IMMIGRANT WORKER INCIDENT MANAGEMENT SYSTEM
By
Group 5

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Supervisor
MR. MUCHAKE BRIAN
Department of Information Technology
School of Computing and Informatics Technology, Makerere University
bmuchake@gmail.com ,+256701178573

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Declaration

We group 5 members, declare that this project work is original and it has never been presented anywhere for the award of degree by institution of higher learning. **Group 5 members**

Names	Student Number	Signature
Katongole Isaac	1900713209	
Kizito Collins Balizakiwa	1900713954	
Moya Rafsanjani	1900719088	
Wanuba Kenneth	1900719370	

Approval

This project Report has been submitted for examination with approval of the following supervisor

Signature .... Date 9 /11 /2022

Dr. Muchake Brian

Department of Information Systems

School of computing and informatics technology

College of Computing and Information Technology

Makerere University

Dedication

We dedicate this project report to our parents for their substantial financial, moral and social support and their continuous prayers that kept us through the academic struggle.

Acknowledgement

We give thanks, glory and honour to God for blessing us throughout the entire project and granting us strength, health, courage and life. We also acknowledge our research supervisor for his support, correction and guidance throughout this project period. May God reward his endeavours. Thank you and may God bless you.

Contents

List of Figures

List of Tables

List of Appendices

Acronyms

CSS	Cascading Style Sheets.
HTML	Hypertext Markup Language
IDWFED	International Domestic Workers Federation
ILO	International Labour Organization
IWIMS	Immigrant Worker Incident Management System
JS	JavaScript
JSON	JavaScript Object Notation.
MoGLSD	Ministry of Gender Labour and Social Development
MOLVT	Ministry of Labour and Vocational Training of Cambodia
Mongo DB	Mongo Database.
NoSQL	No Structured Query Language
PDOLVT	Provincial Department of Labour and Vocational Training
SDLC	System Development Life Cycle
UMWCRF	Ugandan Migrant Worker Complaint Registration Form

Abstract

In this study, a Immigrant Worker Management System was implemented for the migrant workers of Uganda, to enable them to make complaints electronically. This is because there is inefficiency in management of complaints made by migrant workers of Uganda .The study used both qualitative and quantitative approaches. Data was collected using interviews and questionnaire methods and tools like self-administered questionnaires and interview guides, which were used for collecting data from 32 respondents. In objective one, the researcher collected both primary which was analyzed using excel spreadsheets and the user requirements were determined. In objective two, the system was designed using data flow diagrams (DFDs) and enhanced entity relationship diagrams (ERDs). In objective three, the system was developed using technologies such as Cascading Style Sheets, Hypertext Markup Language, JavaScript, react and Mongo Database among others. In objective four, the system was tested and validated. The findings of the study are a great significance to researchers, migrant workers, Ministry of Gender Labour and Social Development and recruitment agencies.

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Chapter One

General Introduction

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1.1 Introduction.

This study focused on the development of an Immigrant Worker Incident Management System. This chapter presents the background to the study, the statement of the problem, the general objective, and the specific objectives of the study, the scope of the study and the significance of the study.

1.2 Background

Overseas employment is recognized globally not only in Africa but also in several continents across the globe, despite it yielding a fortune to participating countries, the practitioner's mainly migrant workers face challenges in the receiving countries and the current means of reporting the challenges they face are still at a low standard.

According to Onlinekhabar (2019), Government of Nepal opened a call center to listen to complaints of Nepal migrant workers abroad in an attempt to address complaints of its migrant workers based in various countries. The call center established in Kathmandu under Ministry of Labour, Employment and Social Security was equipped with modern communication technologies. Migrant worker would file their complaints via telephone or internet-based communications including Messenger, Viber and Imo to be sent to officials of the ministry. The ministry also put a service phone number +97715970008.

According to ILO (2021), In Cambodia, Dispute Resolution Process was put to help in resolving Cambodia migrant workers complaints. The process steer officials towards complaints resolution that ensure outcomes and remedies accord with Cambodian Labour Law. Migrant workers, members of their families or their appointed representatives especially when the migrant worker is still overseas all lodge complaints through the Dispute Resolution Process. Complaints can be directed to individuals' behavior or conduct, or a situation that arises during migration, like underpayment or having a passport withheld. The process give advice as to how officials can pursue complaints in destination countries. All complaints are assessed through a process of

inviting parties to discuss the complaint separately with a dispute resolution officer within PDOLVT, in the hope that a mediated outcome can be jointly agreed. If an outcome is not reached at the provincial level, the complaint is referred to the MOLVT for action.

In Uganda, given the economy's inability to absorb all of the country's graduates from universities and technical institutions into employment (United Nations Committee on Migrant Workers, 2017), many have engaged themselves in seeking employment opportunities in developed countries through recruitment agencies for jobs with a better pay. (Second National Development Plan (NDPII), 2017).

Given the increasing number of Ugandan migrants living the country to work overseas, complaints concerning violation and abuse of their rights, trafficking, labor exploitation are also on their increase yet no effective means in reporting these migrant issues. On different occasions, Ugandan migrant workers have sent information revealing life threatening conditions that need instant attention on social media platforms seeking help from the general public to notify the concerned parties. This leaves us wondering whether there is a proper and reliable means through which such information can be communicated directly and handled by the authorities without disclosing information on social media.

