

SAAS BASED E-COURT APPLICATIONS IN E-GOVERNANCE IN INDIA

T. G. VASISTA

College of Engineering and Technology, Mizan Tepi University, Tepi, Ethiopia

ABSTRACT

Delays in court procedures are observed as potential source of problems to much arbitration and settlements of legal cases now days in India. Corrupt officials and greedy lawyers may instead of speeding up, actually can cause administrative delays in which they have no effect on outcomes but transfer apparent responsibility for decision from elected political officials to agencies or courts. So reformation in administrative procedure in the form of promoting e-government can provide a net benefit to citizens. Developing countries usually face problem of having insufficient infrastructure in fulfilling the needs of providing citizen centric or user centric e-services in various domains such as Judiciary Administration. SaaS based Cloud computing model has a potential to offer solutions in the form of automated user-oriented legal case management system while addressing the capital expenditure and it's Return on Investment. It provides service oriented access to end users without compromising on security. It reduces total cost of ownership, facilitates easy deployment and maintenance services by standardizing services and increases end user satisfaction levels. When properly applied to the development of E-Governance Applications, SaaS based Cloud computing architecture models can transform the nation into an Information Society. This paper attempts (i) to highlight the issue of delay happening in the judicial administration process most importantly at the operational level, (ii) mitigating the problems of delay in terms of bringing administration reforms through adopting e-governance applications such as automated legal case management system by using SaaS based Cloud computing e-Governance Portals.

KEYWORDS

Cloud Computing, e-Court, e-Governance Applications, SaaS, Service Oriented e-Governance, Software as a Service.

1. INTRODUCTION

It is not very uncommon to countries of modern democracies to deal with complex legal systems, as modern societies are becoming more complicated societies. India is no exception for this situation. The primary duty of courts of justice is, precisely, to dispense justice. The end of justice, however, may easily be subverted in a judicial system punctuated with delays in the processing of cases filed in court and marked by congested court dockets. The harm that delay poses to the administration of justice is grave and in some instances, irreparable. The problem of docket congestion is seriously disabling and affects all facets of the judicial process [1]. The Indian judiciary is facing mounting pressures to reform its apparatus. Even the judiciary itself has come to recognize that change need to be brought is long overdue. A rudimentary estimation of about three years is required to clear the current backlog of cases in High courts. While technocrat herald that the problem of enormous backlog of cases can be tacked by achieving the speedier delivery of justice using ICT, however the rural penetration of courts in India is found extremely low, which significantly limits access to justice for the many citizens living far beyond the district courts of city centres. It is believed that the e-government initiatives will continue to transform the nature of India's bureaucracy and enhance the quality of government services and can play central role in judicial reform efforts. Dr M. Veerappa Moily, then Union Minister for

Law and Justice, has proposed for India a centrally funded and administered National Judicial Technology Program [2]. Such a program aims to use ICT in the courtrooms to free the legal system of —historical inefficiencies". It is important to note that ICT intervention and use must be seen as an enabler of a sound national level judicial reform strategy. It is also important to look at how basic infrastructure such as civil courts in rural areas must be in place before the use of ICT can facilitate access to justice for individuals who remain peripheral to the legal system. A well-functioning judicial system is required to keep up with the demands of modern democratic society. It is unquestionable that technology can play an influential role in ensuring that the relationship between citizens and the government is strong and communicative. But how ICT can be used to see that cases are filed and judgments are delivered more quickly to improve efficiency and rationalize resources is needed to be explored [2] by complementing it with the basis of national level judicial reform strategy or policy. (E.g. with supporting article of the constitution).

2. OBJECTIVE OF THE RESEARCH STUDY

This paper attempts (i) to highlight the issue of delay happening in the judicial administration process most importantly at the operational level, (ii) mitigating the problems of delay in terms of bringing administration reforms through adopting e-governance applications such as automated legal case management system by using SaaS based Cloud computing e-Governance Portals.

Correspondingly, the organisation of topics follow the following sequence: About delays and its reasons in legal environment; judicial administrative reforms; role of information technology in judiciary administration in India; electric power supply problem; e-courts; impact of cloud computing on e-governance; user centric SaaS platform for e-governance; information methodology and information technology approaches; software as a service (SaaS); examples of SaaS based applications; challenges in e-governance cloud services provision from a unified view; conclusion.

3. DELAYS AND KINDS OF DELAYS: IN GENERAL AND IN JUDICIARY

Delay means postponement of the initiated task or a process to a different time period than what is originally scheduled to complete it or to finish it. Delay in Civil Law is defined by John Bouvier (1856) [3] that are also applicable to the constitution and laws of the United States are given below as: 1. The time allowed either by law or by agreement of the parties to do something. 2. It is an allowed delay by law and for a party who have been summoned to appear, to make defence, to appeal; it admits of a delay during which and action may be brought, certain rights exercised and the like. 3. By the agreement of the parties there may be a delay in the payment of debt or in the fulfilment of a contract [3].

