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Design and Implementation of a Document Repository and Work Flow System in the Parliament of Kenya

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ABSTRACT

The project report was undertaken in order to learn and use systems and standards for Parliamentary documents. Systems for managing documentation in digital formats can make Parliamentary operations efficient and help increase the transparency of the institution. These systems are evolving to encompass the entire lifecycle of documents from creation through management, dissemination, and long-term preservation. Within these phases documents may be edited and amended by various "authors"; exchanged with different organizations and systems; transformed, for purposes such as searching; validated and certified via digital signatures; rendered in various modes, including printing on paper and online displays; and integrated with other documents. In particular, it is suggested by the researcher that the main goal is to streamline the flow of information in the Parliament of Kenya through the design and implementation of a Document Repository, a web portal and a Workflow system for the Parliament of Kenya. This report describes the features of a document repository and workflow systems that are used around the world, the technical information relating to the project, the methodology that the developer used, the functional and non-functional requirements, the features of the new system, the implementation of the system and finally the testing that was used. This project was extremely helpful for the programmer because it gave him the opportunity to learn a software development tool and to consider a software product from a legal point of view.

Keywords: Parliamentary documents, Systems, Parliamentary operations, Document Repository, Institution.

INTRODUCTION

Systems for managing documentation in digital formats could make Parliamentary operations efficient and help increase the transparency of the institution [1-4]. This system evolved to encompass the entire lifecycle of documents from creation through management, dissemination, and long-term preservation. Workflow technology is becoming the key technology for business process modelling, reengineering and automating [5-8]. During the workflow specification, enactment and administration, there may appear various types of metadata about workflow specifications and instances. A repository manager is therefore necessary to store and manage these metadata Within these phases documents might be edited and amended by various "authors"; exchanged with different organizations and systems; transformed, for purposes such as searching; validated and certified via digital signatures; rendered in various modes, including printing on paper and online displays; and integrated with other documents [9-13]. Pursuant to section 30 of the Constitution, the Parliament of Kenya consists of the President and the National Assembly. The National Assembly, pursuant to section 31 of the Constitution, consists of Elected and Nominated Members; who are currently 210 and 12 respectively. In the exercise of the legislative power of the Republic of Kenya, bills are passed by the National Assembly and become law on the President giving his assent, thus becoming styled Acts of Parliament. Similarly, in its deliberative role and oversight of the Executive, resolutions adopted by the National Assembly are implemented by the Executive, headed by the President. Thus, the use of the term Parliament refers to an institution larger than the National Assembly and the President in their

separate entities [14-17]. The Constitution contained articles which provide for the establishment, composition and functions of the Parliament of Kenya and empowers the Parliament to make laws on any matter for the peace, order, development and good governance of Kenya and to protect the Constitution and promote democratic governance in Kenya. The constitution establishes a Parliamentary Commission, which is a body corporate [11-17]. The responsibility for the organisation and strategic guidance of the Parliament of Kenya rests within the Commission. It is chaired by the Speaker of Parliament and has seven other members, namely, the Leader of Government Business, the Leader of Opposition, the Minister of Finance, Planning and Economic Development, and four Commissioners elected among the Members of Parliament. The Administration of Parliament provides for the organisation and administration of the Parliament of Kenya and for the employment and remuneration of staff of the Parliamentary Service.

Statement of the problem

The lack of a central document depository and the uncoordinated flow of information in the Parliament of Kenya have led to difficulties in controlling the information that is available to members of Parliament, staff and the general public. This has led to poor performance of the Parliament of Kenya regarding its constitutional role of oversight, legislation and accountability.

Aim

The objective of this project was to streamline the flow of information in the Parliament of Kenya through the design and implementation of a Document Repository, a web portal and a Workflow system for the Parliament of Kenya.

Specific Objectives

- To investigate the existing document repository and workflow system problems.
- To design and implement a document repository and a bill Tracking Workflow to store all parliamentary documents.
- To implement a web portal that would act as an interface for the citizens to participate in the legislative process.
- To evaluate the document repository and workflow system.

Research Questions

This work sought to answer the following question:

I. What are the existing methods of document repositories?
II. How can we design and implement a document repository and bill-tracking workflow system to store all parliamentary documents?
III. What steps should be taken to implement a web portal that would act as an interface for the citizen to participate in the legislative process?
IV. How can we evaluate the document repository and workflow system?

METHODOLOGY

The project used UML, a graphical language for visualizing, specifying, constructing, and documenting the artefacts of a software-intensive system. The UML offers a standard way to write a system's blueprints, including conceptual things such as business processes and system functions as well as concrete things such as programming language statements, database schemas, and reusable software components OMG (1997) for modelling the system.

Organization units that were studied

The organization that was studied was the Parliament of Kenya which is a document-centric organization ready to run the e-government and e-Parliament system. This institution was chosen because its size had grown very fast and the file-based system that is currently used had become inefficient. That is why the researcher had chosen to come up with a more efficient bill-tracking and document repository workflow system. Such a system for managing documentation in digital formats would make Parliamentary operations efficient and help increase the transparency of the institution. It would also allow for purposes such as searching; validating and certifying documents via digital signatures; rendering in various modes, including printing on paper and online displays; and integrating with other documents.

The population that was used in the research

The population that was studied included Members of Parliament (MPs) and the general staff at the Parliament.

Sample selection

The researcher used random sampling to select respondents from the Parliament clerk and general staff. In the Hansard department, three respondents were interviewed.

Research procedure that was used

Prior to the study, a letter was submitted to the Clerk of the Parliament of Kenya asking for permission to carry out the study. This was done in order to establish a good relationship with the institution in addition to showing the urgency of the study.

How data was collected

Data was gathered from the sample given below. The major techniques that were used included interviews with limited questionnaires and document analysis. The choice of the method depended on the information needed and the time available for the various respondents.

Interview

"An interview is an oral administration of a questionnaire or an interview schedule", [1]. Interviews are face-to-face encounters. To obtain accurate information through interviews, a researcher needs to obtain maximum cooperation from respondents. Thus, one must establish a friendly relationship prior to conducting an interview. Interviews have the following advantages:

- It provided in-depth data which is not possible to get using a questionnaire.
- It was possible to obtain data required for specific objectives.
- The researcher was able to clarify certain questions and thus it was more flexible compared to other methods.
- The interviewer was able to get more complete and honest information.