According to Yasin (2020), Many Ugandan migrant workers thought they would be helped if they call, text, or whatsapp embassy officers. At first it was possible because the officers had few Ugandans to work on, but now its impossible since each day the number increases, in Saudi

Arabia we have 80,000 Ugandan migrants, in Jordan we've got around 15,000 to 20,000, in Oman almost 25,000.

On the 11th April, a worker in Saudi Arabia contacted the union via whatsapp, in a trembling voice to report the atrocities she was facing during COVID-19 pandemic period, she said that her mobile phone was disconnected from Wi-Fi and she is using her personal airtime to communicate,

To keep in touch with the worker, the union loaded airtime on her Ugandan mobile number, to enable them to access her as she was disconnected from Wi-Fi. (IDWFED, 2020).

In 2016, HTS-Union (UHFTAWU) ran radio campaigns on domestic workers that was not limited to locals, but also migrant domestic workers (IDWFED, 2017). As a result, over 67 local domestic workers contacted the union for assistance and guidance while migrant domestic workers have been rescued from forced labour and abusive employment.

On February 3, 2017 International Domestic Workers Federation (IDWFED) stated that they were contacted by a migrant domestic worker in Oman. The migrant worker said that she was held in custody by her employer and the sons wanted to rape her, she got the Federation's mobile number from the radio campaigns before she left for Oman. The Federation exchanged text messages with her agency's mobile contacts and until she was booked a ticket back home on March 8, 2017.

The late Oulanyah (2020) asked "Do we have a system where our children inform the embassies the challenges and harassment they face when working abroad? Do they have a system of knowing which complaints are reported, who has reported and where are they located so that they can get help?".

With the current means on how the Ugandan migrants report their complaints to authorities and how these authorities such as embassies, MoGLSD and other entities approach these complaints right from the use of social media platforms, uses of Uganda Workers Complaint Form, telephone communication and other related means, managing and handling of such complaints still impose difficulty since information is not centralized, too many unnecessary questions are asked in the UMWCRF, the UMWCRF takes much time to fill which makes it unfavorable for emergency situations, data redundancy in the system caused when migrants submit information that they already submitted when reporting on their first time such as bio data.

1.3 Problem Statement

The current means of using UMWCRF, telephone communications, social media platforms used in complaint reporting are faced with a number of problems and hindrances. There is an upload limitation when using   UMWCRF since it is a Google-based form hence limiting sharing information like images on an occurring indecent. For each single complaint, too much dispensable data is collected from a worker which is done for every single incident or complaint thereby causing data redundancy in the system. It also requires much time to fill the forms which makes it unfavorable for emergency situations. The data submitted through the forms is limited to text, which leaves the uneducated workers who would rather use audio and video means unable to report their issues.

1.4 Objective of the study

1.4.1 Main Objective

The main objective of this project is to develop an Immigrant Worker Incident Management so as to help and improve how challenges and complaints of Ugandans working abroad are handled and worked upon.

1.4.2 Specific Objective

 i To review existing systems related to incident management in order to generate requirements of the Immigrant Worker Incident Management System

iiTo design Immigrant Worker Incident Management System.

iii To implement Immigrant Worker Incident Management System

 iv To test and validate Immigrant Worker Incident Management System

1.5 Scope of the study

This section is a discussion of both non-functional and functional scope of this project. The functional scope identifies the key functions provided by the system and non-functional scope for the constraints considered when developing the system.

1.5.1 Functional Scope

The system will help Ugandan migrants abroad to report their issues, the challenges they face when working abroad so as to get help. It will display the status of the issues reported, that is whether an issue is pending, worked upon or resolved by embassies, MoGLSD.

1.5.2 Non-functional scope

The system can be used by the MoGLSD, licensed labour export companies, Ugandan embassies in different countries, and Ugandan migrant workers still abroad and working under an agency or self. Access is through all computers and mobile devices with an internet connection.

1.6 Significance

a) To Ugandan migrant abroad.

    i. The system serves as a reporting platform for the issues, challenges of the migrant workers so as to get aid from Ugandan embassies and aid from home (from MoGLSD).

    ii. The system provides effective communication and collaboration between migrant workers and the embassies through the use of different forms of sharing information such as videos.

b) To Ugandan Recruitment Agencies.

    i. The system helps agencies to coordinate effective with MoGLSD in order to provide and serve Ugandans working abroad.

c) To MoGLSD

    a. The system acts as a central repository for the issues and complaints raised by Ugandan migrant workers. This will enable data analysis for greater insights and preventative measures.

b. The system creates a letter that MoGLSD receives and can check in case more serious incidents emerge that are related to previous event and helps educate them of past incidents so they know how to manage these in case of recurrence.

c) To academia

c. Data obtained from this study acts as reference to other researchers that are carrying out research related to this study.

Chapter Two
Literature Review

2.1 Introduction

This section explains the critical analysis of research work from internet sources, books, and individual studies that exist in relation to incident management. It also consists of the contribution of the existing systems in relation to the proposed system and a summary of comparative evaluation.

2.2 Immigrant Worker Incident Management System

The IWIMS is an online web based system that will help the Ugandan migrants workers abroad to report incidents (such as issues, complaints) to embassies, MoGLSD and other authority bodies. The system categorizes the incidents, send them to the authorities so that they can be worked upon, feedback, status of the raised incidents, authorities working on the incidents can be provided to the complainant.

2.2.1 Benefits of Immigrant Worker Incident Management System

i   The system generates a report that MoGLSD can check in case more serious incidents emerge that are related to previous event and helps educate them of past incidents so they know how to manage these in case of recurrence.

ii   The system helps in complaint management that is identifying complaints that need immediate actions.

iii The system provides effective communication and collaboration between migrant workers and the embassies through the use of different forms of sharing information.

