

# A Legal Business Information System: Implementation Process Context

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*Abstract: Information Technology (IT) is fast becoming useful in implementing time, case, manpower and cost management strategies within judicial services. The legal system environment has adopted IT not just to save costs and time but also to give organizations a competitive edge and to ensure security as well. The Legal Business Information System is a fully operational and integrated system for a legal department. The mission of the department is to provide innovative and quality services in insolvency and trustee matters. Very few legal business information system implementations are documented in literature. Therefore this paper will facilitate understanding of system implementation in this sector.*

*Keywords: Legal business information system; Information Technology; Implementation; Process*

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## 1 Introduction

The significance of the information era is growing on legal practitioners and, to some extent, successful legal practice depends on it [1], [2]. This is a growing tendency and is compounded by the fast-developing nature of information technology, which stresses the need for sound legal information and knowledge management practices [3]. Court decisions are legal documents with a high potential for later retrieval; many interested parties can benefit from consulting for instance older decisions on cases similar to the ones they are involved in [4]. Legal interpretation is extremely difficult to automate. Years of hard work aimed at creating efficient systems supporting legal interpretation have barely brought this domain out of research laboratories into the common legal practice [5]. Zurek, and Kruk [5] further argue that the reasons why this proves so difficult are varied, including a great deal of common sense coming into play, a lack of precision and the ambiguity of legal provisions, the necessity to take the context of a given situation and the aim of the legislator into account, the choice of the line of interpretation, and so forth.

Law is a knowledge-based profession and its core ‘legal practice’ is about providing specialized knowledge and services to a variety of clients. A knowledge-based system is most effective in the management of semi-structured problems [6]. This knowledge or intellectual capital, i.e. the law firm’s aggregated experience or collective wisdom, applied to delivering knowledge-based services, is one of the most important assets of a law firm [3]. Currently, activities related to law and legal issues involve a large group of professionals, and amount to a multi-billion overall value. People involved in such activities must deal with a challenging amount of text, information and knowledge contained in thousands of documents. Thousands of civil servants and legal professionals need every day to access and analyse the existing statutes in order to propose updates and changes. For them, dealing with information and knowledge is an essential part of their daily work. They are “knowledge workers” and vulnerable to suffering from information overload. Legal professionals and civil servants need to reduce the significant amount of their time spent finding, reading, analysing and synthesizing information in order to take decisions and prepare advice and trials [7]. In the field of legal knowledge management and representation, the problem of representing legal knowledge in the form of a variety of knowledge bases or ontologies has widely been recognized [8].

Legal information constitutes primary sources of information, i.e. statutes and cases, and secondary sources, such as legal reference works, digests, law reviews, legal periodicals, commentaries, and books and articles from specialised law publications. Legal knowledge, that is knowledge on law and its application, is used to procure, produce and manage legal work [3]. Several studies have shown that advances in information and communication technologies (ICTs) are increasingly transforming the methods that lawyers use to access, retrieve and process information in order to solve legal problems and deliver legal services to clients [9], [10]. Nowadays, the Internet can also be seen as an additional ‘library’ or ‘information channel’ from which statutes, regulations and cases reported by countries worldwide, as well as secondary sources, may be retrieved either freely or on a subscription basis [11], [12]. With the rapid increase in the amount of electronic and print information, as well as with the increasing availability of information technologies, information literacy has become one of the most vital skill sets of knowledge for workers in the information era [13]. In the context of the legal profession, Carroll, Johnston, and Thompson [14], view information literacy as: the ability to locate primary and secondary legal materials, which implies sufficient knowledge of retrieval tools and techniques; the evaluation of source authority and content relevance, applicability and value of the materials to the task at hand; management of information, e.g. sorting, categorising, annotating and ranking the information; and lastly the use of the information for the task at hand. An important aspect is the knowledge of how and where to seek information [3]. Although legal research entails much more than just information seeking, the vast majority of lawyers often engage in some form of information seeking and synthesising [15], [16], [17]. Plessis and Toit [3] argue that many legal researchers

nowadays do not ignore the change that was brought forward by the advent of the Internet, computerised legal databases, CD-ROMs and other electronic media channels. Rather, they emphasise that legal research encompasses using and mastering both print and electronic resources.