However, demerits such as high cost, need for a high level of interpersonal skill, bias, small sample size, and responses being influenced will always be expected. Interviews are also of two types that are structured and unstructured interviews. Structured questions usually are categorized and the interviewer simply checked the respondent's response while in unstructured questions, the interviewer asked questions or makes comments intended to lead the respondent towards giving data to meet the study objectives.

Questionnaires

A questionnaire is commonly used to obtain important information about the population. Each item in the questionnaire is developed to address specific objectives. And therefore, a questionnaire must be well thought out so as to avoid cases such as; Confusing respondents as to the nature of the information required. Also, a bad questionnaire discourages respondents to the extent of discarding the questionnaire and this may leave out important information required in the study. Questionnaires were of two types namely; open-ended and closed-ended questionnaires.

Closed-ended questionnaires have the following advantages:

I. They are easier to analyze since they are in an immediately usable form.

II. They are easier to administer since each question is followed by possible answers and they are economical in terms of space, time, and money. However, they are more difficult to construct and normally responses are limited and respondents are compelled to answer according to the researcher's choice. Open-ended questionnaires on the other hand give the respondent complete freedom to answer the way he/she wants, permit greater depth of response, and it is easy to formulate compared to closed-ended questionnaires, and really give's one feeling about a given study. However, there's a tendency of respondents to give information that would not answer the questions at hand and responses would be difficult to analyze and would be time-consuming and expensive compared to closed-ended questionnaires. The fact that I was interested in specific data from respondents, I recommended that closed-ended questionnaires were to be used to make it easier for me to analyze the data. From the clerk, interviews were used exclusively, from the MPs and the general staff, both interviews and questionnaires were used. Interviews were conducted one on one whereas, for those who were using questionnaires, they were given four days to complete the documents. After that period of time, the researcher collected the documents to be used for analysis.

Analysis and Design

Once data was gathered, the researcher presented it in a way that was easily interpreted. Many analytical tools or modelling tools were available. Modelling tools enabled the analyst to come up with a pictorial representation of a system. Examples are CASE tools, dataflow diagrams, flow charts, connectivity diagrams, grid charts, decision tables and many others. CASE tools: (computer-aided software engineering) is a software program that

automates many activities in the System Development Life Cycle (SDLC) and was also used to analyze various aspects of a system. Data flow Diagrams (DFD): A data flow diagram also known as a process model, graphically shows the flow of data through a system that is, the essential processes of a system along with inputs, outputs, and files. [2]. System flow charts: Also called the system flow diagram a system flowchart diagrams the major inputs, outputs, and processes of a system. In some cases a systems flow chart can be used in place of DFD; in other cases, it is useful to supplement. Grid, charts; this shows the relationship between data on input documents and data on output documents. Decision, tables: This shows the decision rules that apply when certain conditions occur and what actions to take. That is, it provides a model of a simple, structured decision-making process. It shows which conditions must occur in order for particular actions to occur.

Document analysis

The first document the analyst sorted out was the organization's organization chart to enable him to study and understand the flow of authority and information. The analyzer further read documents that described the problem at hand. Such documents included; documentation of the current system, constitution, enrolment records, accounting records, brochures showing fee structures and any other relevant reports. All these could enable the analyst to get a view of the kind of information to be used and reports to be printed and many others,[3]. Given all the above data collection techniques, the researcher looked at the exact problem to be addressed and the prevailing conditions and thereafter chose which method to use or where possible he as well chose to integrate all of them.

Development Methodology

System analysis and design is a six-phase problem-solving procedure for designing an information system and improving it. The six phases make up what is system development life cycle. The system development life cycle (SDLC) is defined as "The step by step process that many organizations follow during systems analysis and design" [4]. The number of phases may vary from one company to another, and even the name of the process may differ (application development cycle, structured development life cycle, for instance). The six phases of systems analysis and design may be said to be as follows: Preliminary investigation: Conduct preliminary analysis, propose alternative solutions, and describe the costs and benefits of each solution. Submit a preliminary plan with recommendations. If you are doing a systems analysis, and design, it's safe, even preferable to assume that you know nothing about the problem at hand. In the first phase, it's your job to mainly ask questions, do research and try to come up with a preliminary plan. Systems analysis: Gather data; analyze the data using tools of written documents, interviews, questionnaires, observations, and sampling. Analyze the data using CASE tools, data flow diagrams, systems flow charts, connectivity diagrams, grid charts, and decision tables and write a report. Systems design: Make a preliminary design and then a detailed design using CASE tools, prototyping tools and project management software among others. Do a detailed design, defining requirements for output, input, storage, processing and system controls and backup finally, write a report. System development: Acquire the hardware and software and test the system. In the make or buy decision, you decide whether you have to create a program or have it custom-written or buy it meaning simply purchase a system software package. If you decide to create a new program, then the question is whether to use the organization's own staff programmers or higher outside contract programmers (Outsource it). Whichever way you go the task could take many months. Having made a decision, the hardware to run it must be acquired or upgraded or buy new hardware. System implementation: Convert the hardware, software, and files to the new system and train the users. Convert using any of the following conversions; parallel, phased or pilot. Compile final documentation and train the users. Systems maintenance: Audit the system, request feedback from its users, and evaluate it periodically. Development methodology (Systems development life cycle). The following steps were used to develop the system under study. Preliminary investigation: this phase was conducted for the purpose of determining the cost of operation on the old system and the cost expected for the new system. The problems with the old system were identified through interviews and questionnaires. Systems analysis: the data gathered from the above phase was arranged and prioritized. From the findings of the study, a system's specification was made stating what the system would do to meet the supermarket's goals. Systems design: a logical design for the system that meets the user requirements was made. This would be done by use of a sequence diagram.

RESULTS

Data presentation

Most data presented and illustrated was analyzed from the 15 respondent questionnaires gathered from the survey at the Parliament of Kenya.

