ELECTRONIC JUDICIARY PROJECTS

A number of projects have been created as part of the e-Judiciary and these are:

(i) **e-Courts Mission Mode Project**.
This project is one of the national eGovernance projects that has been implemented in the High Courts and district/subordinate courts. It was based on the National Policy and Action Plan for Implementation of Information and Communication Technology in the Indian Judiciary submitted in 2005- by the E-Committee of the Supreme Court of India. The scope included the computerisation of 14,249 district and subordinate courts in 3069 court complexes and an ICT upgrade of the Supreme Court (SC) and the High Courts. The estimated expenditure under this project is Rs. 935 Crore and the project is supposed to be completed by 2014. (www.nic.in)

(ii) **eCCMS Web 1.0** (Web Based Court Cases Monitoring System):
The Web-based Court Cases Monitoring System (eCCMS Web) – http://ccmspb.gov.in - facilitates the monitoring of court cases of any type pending in different courts. It can provide the latest information about any pending case. It assists officers to track cases, prepare cause-lists in advance, maintain a complete history of cases including follow-up action taken.

(iii) **e-Litigation**
This project was started to help the Law & Judicial Department in India to monitor the court cases that were being handled by the various government department in Delhi. It offers a facility for the online process of engagement of counsels for court cases. The SMS facility to Government Counsels has been incorporated into the system.

(iv) **District Court Information System (DCIS)**
The DCIS project has been implemented in 30 District and Sessions Courts, and some other courts, for capturing case-related information from the filing of the case to its consignment. Numerous kinds of reports can be generated such as a case status, cause list, interim orders and judgments. Some of the other systems implemented under the project includes Leave Management Software, the Lower Courts Statistical System (for calculating the quarterly disposal of each court), the Credit Information System (for evaluating the work performance of judicial officers), Salary Accounts and Recruitment System.

(v) **Integrated Software for Judicial Functions of High Courts**:
This project provides a complete workflow solution for High Court, including filing, refilling, and scrutiny, detailed entry of the case, case grouping, cause list allocation, generation, and case status. besides this, case status, cause list & judgments on the website http://highcourtchd.gov.in can be accessed. Litigants and lawyers can also access the status of their cases through 6 touch screens installed in the High Court building.(www.nic.in)

(vi) **Model e-Courts**
A Model e-Courts pilot project was launched at the District and Session Courts in Gujarat in 2009 in order to make the judicial process more transparent and the delivery of justice faster. The e-Courts project will be providing authentic audio-video recording of proceedings with video conferencing facilities for linking the central jail, courtroom, Police Commissioner's office and the Forensic Science Laboratory respectively (Dasgapta, 2009).

(vii) **e-Filing system**
The High Court of Punjab and Haryana, in Chandigarh is the first high court to start the e-Filing system. Previously, the Supreme Court of India had also started e-filing through which lawyers can file litigation after submitting the petition in soft copy in compact disc.

(viii) **e-Cause List**
Cause lists are the scheduling of cases to be heard by the Courts on the following day. The National Information Centre Division in the courts maintains the Cause lists of the Supreme Court and 21 High Courts, and 10 Benches. With the help of e-Cause lists advocates are able to download their cause list as soon as lists the are generated every evening. E-cause lists have had a significant impact by (a). helping to prepare the case, (b) advocates can

generate a customised cause list with their own case list, (c) the general public can check the listing of a case. (d) it saves money, time and effort of advocates and parties. The website of cause lists is: www.causelists.nic.in (also Pandurangan, 2009).

(ix) **Case status**
This service allows both the advocates and the people to know the status of a case whether pending or disposed of. It provides daily orders and gives the latest information which includes party names, subject category, disposed of details, advocate, the waiting position, the date of the next hearing and the last date of listing. (Pandurangan, 2009).

OTHER SPECIFIC INITIATIVES

Digitisation of Allahabad High Court

The Allahabad High Court has initiated the digitisation of court files in collaboration with the IIIT-A (Indian Institute of Information Technology – Allahabad), a project to be completed in 2 years. The project also involves training High Court staff and providing consultancy. The court decided to start the digitisation process with IIIT-A because of their expertise in the area and their involvement in developing a universal digital library (UDL). About 15 scanners have been acquired for the project and the courts are completing a comprehensive survey to identify the total number of files to be digitised.

ICT in the Gujarat Judiciary

In 1996–97 the process of information and communication technology application in the district of Gujarat was initiated with the help of in-house software developed by the NIC-High Court of Gujarat. This was FoxBASE running on SCO UnixWare and the application has been successfully running at all 24 Appellate Side Courts as well as City Courts of Ahmadabad. (Verma, 2011).

ICT application in Delhi Judiciary

In the year 2002–03, the Ministry of Home Affairs, along with the Planning Commission and Ministry of Law and Justice, granted an amount of Rs. 49.80 million for the computerisation of district courts in Delhi. In the process a database was created of all the 82,265 civil cases and 389,138 criminal cases that were pending in the court.[8]

As part of this operation, an automatic generation of cause lists was begun. Also, an automatic monthly statement was generated showing instances of fresh cases, disposal of the cases during the month and pendency at the end of the month. Prior to computerisation, filing of material was scattered in different courts causing great inconvenience to lawyers and the public. The creation of a centralised filing system has allowed the litigant to make queries via the internet or by visiting the Information Counters. Public Relation Officers have been appointed to assist by answering specific queries regarding the allocation, transfer and pendency of cases and their present status.

CONCLUSION

The size and complexity of the court system in India, and the many perceived inefficiencies associated with it, have focused the government on funding vast improvements to the legal administrative court structure. The application of ICT and the attention given to a range of initiatives, many of which are mentioned above, have begun to reshape the efficiency of the legal landscape in India which has a long and complicated history. However, the size of the task is significant and it will take time.

Footnotes

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[2] "Over 3 Crore Cases Are Pending in Courts in India: Goverment." Editorial. Deccan Chronicle. N.p., 7 Mar. 2013. Web. 15 July 2013.

[3] http://www.supremecourtofindia.nic.in

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http://www.wikipaedia.com
http://www.supremecourtofindia.nic.in/ecommittee.html
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ICT IN THE DISTRICT COURTS OF DELHI- *Challenges, Strategies and Solutions*

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1. **Introduction**

An independent, effective, just and efficient judicial system that fosters respect for the rule of law is indispensable in a truly democratic system. Modernization, streamlining and improved efficiency of the court systems are paramount in order to ensure a high degree of protection of individual rights and therefore increase citizens' faith and confidence in the State. District Courts of Delhi, functioning in three different Court Complexes, known as Tis Hazari Courts Complex, Karkardooma Courts Complex and Patiala House Courts Complex and having a working strength of about 280 Judges, are striving hard to achieve this objective.