Technological advancements have greatly affected our lives today. The use of computer technology and communication via the Internet has connected people around the world in a way never before envisaged [18]. The business world has indeed surpassed the legal world when it comes to using technology. Often, the reason why businesses have moved to using technology is that it is more cost effective to share and store information digitally. Clients will expect their lawyers, and the courts, to do the same [19]. It is common to find many law firms, ranging from the large multinational or leading partnerships to the simple sole practitioner, investing in this new technology, not just to save time and costs but also to deliver professional legal advice in an increasingly competitive market [20]. The Internet now provides a wide range of legal information, and the benefit of information being provided in this way is that it can be kept up-to-date as the law changes. The Internet can also assist in court processes generally, that is, in trial preparation and also, in the court room throughout the hearing. The reason courts should embrace technology lies in the constantly increasing caseloads, the complexity of cases, the jurisdiction, resource constraints, and pressure to improve access to justice, the expectations for improvement in performance and the pressure to improve the efficiency and effectiveness of court administration and the delivery of justice [19]. Data should be entered only once into a system, and this accords with the notion of integrated justice [21]. The areas to be considered in addressing how courts should deal with these problems are [19]:

- Electronic appeals and electronic filing
- Legal research
- Medium neutral citations
- Inside the courtroom
- Virtual courtrooms
- Legislative changes
- Public examination of court information
- Privacy
- Free access

One of the problems with utilising e-filing is that forms are often required to be signed personally by the party who is filing the document [22]. One way to deal with this may be the use of digital signatures. It is recognised that legislation may require amendment so that information can be tendered in evidence and documents can be “signed” electronically. The advantages of the Internet are that the information is generally current and up-to-date, easily accessible and freely available. One disadvantage is that the information is not secure, and downloading

information can be slow depending on traffic. There is also a concern that reports published on the Internet can be sabotaged, although this can be overcome by ensuring that a duplicate copy of a court's database and that the Internet server is regularly updated via a one-way modem link, from the duplicate database [19]. A virtual courtroom is one which need not exist anywhere but electronically [19]. In the United States, Courtroom 21, "The Courtroom of the 21<sup>st</sup> Century Today", is located at the College of William-Mary Law School and is arguably the world's most technologically advanced trial and appellate courtroom [23]. The Singapore Supreme Court has successfully setup a virtual courtroom known as "The Technology Court" [24], which has a local area network (LAN) with an Internet connection and which allows the use of imaging, multimedia and video conferencing. It also has a Litigation Support System for Presentation (LSSP), a Computer Based Recording Transcription System (CBRT), a sophisticated Audio Visual System (AVS), which allows various types of audio and a video conferencing to allow foreign witnesses to give evidence in any proceedings.

Further, to the best of our knowledge, very few real life legal business information system implementations are documented in literature. Therefore, this paper will facilitate understanding of implementation in this sector. This paper is organized as follows: first, the case study with the background, the scope, and the different components and sub components of the project are described. Later, the implementation, including testing, is discussed. Section 3 presents the conclusion.

Generally, the case study method is a preferred strategy when "how" and "why" questions are posed and the researcher has little control over events [25]. The case study method, a qualitative and descriptive research method, looks intensely at an individual or small number of participants, drawing conclusions only about the participants or the group and only in the specific context [25]. The case study method is an ideal methodology when a holistic, in-depth investigation is required [26]. Case studies are often conducted in order to gain a rich understanding of a phenomenon and, in information systems research, the intensive nature, the richness of the description of a case study and the complexity of the phenomenon are frequently stressed in case study reports [27].