Delay, in relation to court process and legal case-flow management, is generally classified into:

(1) court system delay;
(2) lawyer-caused delay; and (3) delay caused by agencies independent of, but which interact with the court system [1]. In addition to these, author suggests another type of delay called delay as a result of the information gap (no matter how it is resulting and at which stage it is happening). What is important here is the provision of status if a case is filed. It is like developing reports on pending cases against docket information as well as the reason for adjournment. This kind of information must be published online by adopting Internet Communication Technology and should be made available to the public related to the cases up on querying. It should not be misunderstood as questioning the authority by accused (not asking the reasons of ‘_why’ while asking about the transparent display of the status of the information (just asking the details of ‘_what’).

3.1. Potential Causes for the Delay in Legal Cases

Virtue (1960) [4] has mentioned about the possible delays in metropolitan trial courts (in USA). Basically these delays are identified at the structural level and operational level. Though it can be argued that Speedy Justice is a thing that is unknown; the speedy trial depends on individual case circumstances (and can be consistent with delays), it can be generalized that the causes of popular dissatisfaction with the administration of justice are: uncertainty, delay and expenses [5]. When the trains were delayed by few hours, author reminds his experiences of comments from the general public (including several government officials) on Indian Railways and its performance that they expressed as if a great thing and/or an event in life is missed. If it has to be considered seriously, then what about the delays in legal cases, their delays are happening not in hours, days, weeks or at least in months; but they are happening in multiples of years sometimes it is even costing the prime life period of a human being who misses the important life cycle experiences that every other human being goes through in general. In this scenario, what justice based proactive role does this judicial administration system is acting to the affected public? How it has been reacting for this kind of situation that is happening to human individuals in terms of not causing violations on any individual and/or human rights indirectly.

It is an appropriate situation and context in the paper to recollect a small story of Sri Rama and a Bird, when Sri Rama asks why a bird could not warn Sri Rama when an arrow was aimed and shot at the bird. Then the bird replied that whenever somebody else does this kind of activity, the bird immediately prays Sri Rama for getting escaped from that kind of situation of hurting activity. But if Sri Rama himself wanted to do that, to whom the bird can go and ask for the justice?. Similarly, if any injustice happens in the society, people approach the courts for getting proper justice. But if the judiciary itself is indirectly providing injustice to the common man in terms of making judicial administrative delays in the processing of court management system and hurting them by indirectly affecting the constitutional rights of the human beings, where does the common people go for the justice?.

3.2. Pending Legal Cases Statistics in India

There have been several reports about the volumes of litigations in Indian courts. Bar & Bench (2010) [6] has compiled a three-year statistics to accurately estimate the pending litigations in India and the vacancies of judges in the Lower courts, High courts and Supreme Court as shown in figure 1, figure 2 and figure 3 with figures sourced from [6].

Courts		2008	2009	2010
Supreme Court*	Admission	26,863	30,834	33,352
	Regular	19,024	19,329	21,512
	Total	45,887	50,163	54,864
High Courts*		3,743,060	3,874,090	4,060,709
Lower Courts**		25,418,165	26,409,011	27,275,953
Total (All Courts)		29,207,112	30,333,264	31,391,526

*Statistics as of March 31, 2010
 **Statistics as of December 31, 2009

Fig. 1 Pending Cases [6]

Courts		2008	2009	2010
Supreme Court*	Sanctioned	26	31	31
	Vacancy	1	7	2
High Courts**	Sanctioned	876	886	895
	Vacancies	284	251	267
Lower Courts**	Sanctioned	15,917	16,685	16,880
	Vacancies	3,393	3,129	2,785

*Statistics as of March 31, 2010
 **Statistics as of December 31, 2009

Fig. 2 Judge Vacancies [6]

Note: Some legal experts claim that the huge backlog of unresolved cases is directly proportional to lack of judges and is found increasing with a rate of 3.4% annually. For example In India there are only 10 judges for every million people whereas the United States and Great Britain have around 150 judges for a million of its population [6]

Sl No	State / Union territory	Lower Court ^a	High Court ^b
1	Uttar Pradesh	5,404,633	950,864
2	Andhra Pradesh	959,010	187,050
3	Maharashtra	4,158,458	338,183
4	Goa	28,937	BHC
5	Daman and Diu	1,937	BHC
6	Dadra and Nagar Haveli	3,574	BHC
7	West Bengal	2,597,655	319,846
8	A & N Islands	14,587	CHC
9	Chhattisgarh	276,919	60,418
10	Delhi	918,386	61,277
11	Gujarat	2,162,599	97,623
12	Assam	232,957	59,336
13	Nagaland	5,597	GHC
14	Meghalaya	12,556	GHC
15	Manipur	8,260	GHC
16	Tripura	67,365	GHC
17	Mizoram	5,531	GHC
18	Arunachal Pradesh	5,808	GHC
19	Himachal Pradesh	159,966	51,643
20	Jammu and Kashmir	182,187	55,588
21	Jharkhand	273,296	55,206
22	Karnataka	1,139,691	172,302
23	Kerala	996,503	113,426
24	Lakshadweep	187	KHC
25	Madhya Pradesh	1,130,542	196,921
26	Tamil Nadu	1,094,897	431,390
27	Puducherry	25,774	MHC
28	Orissa	1,078,964	259,818
29	Bihar	1,490,833	128,907
30	Punjab	574,318	
31	Haryana	560,143	243,782
32	Chandigarh	95,152	P&H HC
33	Rajasthan	1,418,883	259,187
34	Sikkim	1,128	85
35	Uttarakhand	188,720	17,857
Total		27,275,953	4,060,709