In the year 2002-2003, Ministry of Home Affairs along with Planning Commission and Ministry of Law and Justice decided to release funds to all the four Metropolitan Cities for computerization of District Courts to made as them "Model Courts". Delhi was given an initial outlay of about Rs.49.80 Million for starting the computerization process in District Courts.

The District Courts Computerization Project was formally inaugurated by Hon'ble Chief Justice of India in a glittering function held at District Courts Complex, Tis Hazari on 23.11.2003 and from that day onwards District Courts have not looked back and have achieved one milestone after the other in the field of computerization.

When the initial plan was being implemented, another batch of 76 Judicial Officers consisting of Delhi Higher Judicial Service Members and Delhi Judicial Service Members joined the District Judiciary. So it was necessary to provide additional computers for the Courts of newly appointed Officers. The further allocation of Rs.22.80 Million was made by the Central Government for this purpose as well as to take care of enhanced requirements in other fields also.

Delhi Government has made yearly allocation of Rupees 27.50 Million for the next five years beginning with financial year 2004-2005 for computerization of District Courts. As on date, the finance provided by the Delhi Government is the only source for financing present and future plans of computerization in District Courts as no more funds are being released by the Central Government for this project.

2. Operating System

Operating system is the software that determines how a computer operates, including such things as file structure, input and output devices, printer routines and screen manipulations. When the question regarding selection of the operating system came up, then after due deliberations, it was decided to use LINUX based operating system. The main reason for selecting this operating system is that it is cost effective and is an open platform software. As and when future upgrades are required, the same are available either free of cost on the Internet or at a negligible cost from vendors. The other reason to go for LINUX based system is that it is almost virus free.

3. Hardware

In the first phase, standalone Personal Computer systems [PCs] were provided to the Stenographers and Ahlmads (Record Keepers) attached with every Court and instead of Dumb Terminals [A terminal that doesn't contain an internal microprocessor. It responds to simple control codes and usually displays only characters and numericals] or Thin Clients- linked to main server [A computer system or service that provides information or a service to other computers on a network] through the network. The rationale of providing PC system was to be allow system -to perform the required task that is capability of storing sufficient amount of data and retrieval of the same should be quick and instantly available as and when required for efficient functioning of the Court system. Moreover, the Judges were hesitant to allow

transfer of half-baked information to the servers like judgments or orders, which have not been finalized. Similarly the data for daily use is required to be kept in the computers of the Ahlmads. A backup copy of the data in the Steno's computer system is also kept in the computer system of the Ahlmads, so that in case of any accidental erasing of data of Steno's computer system, its backup copy can be retrieved from the computer system of the Ahlmads of the same Court. Both these computer systems are linked to the servers by LAN [Local Area Network]. In the first phase, only one Dot Matrix Printer was provided on the table of the Stenographers for one Court. The Ahlmad was required to take printout of the reports, cause list and other documents at the Steno's end as both these computers were networked with each other. The Server Room is the nerve centre of all activity as far as the computerization is concerned. In Tis Hazari Court Complex, six Servers were installed in Server Room on the second floor. Similarly, in Karkardooma Court Complex, four servers have been installed in the designated Server Room. In Patiala House also four servers were installed in the make-shift room, as there is acute shortage of space in the said Court Complex.

Initially, it was decided to go for centralized UPS [Uninterrupted Power Supply] System to power the computer systems in case of electricity failure. One UPS of 10 KVA serves about 30 computer systems. These UPS were installed in secured ventilated rooms with proper power supply and from those UPS rooms, power supply cables were laid to the user's ends in respective Courtrooms. Later on, it was noticed that if one central UPS trips, it will make about 30 Court computer systems non-functional. So, from the year 2005 onwards, it has been decided to install individual UPS with every system to provide required power back up in case of electricity failure. .

The three Court Complexes were connected to NIC's Headquarters; initially by using ISDN lines, which are now being upgraded to 2 MBPS leased lines of MTNL. This upgradation is the need of the hour keeping in view the manifold increase in traffic between the three Court Complexes and NIC's Headquarter at CGO Complex, Lodhi Road New Delhi. Enhanced speed as well as online connectivity is required for integration of the computerization process of the three District Courts into one centralized system from the users' point of view.

4. Customized Software

The heart of computerization of District Court of Delhi is the customized software developed by NIC under the guidance and supervision of the Software Development Committee of the District Court Level. The Judges and the Court Staff i.e. Court Clerks, Stenos, Ahlmads, Readers etc. gave their valuable input to software developers to make them aware of the work flow type of registers/forms/data/summons/warrants etc. being maintained and the reports being generated in the Courts. Requirements were analyzed and in accordance with the said requirements specific Softwares were developed.

After a test run and approval of the Software Development Committee, the software modules were integrated in the main Case Information Management System (CIMS). There is no doubt that it was a time consuming process but there were no other shortcuts available.

The District Courts in Delhi are governed under the Delhi High Court Rules, Punjab Court Act and a number of other legislations and rules passed from time to time. Entire working is quite complex to understand by a layman who may be a programmer but without having any legal background. NIC's programmers were taught step by step the complex processes before thay could venture into the development of the appropriate customized software modules. These were deliberated in length with the members of Software Development Committee of the District Courts. After the members of the Software Development Committee were satisfied, authorization was given to commence the computerization of those processes. These software modules were then standardized and authorization was given to integrate them it in the master software known as CIMS.

5. Management of Computerization in District Courts - As on date, the computerization process is being looked after at the District Courts level by a Central Computer Committee, which assists the learned District & Sessions Judge in computerization of District Courts. The members of the said Central Computer Committee are the Judges In charge of Computerization in the three Court Complexes alongwith Nodal Officers of Tis Hazari Court Complex and the Administrative Civil Judge. Central Computer Committee lays down the guidelines and oversees the proper implementation of the computerization. There is also a Central Computer Purchase Committee, which looks after the hardware and software purchases under the guidance of the District & Sessions Judge. The Purchase Committee consists of members of the Central Computer Committee, representative of Delhi Government, and an official from Accounts Department etc. And the purchases are made as per the guidelines laid down by the Government of NCT of Delhi from time to time after observing all the necessary formalities. At the respective District Court Complex level, a Higher Judiciary Judge has been appointed as the Judge In charge, who is assisted by a Nodal Officer and other members of the computer committee for the said Court Complex. Computer Branches in all the three Court Complexes are utilizing the services of the staff withdrawn from other areas as the process of creation of posts for Computer Branch is still pending with the Delhi Government. The Staff so withdrawn and posted in the Computer Branch is computer savvy, they have been given basic training in troubleshooting and maintenance of computer systems and most of them are holding computer qualifications like Certificate/Diploma/Training. It is worthwhile to note here that we even have MCAs and BCAs working in our District Courts and their expertise is being utilized in computerization of District Courts.