## **2 Case Study**

### **2.1 Background**

The legal business information system is responsible for ongoing programmes and services under relevant acts such as official Assignee, official receiver and public trustee. Systems that were used prior to the fully integrated system were the accounting system, asset realization system and liquidation management system. The proposed system was aimed at meeting the increasing business requirements

of management of corporate insolvency cases, case accounting and asset realization processes. It also has interfaces with relevant applications of the existing application systems to ensure the seamless flow of data and business processes. The key motivation behind the system was to adopt an integrated approach to streamline processes, computerize operations and enhance information flow and communications. The department had invited prospective software developers for a tender for the proposed system and a local IT company was awarded the contract for the supply, delivery, development, customization, installation, testing, data migration, data conversion, training, commissioning, implementation and support of the proposed system.

## 2.2 Scope

Several meetings were conducted between developers and users to gather the requirements. Afterwards functional specifications covering all the requirements were documented and signed by key users. It was found that the proposed system would consist of a Corporate Insolvency Management System (CIMS), a Case Accounting System (CAS), a Support Services Management System (SSMS), a File Management System (FMS), and a Workflow (Document/Content) Management System (WDMS).

### 2.2.1 A Corporate Insolvency Management System (CIMS)

A CIMS provides users with the facility to manage the administration of corporate insolvency cases. The system supports users in their business processes with the following modules:

- Case creation, search and summary: This module facilitates the creation of cases for users. It also provides functions for user to search and retrieve a specific case and then to view pertinent summary information regarding the case.
- Pre-winding up activities: This module helps users in the generation of letters to consent to act as liquidator or to suggest that a private liquidator be appointed as liquidator.
- Pursuance of Statement of Affairs (SA)/Statement of Assets and Liabilities (SAL) Filing: This module supports users in the process of pursuing officers of the wound-up entities to file SA or SAL respectively.
- Statement of affairs/statement of assets and liabilities: This module allows users to capture the details of the SA or SAL submitted. It also provides facilities for users to consolidate the details in the event of multiple submissions.
- Preliminary investigation: This module allows users to generate the summary of company affairs for each SA submitted.
- Asset management: This module supports users in the administration of the assets of the wound-up entity.

- Administration, adjudication and payment of claims: This module allows users to capture the details of the proof of debt submitted by claimants/creditors of the wound-up entity. It also supports users in the verification of the proof of debt submitted electronically. This module also provides users with the functions to manage the proof of debt filed; to manage claims that are both disclosed and not disclosed in SA; to manage tax on interest on investment; and to manage petitioner's costs.
- Return of capital to contributories: This module supports users in the process of returning capital to the contributories of the wound-up entity. It facilitates the generation of the various statutory forms and affidavit to be used in the process of returning capital.
- Regulation of private liquidators: This module supports users in the process of regulating private liquidators. It facilitates the generation of letters to the private liquidators and liquidator's report. It provides functions for users to manage the statutory forms submitted by private liquidators and to manage the refund of money to private liquidators.
- Preparation for release of liquidator and dissolution of company: This module supports users in the process of preparing for the release of the wound-up entity and the discharge as liquidator upon completion of administration of the wound-up entity.

### **2.2.2 Case Accounting System (CAS)**

CAS provides users with the facility to create the chart of accounts manually or through respective systems of the business units. Once the chart of accounts has been created for the respective business unit, users can issue receipts for payments made by the public through the receipt function. For all cases, payments received from the public are to be paid to a case account, which already exists in the CAS.

The system also captures the details of payments such as distribution of dividend, distribution of motor accident compensation, etc. to be made to the public, thus expediting the payment process through electronic capturing and processing. The maintenance payment for the trust cases is fully automated. Business units through workflow can initiate payment process. The individual business units should approve of all the payment processes before they are routed to the CAS to be processed. The CAS user can also reject and route back the payment process to the individual business units due to insufficient information.

Bank reconciliation of transactions made between the legal department and banks can be done via the bank reconciliation functions, which match the legal department's bank transaction records against the bank statement.

Investment processes, such as the identification of cases for a new investment and the renewal and withdrawal of an investment are performed via investment functions.