2.3 Existing System

According to Yasin (2020), Many Ugandan migrant workers thought they would be helped if they call, text, or whatsapp embassy officers, at first it was possible because the officers had few Ugandans to work on, but now it's impossible since each day the number increases, in Saudi

Arabia we have 80,000 Ugandan migrants, in Jordan we've got around 15,000 to 20,000, in Oman almost 25,000. The above reason forced us to use UMWCRF.

2.3.1 Uganda Migrant Worker Complaint Registration Form

Uganda Migrant Worker Complaint Registration Form (UMWCRF) is a Google based form that is used by migrants to raise complaints to embassies and MoGLSD. (UMWCRF, 2022) It is used across countries where Ugandan migrants go for employment. Here are some of its merits and demerits.

2.3.1.1 Merits of UMWCRF

i   The complainant is sure that he or she complaint is received, given fact that each complaint is assigned a number (ID). (Yasin, 2020).

ii   The complaint is received by several entities such as MoGLSD, embassies, and other related organizations. (UMWCRF, 2020).

iii   There is collaboration, each entity involved in handling complaints is notified each a new complaint arrives and is worked upon. (Yasin, 2020).

2.3.1.2 Demerits of UMWCRF

i   It accepts limited information such as textual data leaving out video, audio data.

ii   There is a lot of information required when reporting the case which may not be very crucial.

iii   Migrants cannot fully express themselves when using textual data only.

iv   It requires much information to raise a complaint.

v   Few migrants are worked upon hence many are left out

2.4 System Development Life Cycle (SDLC)

According to Alex (2017), System Development Life Cycle is a conceptual model used in project management that describes the stages involved in an information system development project from initial feasibility study through maintenance of a completed application .There are various models necessary for guiding system development and Agile is one of them. According to Alexander (2017), Agile methodology is a people focused approach to software development that respects

our rapidly changing world, its centered around adaptive planning, self-organization and short delivery time.

Figure 2. 1Agile Model

Requirement: This is the most fundamental phase in the SDLC, it involves understanding the system to be developed and identifying all the possible requirements needed which are then documented in requirement specification document. ("What is agile methodology," 2020) **Design:** this involves gathering of all specific detail required for the new system and its also where the first prototype ideas are discussed. ("What is Agile Design Methodology," 2020)

Development: In this phase, the database admin creates and imports the necessary data into the database. Programming languages are defined by requirements. Developers create the interface as per the coding guidelines and conduct unit testing. (kate, 2019).

Testing: This involves testing the software against the requirements to make sure that the software is solving the needs addressed and outlined during the planning phase. All tests are conducted as functional testing, including unit testing, integration testing, system testing, acceptance testing, and non-functional testing.

Implementation and integration: According to Wikipedia (2022), after testing, the overall design for the software will come together. Different modules or designs will be integrated into the primary source code through developer efforts, usually by leveraging training environments to detect further errors or defects.

Maintenance: SDLC does not end when development of the system is finished and put in use. The developers after deploying the system they change to maintenance mode and begin practicing activities required to handle and solve any reported issues. ("Systems Analysis and Design," n.d.)

2.4.1 Advantages of the Agile model.

i   When new changes need to be implemented. The freedom agile gives to change is very important. New changes can be implemented at very little cost because of the frequency of new increments that are produced. (Richardo, 2021).

ii   To implement a new feature the developers need to lose only the work of a few days, or even only hours, to roll back and implement it. ("Agile Methodology: Advantages and Disadvantages" , 2020). iii People and interactions are emphasized rather than process and tools. Customers, developers and testers constantly interact with each other. iv Working software is delivered frequently (weeks rather than months).

2.4.2 Disadvantages of Agile model

i   In case of some software deliverable, especially the large ones, it is difficult to assess the effort required at the beginning of the software development life cycle.(Rachaelle, 2021)

ii   There is lack of emphasis on necessary designing and documentation.

iii   The project can easily get taken off track if the customer representative is not clear what final outcome that they want. (Rachaelle, 2021)

2.5 Comparative Evaluation

Compared to features provided in UMWCRF, the IWIMS will provide more advanced and user friendly features so as to ensure effective workflow in both how the embassies and MoGLSD manage and handle migrants' complaints.

Table 2. 1: This show a comparison between features provided by UMWCRF and IWIMS. It also illustrates that IWIMS has some unique features than UMWCRF.

Features	UMWCRF	IWIMS
Feedback	Not immediate	Immediate
Complaint status	No status	Status present
Migrants worked upon	Few migrants	Much migrants
Information Required to report	Much information	Less information
Text, video and audio capture.	Only text.	Text, audio and video.
Comment	Can't.	Comments can be written on complaint.

2.6 Conclusion

The findings from this review reveal the literature and comparisons among the existing means used in incident management (UMWCRF) which are compared with the proposed system in terms of unique features. This clearly shows that IWIMS will contribute to the improvement on how embassies and MoGLSD manage migrant complaints.

Chapter Three
Methodology

3.0 Introduction.

This chapter outlines the methods adopted in order to provide a solution to the problem detailed in section one. It looks at the research design, study population data collection methods, data analysis and design and system testing and analysis.