The Trouble Shooters take care of the day-to-day maintenance of the computer systems, Printers, UPS Systems, Servers and the LAN connectivity, which is the backbone of the entire system. In case a problem is too complex, the Trouble Shooters immediately inform the Service Engineers and ensure that the work of the Court should not be hampered beyond reasonable minimum period. If a particular item requires removal to the workshop, standby equipment is provided to the said Court/Branch. Complaint Registers are maintained in all the three District Court Complexes in the Computer Rooms and direct telephone connections as well as Inter-com connections have been provided so that complaints can be lodged, which are rectified on top priority.

6. <u>Progress made</u>

The main Court processes, which have been computerized and put into practice, can be categorized as under:

(i) Creation of database of all the pending cases - In District Court of Delhi, at 1 January 2005, 471.403 cases were pending [82,265 Civil cases and 389,138 Criminal cases] Every year more than 110,000 cases are filed and about 115,000 cases are disposed of. It was a mammoth task to enter the details of all the pending cases into the computer system and that too, not by employing any external hands for assistance but by the Court staff itself, who are otherwise looking after the day to day functioning of the Courts and they are too busy in their regular court work. District Court is proud to complete the entire data entry of all the pending cases as on date. It was possible by dividing the data entry into three stages.

At that initial stage, the staff was required to enter only the case name, type of the case and other minor details so that unique ID (Identity Number) of the case is created and a slot is reserved for the case in the CMIS. In the second stage, complete names, addresses and other particulars of the parties to the cases were entered. In the third stage, the list of witnesses and all other remaining fields were entered.

A major problem was faced at Patiala House Court Complex because of pendency of about one hundred thousand complaint cases under Negotiable Instruments Act regarding dishonour of cheques before the Magistrates. In some of the Courts, more than ten thousand cases are pending. There is no space in the Courtrooms of Magistrates to accommodate additional helping hands, as most of the

courtrooms are too small. This problem was solved by dedicating the computer training room only for the purpose of data entry for a period of six months and by identifying and allocating 10 computer trained staff members for data entry work. Initially a proposal was also mooted to outsource the work of clearing the backlog of data entry but the idea was discarded because of the sensitive nature of data to be fed in. Moreover the case files containing important documents cannot be handed over to outside agencies. Further, the economic parameters were also not found feasible. During summer vacations of 2005, the Judges and staff worked tirelessly to complete the data entry work. District Courts Administration is grateful to the Judges and staff members for their cooperation to complete this Himalayan task, which has not been achieved so far by any other organization in the country on the same scale in such a short time without incurring any cost and without employing an outside agency.

(ii) Automatic generation of Cause Lists - Before the computerization process was started, every Ahlmad (Record Keeper) used to spend about 45 minutes everyday for preparation of the Cause List of the cases to be listed before the Court on the next day. This was quite time consuming task and there were chances of mistakes, like non-listing of the cases fixed for the day or listing of the cases which are not fixed for the said date. It used to cause great inconvenience to the lawyers, litigants and the Judges. After computerization, this problem has been solved successfully as the database is upgraded on daily basis by the Ahlmads so, as and when required, Cause List for any working day can be generated at the press of the button. It saves time, efforts and energy on the part of the Ahlmads who have become more efficient after introduction of the automatic generation of Cause List. The said Cause Lists are also available on the Internet in advance, so that lawyers and litigants can plan and schedule their visits to the Courts accordingly.

(iii) Automatic generation of Monthly Statements - Every Court is required to submit to the Hon'ble High Court monthly statements showing institutions of fresh cases, disposal of the cases during the month and pendency at the end of the month. Earlier, the Ahlmads used to take about 2/3 days to manually prepare the said Monthly Statements. As mentioned earlier, since the entire database is available on computers, the Monthly Statement is generated only on the press of a button, resulting in saving of time and energy. The response time has reduced to the bare minimum. Now the said statements can be generated for a week, fortnight or on monthly basis, which helps in planning by the Judges to maximize the disposal.

(iv) Generation of reports in response to Parliament questions Sometimes Parliament questions are received regarding number of cases of a particular type pending in the Courts, the age of the cases or the Courts in which the said cases are pending. All these details can be sorted out on the basis of the inquiry and reports can be generated and dispatched in the least possible time only because of availability of the entire data on the Servers.

(v) Centralized Filing - Prior to computerization, the filing was scattered in different Courts causing great inconvenience to the Lawyers and the public at large. Nobody was sure about the place where he had to do the filing. Now special Counters known as "**Facilitation Centers"** have come up in all the three Court Complexes where the entire filing for the Courts can be done. In Tis Hazari Court Complex, filing counters have been opened at two places, keeping in view that there are about 160 Courts functioning in the said Complex and it is the largest Court Complex in Asia. At the counters near the Post Office facing the Civil Side Chamber Complex, cases of the Court of Senior Civil Judge and District Judge including matrimonial and rent matters can be filed. The filing counters have been opened at the said place with a purpose because most of the Civil Lawyers have their chambers in the Eastern Wing and it is very convenient for them to approach the filing Counters on the Eastern side.

The Criminal Lawyers have their chambers mainly in the Western Wing and they also operate from Central Hall. Hence a filing counter has been opened in the Central Hall itself where criminal complaints

to be listed before the Chief Metropolitan Magistrate and the bail matters to be listed before the Additional Sessions Judges, can be filed.

As soon as a matter is filed, it is given a unique number; the first digit denotes the Court Complex like "1" stands for Tis Hazari, "2" stands for Karkardooma and "3" stands for Patiala House. The next six digits denote the number of case and last four digits after "/" denote the year of filing. The type of case is mentioned in the beginning and a normal case number generated by the computer looks like "Civil Suit No. 1756/2005". In this number, the type of suit is "Civil Suit", "1" stands for Tis Hazari and '756' stands for the particular case number and 2005 is the year of filing. **The bumbering digits can go upto six digits, so that the future needs of filing have been also taken care of.**

The case number will remain permanent for the life of the case irrespective of the fact that the case is transferred from one Court to the other. Even after final disposal, the case file can be easily traced from the Record Room on the basis of this number. The permanent numbers have solved the problem of identification and tracking of cases because at the time when computerization was not in place, every Court was assigning its own case numbers as and when the matters were allocated or transferred to the said Court and this practice used to result in great confusion in the minds of the litigants.

Now with the introduction of permanent case numbers, one can easily trace his case by making query on the internet or by visiting the Information Counters where Public Relation Officers have been appointed to assist the general public and the Lawyers for answering their specific queries regarding the allocation, transfer and pendency of cases and their present status.