Fig. 3 State wise pending cases [6]

4. JUDICIARY ADMINISTRATION REFORMS

According to Hon'ble Justice R. K. Abichandani (Undated) [7], Judge of High Court of Gujarat mentioned that the constitutional concern is not limited to decision making by the courts but extends to the processes of decision making which should bring about acceptable standards of administration of justice in courts. The responsibility is clearly of the respective high courts to ensure proper judicial administration within their territory. Hon'ble Justice Asok Kumar Ganguly [8], a judge of the Supreme Court suggested that [8] judicial administration should maintain standards in terms of the full utilization of the court working hours, punctuality of judges and about lawyers in not asking for unreasonable and intentional adjournments by inducting the loop holes (as per the suggestion it must be done strictly based on the provision of Order 17 of the Civil Procedure Code). It is important to be emphasized about adoption of technology in prioritizing, merging and disposing of cases, their monitoring and tracking [8]. Article 21 of Indian Constitution (also the 6th Amendment-1789 of U.S. Constitution) mandated the constitutional right of the accused to a speedy and public trial in all criminal prosecutions (as evident from the case proceedings of [9] and [10]).

5. ROLE OF INFORMATION TECHNOLOGY IN JUDICIARY ADMINISTRATION IN INDIA

Information Technology (IT) has captured unprecedented importance at national as well as global level as one of the vital factors for growing and sustainable economy, good governance and administration of justice. One of the prerequisites for ensuring sustained growth of the above mentioned areas is the provision of a definite framework consisting of I.T. policy, plan and strategy including technical, administrative, auditing, legislative, financial, and operational guidelines [11]. Prime Minister Dr. Manmohan Singh said that —A stable, sound, legal system which dispenses justice is essential to the sound economic growth of the country [12]. On February 19, 1999, then prime minister, Atal Bihari Vajpayee mentioned in his address to National Development Council, India that bureaucracy is an agent of exploitation rather than a provider of service. Corruption has become a low risk and high reward activity [13]. Further Jwala Narasimha Rao [13] on behalf of Dr. MCR HRD Institute had mentioned many topics for strengthening of state during an administrative training session under UNDP project in a document. Out of those many topics, computerized information; facilitation counters in all offices with large public interface; improving the performance of integrated public services; making the administration accountable and citizen-friendly by ensuring transparency and right to have information (keeping the provision of the Official Secrets Act-1923 and the Indian Evidence Act-1872 and other relevant laws in mind). Later, the National e-Governance Plan approved by the Indian Government comprise of 27 mission mode projects and 8 components on May 18, 2006. E-Courts Mission Model Project is one among them. But that was aiming to create e-filing facility in the Supreme Court and High court. Does this mean the common man from the rural and urban sectors of district and metropolitan levels have to get suffered with judicial administration delays? Well!, as High courts become responsible to its territories, State Governments and Municipal Corporations have to take initiatives in implementing the e-Courts concepts. E-Courts in connection with CCTNS Project of E-Governance in relation to Police Crime Control and Monitoring project could Speed up the deliverance of records and verifications of data (modernisation of police network).

6. ELECTRIC POWER SUPPLY EXPRESSED AS A PROBLEM

However it is expressed that [14] power condition in many states is really bad. In May 2011 report, India's Central Electricity Authority anticipated, for 2011–12 year, a base load energy deficit and peaking shortage to be 10.3% and 12.9% respectively. Due to it, Only 6 – 8 Hours power is available in many states. So running computers and network is becoming a challenging task to them. Correspondingly Uniline Energy Systems Pvt. Ltd., an Indian Company is involved in installing the electrical power ranging from 73000 500VA to 2 KVA to Courts under E-Governance Project that Connect the Talukas – Tehsil – District Court – High Court – till Supreme Courts to speed up Judiciary Processes and maintaining records and data resulting in reducing trial time. Over 2010– 11, India's industrial demand accounted for 35% of electrical power requirement, domestic household use accounted for 28%, agriculture 21%, commercial 9%, public lighting and other miscellaneous applications accounted for the rest. It looks like about 1700 Tera Watt Hour with a peak demand of 250 GW electrical power (extrapolated and averaged figure) would be required by the year 2020 [15].