3.1 Research design.

The project study entailed the use of qualitative, quantitative, action and case study research designs to achieve the stated objectives. The case study approach was used because it supports an empirical investigation in a contemporary phenomenon (Rashid et al., 2019). The qualitative techniques used in the study include document reviews, interviews. In quantitative research design, the researcher used interviews as the tool of data collection.

3.2 Study Population

In this study, the researcher's respondents included three people in charge of labour externalization at Ministry of Gender Labour and Social Development, three migrant workers and twenty six relatives of migrant workers hence able to collect information relevant to the study.

3.3 Sampling Technique

Sampling is the act, process, or technique of selecting a suitable sample, or a representative part of a population for the purpose of determining parameters or characteristics of the whole population (Mugo, 2002). This technique allowed every unit of the population to have a chance of being selected in the sample.

3.4 Data Collection Methods.

The data collection methods used include document reviews, interviews and questionnaires. They included the following;

3.4.1 Document Reviews.

This is a secondary data collection method that helped to provide an overview of the project insight.

A critical review of documents was undertaken so as to identify the best tools and techniques for developing the proposed system. This method was carried out through the entire project study. The documents reviewed include books, conference proceedings, articles, online content. This enabled as the researchers to get secondary data, which we based on to identify the missing gaps in the previous studies made about the related systems.

3.4.2 Interview Method.

An interview is a qualitative research method in which the researcher collects data directly from the participants. The types of interview questions included open and close ended questions. The researchers posed questions to labor officials at both ministry and agency levels and interacted face-to-face using an interview guide. This enabled collection of first-hand information from the respondents that enabled proper analysis of the problem. Researchers used an interview guide as shown in appendix b to interview the labor support officers at the MoGLSD. This method was time saving, less costly, increased knowledge about the systems since views and ideas were exchanged, flexible since its framing depended on the situation and in-depth analysis.

3.4.3 Questionnaire Method.

A questionnaire is a research instrument that consists of a set of questions for the purpose of gathering information from respondents.(Boparai et al, 2018). A research questionnaire is typically a mix of close-ended questions and open-ended questions. Open-ended, long-term questions offer the respondent the ability to elaborate on their thoughts. Questionnaires were sent through electronic means to the respondents.

The researchers administered questionnaires to migrant workers and also non-migrant workers who have relatives working abroad. Of the distributed electronic questionnaires, 29 respondents filled in the questionnaire of which 13.8% were migrant workers and 82.8% were people who had relatives working abroad. Questionnaires provided a relatively cheap, quick and efficient way of obtaining large amounts of information from a large sample of people. Data was collected with

ease because the researchers were not required to be present when the questionnaires were filled electronically.

3.5.1 Data Analysis.

Data analysis involved inspecting, cleaning and transformation and modeling of data with the goal of discovering useful information, and also elimination of inconsistencies with in the data collected.

3.5.2 Quantitative Data

According to Rouse (2018), quantitative data is information about quantities; that is, information that was measured and written down with numbers. Some examples of quantitative data include migrant workers age. The quantitative data that was collected was quantified before doing quantitative analysis, with the aid of a statistical tool, Excel spreadsheet.

3.5.3 Qualitative Data

Qualitative data was information about qualities; information that cannot actually be measured (Rouse, 2018). Some examples of qualitative data were the reasons why migrant workers' complaints took long to be worked on is bureaucracy.

3.5.4 System Analysis and Design

Structured analysis and design methodologies were used in design and modeling of the system. DFDs were used during system design to solve multiple problems at the same time.

3.5.2.1 Requirements analysis

According to Rouse (2018), Requirements analysis is the process of determining the user expectations for the proposed system. These features, the requirements had to be quantifiable, relevant and detailed. Requirements were generated after data analysis.

According to Fabrycky & Benjamin (2010), system design is the process of defining the elements of a system such as the architecture, modules and components, the different interfaces of those components and the data that goes through that system. It is meant to satisfy specific needs and requirements of a business or organization through the engineering of a coherent and well-running system. System design focused on how to accomplish the set objective of the system. This was achieved using both the process and data design techniques.

14

3.5.2.2 Process Modelling

Process modeling is a diagrammatic representation of a sequence of activities showing events, actions and connection points in the sequence (Indika, 2018). Process modeling is used to improve the efficiency and the quality of the business process, increase control and consistency and also improve process communication and to manage complexity. Process modelling tools include data flow diagrams, Flowcharts, activity diagrams, process modelling notation, use case diagram among others.

In this project, data flow diagrams (DFDs) were used to model the different business processes in the system. This is because DFD shows how processes depend on one another for information and also shows data flow from external into the system and shows how the data moves from one process to another process within the system.

3.5.2.3 Data Modelling

According to Indika (2018), data modeling is the process of creating a conceptual model of data objects and how the data objects associate with each other in a database. Data modeling focuses on how the data objects are organized than on the operations that are performed on data. In this research, entity relationship modelling was used for data modelling and the end product was the structure of the relations in the relational schema. ER modelling is a top-down approach to database design that begins by identifying the important data called entities and relationships between the data that must be represented in the model, followed by adding more details such as the information about the entities, attributes and any constraints on the entities, relationships, and attributes (Connolly & Carolyn, 2005).

3.6 System Implementation.

The implementation of the web and mobile component was done using open source technologies that offer ease of use in development. The system components were constructed using web technologies namely Node Java script, HTML (Hypertext markup language) and Mongo DB, CSS (Cascading Style Sheets), JavaScript.