Ad-hoc processing, enquiry and reports functions are made available to users for the overall completeness of the accounting system.

Every user of the system is authenticated before the use of any function. Only the authorized functions are displayed for the users. Audit trails for the critical functions are also provided. The old transaction records are archived or deleted after a period of time set by the users.

## **2.2.3 Support Services Management System (SSMS)**

This system, SSMS, is established to provide an effective and efficient system to support the users in the management of court, asset management and prosecution matters.

### *2.2.3.1 Court*

Petition details for both individual and corporate insolvency are created by the system through data exchange with the supreme court.

Besides the automated creation and updating of case records, the system provides functions for the user to maintain case details manually as well. As there are documents to be provided for each petition, the system provides facilities for the user to track the availability of documents.

As petitioning creditor's deposit needs to be paid for each petition, the system provides functions for tracking of petitioning creditor's deposit payment and sending of reminders to solicitors for missing payments.

Functions are provided for users to manage the hearings of petitions, release, discharges as well as other types of hearings. As multiple cases are heard on a day, a function is designed to enable users to update multiple records together for faster data capturing.

The system provides functions for printing of letters, notices and reports. A facility is provided for users to keep the documents in document management system.

Every user of the system is authenticated before the use of any function. Only the authorized functions are displayed for the users. An audit trail for the critical functions is also provided.

### *2.2.3.2 Asset Management*

The system provides the ability to maintain the agent and contract details for asset seizure and realization work.

For those visitations, seizure and realization work carried out by agents, asset management officers need to keep track of the status of their realization work. Details pertaining to the realization of the assets are required to be captured into the system as well for information and tracking purposes.

The system provides the asset management officers with functions for maintaining the visitation, seizure, assets, lot allocation and details of the disposal assets.

In addition to capturing information, the system provides functions for printing of letters, notices and reports. A facility is provided for the user to keep important documents in Electronic Data Management System (EDMS) as well.

As the sale of assets involves payment of the sales amount to the legal department by the agent, a facility is provided for users to initiate such payment to the cashier via the system.

#### *2.2.3.3 Prosecution*

All cases referred to prosecution are consolidated under one function, whether the referrals are manually initiated or system initiated based on specific business requirements. There are 3 main areas covered under prosecution: investigation, summons, and high court warrant of arrest.

### **2.2.4 File Management System (FMS)**

The FMS consists of the following modules:

- **Maintain file:** Maintain file module allows registry users to create or update the details of a physical main/sub file to the FMS.
- **Maintain storage media (e.g. compact disc):** Maintain storage media allows registry users to track the movement of storage media e.g. compact disc.
- **Maintain multiple files:** Maintain multiple files module provides an alternative for registry users to update movement and archival of records in bulk. Registry users can also perform bulk update of disposal and archival information via this module.
- **Enquiry:** The enquiry module consists of commonly used enquiries needed by the registry users to find out the information they required.
- **Report:** The report module allows registry users to generate out simple reports needed for daily processing, etc.

This system also integrates with the existing handheld device via batch job to upload the movements tracked by the device.

### **2.2.5 Workflow (Document/Content) Management System (WDMS)**

The features included in WDMS include:

- Check-in and check-out documents
- Version controlling the documents
- Audit trails of document changes
- Indexing and keyword management to the documents
- Archiving
- Content/document search utilities based on document attributes, i.e. index fields and keywords



- Multiple index search at the same time
- Document life cycle
- Review and annotation capabilities
- Storage of all types of documents
- Web-based access to authorized users

Work/task shall be assigned using rule-based routing and ad-hoc routing with options for round- robin or load balancing capabilities. These routings policies are well defined to various sets of rules and conditions according to the business process. Various alerts like email, fax can be provided to the users with deadlines and schedules.