The Occupation of respondents

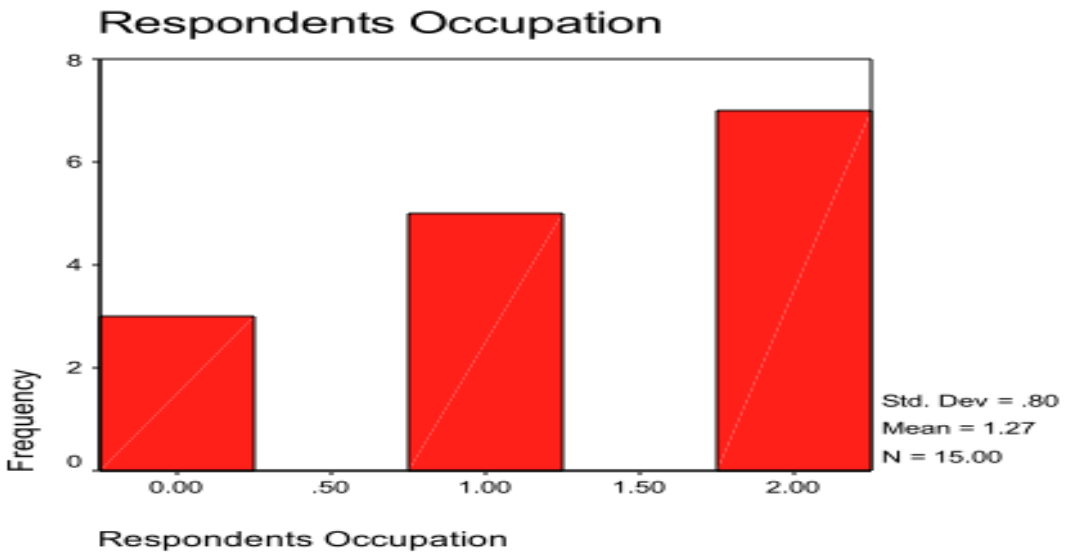
The findings on the occupation are presented in the table below.

Table: 1 shows the occupation of the respondents

Respondents Occupation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	MP	3	20.0	20.0	20.0
	Minister	5	33.3	33.3	53.3
	Others	7	46.7	46.7	100.0
	Total	15	100.0	100.0	

Figure: 1 shows the occupation of the respondents



Source: primary data

The majority of respondents' occupations were other staff, followed by ministers and MPs, with 46.7, 33.3 and 20.0 valid percentages respectively which were accounted for by the fact that the study was mainly focused on them.

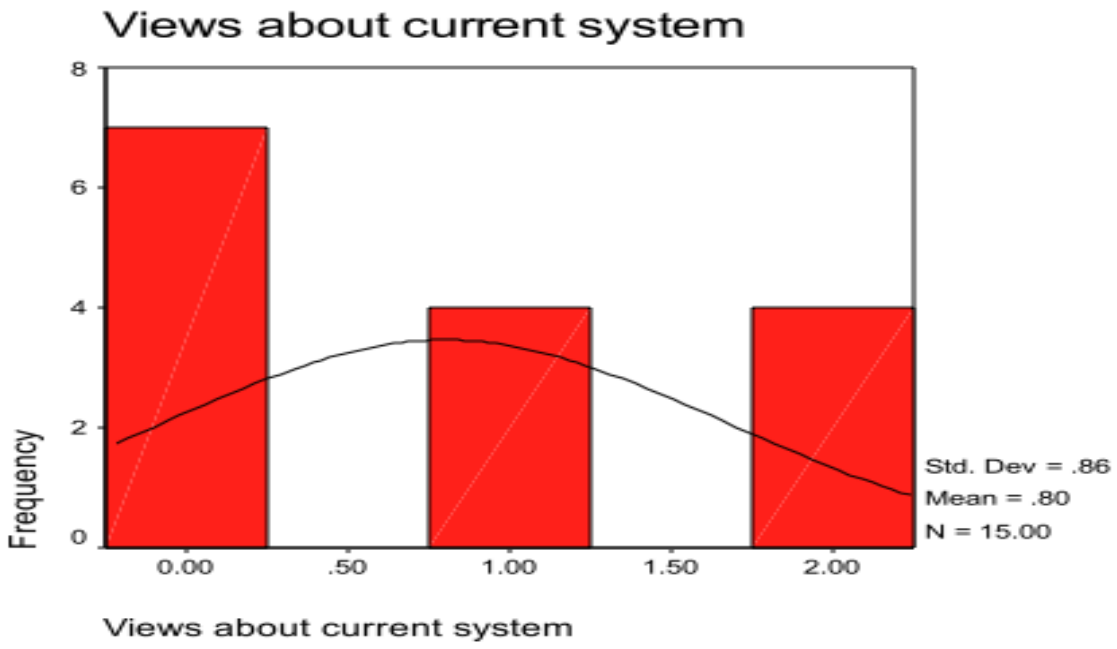
Respondent's view about the current document handling system

Table: 2 shows the views about the current system

Views about current system

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	excellent	7	46.7	46.7	46.7
	good	4	26.7	26.7	73.3
	average	4	26.7	26.7	100.0
	Total	15	100.0	100.0	

Figure 2: Shows the views about the current document handling system



Source: Primary data

46.7% of the respondents agreed that parliament's growth rate is good, only 26.7% said that the growth rate is averaged and the others followed.

