

# Document and Case Management Software for Law Firms: Bringing Technology and Tradition Together

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**Abstract:** Lawyers play an important role in maintaining law and order in the society we live in and thus help in settle unrest and disorder prevailing in the society. People involved in disputes approach attorneys with their legal issues belonging to various domains namely domestic issues, legal disputes, business and other professional matters, complaints and claim for justice against malpractices and many more. Attorneys when accept these cases become responsible for the further advancements of the cases based on the legal hearings that follow. This may be a long, time consuming and tedious process for the attorneys as well as the victim. Documents play a major role in the entire process and are the backbone of every case. Therefore document management thus is an extremely important aspect for the attorneys which practically are the backbone of the entire process.

**Index terms:** Law firms; Case; Document; Management;

## 1. INTRODUCTION

There have been some evidences and statements in the past which claim that lawyers cannot adopt technological advancements as rapidly as they are actually expected to and hence cannot maintain a pace with the advancing and ever-developing world. One such reference can be found in Ted Lewis's "LIVING IN THE REAL TIME, SIDE A"(Computer, september 1995, pp.8-10)

But as a step towards proving the above claim untrue there have been some successful attempts to merge technological advances with the traditional methods of working in countries like norway and germany in the last decade.

### 1.1 Need of automation in work-

- Clients have huge expectations from lawyers and law firms which sometimes may not be fulfilled due to human errors and constraints involved in manual work.
- Automation of work can make it independent of place and time which thereby supports the concept of globalization prevailing in today's world.
- A software delivering inputs to the attorneys will certainly put them up more efficiently and in lesser time as compared to the same job being done by a human being.

## 2. THEORY

### 2.1 Introduction to a Law Firm.

Law firm is a business entity formed by a few or many lawyers working together with similar business interests. Similar to other business entities law firms have lawyers as their employees and victims as customers.

### 2.2 Introduction to a case.

A person with a problem and a person with an appropriate solution need to be brought together in order to fulfill each other's demands. "Campaign management system" plays the role of getting substance to achieve this target.

People are usually divided as-

- COLD- People who do not respond to the attempt made by law firms or lawyers in order to fetch for similar cases.
- WARM- People who respond but passively to the attempt made by law firms or lawyers in order to fetch for similar cases.
- HOT- People who actively respond to the attempt made by law firms or lawyers in order to fetch for similar cases.

### 3. SYSTEM ARCHITECTURE

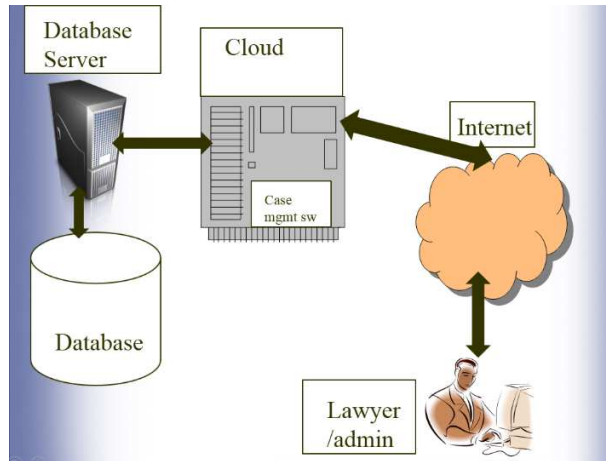


Fig1.System Architecture Diagram

### 4.SYSTEM FEATURES

#### 4.1 Legal Calendars

From statutes of limitations to staff assignments, the system track everything and everyone in one master calendar with multiple views. The user chooses what type of calendar, layout and content he wants – daily, weekly, monthly or side-by-side staff calendar. Dragging and dropping of events, changing the colors and much more is allowed.

- Appointments
- Dead Lines and To Do's
- Show Adjournments
- Change Notifications
- Appointment Reminders
- Group Schedule
- Linking Documents and Emails to Events

#### 4.1.1 Appointments

The calendar feature tracks appointments, displays deadlines and lists to do's in a familiar daybook format. One can easily set an appointment by selecting a time range on the calendar using the mouse. Change an appointment with drag and drop re-scheduling to a different time on the same day or to another date.

Simple to use, but far more than a simple calendar. With this one can associate each event with the appropriate file(s) and people. Quickly access file

information for associated files.

#### 4.1.2 Dead Lines and To Do's

Tasks and deadlines are a vital part of the practice of law. This Software makes sure that a track is kept for both. Schedules can be made when one wants to start working on something and have its deadline appear separately in his calendar with a different Color and warns the user about how much time is left. The Daily Practice Reminders include alerts about deadlines and milestone events as well.