3.6.1 Cascading Style Sheets.

This is a style sheet language used for describing the presentation of a document written in a markup language such as HTML. CSS is a cornerstone technology of the World Wide Web,

alongside HTML and JavaScript. CSS is designed to enable the separation of presentation and content, including layout, colors, and fonts.

Hypertext markup Language (HTML). According to mdn web docs (2022), HTML (Hypertext Markup Language) is the code that is used to structure a web page and its content. For example, content could be structured within a set of paragraphs, a list of bulleted points, or using images and data tables. As the title suggests, this article gave us a basic understanding of HTML and its functions.

3.6.2 JavaScript:

JavaScript, often abbreviated JS, is a programming language that is one of the core technologies of the World Wide Web, alongside HTML and CSS. As of 2022, 98% of websites use JavaScript on the client side for web page behavior, often incorporating third-party libraries. All major web browsers have a dedicated JavaScript engine to execute the code on users' devices. JavaScript is a high-level, often just-in-time compiled language that conforms to the ECMAScript standard (Ecma-262, 2022).

3.6.3 React JavaScript

This is JavaScript library which is deployed to develop reusable user interface (UI) components. According to React official documentation, following is the definition React is a library for building modular user interfaces. React basically enables development of large and complex web based applications which can change its data without subsequent page refreshes (Aggarwal, 2018).

3.6.4 Mongo DB

According to Mongo DB (2022), Mongo DB is a source-available cross-platform document-oriented database program. Classified as a NoSQL database program, Mongo DB uses JSON-like documents with optional schemas. Mongo DB is developed by Mongo DB Inc. and licensed under the Server Side Public License which is deemed non-free by several distributions.

3.7 System Testing and validation

3.7.1 System Testing

This was an investigation conducted to provide stakeholders with information about the quality of the system under test. This involved the execution of the system component to evaluate one or more properties of interest. This was done in order to appreciate and understand the risks of

implementing the system with the motive of finding out bugs and other defects and to ensure that the system is fit for intended use.

Unit testing was carried out to test the system's individual features, partial testing which involved testing certain features such as the systems backend databases through running different data manipulation ways.

3.7.2 System Validation

System validation is the process of providing documented evidence that an electronic system or technology will be performed as specified. The system was given to the test users to use it and give feedback about whether it was meeting the user requirements. The researchers collected data about the validation feedback using a questionnaire. The collected data was analyzed descriptively.

3.8 A summary of the data collection techniques and tools used to achieve the objectives.

OBJECTIVES	METHOD(S)	TECHNIQUES	OUTPUT
To review existing systems related to incident management in order to generate requirements of the Immigrant Worker Incident Management System	Data collection and Analysis	Conducting interviews, Using questionnaires, Reading secondary data, such as; documents about the existing Migrant worker complaint system	User requirements, Functional and non-functional requirements
To design the Immigrant Worker Incident Management System.	Modeling.	Using data flow diagrams, and enhanced entity relationship diagrams.	Data Flow Diagrams, Use Case and EERD
To implement the Immigrant Worker Incident Mangement System.	System Prototype.	Using HTML, CSS, React java script and Mongo DB.	Prototype of Immigrant Worker Incident

			Management System.
To test and validate the Immigrant Worker Incident Management System.	Unit and integration testing.	Black box and white box testing techniques.	Fully functional Immigrant Worker Incident Management System.

Table 3. 1: Summary of data collection tools and techniques used

3.9 Conclusion

This chapter has detailed the techniques, tools and procedures used in the design of the of Immigrant Worker Incident Management System (IWIMS).

Chapter Four
Findings, System Analysis and Design

4.0 Introduction

This chapter describes the design issues, structural layout of the data flow, software analysis requirements specification and design of the system.

4.1 System study

During research, interviews and questionnaires were used to collect data about the existing complaint system or ways through which the complaints were handled. We discovered about the current ways of handling complaints at the ministry which was carried out between the ministry officials that is the labor support officers who directly handle the complaints in a quest to get ideas on how to develop the system. According to the findings there was no system currently that handles complaints in all the organizations we carried research about which include the MoGLSD, recruitment Agencies as well as the migrant workers themselves who acknowledged that the system will be of greater use to all these entities and majorly the migrant workers

According to the research we carried at the Ministry of Gender Labour and Social Development we conducted an interview and interviewed three officials that is one lady and two gents who revealed that currently there is no electronic system in place that handles migrant workers complaints and they told us how the complaints flow through the hierarchy at the ministry.

This is the flow of complaints and data at the ministry. First of all a letter must be written and sent to the permanent secretary (works as an accounting officer) who then forwards it to the Director of labour (monitors labour issues) who then forwards it to commissioner employment services who forwards it to assistant commissioner employment services who forwards it to the principal of labour office then forwards it to labor support cases who are supposed to handle these complaints. The labour support officers can only work on cases/complaints which have passed through that process.