6.1 Comments and Suggestions on Electric Power Supply Problems

Power unavailability should not become an excuse and should not be claimed as a barrier for important cases to be disposed-off at different levels of courts. Alternate solutions to these barriers can be suggested in the form of rising questions and suggestions: (i) why can't the state governments take initiative in providing judicial administrative based services against user charge

payments? What federal (central government) policy is stopping them to do that? (ii) why can't we combat corruption, save and utilize that money for public welfare schemes planned by planning commission? if we look at the amount of money involved in top 10 scams in India [16] it amounts to a total of approximately INR 86,000,000 Millions 1. Indian Black Money Scam - Rs. 72800000 Millions, 2. Common Wealth Games Scam - Rs. 700000 Millions, 3. 2G Spectrum Scam - Rs 1760000 Millions, 4. Scorpene Submarine Scam - Rs 189780Millions, 5. Stamp Paper Scam - Rs 200000 Millions, 6. Bofors Scam - Rs. 400 million, 7. Mining Scam - Rs. 3000000 Millions, 8. Fodder Scam - Rs. 9500Millions, 9. Hawala Scam - US\$ 18 billion (@ 40INR per US Dollar during Year 2000) ~ 7200000 Millions, 10. Satyam Scam - Rs. 140000 Millions). In many rich people's house there are inverters and power back up storage plans that they execute whenever there is a power failure. Things that they feel important for them are not stopping just because of the reason called the unavailability of the regular electrical power supply. I would not see implementing e-governance effectively becomes a problem against the unavailability of the power. Rather, not having set it as a priority and not having commitment to implement seems the reason. (iii) In the rural sector, Council for Advancement of People's Action and Rural Technology (CAPART) is an autonomous body within MoRD (Ministry of Rural Development), registered as a society under the Societies Registration Act. It is the largest single agency promoting voluntary action for rural development in India, which can take initiative along with National Institute of Rural Development (NIRD), High Court Authority and National Informatics Centre (NIC) in mediating with the government in effectively implementing the e-Governance projects such as E-Court at the Taluka level [17]

7. E-COURTS

E-Court will re-shape the future of the Indian Litigation. It forces transformation of the legal industry by promising the emergence of new models that will allow clients to reap huge efficiencies [18]. According to the administrative reforms suggested by Hon'ble Justice Asok Kumar Ganguly (as mentioned earlier in this paper) [8], technology adoption such as Information Technology can play a contributory, efficient and effective role in mitigating administrative delays by implementing the automation of legal case management systems. Steelman (2004) [5] mentioned in his presentation that a case flow management system can be considered as the heart of the court management system, where the entire set of actions that a court takes to monitor and control the progress of cases, from commencement through trial or other initial disposition to the completion of all post-disposition court work, in order to make sure that justice is done promptly

7.1 Value Identification for taking up Legal Case Management System Automation

The review of the California Court Case Management System (The largest court system in the USA) from the CCMS final report (2010) [19] mentioned four broad areas of legal case management system automation viz.: (i) Electronic Filing (ii) Electronic Calendars (iii) Self-service case inquiries and the status of the case and (iv) Self service payments and identified that the business value or public value exists as given below [19]: The value of having a court case management system is to replace failing systems in individual courts; The value lies in having a ready automated system for courts that currently use completely manual processes; The value lies in automating some manual processes within a court thereby reducing time to input data, time to retrieve data, and paper storage costs; The value lies in allowing e-filing (self-service) to the public; The value lies in sharing data across courts; The value lies in sharing data between justice partners; Cost avoidance due to the consolidation of over 70 different instances of different systems.

7.2 A Review of e-Courts Mission Mode Projects in India

According to the final version of a compendium document of Mission Model Projects (MMP) under NeGP (2011) [20], though the project is aimed at Supreme Court and High Court levels, it is interesting to note that e-Courts project entails ensuring of digital interconnectivity between all courts from the taluka level to apex court. The e-courts MMP is aimed to provide a range of services such as: automation of case management processes (include: case filing, scrutiny, registration, case allocation, court proceedings, details entry of a case, case disposal and restoration, transfer of case etc.); provisions of online services (include: certified copies of orders and judgments, case status, calculation of court fees, cause lists, institution registers and court diaries); establishing information gateways between courts and government agencies (information exchange with police, prisons, land records department, registration offices etc.; distant production/examination of under trial and witness through video conferencing); Creation of National Judicial data grid (include: monitoring of pendency in the courts). The automation of case management system would enable the judges to exercise greater control over management of cases in their dockets. The services envisaged under the project cater to all the key stake holders in the judicial system of India including the citizens, litigants and advocates. E-Courts project is set to move forward aiming to adopt a differentiated strategy to complete computerization of courts with prioritization of implementing in various states; take up Process Re-engineering (PR) in accordance with the above differentiated strategy. PR would be started in states in advanced stage of ICT implementation; prepare and implement change management strategy; Integrating e-courts service services with other MMPs under NeGP with its allocated budgets and timelines [20].