#### 4.1.3 Show Adjournments

Appointments get postponed all the time. Now, when an appointment gets adjourned, one can track and view its history including original date, rescheduled date and reasons for adjournment from the calendar feature.

#### 4.1.4 Change Notifications

When ever any change is made it gets reflected to all users. The notification tool helps to track scheduling changes, whether a user is the organizer or an attendee.

E) The system Makes sure all people involved in the case remember the meeting with the handy appointment reminders. Automatically remind attendees via Reminder Alert or email message. One can decide how much warning to give . One can even decide the date and time of day when one wants them to be reminded. The system can also automatically email a client a day ahead of time to remind them of the scheduled meeting.

#### F)Others View

View calendars by day, week, date range, month, year or in lists if you prefer. The system provides Controls for the views conveniently in the toolbar just below the calendar.

#### 4.1.5 Group Schedule

In Group Scheduling one can view multiple calendars at once and in a format one would prefer. Group calendars update dynamically as anyone makes a change. The calendar can display any cross-section of people in your firm or display information just for you. So one can use this to design custom calendars for yourself as well.

#### 4.1.6 Linking Documents and Emails to Events

Associate can save document records to an event in his calendar for quick and easy reference. It's much more convenient when the meeting agenda, draft

agreement, transcript or other relevant document is there in the calendar with the event it relates to. Associate can also save emails to an event in the calendar for quick and easy reference. So the to do list can show the emails you are following up on, or related emails can be attached to appointments.

## 5. RESEARCH ASPECT

### 5.1 Document Management and Assembly Module

Document management system is one of the module of system which offers the functionality of handling documents in such a way that documents can be created, shared, organized and stored efficiently and appropriately for law firms. The focus of document management is on the organization and storage of documents.

#### 5.1.1 Features:

- Able to upload and download documents from server.
- Admin and lawyers can view clients' documents.
- Document upload and download facility.
- All the documents related to case are gathered in one docket(folder).
- Also for ease retrieval of documents the system provides searching facile for documents on the basis of entered query.

#### 5.1.2 Document Searching Module

For document searching feature the system implements page ranking document searching algorithm. This algorithm calculates the rank of each document in database according to query entered by user and returns the documents according to their rank.

##### 5.1.2.1 Algorithm

Input: Keywords (set of keywords in user query),  
 WP (set of web documents to be searched),  
 Q (set of interrogative words)  
 Output: Rank [WPj, Keywords[K], Qp]

1. for each Keywords[k] of set Keywords do,
2. for each WPj of set WP do,
3. for each WPj[i] do,
4. increaseWordsj by 1
5. if (Keyword[k] = WPj[i]) do
6. increaseFreqk by 1
7. for (l=i-5 to i+5) do,
8. Disp =  $\infty$
9. for each Qp of set Q do,

10. if(Qp= WPj[i] ) do
11. TEMPP = | WPj[i] – WPj[l] |
12. if(Disp>TEMPP)
13. Disp= TEMPP
14. End for
15. End for
16. for each Disp do,
17. if(Disp!= $\infty$ )
18. Rank [WPj, Keywords[K], Qp]=(11 - Disp)+(Freqk/Wordsj)
19. End for
20. End for
21. End for
22. End for

### 5.2 Page Ranking Algorithm for Indexing Web Page.

Ranking algorithm for indexing the web pages for effective Semantic information retrieval by ranking the pages.

The input of algorithm is the keyword specified in the meta-tags of the web page, set of interrogative words and web pages.

The output of algorithm is the rank of the web pages with respect to the keyword and interrogative word.

The ranking results can be further used for indexing the web pages according to the ranks calculated. In the indexed database, the links of the web pages, keyword, interrogative word and its rank corresponding to the keyword and the interrogative word is stored. So the indexing of the web pages become very simple which further makes the retrieval more fast and efficient. Hence the interrogative words and main keywords in user's query are searched in the indexed database and where the words matched in the database, the corresponding links are shown in descending order of the ranks.

#### 5.2.1 Algorithm explanation:

Let **WP** be the set of web pages that are to be searched.

**Keywords[i]** be the set of keywords for which searching is to be done which are taken from meta-tags and heading of web pages.

**Q** be the set of interrogative words like what, why, where, how, when, if etc.

**Freq** is the frequency of the word at particular iteration.

**Rank** is the set of ranks of different web pages **WP** for set a words **Keywords** and **Q**. **Words** be the set of total number of words in different web pages. Let say a keyword **K** is selected from the set of keywords.