The respondents recommended and embarked on the integration of audio and videos into the system since these have easy usability.
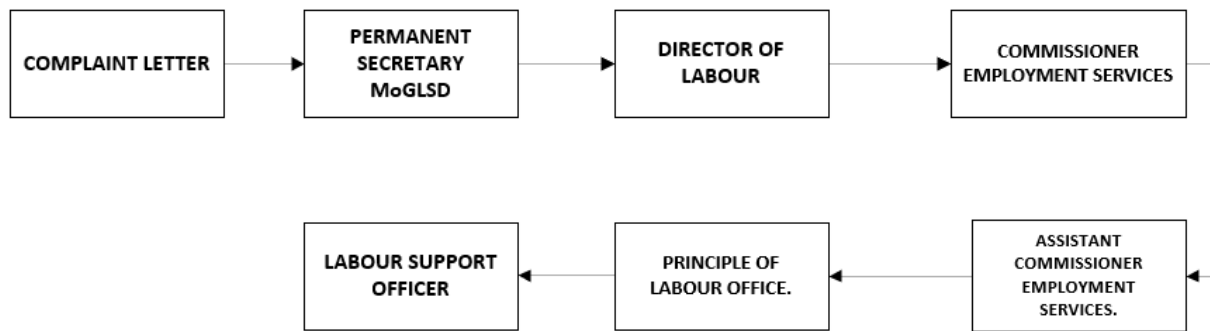
ILLUSTRATION

Figure 4. 1Existing System flow.

4.1.1 Weaknesses of the existing System.

There is no automation of complaints management in the current information management systems used in handling incidents related to migrant workers. Workers complain directly to their employment agencies which write letters to the ministry manually at their will and have them delivered by the complainant's next of kin. This pauses a threat on integrity and reliability of information pertaining migrant workers' incidents.

There is no real-time problem solving. The system is very slow due to bureaucracy in manual complaint handling. Each single complaint goes through multiple parties including the permanent secretary, the commissioner employment services, director of labour, commissioner labor externalization, each taking at least two days to be accessed and to append their consent on the complaint letter, then to the labor officials who work on the complaints.

The system is ineffective as it does not cater for illiterates who are its major audience. Migrant workers are mostly illiterate and not familiar with technology and keyboard input. This makes it hard to record their complaints as they have to explain to their agencies in their familiar languages which transcribe to letters sent to the ministry. This process takes time and is prone to integrity compromise.

The manual system also has issues in storage and redundancy of data. Information relating to incident management is handled on papers and stored physically in sacks. The information

consumes a lot of space in the office of the labor officials and takes time while trying to retrieve a complaint made years back.

The current means do not provide for feedback collection. The concerned parties are not aware of the performance of their system in regards to their audience's needs or satisfactory.

The current system faces rampant system failures while in operation.

4.2 Data analysis results

From the interviews we conducted and questionnaires we deployed it was confirmed that the existing way these incidents were reported was through a form which prompted for recording of the incidents that happen to the migrant workers abroad. According to the results of data analysis most of the respondents supported the idea of developing the Immigration Workers Incident Management System.

The primary data that was collected by conducting interviews and administering questionnaires and data of the respondents was analysed by using excel spreadsheets. The following are the results of data analysis:

4.2.1 Response Rate

The researchers also issued questionnaires to selected respondents. Of the distributed questionnaires, 29 (82.9%) were successfully filled and returned by the respondents while 6 (7.1%) questionnaires were not returned, which gave the response rate of 82.9%.

4.2.2 Background Characteristics of the Respondents

i.**Gender of the respondents**

To present the results on gender distribution, frequency tabulation was used by the researchers as presented in Table 4.1.

Table 4. 1: Gender of respondents.

Gender	Frequency	Percentage
Female.	17	58.6%
Male.	12	41.4%
Total	**29**	**100.0%**

Findings from table 4.1 above reveal that most of the respondents 58.6% were female while the least 41.4% were male. The gap between male and female categories of the respondents is narrow and this brings us to the perception that since more females go for migrant labour opportunities than males, they exhibited more interest in the system than the males.

ii. **Age bracket of the respondents**

The study also investigated the age bracket of the respondents and the findings are as shown below.

Table 4. 2: Age bracket.

Age	Frequency	Percentage
< 25 years	3	10.3%
26-30 years	8	27.6%
31-35 years	10	34.4%
36-40 years	6	20.7%
> 40 years	2	6.9%
Total	**29**	**100%**

According to table 4.2, the study reveals that most of the respondents who participated in the study were 34.4% with ages between 31 and 35 years, followed by the 27.6% who were between 26-30 years, then the 20.7% who were 36-40 years. 10.3% were less than 25 years old while the least, 6.9% were greater than 40 years old.

 iii) Nature of respondents; migrant workers or not.

The respondents were asked to reveal whether they were former migrant workers or were simply answering the questionnaire on behalf of someone they knew that had once gone to work in the diaspora. This was to ensure the information they gave researchers was (near to) accurate.

Figure 4. 2: The nature of respondents.
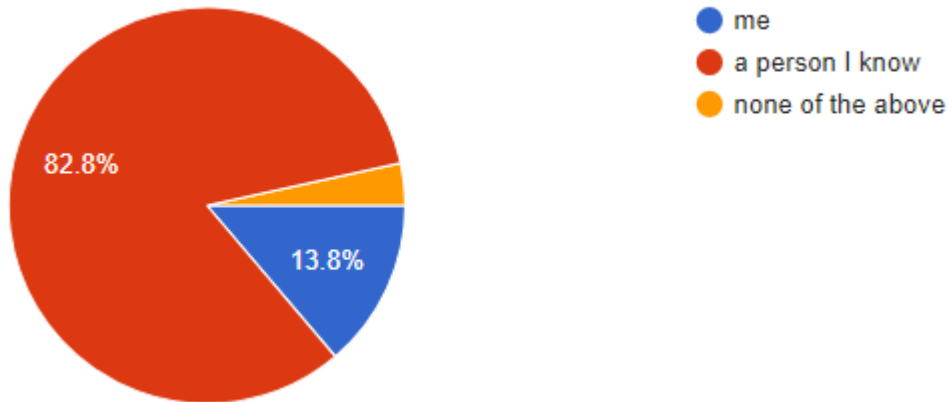
According to the graph, most of the respondents were not victims of diaspora employment but were answering the questions on behalf of their relatives.13.8%were victims and were giving testimonies of their own experiences while none outside those two categories was allowed to fill the questionnaire.

iv)Ability to access internet for-example how many had access to smart phones.