(vi) Automatic allocation of cases - At the time of filing a case at the Central Registry, the party's name, jurisdiction, type of case and the statute under which the case has been filed, are entered into the system. Immediately the computer assigns unique IDs to the cases and sorts them on the basis of set norms like jurisdiction of a particular Police Station, pendency status in the respective Courts, specific allocation of cases to designated Courts and other pre-determined parameters and the cases are automatically allocated to the Courts. The lawyers/litigants are informed in the least possible time about the allocation of the cases filed by them. This system operates without any intervention by the officials manning the Filing Counters, so the chances of manipulating the allocation of cases is ruled out. However, the District Judge/Judge In charge has the right to over-ride the allocation done by the Computer and for this purpose, he may identify a particular case online and decide that the said case is to be allocated not to a Court chosen by the system but to some other Court. This overriding option is excised in exceptional cases, as and when the need arises.

(vii) Transfer of the physical case file and the data to the Allocatee Court - After allocation, the sanction of the District Judge/Judge In charge is obtained and the hard copy of the case file is sent to the said allocatee Court. The data captured in the Central Registry is also transferred to the said Court through Central Server. Once the case reaches the concerned court, the Ahlmad makes the second and third stage entries, i.e., he completes names and addresses of the parties and witnesses in the computer system alongwith the next date of hearing as fixed by the learned Judge. So by the end of the day, the entire details of the cases filed during the course of the day reach the Central Server and the said data can be used for any pre-defined purpose. This information is automatically sent to the Court Web-Site.

(viii) Grouping of cases - Sometimes, it is decided to transfer cases of a particular type to one court. Earlier the process of identifying the said cases used to take a long time as manual lists were prepared but now as and when a decision is taken, it can be implemented within few minutes because the entire data regarding the nature of cases, their respective age, special characteristics, nature of offences, age of the accused, place of residence of the parties and other unique identities are available in the data bank.

(ix) Allocation of Court Numbers to different Courts - Prior to computerization, all the Courts were known by the names of the Presiding Officers of the said Courts like the "Court of Mr. ABC". The frequent transfers, abolition of certain courts due to exigencies and creation of new Courts because some Officers had come back from deputation or they had been transferred to a particular Court Complex

used to result in great confusion in the minds of the Lawyers and litigants. Another reason for the said confusion was that a number of Judges share the same name. Allocating specific Court Numbers to all the Courts, which are situated in three District Court Complexes, has solved this problem.

To overcome the problem of abolition of a particular Court when a Judge is transferred out/he proceeds on deputation, it has been decided not to allocate the same Court Number to any other Judge for a period of one year. The said Number can only be re-used after one year so that in the intervening period, the pending cases of the earlier Court stand transferred to other Courts and by that time, the litigants and the lawyers may also notice that a particular Court stands abolished. To take care of appointment of new Judges and creation of new Courts when the Judges are transferred to a particular Court Complex or they come back from deputation, sizable numbers of vacant Courts numbers have been provided in every Court Complex, where the said Officers can be accommodated.

It is pertinent to mention here that a particular Court Number is not associated with the Room Number or seniority of the Judge. The Court Numbers continue from year to year and it becomes easy to identify a particular Court by its Number rather than by the name of the Presiding Officer. Even for the purpose of report generation, the process has become quite simple now because Computer can easily track the Court Numbers. Associating the Courts with the names of the Judges was quite a cumbersome process which was very difficult to be handled by modern technology of computerization, where certain specific parameters and fundamentals have to be followed while performing a particular task.

(x) Automation of the Process Serving Agency - The automation of the Process Serving Agency was a daunting task as it was following the practices adopted about one century ago of creation of Beats for distribution of summons, marking of reports on the said summons and their ultimate return to the concerned Courts. This process has been given special attention.

The summons is entered in the Computerized Registers on receipt from respective Courts. The said Programme automatically allocates the summons to the next Process Server in line and the summons are accordingly distributed area-wise to the Process Servers by the computer. After such distribution, the progress regarding service of summons is noted on day-today basis in the form of Daily Reports to be submitted by the said Process Servers. The Process Servers are made accountable. Every day, they have to submit a report stating the number of summons already pending with them, new summons allocated on the said day, number of summons served by them during the day and number of summons returned by them unserved with specific reasons as to why the said summons were not served. The data collected from Process Servers is fed into the Computer System, which generates a Daily, Weekly and Monthly Report on the basis of number of processes served during the said period and the percentage of success. The performance of the Process Serving Agency has significantly improved after computerization. The Ahlmads of the Courts have the facility to check at the end of the day as to how many summons issued by their respective Courts have been served and how many of them are still pending. The matter can be brought to the knowledge of the concerned Judge regarding the service of the summons because the performance of the Process Serving Agency is available on the intra-net to all other terminals in different Courts and Branches. (xi)Implementation of the Financial Accounting Package – The Accounts and Cash Branch are fully automated. Payment of Salaries to the Judges and the Staff, numbering about five thousand has being taken care of by the System. The fines collected in the Courts, fees collected in the Copying Agency and other Branches are being monitored by the Accounts and Cash Branch on real time basis and remedial actions are taken as and when required. It has minimized the risk of financial irregularities because the details are available online and any deliberate deviations can be pinpointed well within time.

(xii)Automated Attendance Marking System - The District Courts of Delhi are first in India to opt for the most modern Automated Attendance Marking System, which is based upon Advanced Smart Card Technology. A Micro Chip of 1 KB capacity is embedded in every Smart Card, which contains all the details regarding a particular employee alongwith his photograph and designation etc. The attendance can be marked on the Automatic Contactless Terminals provided at different entry points in all the three

District Court Complexes. To mark the attendance, only the Card is to be waved before the Machine and it takes not more than one second for one person to do so. The problem regarding late coming and leaving the Court early stands resolved by installing this system.

The Attendance software is duly integrated with the Salary Preparation System and it takes care of leaves and other facilities availed by the said employees. Different reports based upon the information captured through the system can be generated. The entire information collected from all the three Court Complexes regarding attendance is combined in one database, which can be accessed even from the web browser.

In future the finger print identification system is also to be introduced with a view to restrict entry of undesirable elements in security zones like Server Rooms, Record Rooms and Stores etc.

(xiii) Digitization of Disposed Records - The disposed files take a lot of space to store, so it has been decided to digitize the old records and keep them safe in the digitized form instead of maintaining the physical files for decades together. Proper care has been taken while weeding out the record by following the rules framed in this regard. A lot of space is being made available for other important purposes after digitization of the records and there is no danger of any fire, termites or other natural calamities, which may destroy the record. Proper backups are being kept at different places so that the data is not lost in case of any eventuality.