## 2.3 Design

The salient features of their proposed solution are as follows:

- Employs the best of breed and industry proven products.
- An open, generic and flexible solution, which allows for future expansion.
- Reusable system components and application modules to provide seamless system integration, thus minimizing administrative effort. Lower total-cost-of-ownership in long-term maintenance of the system can also be achieved. Effective integration is the key because if one of these links fail, the organization's performance may suffer and may not meet the expectations of its customers or the service level of its competitors [28].
- Highly integrated and workflow-driven intelligence, together with middleware to deliver data and images from one business process to another.

After a careful analysis of the requirements, the vendor used a combination of commercial off-the-shelf packages, application framework and custom development to deliver the solution for the legal department's system. This enabled the system to leverage an advanced and proven application framework and available solutions in the market wherever possible, that are able to satisfy the business and operational needs of the system so that a cost effective and quality system can be delivered within the expected timeframe.

The solution had been designed keeping in view the following major principles:

- **Open architecture:** The solution is based upon open standards to allow for ease of future expansion and services to be built upon the infrastructure proposed. Proven technology and standards such as J2EE, XML and relational database standards are deployed.
- **Scalability:** The solution has been designed so that servers can be added easily to accommodate increased users and volume. The design also takes care of the ease of potential extension of the usage of the system beyond the defined user environment, i.e. the Internet.

- **Ease of use:** The solution has been designed to allow the end user to access from the common web browser. The deployment of web solution also enables the users to perform their tasks without being constrained in their office environment.

The overall application architecture for the custom built application was based on the N-Tier web-based architecture. The architecture of the system adopted a layered service-based approach with collections of co-operating and communicating services.

Service driven architectures refer to architectures that provide a high quality of service delivery. This can be achieved by listing services in well-defined public interfaces with discretely packaged functionality. In the context of this system, the supporting application and security services encapsulate the business services in the application layer. The business components of the system like CIMS, SSMS, CAS, Insolvency e-Services, etc. can then ask for services rather than interacting with them directly. This loose coupling means that service-based architectures are less brittle and respond easily to changes in business demands.

This service-based concept allows the system to be further tuned to provide additional functionality/services. Subsequently, applications are able to share these added functionality/services, hence promoting reusability of complicated services and making the application more extensible and easier to manage.

In addition, the layered approach allows the design of this system to be modular by using the “building-blocks” concept. Components can quickly be developed and deployed using lower layer application services. By using this approach, the developed application modules can easily be reused. This has the added advantages of saving cost and manpower efforts as well as ensuring standardization in the implementation of proposed system application services.

The J2EE platform provides a reusable component model, using Enterprise JavaBeans and JavaServer Page technologies to build and deploy multi-tier applications that are platform and vendor-independent. The system leverages heavily on state-of-the-art technologies such as:

- Java and Object Oriented Design
- Design Patterns and Sun’s Core J2EE Design Patterns
- The Internet and Internet based standards/protocols (eg. HTTP / HTML / RMI-IIOP / XML)
- J2EE standards like JSP (JavaServer Pages), Java Servlets, Enterprise JavaBeans (EJB) Component Architecture, JavaMail and JNDI (Java Naming and Directory Interface).

The N-Tier J2EE based architecture consists of the following tiers as shown in Figure 1:

- Client tier – Mainly front-end client browser

- Web tier – Hosts the web servers and other web services
- Business tier – Hosts the application servers and line of business servers
- Data and Interface tier – Stores and delivers data to the application. This tier possesses RDBMS and few interface systems

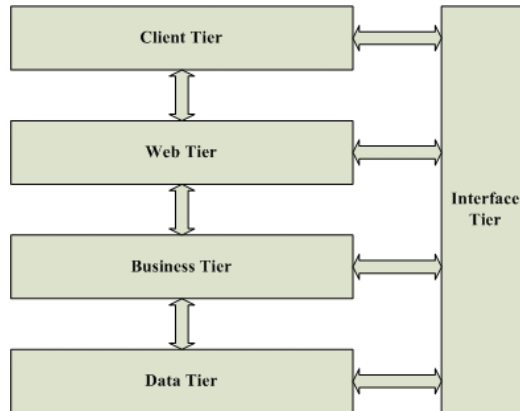


Figure 1  
Implementation Architecture

## 2.4 Implementation Process

Prior to the implementation, a system load performance test was carried out on the production environment. To facilitate this testing, data converted in the user acceptance testing environment was ported over to the production environment. Users made use of these functions for verification and update of code and parameter lists, in preparation for the final phase implementation.