The respondents were requested to reveal whether the victims of the study they were testifying about had smart phones while in the diaspora. Results were tabulated and a graph was generated as follows.

Figure 4. 3: Accessibility to smart phone
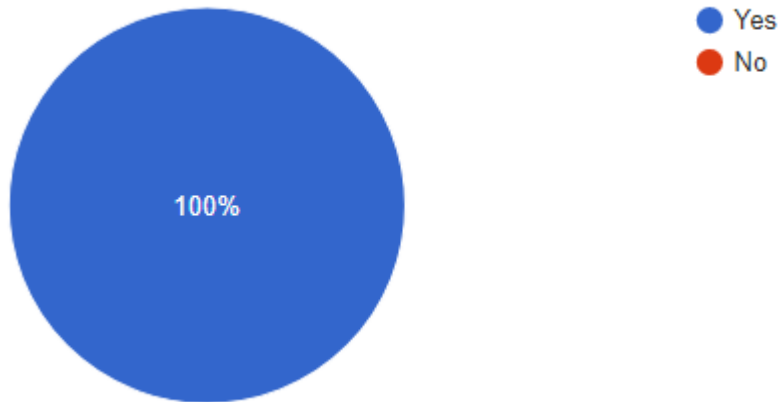
According to the results analysis as depicted in the graph, all respondents agreed that the victims had smart phones while they were working abroad. This leaves us confident that a solution can be sought easily since most of them had access to mobile devices.

4.2.3 Education background of victims.

The respondents were also asked if the victims were educated before they went for employment in the diaspora. The results were tabulated and a graph was obtained as shown below.
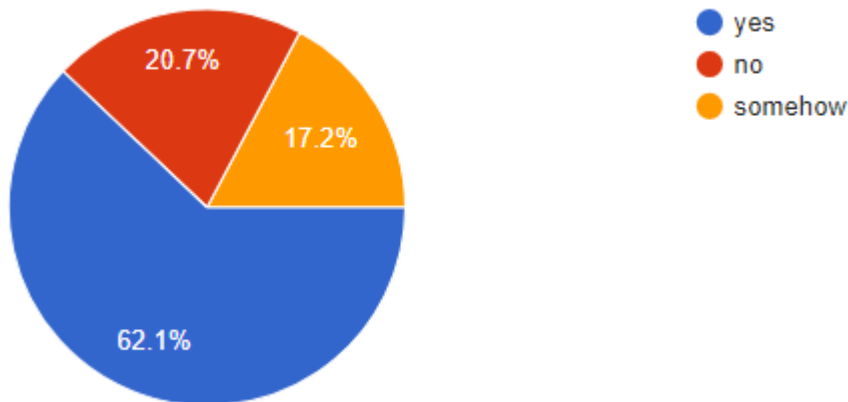

Figure 4. 4: Education background.

Figure 4.4 Education background of victims.

Findings from the research show that the biggest percentage of 62.1% of the respondents were fully educated while a moderate percentage of 20.7% were sure that victims were not educated. The least percentage of respondents who said victims were half educated were 17.2%.
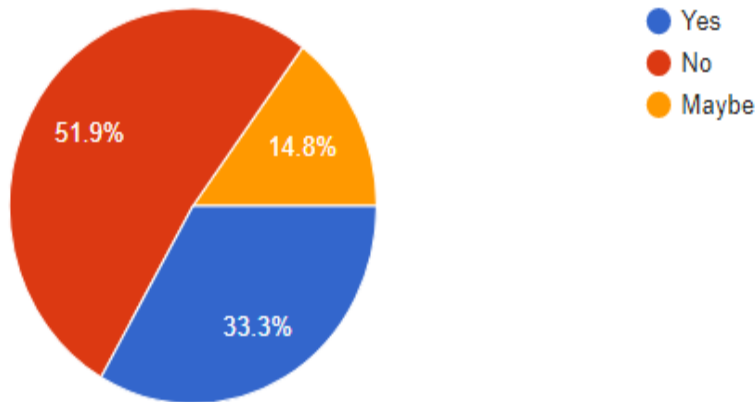

Figure 4. 5: Availability of information pertaining to migrant worker's incident management

According to graph 4.4, the study reveals that the majority of the respondents 51.9%% do not access the information pertaining to how and where migrant worker's incidents and complaints are handled while the least 33.3% accepted that they had knowledge on such info and 14.8% didn't. Therefore, the researchers realized that the majority of the respondents are ignorant about the information pertaining to how migrant worker's complaints are supposed to be handled.

4.2.4 Issues faced by victims while in the diaspora.

The respondents were asked about the problems they faced while working in the diaspora and results were tabulated. Results analysis was done and a graph was obtained as below.