(xiv) Computerization of Judges' Libraries - The Judges' Libraries in all the three Court Complexes have hundreds of thousands of books, which have been affixed with Bar Code Tags. As and when a book is to be searched, it is easy to trace the same and entries regarding their issuance and return are made automatically with the help of the Bar Code Readers. On the intra-net, the judgments of the Hon'ble Supreme Court and Hon'ble High Courts have been provided so that Judges may access them from their computers installed in the chambers. The said judgements can also be accessed from terminals installed in Courts so that the Judges have the ease of looking for a particular law point and use the same as and when required.

(xv) Provision of TFT LCD Screens on the Dias - In the second phase of computerization, TFT/LCD 15" Screens have been provided on the Dias which are connected to the computers of the Stenos. The Judges are able to keep a watch on the evidence being recorded by Stenos under their dictation and they are further able to go through the transcripts of the judgments typed out by the Stenos. Necessary corrections can be made there and then so that the judgments are announced on time, without any delay and mistakes.

(xvi) Provision of Computers in the Chambers of the Judges – Similarly, in the second phase of computerization, Judges have been provided with computer systems in their respective chambers so that they are able to use them as and when they are free. These systems can be also used by the Stenos to type out the judgments when the learned Judge is holding his Court. Thereafter, the learned Judge can check the said judgments and in spare time, he/she can also access the judgments of Hon'ble Supreme Court and High Courts. He/She can transfer the files from his Court Room to his residential Computer Systems by using the secured E-mail facility. The judges have been provided with digital signatures and they can always sign their judgements digitally, so that no one is able to tamper the data when the same is transmitted. Judges may make necessary corrections in the judgments in the comfort of their homes and thereafter the said judgments can be transmitted to Courts by using the secured E-mail.

(xvii) Computerization of Copying Agency - Since all the orders and judgments are available on the intra-net, now there is no need for typing or photocopying the orders in the Copying Agency. The required orders are downloaded and printed in the Copying Agency, properly authenticated and delivered to the applicants in the minimum possible time. Uncertified copies of the orders are available on payment of nominal fees on the very next day of moving the application, as the Copying Agency only has to print the orders already available on the intra-net.

(xviii)E-Mail Facility - E-Mail facility has been provided to all the Judges and Courts with the commissioning of dedicated E-Mail Server for district judiciary in Delhi. The Judges are able to transfer the drafts of the judgements/orders from Courts to their residences by using the secured e-mail facility and vice-versa. All the circulars are also e-mailed to the Judges. It has resulted in availability of cost effective instant communication facility. District Courts have been able to cut cost of paper printing and labour by use of e-mail facility.

(xix) Automatic Staff Posting System - Prior to computerization, it was very difficult to keep track of the postings of the staff members numbering about five thousand. Now a Personnel Information System (PIS) is in place. All the details and particulars of the employees along with their postings have been entered into the system and the said software generates the reports on the set parameters and indicates the names of the Court Officials who are mature for their transfers after serving for a particular number of years in their present postings. The said PIS System also takes care of the Annual Confidential Reports, Provident Fund Entries and Service Book Entries. It signals well in time the steps to be taken in respect of the Court Officials who are going to retire in a few months' time. It helps in proper management of the staff, which is a valuable asset for the District Courts of Delhi.

(xx) Stores Management - Every year, the District Courts purchase huge quantity of consumables valued at millions of rupees. A proper Stores Management System has been put in place with computerization of the District Courts. It indicates well in time the store items, which need replenishment, monthly/weekly consumption pattern of different types of stores and the budgeted and actual expense on a particular store item. It helps in planning the future budget for purchase of the store items and proper inventories are maintained.

(xxi) Laser Printers for District Courts - Dot Matrix Printers installed in the first phase of computerization on the stenos' tables have been found to be very noisy and slow in their operation. After much deliberation and working out the feasibility of going for different options, it was decided to purchase Laser Printers for the Stenos. The Laser Printers perform the printing function without any noise and disturbance. The speed is fantastic and overall efficiency of the Stenographers has improved. They do not interfere with the normal functioning of the Courts. The Dot Matrix Printers removed from the Stenos' seats have been provided to the Ahlmads, who need to generate different types of reports and summons etc.

(xxii) Automatic Generation of Summons and Warrants etc. -Considerable time was being spent every day by the Ahlmads for preparation of the summons, warrants and other types of notices to be sent to the witnesses, parties and other officials requiring their attendance in Court. After the introduction of computerization and completion of third phase of data entry (primarily concerning with entering the names of the witnesses in the Computer Data Bank) now the summons to the witnesses and Notices to the parties, Production Warrants, Bailable and Non Bailable Warrants, Release Warrants and custody warrants etc. are being generated by using the Computer System. The Ahlmad only requires to select the serial number of witness to be summoned and thereafter, the summons is automatically generated showing the next date of hearing, time of appearance and the purpose for which the summons/warrant has been issued. It saves a lot of time for the Ahlmads and the summonses are generated in a legible format, which can be duly acted upon by the concerned authorities. In the past, number of reports were received regarding non-mentioning of complete names and illegible handwriting in which the summon formats were filled in and sent for service resulting in delays. With the introduction of computerization of summons, this problem has been taken care of.

(xxiii)Training to the Staff - The District Courts had engaged the services of NIIT in the initial stage to train the staff and judges, which ran a capsule course of 15 days for all the court officials. Moreover, intensive training was provided by NIC to the staff regarding the customized software developed for District Courts. Refresher courses are being run from time to time as and when the need arises. New staff appointed in the District court is given training to use the computer system in the most effective

manner soon after their appointment. Gradually we have developed our own faculty to take care of the staff training and dependency on outside training agency is not required.

(xxiv) Introduction of Digital Signatures - Since the volume of data being sent and received by use of electronic means is increasing, a concern was shown regarding security of the said valuable data. Need was felt to introduce digital signatures for Judges. Digital signatures have been provided to the Judges and the Court officials. After pronouncing the judgments, the same are digitally signed and transmitted in a secured environment to the intended recipients. The benefit of digitally signing a document is that a third party will not be able to make alteration in the contents of the document and the intended receiver on receipt can verify whether the transmitted document has been in its original format or not. Successful experiments have been made to transmit the bail orders to the jail complexes from District Courts by using the digital signatures and very soon it will be implemented on a large scale.

(xxv) Provision of Photocopiers - The plans are afoot to provide one photocopier to each Court so that the copies of the evidence recorded during the trial and the orders/judgments pronounced by the learned Judge are made available to the litigants there and then. It will save their frequent visits to the Court Complexes and will result in lessening the burden of the Copying Agency. It is worthwhile to mention here that as per Law, the Courts are bound to supply free copies to all the under-trials lodged in Jails and to the parties in Motor Accident matters. In other cases, copies have to be provided as and when proper application is moved with requisite Court fees. Hence, one photocopier in each Court is the minimum that is required to take care of granting copies to the said applicants/parties.