For k we select a web page W on which searching is to be done. So scanning of the whole web page W comparing each word with K is done. As soon as K at any index I of W is found, the frequency F for K is incremented by 1. Total number of words WD in W is also calculated. Then from the index i-5 to i+5, any interrogative word IW is found as we are assuming that the relevancy of interrogative word is only there if IW is found within 5 words before or after the word K. If IW is found then the distance D between IW and K is calculated by subtracting their index. After calculating the minimum distance, the rank of W for IW and K is calculated by adding (11- D) and frequency factor that is F/WD. So the page with high rank is more relevant.

### 5.2.2 Analysis of algorithm:

Algorithm gives output that is rank of documents in definite time, hence it is deterministic in time hence belongs to P-Class.

### 5.3 Implementation of Data Mining.

In simple terms, data mining is gaining knowledge from the data. The data sources can include databases, data warehouses, the web, other information repositories or the data that is streamed into the system dynamically. Association pattern in data mining plays an important role in the process of mining data from frequent item sets. Finding frequent patterns are called associations. Patterns can include item sets, sequences and subsequences. A frequent item set refers to set of data items that often appear together in a transactional data set. E.g. On Sunday when people go to the market to buy vegetables they also buy a bottle of beer. Now if we observe this trend we can decide the strategies to offer discounts on other products. These will not only help in gaining profits but also customers will be happy because the decisions regarding product discounts are taken in their interests.

#### 5.3.1. Algorithm

##### 5.3.1.1 Algorithm:

**Apriori.** Find frequent item sets using an iterative level-wise approach based on candidate generation.

##### 5.3.1.2 Input:

D, a database of transactions; *min\_sup*, the minimum support count threshold.

##### 5.3.1.3 Output: L, frequent itemsets in D.

##### 5.3.1.4 Method:

- (1)  $L_1 = \text{find frequent 1-itemsets (D)}$ ;
- (2) for  $(k = 2; L_{k-1} \neq \phi; k++)$  {
- (3)  $C_k = \text{apriori\_gen}(L_{k-1})$ ;
- (4) for each transaction  $t \in D$  { // scan D for counts
- (5)  $C_t = \text{subset}(C_k, t)$ ; // get the subsets of t that are candidates
- (6) for each candidate  $c \in C_t$
- (7)  $c.\text{count}++$ ;
- (8) }
- (9)  $L_k = \{c \in C_k / c.\text{count} \geq \text{min\_sup}\}$
- (10) }
- (11) return  $L = \cup_k L_k$ ;

Procedure *apriori\_gen*( $L_{k-1}$ :frequent (k -1)-itemsets)

- (1) for each itemset  $l_1 \in L_{k-1}$
- (2) for each itemset  $l_2 \in L_{k-1}$
- (3) if  $(l_1[1] = l_2[1]) \wedge (l_1[2] = l_2[2]) \wedge \dots \wedge (l_1[k-2] = l_2[k-2]) \wedge (l_1[k-1] < l_2[k-1])$  then {
- (4)  $c = l_1 \bowtie l_2$ ; // join step: generate candidates
- (5) if has infrequent subset( $c, L_{k-1}$ ) then
- (6) delete  $c$ ; // prune step: remove unfruitful candidate
- (7) else add  $c$  to  $C_k$ ;
- (8) }
- (9) return  $C_k$ ;

procedure *has\_infrequent\_subset*( $c$ : candidate k-itemset;  $L_{k-1}$ : frequent (k-1)-itemsets); // use prior knowledge

- (1) for each (k-1)-subset  $s$  of  $c$
- (2) if  $s \notin L_{k-1}$  then
- (3) return TRUE;
- (4) return FALSE;

#### 5.3.2 Application

This algorithm is going to be used to generate reports regarding which lawyer is best in which case type or which justice passes the judgments for/against which case type.

The same reports will be presented in bar charts, pie charts and histograms to the administrator of the law firm. This analysis will help the administrator to take the business decisions more intelligently

## **6. CONCLUSION**

We can thus safely conclude that this DOCUMENT MANAGEMENT AND CASE MANAGEMENT SOFTWARE will surely prove a boon for all the lawyers working on various cases all over the world. It embarks a successful blend of new-age technology and traditional working style thus retaining the positive aspects of the traditional method of work and introducing automation with the help of technology.

## **7. FUTURE SCOPE**

The future scope of this application can be implementing the same system on an android platform or any other platform supportive to mobile phones so that it could be used handily by all lawyers.

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