8. IMPACT OF CLOUD COMPUTING ON E-GOVERNANCE

The aim of e-governance is providing citizen-centric services ensuring transparency and accountability in the service interactions. Cloud computing is increasingly becoming a viable platform to host e-Governance applications [21]. Cloud computing provides a new service consumption and delivery model inspired by consumer internet services. E-Governance with cloud computing offers integration management with automated problem resolution; it manages security end to end and helps budget based on actual usage of data. At global level, cloud architecture can benefit government to reduce duplicate efforts and increase effective utilization of resources. This makes possible to bring Green IT [22]. Taking up e-governance initiatives in a massive manner is important to the government so as to get the benefit of low capital cost utilization per service per person (including the development of skills and knowledge of end users in computers and internet) and to realize ROI in an optimal/ a balanced period as it becomes the venture of Public Private Partnership. E-Governance Cloud computing can reduce IT labor cost by 50%, improve capital utilization by 75% and can significantly reduce license costs while providing scalability. Types of E-Governance requirements include: Functional, economic, political, technical and cultural reasons [22]. Cloud computing becomes one such strategy of providing citizen-centric services (under G2X pattern) in a massive manner covering different cloud types viz. Public Cloud, Private Cloud and Hybrid Cloud (Public-Private Cloud). Cloud computing is a technology that has a potential to offer solutions for e-governance providing service-oriented access to users without compromising on security [21]. US IT analyst firm McKinsey & Co estimated that if an organisation could consolidate servers and keep the operational costs of the resulting data centre to \$45 per month per CPU, it could enjoy this computational power at a rate that would be less expensive than the cost of running operations [23]. A snapshot view on comprehending the basics of Cloud computing knowledge [24] [25] [26] [27] has been presented in the form of Table I and can be referred in the APPENDIX.

9. USER CENTRIC SAAS FOR E-GOVERNANCE

User-centred e-government attempts to consider needs, situations and experiences of users into account while determining the strategies and activities.

User-driven e-government goes beyond the user-centric approach by directly inviting and involving users (by bringing agility) into the process whereby the public sector determines its strategies and activities. Bringing agility in service design, production and delivery helps in the formulation of public policy and decision making, working and arrangements of public sector and public governance more widely and correspondingly helps to build a consistent and sustainable quality based good governance. Though the major responsibility of providing user-centred services lies with the back office, determining, realizing and satisfying user-centric front-office based activities require considering broad aspects such as change management, innovation, organisational re-structuring and business process re-engineering and management. Adopting inter-operable standard frameworks, open standards, service oriented architecture and considering user segmentation become important while building e-government services. User segmentation, user centricity and personalization can, however, be extremely costly for the public sector to develop as highly nuanced personal welfare systems. This problem can be mitigated by customizing it to community levels so that public value benefits can be gained. Evolution of these communities can be classified based on observing and monitoring the frequency and consistency of service consumption patterns. Because personalized services are considered as the most focused expressions of user-centric services in which the end user's interests and needs are in principle will become known to the service provider. A self-service oriented personalized service provision will help protecting the privacy and improves trust on e-government services [28].

9.1 Proposed and Important Features of User-Centric Cloud Computing based E-Governance Model

It includes: Dynamic Object-oriented Service Activity Encapsulation; Dynamic User-centric and user-specified functional service activity aggregation; Dynamic Services Management (including dynamically aggregated service identification, its storage, retrieval, backup and destruction); Dynamic service binding with corresponding service profile (include service policy, service level agreements and service role specification) at the server machine end; service consumer profile at the client machine and creating a match between the service profile & service consumer profile contextually and dynamically based on user specifications; Consumer centric, self-service based user interface design; and Security Wrapper.

9.2. Example of User-Centric Functional Requirements on Search Capabilities in E-Court

Just like G2B and G2C, the courts must be initially and broadly classified as Courts2Government, Courts2Business and Courts2Citizen; Police2Government, Police2Business and Police2Citizen etc. The search capability must be available to the citizen based on Name (or Last Name)/Case No., Case Title etc. and Case Types and Subtypes (Criminal Case, Family Case-Divorce Case, etc...). It is because some lawyers and agencies are causing intentional delays and creating information gap. This kind of information provision on the e-court portals help petitioners in understanding the stage at which the delay is occurring and can explicitly demand the lawyers/agency for taking up the action to be followed. This is where the Judicial Administration must focus and make the status transparent (as per the Right of Information Act) and explicitly make the information available to the citizen, upon querying against the e-courts portals and alerting the adjournment information through mobiles. The e-courts system may levy user

charges for every transaction when the user wanted to make if required and against the e-payment features integrated to it

9.2.1. Query and Update Features

- i) Electronic Docket Specification (with FIR No.) and retrieval by the client facing legal problem.
- ii) Periodical status display of adjournment details against case numbers and client name and its retrieval based on the case number/against the full name/ against citizen id (such as passport number or any other identification that can be acceptable to the government e.g. PAN number, Voter Id, Driver's License No. Adhar Card No. etc.) and against secret password before actually displaying the complete case record in order to protect and maintain privacy and under self-service operating mechanism.