(xxvi)Computers for Readers/Court Masters - Computers are also being provided to the Readers/Court Masters as the said officials are also required to maintain and update a number of registers like Peshi Register, Disposal Register and they have to collect fine and prepare Fine Statement etc. In the spare time, the said computers can be utilized by the additional Steno for typing the judgments or orders. It is a step, which is necessary to be taken for full computerization of District Courts. This proposal is being forwarded to Delhi Government for approval.

(xxvi) District Courts Website - The District Court Website is a unique inhouse venture of District Courts of Delhi. It is the first Web-Site of District Judiciary in India, which is, updated daily. The entire Website was developed by the Author and the same is being hosted successfully for the last about two years. The website is available at www.delhicourts.nic.in. It provides the Judges, Lawyers, litigants and the general public host of facilities. Some of the highlights of the Web-site are:-

(a) History of the District Courts - The history of Delhi Courts has been traced back to the year 1911 when the Commissionerate of Delhi was carved out by a Proclamation Notification and from that date onwards all the historical developments in the field of judicial history of Delhi have been enumerated.

(b) Introduction - The brief background of all the three Court complexes has been given. Specific Courts housed in the said Court complexes have been detailed and direct links have been provided to the said Courts. Introduction of the present District & Sessions Judge and a list of his learned predecessors has been provided along with brief introductions of the Judges In charge of Karkardooma Courts and Patiala House Courts.

(c) Jurisdiction - The jurisdiction of different types of Courts situated in District Courts has been given. The Court numbers, names of the Judges, their respective jurisdictions, specific room numbers and their place of sitting have been listed. A special feature is the chart showing Police Station wise list of the Magistrates in which all the Police Stations of Delhi have been alphabetically arranged. If a person knows the Police Station where crime has taken place, he can track the concerned Court, where the case is pending along with other details. It works as a guide to litigants. A list of all the Special Courts in Delhi has been also provided, which deal with specific type of offences under different law enactments.

(d) **General Information -** General information regarding types of cases, place of filing, requisite documents to be filed along with specific types of petitions, necessary Court Fees to be affixed etc. is provided in the General Information Section.

(e) **Important Links -** Links have been provided to all the important legal Websites available on the inter-net like Supreme Court of India, Delhi High Court, National Crime Records Bureau, Delhi Police, Tihar Jail, different Libraries and other Departments concerned with the District Courts.

(f) **Other Legal Forums -** All the other legal forums in Delhi have been listed like FERA/FEMA Board, MRTP, NCDRC and State Consumer Commission etc. and links have been provided to the Websites of the said Forums is available.

(g) **Tender/Bids -** All the tenders and bids issued by the office of the District & Sessions Judge are being uploaded on the inter-net so that interested vendors may submit their competitive quotations and the purchases can be made in an open and fair manner.

(h) **Daily Cause List -** Cause Lists of all the Courts in the three District Court Complexes are uploaded a day in advance on the inter-net and the same are available after 6:00 PM. Lawyers and litigants can plan their visit to the respective Court Rooms on the basis of the information provided in the Cause Lists and it helps in reducing the rush in the Court Complexes in the morning hours.

(i) **Bail Cause List -** Seven Sessions Courts in Delhi hear bail matters for specific districts. The Cause Lists of these Bail Courts are also uploaded a day in advance so that the Lawyers can plan their visit to appear in the said Courts, where their bail matters are listed.

(j) **Bare Acts -** Bare Acts, which are necessary for running the Courts on day to day basis have been provided with direct links so that as and when required, a particular bare Act may be accessed and relevant section may be extracted, copied, saved or printed.

(k) **Pleading Forms -** Most of the pleading forms used for filing in the District Courts have been listed and their specimen formats have been provided on the Website so that Lawyers and litigants are able to use the said forms for drafting pleadings.

(l) **Daily Orders-** All the important interim orders passed by the District Courts in Delhi are uploaded in secured PDF format on the same day so that lawyers/litigants are able to access them by the evening. The orders can be searched by name of the Judge and specific date of the said order. Daily Orders are available on the Internet for a period of one month from the date when they are pronounced.

(m) **Availability of District Courts Judgments -** Judgments pronounced by District Courts are uploaded on the Internet by 6.oo p.m. in secured PDF format so that the lawyers and litigants are able to access the said judgments and there is no need to come to Court for their uncertified copy as prints can be directly taken from the Website. It reduces the work load of the Copying Agency and the visits of the public and the lawyers to the Court complexes. Care is taken not to upload the judgments in matrimonial cases, rape matters, Official Secret Act cases and other matters of sensitive nature.

(n) **Judgments of Hon'ble High Court -** Every month's judgments of the Hon'ble High Court are uploaded on the District Courts Website after sorting them subject-wise, party name-wise and Judge-wise. It helps the District Court Judges to access the latest judgments of the Hon'ble High Court on the specific topics pending before the District Court Judges. The High Court Judgments work as a guiding force for them and they are kept informed of the latest developments in the field of law. Even lawyers and litigants have found this feature quite useful in sharpening their legal skill and knowledge.

(o) **Case Status -** Any litigant can check the case status on the Internet where he is a party by entering the name of any of the party/case number/Court Number/Name of Judge. Free text search is also available. One can check the case status even by entering the type of case if he is not sure of any of the above parameters. It reduces the crowds in Court Rooms where litigants/lawyers and their clerks visit only for enquiring the purpose for which the case is fixed on the next date of hearing.

(p) **Certified Copy Status -** The certified copy status of the applications filed in the three Court Complexes is available on the inter-net. If the copy is ready, the party can visit the Copying Agency and collect the same. If the copy is not ready then the probable date when the copy will be ready is automatically displayed and there is no need to visit Copying Agency only for the purpose of noting down the next date when the copy will be ready.

(q) **On Line Enquiry Facility -** To reduce the rush in the Courts, an on-line enquiry facility has been provided on the Website. Litigants/lawyers can submit their queries, which are answered on-line in least possible time. The enquiries can be related to any matter concerning their cases pending in District Courts.

(r) **Members' Area -** The Web-site also provides an exclusive members' area for the District Court Judges. The telephone directories of the District Courts and other important institutions are available. The list of judges with their date of appointment and place of posting has been provided. In the EJournal Section, Judges are encouraged to publish their articles. All the forms useful for the Judges, like Leave Applications, Medical Claim Form and LTC form etc. with extracts of the relevant rules have been provided. It saves the numerous rounds to the different branches to collect the forms and to know the relevant rules. The Judges can also access their own personal information like salary and leave details etc. on-line. A discussion forum has been started where unique questions of Law are put to the participants who are encouraged to provide their viewpoints/solutions. The Judges may also file their computer related complaints on-line, which are attended on priority. The members' area is quite popular with the members of District Judiciary.