The data conversion process was carried out over a weekend before the implementation. Users were involved in the meetings where data mapping had to be established between the old system's data and new system's data structure. For some special scenarios, users had to decide on the conversion strategy. After data was converted, users tested the new system by accessing old converted records to verify that there are no issues with the conversion. After the data was successfully converted, users verified the data and performed wellness testing.

The system was implemented in two phases:

- Phase 1 – Web portal and FMS
- Phase 2 – Rest of the system

There was also a contingency plan in the event of implementation failure. In the event of the implementation failure, users would switch back to the existing systems. Before the commissioning of the system, all end users and technical support staff were trained by the vendor company.

## 2.5 Testing

The testing aimed at achieving the following objectives:

- Verifying that the system meets business requirements.
- Confirming that the system performs to acceptable levels.
- Confirming that the system operates correctly with interfacing systems.
- Verifying the usability of the system functions.

The scope of the testing included testing for the online and batch functions (including converted data) covering the following aspects:

- Functional - To ensure that the system satisfies the requirements spelt out in the functional specifications.
- Error handling - To ensure that the system detects incorrectly entered data and displays appropriate error messages in accordance with the validation rules.
- User interface - To check the page layout of all the functions and to ensure that the system complies with the user interface standard as spelt out in the proposed system's user interface design standards.
- Performance - To ensure that the system meets the performance standard as specified in the functional specifications.
- Control - To ensure that proper audit trail is created for critical functions as specified in the functional specifications.
- Inter-system - To ensure successful communication between all sub-systems of the proposed system.
- Compliance - To check that the functions have been developed in accordance with proposed system's project standards and procedures.

The testing approach adopted was based on each logical functional group/module identified in the various systems. Test specifications were created according to each logical functional group/module. For each incident encountered, there was proper follow-up to correct and retest the issue before closing it. When all problem reports were resolved and closed, the system was considered ready for user acceptance testing.

## 2.6 User Acceptance Testing

This was the final test and, as suggested by its name, stakeholders, IT managers and users played the main roles in this stage [29]. Test specifications were released to users for review before the actual start date. Each release was accompanied by an increase of the version for the user acceptance testing plan. The test specifications were reviewed and signed off by the users. A user acceptance testing briefing (of around 1 hour) was conducted during the 1<sup>st</sup> session of the user acceptance testing for each group of modules released. The user

proceeded with the user acceptance testing after the briefing. Users were actively involved in testing all functions of the system. They would report errors and after the development team resolved them, users would retest the functions. Some enhancements were also made during this stage. There were weekly review meetings to review the user acceptance testing progress (updated by users) and status of the problems/changes reported (updated by the developers). When all reported problems were resolved and closed, the system was considered ready for operation.

### **Conclusion**

This study provides valuable insights towards understanding the implementation process, different components (modules), sub modules, design and testing issues to provide quality services in insolvency and trustee matters of legal business information system.

End-user satisfaction includes five components: content, accuracy, format, ease of use, and timeliness. User's feedback showed they were satisfied with the system operation. The system provided precise, concise information and the reports content met stakeholders' needs. Users found that the report format was clear and useful and they also appreciated the system's user-friendliness and up-to-date information content, which was delivered on time. It is also significant to mention the following issues related to this implementation:

- End users are satisfied. No major problems have been encountered since the system was implemented.
- Developers are also satisfied with work. The same team that developed the system is also maintaining the system. Hence users have no problem working with the IT team for enhancements or problems encountered with the system. Problems encountered have all been solved within the service level agreement period.
- There have also been frequent enhancements requested, which indicates that users have actually been using the system and would like to improve it further.

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