Statistics

Table 3: How efficient is the existing System

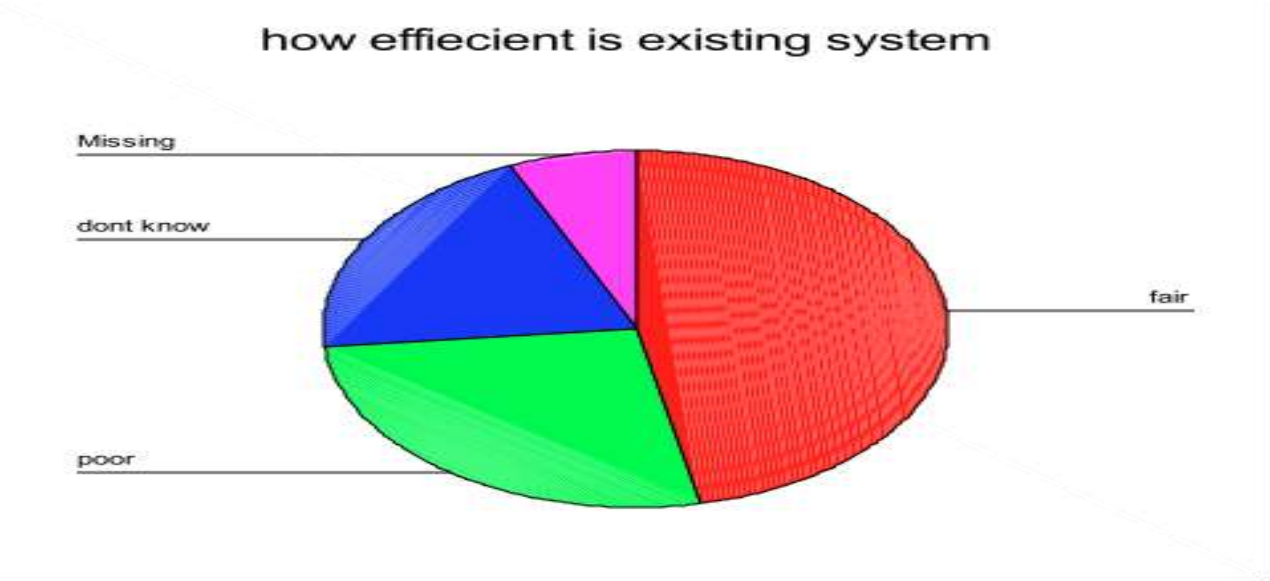
Valid	14
Missing	1

Table 4: Table showing the efficiency of the current system

how effiecient is existing system

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	fair	7	46.7	50.0	50.0
	poor	4	26.7	28.6	78.6
	dont know	3	20.0	21.4	100.0
	Total	14	93.3	100.0	
Missing	System	1	6.7		
Total		15	100.0		

Figure: 3 displays respondents' view on the efficiency of the current system



Source: primary data

With a standard deviation of 0.91 and a variance of 0.81, the Respondent's views about the efficiency of the current system showed that the system was in a fair state (46.7%) followed by poor (26.7%) and the rest followed.

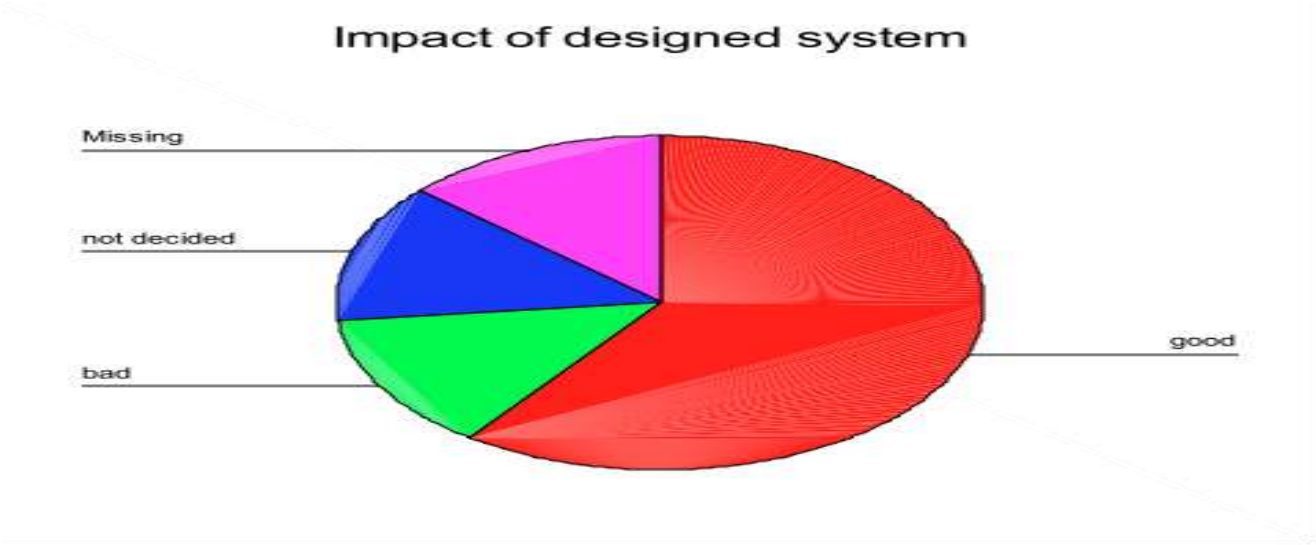
Findings on what respondents believe will be the impact of the designed system on the cost of operation (administration)

Table: 5 Table showing the effect of the designed system on the cost of operation

Impact of designed system

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	good	9	60.0	69.2	69.2
	bad	2	13.3	15.4	84.6
	not decided	2	13.3	15.4	100.0
	Total	13	86.7	100.0	
Missing	System	2	13.3		
Total		15	100.0		

Figure: 4 shows the effect of the designed site on the cost of operation



Source: primary data

60.0% believed that the effect would be good. However, they could not justify how good and why. They only look at having computers as a good thing. 13.3% were not decided because they don't understand anything to do with computers.

DISCUSSION

System study

Overview of the existing system processes

The existing system at the Parliament of Kenya studied was carried out. The existing system is paper based in such a way that there is no centralized system to be able to make positive contributions that would help the management of the Parliamentary body to make necessary improvements on document management performance.

Weaknesses of the existing system

From what was gathered, it was made clear that most of the problems with the old system originated from inefficiency in record tracking, storing, retrieval and manipulation of information when required. A lot of time was normally wasted while trying to carry out all these and hence there was a need for a new system that would solve problems of data redundancy, and time-wasting, reduce search time, allow easy data manipulation, with the ability to sort information, print out reports among others.

Overview of the new system

The new system is a Web-Based Document Management System for the Parliament of Kenya that facilitates the staff, members of parliament and the administration in the storage, classification and tracking of parliamentary documents, bills and other information.