(s) **Service Rules –** The service rules of Delhi High Judicial Service (DHJS) and Delhi Judicial Service (DJS) have been published on the Website, so that interested persons can view them. For the lawyers who wish to join judiciary, these rules are quite useful.

(t) **Statistics–** The periodical pendency statements in respect of all types of cases are also published on the Website, which are quite helpful to understand the trend of disposal of cases.

(u) **Annual Report – We are the only District Court in India that publishes** every year Annual Report of the District Judiciary on its Website. The Annual Report gives details of history of Courts organization, branches, disposal trends and future vision etc. One of the resolutions in the Conference of the Chief Ministers of the States and Chief Justices of the High Court's held on September 18, 2004 in New Delhi is that one of the confidence building measures among all the stakeholders in the justice delivery system is for the Court system is to publish Annual Reports of achievements and use of resources. In Delhi we have already achieved this target.

(v)

7. Future Plans: –

(i) **Video Conferencing -** A need was felt to establish Video conferencing Studios in all the existing Court Complexes. As far as future Court Complexes are concerned, plans have been made to introduce E-Courts in the said Court Complexes, which will be fully equipped with Video Conferencing facilities as well as other E-Governance paraphernalia. In the present Court Complexes, efforts are being made to establish at least two Studios in each Court Complex to enable Video Conferencing between Courts and Jails as well as between Courts and Witnesses, who are living at far flung places and are unable to come to Court to attend the hearings. There

is a legal requirement to have Video Conferencing facilities in the Courts in view of the judgment of the Hon'ble Supreme Court in the matter of Sakshi vs. State as well as the judgment passed by our own Hon'ble High Court in a child rape case where it was observed that the child is not to be exposed again to the said alleged rapist during the trial and electronic means are to be used to record his testimony.

(ii) **Direct Connectivity with Delhi Police, Hospitals and Jails -** In the near future, we wish to go for direct connectivity with different Police Stations in Delhi so that copies of FIR can be sent using E-mail and other electronic facilities to the concerned Magistrates. The summons of police witnesses can be also issued using electronic communication. Another area where we want to concentrate is to have a direct link to the posting list of Delhi Police. By the time a case reaches the evidence stage, the concerned Police Officials, who are witnesses in a case stand transferred once or twice and their present postings are not noted anywhere. It results in delay in tracing the said witnesses. If the present posting status of over fifty-four thousand strong Delhi Police is available on intra-net, our system can track a particular police official using his PIS number and the summons can be directly sent to his present place of posting. This way, the wastage of Court time in tracing the police officials can be minimized and disposal rate will certainly increase. Similarly, we require direct access to the data banks of different hospitals as the Medico Legal Cases requiring opinion in respect of nature of injuries, the availability of the doctors to depose in Courts and opinion of the experts take a long time to reach the Court. District Courts also we want to establish a direct access to the Computer Systems of the Jail Authorities as on number of occasions, the under trials are not produced due to one reason or the other. In some cases, they are lodged in Jails under different names because at the time of arrest, they did not disclose their real name by which they were earlier booked. The identity can be ascertained on the basis of finger prints, Retina Identification and other approved electronic identification kits so that the anomaly of identifying a person only by his name is taken care of and accused are produced in Courts on time. The bail orders can also be transmitted electronically to Jail by e-mail in secured environment using digital signatures.

(iii) **Interactive Voice Response System –** In India, the penetration of computers is very low. Although most of the lawyers now have computers and Internet facility but most of the litigants do not have these facilities available to them. To provide instant information to them, the District Court has plans to introduce Interactive Voice Response System by providing dedicated telephone numbers for enquiry. The litigants can dial these numbers and a voice will guide them to make appropriate choices regarding Court Complexes, type and number of Court, details of the case and then the present status of the case will be intimated to him. The details provided are the next date of hearing and the purpose for which the case is listed.

(iv) **SMS Enquiry Facility for Lawyers/Litigants –** The lawyers, who will register for e-filing, they will be provided facility of automatic SMS intimating them the next date of hearing and purpose for which their cases have been adjourned. The litigants and other lawyers can send in their queries at a given number by SMS and the latest details of their cases will be sent back to them by SMS. It will save frequent visits to Courts by the lawyers, their staff and litigants to know the present status of their cases.

(v) **Minute to minute progress of Cause List on Internet -** It has been also proposed to provide minute to minute progress of the Cause Lists of the Courts, so that the lawyers and litigants can come to know whether their cases have been adjourned or their matters are still pending, so that they can attend the same.

(vi) **E-filing -** The next big step is to go for E-filing. We are in the process of establishing infrastructure to allow the Lawyers to file civil cases in electronic form. It is need of the hour as legislature has already allowed electronic service of summons by use of e-mail and fax but it can

become a reality only when e-filing of cases is allowed. The availability of the electronic copies of arguments and pleading in the system will improve the efficiency of the Case Information Management System (CIMS), as there will not be any need to type in the details mentioned in the said cases and the summonses can be generated and dispatched to the parties by E-mail and fax by enclosing the copy of the petition and documents available in electronic form. The concerns and advice of different interested groups like Lawyers, Litigants, Judges and the Staff as well as the Higher Authorities will be taken into consideration before initiating E-filing in consonance with the laws of the land. In the end, it is reiterated that we have a vision to become the first District Court in India to be fully computerized before the end of 2005 and to achieve this target we are working tirelessly.

RECENT TRENDS IN USE OF ICT IN JUDICIARY

By: TALWANT SINGH & MANOJ JAIN[1]

In a short span of a decade or so, there is quantum jump as far as technology in context of Indian judiciary is concerned. Transition is not slow or gradual. If we go in retrospection, we will rather find that just 10-15 years back, judicial system was virtually in a *Stone Age* in terms of technological tools. From just one typewriter per court, today the court room is equipped with three computers, TFT screen, laser printer, photocopier, pen drive, data uploading facility, library software, etc.

Delhi District Courts computerization had started in the year 2003 when Hon'ble Chief Justice of India flagged off the first phase of computerization. Thereafter, Delhi District Courts have shown great concern and extra zeal in this regard and various plans have been chalked out, under continuous guidance of Hon'ble High Court, to make fullest use of technology. Computers were provided to Judges at their residences for the first time way back in the year 2001 though first batch of computers to be installed in Court complex came as late as in Oct. 2003. Thereafter, there was no looking back and as on date there are around 1500 computers and 600 printers installed in various courts and branches. Presently, all the judges have been provided with latest Desktop computers for their residences. Laptops and printers have also been provided for residences by E-Committee. Latest Law-software has also been provided.