TABLE II. LINKS TO SOME WEB SITE EXAMPLES RELATED TO COURTS AND JUSTICE SEARCH INTERFACE EXAMPLES

Sl. No.	Country	Web Site Address
1.	India-Supreme Court	http://www.courtnic.nic.in/ordersmore.htm
2.	Australia-Queensland	http://apps.courts.qld.gov.au/esearching/
3.	USA-New York	http://iapps.courts.state.ny.us/webcivilLocal/LCSsearch?param=P
4.	Malaysia	http://efiling.kehakiman.gov.my/eFiling/

- ii) E-Courts must have a pre-authorizing e-filing capability in stages with its correspondingly stage wise saving of data entry before actually taking up it as a legally recognized and authorised to the court proceedings. Because progressing, updating and processing incrementally is the most usual and practical phenomenon adopted by the most common user because the data might not be aviable with the user while actually trying to feed-in with any system capabilities, though there exists radical progress phenomenon theoretically. If a petitioner follows a self-service based approach, the process must facilitate to provide the complete information submitted to the court in multiple stages of data entry and its corresponding saves while filing electronically and before considering it as a final submission.

9.2. Facilitating the schedules of appearing before the court

Up on understanding the status, stage and the details of case and adjournments, the parties involved in a civil case must be able to choose/select a particular day from a graphical reservation booking slots chart for appearing before the court to participate in the proceedings according to the multiple conveniences offered by the office of the Judiciary.

10. INFORMATION METHODOLOGY AND INFORMATION TECHNOLOGY APPROACHES

Adopting Web 3.0 and Web 4.0 based development provide a combination of top-down and bottom-up approaches that is relevant to e-government. For example, policy modeling and simulation that follow top-down approach considers: massive potential of public sector information, GRID, distributed data, seamless cloud computing, data mining, pattern recognition, visualization, gaming, information, consultation, petitioning, voting etc, greater precision on policy choices and trade-offs. Similarly, Mass collaboration that follow bottom-up approach considers: Open ID, privacy, data protection, crowd-sourcing, wisdom of the crowd, large scale semantic interoperability across languages, cultures, structures, opinion modelling, debate & argument mapping, agenda setting deliberation [29], roles of representatives and intermediaries, rights, responsibilities and accountability [28].

11. SOFTWARE AS A SERVICE

SaaS can be defined as —software deployed as a hosted service and accessed over the Internet. SaaS applications are expected to take advantage of the benefits of centralisation through a single-instance, multi-tenant architecture and to provide a feature-rich experience competitive with comparable on-premise applications. A typical SaaS application is offered either directly by the vendor or by an intermediary party called an aggregator, which bundles SaaS offerings from different vendors and offers them as part of a unified application platform. In this kind of SaaS based Cloud setup, a provider of SaaS hosts an application centrally and delivers access to multiple customers over the Internet in exchange for a fee. The important check-list to SaaS providers include: Data-Security standards, SLA guarantees, Migration strategies, In-house integration requirements, Reporting services [30].

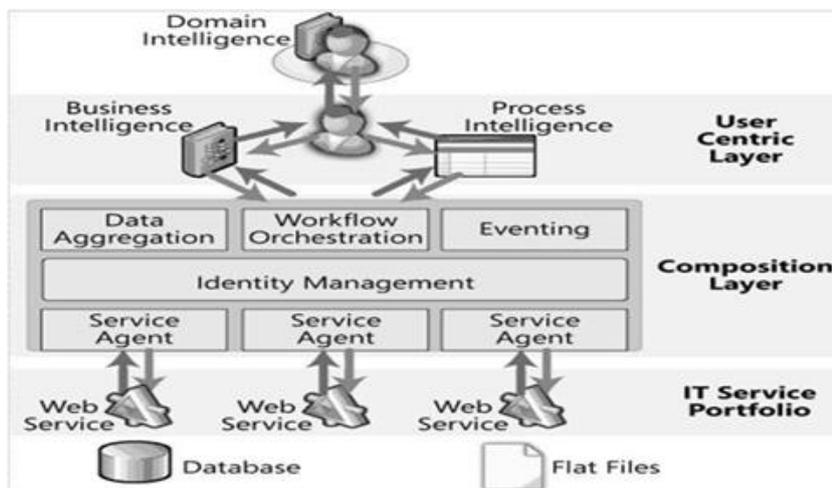


Figure 4. Service composition architecture based on SaaS [30]

Two types of scenarios can be visualized with SaaS Clouds.

- (i) Building services that match public value in a value chain needs to keep the Software as a Service within a cloud centrally, so that Proposed and Important Features of User-Centric Cloud Computing based E-Governance service can be built dynamically.