Strength of the new system

The proposed system is capable of record tracking, storing, retrieval and manipulation of information when required. It is time-saving as each user knows his/her role. Data redundancy is eliminated through normalized database entities. Overall the system has clerical and attractive user interfaces that need a click to reach a specific goal.

Requirements

In order to document all the end-user requirements for the system, the data collected was analyzed using a structured analysis approach to rigorously specify the processes. This section includes the requirements of the new system that we categorized into user requirements, functional and non-functional requirements as follows;

User requirements

From the system study, the following system stakeholders were identified; Hansard, Members of Parliament and House with the following user requirements:

- View and validate information about records registered to the system.
- Should register documents and views into the system.
- Systems administrator should be able to manage users in the database.
- System administrators should be able to control data manipulation requests.

Functional System Requirements

- ❖ It should be able to accept input from the user.
- ❖ It must provide a way of keeping the system secure by the use of a password.
- ❖ The system must allow the administrator to access information entered by other users of the system.
- ❖ The system should enable the user to search the database using a keyword. This can be by for example entering a book author, file category or any other data.
- ❖ The system must only accept unique records in the database.
- ❖ It must provide a way for the user to search documents.

Non-Functional Requirements

The system was designed to fulfil the following non-functional requirements:

- The system must verify and validate all user input and users must be notified in case of errors.
- The system only allows authorized users to update records.
- The system administrator is the only one privileged to delete or add users.
- The system must allow for expansion in the future.
- The system must have a high-performance level. Its level of reliability must be high.

System Requirements

In order for the system to perform as expected, the following system specifications for hardware and software, security and operations are required.

Cost

The cost of economic feasibility was put in place to determine whether the management of the Parliament had the ability to fund the project. Technical feasibility was aimed at finding out whether the Parliament had the technical equipment to house the proposed system coupled with whether users know how to use and integrate with the system. It was found out that the users need further training and sensitization on how to use the system and furthermore, some of the technical equipment was available for implementation of the new system.

Operation

Operational feasibility was aimed at studying the environment where the current system works. This was important to ensure that the non-functional requirements of the system were applicable these included; the availability of space, electricity and safety of the system equipment.

Security

In this sub-section, it was made possible that only those users with legitimate access rights are allowed to use the system. It means that authentication was defined through the use of user names and passwords; also the addition of

more users and elimination of users especially those who left the Parliament were defined to be performed explicitly by the administrator.

System Design

In this section we presented the system design portion of the Document repository concentrating on four areas these were; high-level application design, relational database, actual system design and interface design.

High-Level Application Design

This system was a Document repository system intended to follow the design principles of a decision support system [5]. The Document repository system is made up of five components these are:

I. A Database store of all related documents to the algorithms that generate results for user queries.

II. A User interface comprising all code associated with a screen that processes user input and displays system output.

III. And a database management system comprising code that allows all of the system components listed previously to share data.

Relational Database Design

We have consolidated all system entities and attributes and these may include administration, users, research documents, reports, and departments' authority. This database we designed it with the use of database management tools such as MySQL in order to come up with a system that stores the recorded information

Actual System Design features and Interface design

The actual system design involves the following features:

- Document search tool - The document search tool allows staff to search and sort documents that can be uploaded by users. The user enters a title and description he will be searching for.
- Document uploader - This feature of the system allows users to upload reports, research and profiles that users can use for research/consultation purposes. The user can search for these documents.
- Check in/Check out - This feature gives a user an interface to confirm results on the system. The user can use the check-in button to see what has been uploaded. They can also check out a document for editing.

Interface design

As is true for most Information systems, the user interfaces are the most visible and most important to the user therefore we identified key interface design principles these were: integration with workflow, ease of use and consistency.

Diagram Designs of the system

The system developed is based materially on what was provided by the users as requirements which means that the diagrams were used as techniques in coming up with the actual performance flow of the system. The diagrams in this section take the form of Context Diagrams (CD), Data Flow Diagrams (DFD), Flow Chart (FC), Relationships and Entity Relationships Diagram (ERD). The diagrams were so useful in describing the system diagrammatically which simplified the coding process after analyzing the performance. The following are the diagrams used: Workspaces architecture. At the core is the Workspaces engine, which includes an XSL processor for executing locally accessed or remote steps. All documents are stored in the XML spaces repositories. The user interacts with the Workspaces engine directly and via invoked applications

Conceptual Designs/Logical Designs

This section defines the various entities, their attributes and data types as well as the relationships among them.

Relationship Diagrams

Figure 5: Odm_admin

	Field	Type	Collation	Attributes	Null	Default	Extra
	id	int(11)		UNSIGNED	Yes	NULL	
	admin	tinyint(4)			Yes	NULL	

Figure 6: Odm User

	Field	Type	Collation	Attributes	Null	Default	Extra
	usergroup_id	int(11)			No		auto_increment
	parent_id	int(11)			No		
	usergroup_name	varchar(50)	utf8_bin		No		

Figure 7: Odm_proguser

	Field	Type	Collation	Attributes	Null	Default	Extra
	proguser_id	int(11)			No		auto_increment
	usergroup_id	int(11)			No		
	proguser_name	varchar(50)	utf8_bin		No		
	proguser_surname	varchar(50)	utf8_bin		No		
	proguser_middlename	varchar(50)	utf8_bin		No		
	proguser_login	varchar(30)	utf8_bin		No		
	proguser_password	varchar(30)	utf8_bin		No		
	proguser_func	varchar(30)	utf8_bin		No		
	proguser_email	varchar(50)	utf8_bin		Yes	NULL	

Check All / Uncheck All *With selected:*

Figure 8: Odm_docuser

	Field	Type	Collation	Attributes	Null	Default	Extra
	docuserlog_id	int(11)			No		auto_increment
	docuser_id	int(11)			No		
	proguser_id	int(11)			No		
	docuserlog_state	int(11)			No		
	docuserlog_date	timestamp		ON UPDATE CURRENT_TIMESTAMP	No	CURRENT_TIMESTAMP	
	docuserlog_text	text	utf8_bin		Yes	NULL	