Facility of Broadband has already been provided at the residences of Judges. Some more novel plans have already started taking shape and short depiction of such plans is as under:-

[1] Addition and Session Judges, Delhi

Digitization of Files

Record Room in each court complex occupies a huge area. Files, which have been otherwise disposed of, are kept in such *record room* and it requires a lot of manpower and space to keep the record properly. To access such record is again a cumbersome job despite the fact that good numbers of files are being destroyed periodically. It has been decided to preserve the record in *digitized form* instead of keeping the physical files. Contract has been already awarded for digitization of 150 Lakh pages of records in the first phase.

For preserving physical files, besides space crunch, we are also required to take care to thwart any possible damage which might occur from dust, termite, or rats, etc. Once the entire record is digitized, we would be saving space, money, time and manpower also.

Digital Signatures

Introduction of digital signatures would indeed go a long way. All the Courts have already been provided with computers and printers and once judgment is announced and signed, such judgment or order is immediately uploaded so that same is available to the litigants, advocates and general public. In order to ensure the genuineness of the text of the judgment, digital signatures would be provided to judges and officials and once the order or judgment is pronounced, same would be digitally signed and transmitted accordingly. Any receiver or recipient of such order or judgment can always very well know whether the transmitted order or judgment is in original format or not. In case, there is even slightest alteration, digital signatures would promptly declare that the document was not in the original format. Some of the judges have been already provided with the digital signatures and the experiment has proved to be successful and very soon all the judges will be provided with digital signatures.

Upgradation of Website

Website of Delhi District Courts, which is the most beneficial technological tool for all stake-holders, is being further updated so that every litigant or lawyer is in a position to access date-wise continuous progress in the matter.

Installation of CCTV

Installation of CCTV Cameras in Tis Hazari Courts has already begun. 125 cameras would be installed in Tis Hazari Court complex with a state of art *control room* which would be manned by court staff as well as by the local police so as to monitor all the activities. The configuration

would be of such nature that audio and video recording is preserved for at least seven days. This would enhance the security in the court complex as any suspicious movement in the court complex would be caught immediately.

Surety Management System

This is altogether a new concept which would be introduced in India for the first time. We all know the menace of bogus sureties. We do not have any record of sureties and it is very easy for anyone to stand surety time and again without being caught. In connection with criminal matters, numerous sureties come to court complexes daily and submit bail bonds. It is desirable to have a complete data base with respect to the persons submitting surety bonds. It is essential to have complete details with respect to background of such surety in order to control the menace of bogus sureties and in order to see that there is no fraudulent duplication of sureties. Objective is to have the complete data base of the surety along with his fingerprints and facial recognition system. Requisite data is to be stored in the system through machine readable text tools and photos would be taken with the help of digital cameras. Surety would be directed to the verification/identification wing in the Court Complex. There would be 3 separate rooms, in each court complex, meant for verification/identification. Each room would be equipped with necessary hardware and software and each surety would give 10 fingerprints and a match of these would be done in the existing database. The Surety would be photographed and his photo image would also be verified in existing database. The result of automatic Fingerprint & Automatic Facial verification would get displayed on the PC. In case of a match, the data of the person will be available for further scrutiny. In case no match is found using both biometric systems, the surety details, photo and his fingerprints templates will be added to the database. Technical bids have already been invited and project would be commissioned very soon.

E Kiosks

E kiosks have been installed in Tis Hazari Court-Complex on experimental basis where any litigant or lawyer can gather information about his/her case. These Touch-screen systems are user-friendly and they have considerably reduced the work load of Facilitation Center.

Biometric Attendance System

Hon'ble Supreme Court and High Court of Delhi have already installed biometric attendance system for their staff and project was approved for implementation of the same in the District

Courts. Formal contract has been signed and the Vendor has started the preliminary work. It has been proposed that fingerprint impression of each staff member would be taken and preserved in data base as well as in a smart card and such smart card would be thereafter given to concerned staff member and while recording the attendance, every staff member would be required to place his/her finger on a particular terminal and to flash the smart card from a short distance and once the fingerprint impression matches with the image stored in the smart card, the attendance, along-with time, would be marked electronically. We would be in a better position to keep entire record with respect to attendance and since there won't be any possibility of tampering with such electronic record, staff would naturally become more disciplined and punctual.

E Filing

E-filing would be a quantum leap in use of technology. Recent amendments incorporate provisions of service through electronic means, i.e., through e-mail and fax and it would be feasible only when e-filing starts taking place and the soft copies of the pleadings are also made available to the courts. E-filing would take place once all the stake holders actively participate and give their valuable input and co-operation. Preliminary study in this regard is being undertaken.

Inter-active Voice Response System (IVRS)

Though the computerization has become order of the day yet it is not possible for each and every litigant or lawyer to have a computer and Internet facility and to provide them with instant information, the District Court has definite plans to introduce Inter-active Voice Response System. Dedicated telephone numbers for specific enquiry would be installed and voice would guide the litigants to select requisite choice and then the status of the case would be made available to such litigants.

SMS Enquiry Facility for Lawyers and Litigants

It is being studied whether facility of automatic SMS can be started whereby public can be intimated regarding status of the case, next date of hearing and purpose of hearing. Litigants and lawyers would be required to send their enquiries to a specific mobile number and they would be provided with status of the case immediately through SMS. This would save their time and in such a situation they would not be required to visit the court complex.

Creation of E-Court

India's first District level E-Court has been inaugurated on 08.02.2010 at District East, Karkardooma Courts by Hon'ble Chief Justice of High Court of Delhi in the presence of Hon'ble Judges of High Court as well as other dignitaries. It is a pilot project executed under the guidance of Computer Committee of High Court of Delhi. Funds for this project were sanctioned by TIFAC, an autonomous body under Ministry of Science and Technology and the project has been executed by C-DAC, Noida. This E-Court is a pilot project and after testing the technology in this Court, this experience will be utilized for making more Courts paperless. There is a provision of a document visualizer and any document can be projected on the LCD Screens installed in the E-Court, so that the same are visible to the accused, witnesses or the prosecutor in the same Court, as well as when they are connected through Video-Conferencing. At any given point of time, E-Court can be connected to four distant locations, which may be the Jail where the accused is lodged, Forensic Lab from where Forensic Expert is to be examined, Hospital where Doctor is to be examined or any other remote location where either the ISDN based Video-Conferencing facility or at least a laptop with a Webcam connected to internet through broadband is available. This will not only revolutionize recording of evidence but it will also enable the E-Court to record evidence of the witnesses who are incapable of coming to the Court due to health reasons, old age or when they are abroad. This E-Court is already connected to all the Jails, other Court Complexes in Delhi as well as to the office of DCP (East). Efforts are underway to provide videoconferencing facilities at Forensic Lab, Rohini, Delhi, all Police Stations and Hospitals. In near future, we will gradually shift to new era of court management, where the paper records will be replaced by digital records in all aspects of functioning of courts. We have to brace ourselves to face these challenges by updating our knowledge regarding advancements in information and communication technology for courts.