- (ii) Applications that are useful in building domain specific services dynamically using cloud computing model can be kept as a part of the cloud in order to provide on-demand access to virtualized computing sources over the internet. The composition architecture based on SaaS is shown in figure 4. SaaS can provide business potential to become SaaS provider, where the central business can host specialized applications for its franchisees for various business functions [30].

12. EXAMPLES OF SAAS BASED APPLICATIONS

12.1 DIEGO

DIEGO is a highly scalable deployment model of inclusive e-Gov. It is a SaaS based framework for e-Governance Services targeted to the European Union's inclusive e-Gov. service delivery model based on multi-channel strategies (including virtual face-to-face interactions and proxy roles on behalf of still reluctant ICT citizens) and integrated infrastructure (one-stop-shop) specifically aimed at reaching the disadvantaged citizens. This project is coordinated by Spain. DIEGO uses its interoperable and integration standard and open source based features to generate a unique citizenship framework where different e-Gov. services coming from different sources and with different scopes can be combined to make real the unique citizen window goal that e-Gov. is looking for. DIEGO is aimed at facilitating service delivery by civil servants and other practitioners along the delivery chain. It empowers public administration capacity for offering citizen oriented services by integrating FULL e-Accessibility interfaces to —as much as possible! previously existing services (without changing workflow or management procedures) but also providing new Software as a Service (SaaS) standard back offices for new services generation that public administration is responsible for [31].

12.2 Electronic Discovery Software as a Service (eDiscovery SaaS) of Singapore

The Singapore Academy of Law (SAL) with support from Singapore Judiciary, Law Society of Singapore (LawSoc) and the Info-communications Development Authority of Singapore (IDA) is proposed a programme to provide electronic discovery (eDiscovery) Software as a Service (SaaS) for law firms and client organisations in Singapore. The eDiscovery SaaS platform can be used by Lawyers who are engaged in providing litigation services in bulk with corporate clients so that they can serve better to their clients. The willingness of the Judiciary to embrace electronic discovery must be matched by the technological readiness of lawyers in Singapore, of which approximately 45% are involved in dispute resolution, i.e. litigation or arbitration. However over 80% of the 800 law firms have fewer than 5 lawyers and these small firms are finding it as a challenge to utilize technology in view of their limited financial and technical expertise [32]. The scope the eDiscovery SaaS Services is shown in Figure 5.

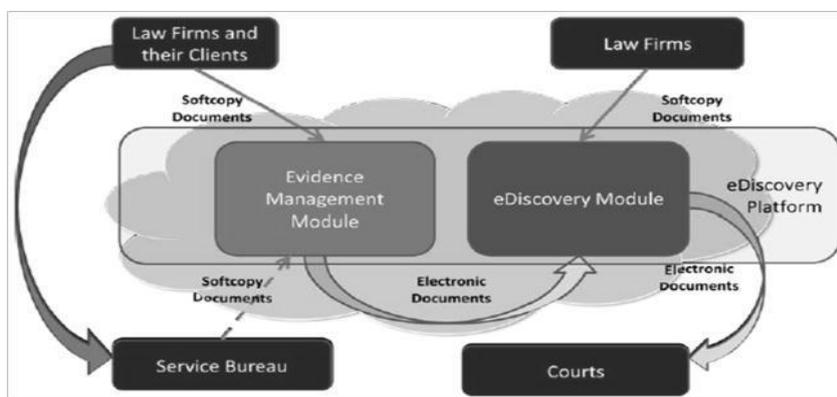


Figure 5. Scope of eDiscovery SaaS Services (Source: SAL, 2012) [32]

13. POTENTIAL CHALLENGE OF E-GOVERNANCE CLOUD SERVICE PROVISION FROM UNIFIED VIEW AND MITIGATING VENDOR LOCK-IN IN CLOUD COMPUTING

Deciding a particular level of abstraction and deciding and setting it as a standard; disseminating this level according to Right of Information Act to the citizen might become a great challenge in the process of functionally matching and providing the needs and requirements of consumer centric dynamic service. For example during the Discovery phase MoDisco, a reverse engineering tool that traduces sources to UML models or even an Abstract Syntax Tree (AST). The OMG;s Knowledge Discovery Metamodel based discoverer is a built-in feature of MoDisco which takes away the complexity process [40].

Vendor lock-in is a major barrier to the adoption of cloud computing, due to the lack of standardization. The vendor lock-in is a problem in cloud computing [39] where customers are dependent on a single cloud provider technology implementation and cannot easily move to different vendors without costs, legal constraints and technical compatibilities such as changes in security policies [40]. Therefore lock-in affects cloud migration. In order to avoid such migration difficulties and to mitigate vendor lock-in cloud specific standards are required to be initiated. It then facilitates portability and interoperability. Examples of such cloud specific standards OASIS CAMP for PaaS and TOSCA for IaaS [38]. Red Hat with OpenShift, VMWare with CloudFoundry and IMBs SmartCloud Application Services are three of the examples for portable PaaS solutions as in [40]. Distributing the data to multiple locations has been identified as a solution to minimize vendor lock-in problem. RAID-like technologies are utilized by splitting file over multiple different cloud storage providers' servers so that only required part of the need for reconstruction can be considered as needed [39]. However, the decision process for cloud SaaS service migration to avoid vendor lock-in risks is proposed in passing [41]

Thus Open Stack based cloud computing paradigm is a new and powerful infrastructure for building public and private clouds which is capable of serving the user request for infrastructure and platform services.