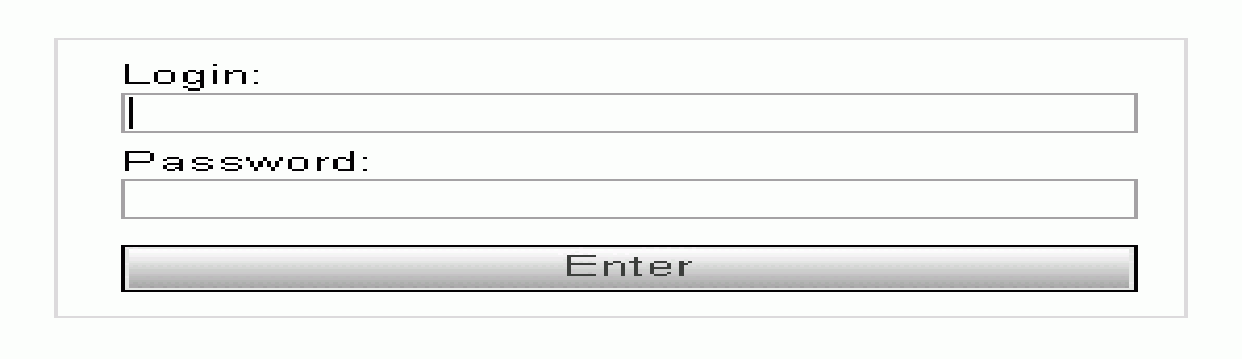
Figure 9: Odm Doctype

	Field	Type	Collation	Attributes	Null	Default	Extra
	doctype_id	int(11)			No		auto_increment
	doctype_name	varchar(50)	utf8_bin		No		
	doctype_func	varchar(30)	utf8_bin		No		

Physical design

This part of the system development life cycle was concerned with the actual construction of the designed system, testing to see whether it fulfilled the objectives, delivery of the system into day to operation, user training and finally commissioning of the system into operation. The system was designed in PHP, Javascript and XHTML and the ease that it provides in linking with the database. The database design was implemented using MySQL. This was chosen because it is more secure compared to other DBMSs. After the system has loaded, it provides the home page which is the index which has links on which the user selects, according to the accessibility that the user was authenticated. Each user was given different access credentials where the user first registers with the system then it generates a password which after login using the details he or she registered with. This was manually designed because different users access the system at different intervals hence sessions are provided to a particular user at a particular time. On accessing the system, it loads with the home page which is portrayed in the figure below.

Figure 10



If the login and password are right, there will be the window:

Figure 11

In the menu "Lists of documents" there are references to the folders "Entering documents", "Created documents", "Documents on control", "Accepted documents", "Signed documents", and "Archive". Near the folders "Entering documents" and "Documents on control" the number of unread documents was specified parenthetically.

The Structure and Functions of These Folders.

Created documents

In this folder, the created documents are kept (except the documents that were sent to the "Archive"). After clicking the name of the folder, on the screen will be its content. The content of the folder is displayed in tabular with sortable columns. The document opening is carried out in the folder "Entering documents". The new or unopened documents are bold.

Figure 12

Folder "Documents on control"

To enter this folder, it is necessary to click its name in the menu "Lists of documents".

Figure 13

The folder is for the keeping of documents, where the system user is a controller. The content of the folder is displayed in tabular with sortable columns. The document can be opened and sawn, by clicking its name.

Folder "Accepted documents"

To enter this folder, it is necessary to click its name in the menu "Lists of documents"

Figure 14

In this folder, there are documents that the user works with. The content of the folder is displayed in tabular with sortable columns. The document can be opened and sawn, by clicking its name.

Folder "Signed documents"

To enter this folder, it is necessary to click its name in the menu "Lists of documents".

Figure 15

In the folder there are documents of the user, work with that is ended, or the signed documents, if the document was in the coordination.

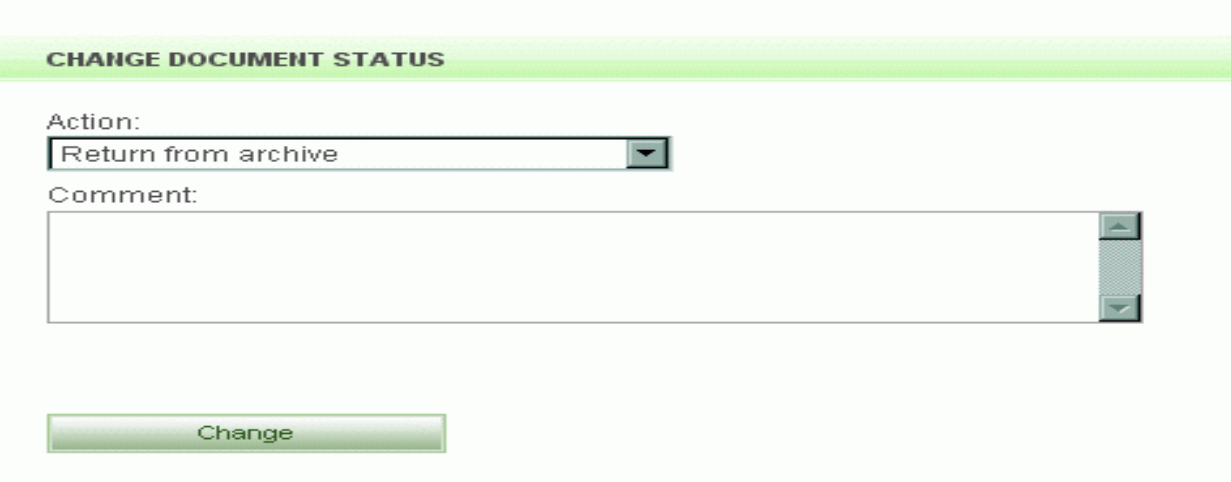
Folder "Archive"

To enter this folder, it is necessary to click its name in the menu "Lists of documents".