14. CONCLUSION

For good governance of any nation, it is necessary that all decision makers (legislative bodies) are sensitive and transparent to the needs of the common man. Deadlines are important for parliamentary body to control the bureaucracy of agency rulemaking or adjudications. For this purpose rather than focusing and demanding the specific knowledge of the content of agency decisions, parliamentary body relies on either regulating the method of agency decision making or the timing of the decision subject to the verification against administrative law [33]. Administrative procedures act as mechanisms to affect the institutional environment in which agencies make decisions [34]. It would seem intuitively correct that administrative process improvement using web-enabled technologies would be less disruptive than governance process improvement [35]. The diffusion of web-enabled technologies is perceived as tools to introduce a process rationalization of public offices and customization of public services [36]. G-Clouds play a big role in the accountability and transparency in the functioning of government machinery. Thus, the socio-economic development and the behavioural decisions of a country are now days resting on the G-Clouds [37].

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APPENDIX

TABLE I. A SNAPSHOT VIEW ON COMPREHENDING THE BASICS OF CLOUD COMPUTING KNOWLEDGE

Definition models and Functional Requirements	Characteristics and Benefits	Technology and Tools	Concerns, Issues and Challenges
<p>Definition [24]: Cloud computing is a model for enabling ubiquitous, convenient, on-demand network to a shared pool of configurable computing resources (e.g. networks, servers, storage, applications and services) that can be rapidly provisional and released with minimal management effort or service provider intention.</p> <p>Cloud Deployment Models [24]: Public Cloud, Private Cloud and Hybrid Cloud Cloud Service Models [24] Software as a Service (SaaS) Platform as a Service (PaaS)</p> <p>Functional Requirements [23]: Self Service Portals, dynamic business rules and SLA management multi-tenancy & workflow management, security-data, physical, network and application, monitoring maintenance & Ubiquitous network access, Rapid elasticity and Virtualisation, Automated dynamic provision, Automatic reservations and scheduling, Multi-Lingual Support</p>	<p>Essential Characteristics [23]: On-demand self-service, Broad network access, Resource pooling, Rapid elasticity and Measured service</p> <p>Benefits [25]: Minimized capital expenditure, Location and device independence, Utilization and Efficiency</p>	<p>Technologies [25]: Virtualisation, Grid technology, Service Oriented Architectures, Distributed Computing, Broadband networks, Free and Open Source Software, Web 2.0, Web application Frameworks, Service Level Agreements</p> <p>Tools [23]: Amazon EC2, VMWare DRS 3.0, Platform Orchestrator, Nimbus, Eucalyptus, Enomaly Computer Platform, Ovirt, Open Nebula 1.2</p>	<p>Concerns [25]: Based on the survey results of Fujitsu Journal customer questionnaire (2009): Security – 73% Operational Stability – 65% System Supporting for implementation, operation and usage of virtualisation – 48% Compatibility – 42% User Friendliness – 35% Green IT – 9%</p> <p>Issues and Challenges [26]: Compelled disclosure to government and business strategy and security, privacy breaching against corruption; Data security and disclosure of breaches; Data accessibility, transferability and retention by having compliance to government standards and law; Jurisdiction determination for fraudulent activities Intellectual Property Right (IPR) issue while aggregating services and providing service identity for utilizing it as both global and local service with corresponding determination of legal jurisdiction. Multi-tenancy, encryption, trust and compliance needs to be examined and addressed [27]</p>

Author Short Biography

Dr. T. G. Vasista is currently working for Mizan-Tepi University in the college of Engineering and Technology. He obtained educational degrees not only from Civil Engineering and Construction Management domain but also from Post Graduate Diploma in Electronic Governance and Doctor of Information Technology focusing more on Enterprise Systems and Web. He also worked as Researcher at King Saud University Riyadh. This kind of exposure in the domains Of Civil, Computer Aided Civil and Construction Management fields as well as E-Business and E-Governance Fields Fields has put him to get involved in conducting his post-doctoral research efforts in the areas of Computer Aided Construction Management in general and construction Safety Management and Maintenance Management in Specific. He is also a regular reviewer for AIRCC publications and IBIMA conferences in the fields of E-Business, E-Governance and Information Management, Information Systems and Project Management fields. He has got best paper award in IT conference conducted by Asia Pacific Management Institute during the year 2007 in New Delhi. He has also been awarded as Excellent construct Reviewer during the years 2016 and 2018 by IBIMA and as best researcher during the Year 2018 by IOSRD.