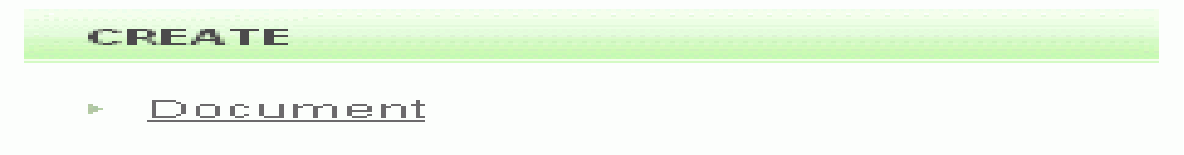
Figure 16

In this folder there are documents from the folder "Documents on control", that helped the user to decide, that the work with them was made. The content of the folder is displayed in tabular with sortable columns. The document can be opened and sawn, by clicking its name. If it is necessary, the user can return a document from "Archive". For that, it is necessary to open it, choose "Change document status" the action "Return from archive" and click "Change".

Figure 17



Menu "Create"



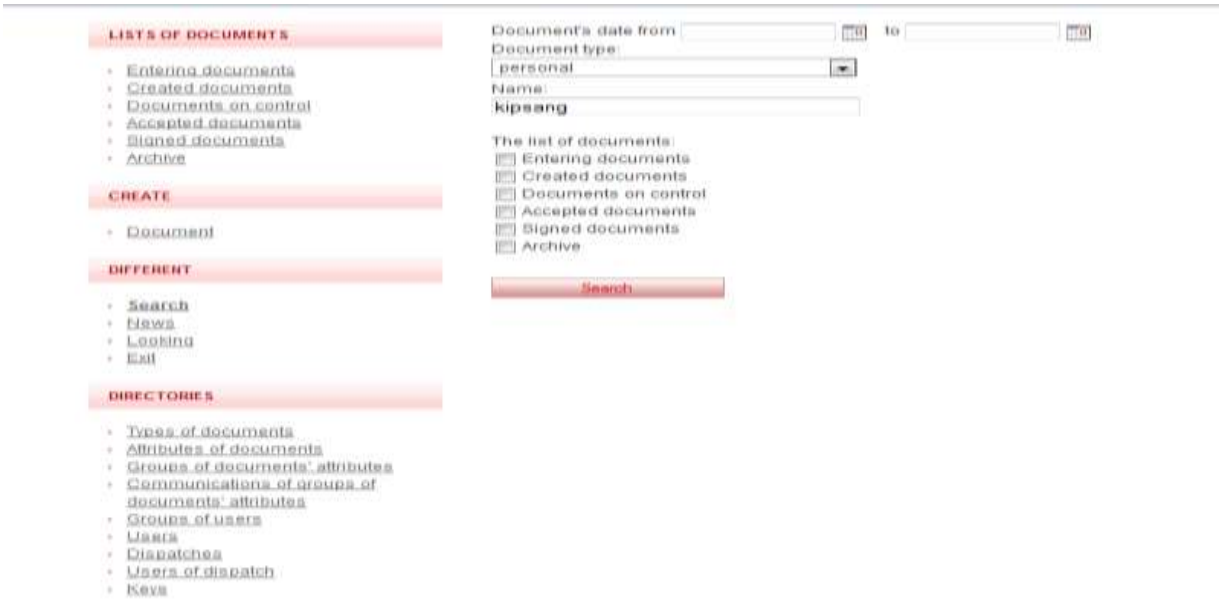
Document

The folder "Document" is used for the creation of new documents: service notes, orders, instructions etc.

Figure 18: Menu "Different"

The search is carried out by clicking "Search" and in the content of the folder of the system user. After clicking the following window appears:

Figure 19



The search can be carried out in any box. It is obligatory to point the folder, where the search will be carried out. The user can point some folders. The name of document can be pointed incompletely. For example, to find the document "E-mail settings" it is necessary to type "Setting". After that there will be a list of documents that have this word. In the search it is important, if the word is typed with capital or small letters. If the word "selling" is typed in the field "Name", the document with the word "Selling" will be not found.

News

In this paragraph the actions are displayed, that were made with documents last time.

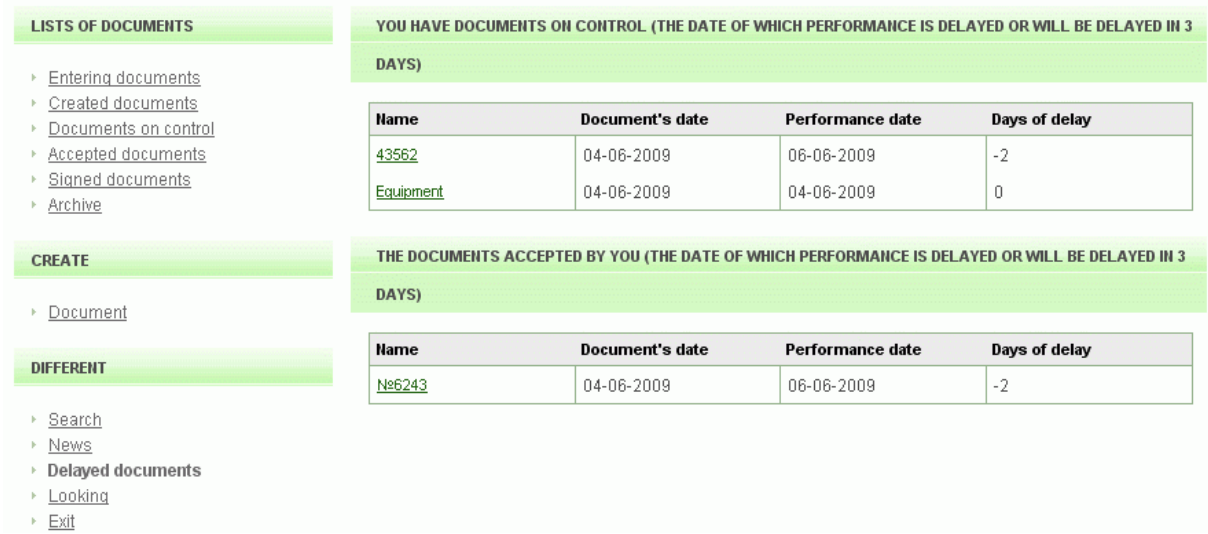
Figure 20

In the column "Date" there is the date, when the action was made. For example, when the document was signed, or when the system user was added in "Discussion" etc. To enter the document it is necessary to click its name in the column "Additional information". The news can be sent to e-mail, if the admin of the system makes some settings of the user.

Delayed documents

In this paragraph, there is a list of documents, with due dates that will be delayed by 3 days.

Figure 21



The list consists of 2 tabulations. In the first one, there are documents that are in the folder Documents on control", in the second one - in the folder "Accepted documents".
In the column "Days of delay" is the number of overdue days (if it is a positive number) or the number of days until the due date (if it is a negative number)

Looking

The user can change the colour of looking of the system on the PC:

Figure 22

It is enough to put a point near the needed color and to click "Set"

Exit

Clicking this paragraph, the user exits from the system

Implementation

This constitutes the implementation of the system. In this part, we discuss all system features that have been implemented throughout the system design.

Installation

This system was installed based on a server-side application. To install this system, the following steps were followed.

I. Unpack the archive of the installation package.
II. Copy the files from the folder www to the home folder of your web server.
III. Create the MySQL database and the user for it with rights.
IV. Realize script sql in the created database.
V. Substitute in the folder user params.php for yours:
VI. Restart the WEB server
VII. Setting is over. Enter the login root and password 1.

User training

The users have not been trained; though this task was supposed to come after testing this was so because the system has not been delivered to its end users.

System Conversion

The fact that the relationship between paperwork and computer systems is little, we recommend a parallel conversion strategy. This is a conversion strategy where both systems are kept running for some certain period of time until the new system is endorsed as a perfect system. This has the advantage that in case the new system contains some unidentified errors; the old system can always be resorted to. This strategy has also been recommended because, from the research we carried out, we found out that most of the likely users of this system don't understand it hence the need for them to first get experience and thereafter they can do away with the old system.

Change over strategy

This will be affected as long as users are comfortable with the new system in place thus a complete resort to the new system.

Testing Plan

Testing is an important part of the design of the system. It involves checking for correctness, which is one of the focuses of the project. The way to test to see if the system is working correctly is to use black box testing (or functional testing). What black box testing does is feed in inputs and obtain relevant outputs. These inputs and outputs are then studied and checked to make sure that they are the desired result, in order to make sure that the system is behaving properly. The testing process in systems like the one that we will attempt to build is not an easy job. We will not build a simple application. We will build a whole parliamentary system, which consists of sub-systems. We are planning to perform tests in parallel with the implementation of the new system and we are going to follow some testing procedures described in the software engineering literature. We will first build our database and we will insert sample data in it. Note that even if the data that we will put are samples, they are going to be taken from the real Parliament. Here we have to mention that we will have of course a smaller in physical size database, than in a real environment, but the most important is the quality of the sample data. And this quality will be the quality of a real environment. The functionality of the database will be tested with sample operations, such as queries, updates, insertions and deletions. Then we will build the Web-Client's application. We will start with the user interface in order to identify the components and objects that we will need. Then we will define the appropriate classes and methods. We will test with sample data the operation of each method independently, and inside its class. Then, we will test the functionality of each class with our database. The same testing approach we will follow with the Local-Client subsystem.

Testing Schedule

In this part, we are going to analyze the testing schedule and the techniques that we are planning to use.

Code Walk-through

The programmer who developed it inspects the code for each part of the system. This is seen as far better to find a problem at this low level rather than later in the testing cycle when several components have been joined together. These should be completed as soon as the developer completes the code for a section of the system. Things to look for in the code are syntax errors, incorrect function / variable names, and inefficient data structures. Once the changes are completed a second walk-through should occur to check for any problems created by changes made to the code.

Component testing

This should occur on the development machine, immediately after the code has been given the 'all clear' in the code walk-through. The code for the individual function is compiled and executed to see if it completes the function that it was designed for. If a section of code does not produce the required outcome then the code should be checked against the requirements specification given for that section, and rewritten as required.

Bottom-up integration test

Integration testing is where all the components will be combined together and checked to see if they work correctly. If they don't, then there are problems with the code and unit testing will have to be reviewed again in order to pinpoint the problem and correct it. According to [6], the integration test should ideally be completed on a machine that was not used during the production of any individual sections of code.

System Test

Here the objective is to make sure that the system can perform the way the customer has asked it to and that the system design has been implemented correctly. The two major issues that need to be taken into consideration here are:

- Functional testing
- Performance testing

Functional testing checks that once the system has been integrated together, it works as desired, by checking that the functional requirements have been satisfied. Performance testing checks that the non-functional requirements have been satisfied. This will include security matters, speed, accuracy, and reliability. According to Figure 3, of Chapter Four, it was found that the majority of the respondents in the sample that was taken according to age were between 30 to 40. This was so because the study was aimed at getting ideas from parliamentarians about the system and the fact that the institution is of high integrity. Based on the basis of occupation, it was found that the majority of respondents' occupation was Other parliamentary members, followed by Ministers and MPs 46.7, 33.3 to 20.0% respectively and is accounted for by the fact that the study was mainly focused on them.

RECOMMENDATIONS

A thorough and exhaustive investigation of the constraints should be carried out to determine the appropriate data values for different fields in order to ensure data integrity, though the little sample data that the system was tested on was a success. While this approach may not be appropriate in all environments, we feel that for the most part, it is especially suitable for ad hoc workflows. The concept of a document-driven model can be extended into a more comprehensive resource-based model by viewing documents as a type of resource along with other resources such as people, machines, facilities and equipment. Information about all these resources can be kept in a database, and tasks would be enabled only when all the resources are available. Thus, the same approach presented here can be easily extended to encompass multiple types of resources. Finally, the researcher recommends the system to be implemented to replace the old system simply because all samples which were taken revealed that the new system should replace the old system.

CONCLUSION

Finally, the study has not been easy at all. The researcher has acquired skills in project management and at least can make claims of having minimal experience designing database systems. In this system, it was made sure non-users are prohibited from accessing it because those people who use the system have passwords and thus used it as required.

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