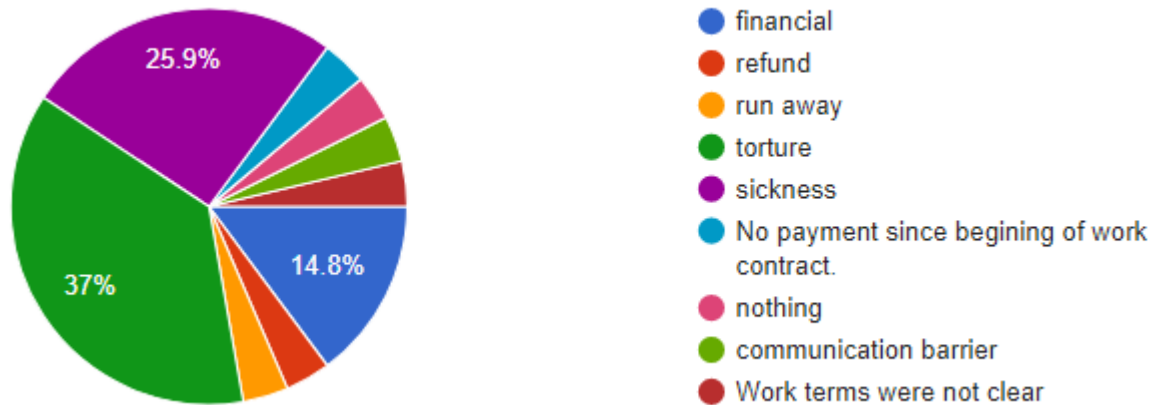**Figure 4.6: The issues faced while abroad**

Figure 4. 6: Issues faced abroad.

According to figure 4.6, the study reveals that the majority of the respondents 37% have communication barrier issues, 25.9% had sickness issues and 14.8% had issues with no payment since beginning of work contract. Therefore, this created a need for Immigrant Worker Incident Management System so that their issues are raised and action can be taken to help them.
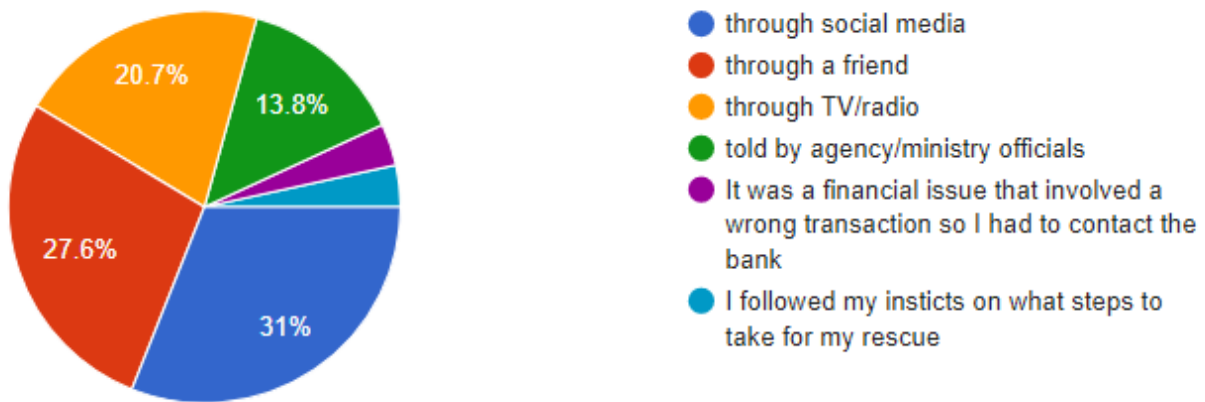
How victims get information

Figure 4. 7: Discovery how raise complaint

Figure 4.7 How they found out to make complaint.

electronic information — 5 (17.2%)
social media — 16 (55.2%)
phone call/sms — 13 (44.8%)
police/Interpol — 1 (3.4%)
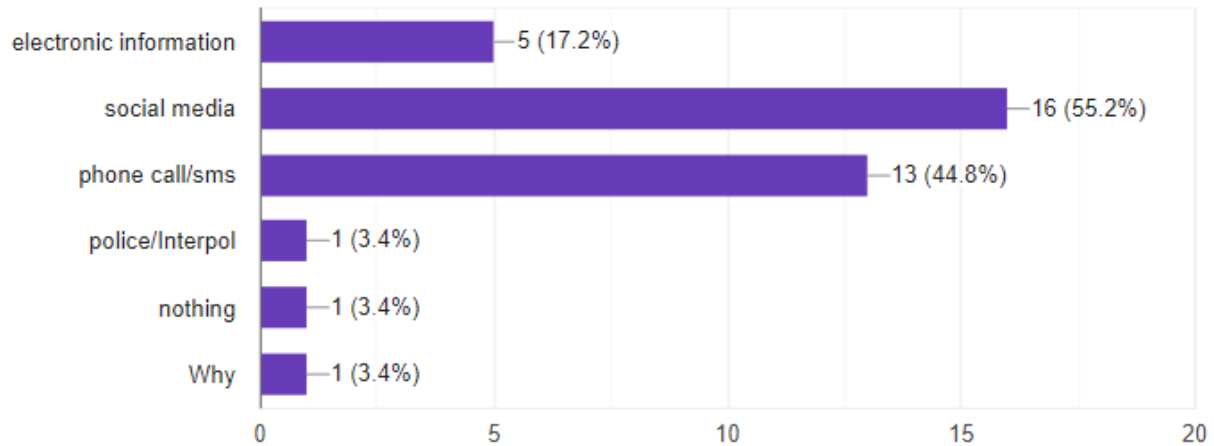nothing — 1 (3.4%)
Why — 1 (3.4%)

Figure 4. 8: Ways complaints were made

Figure 4.8 Ways through which complaints were raised.

The currently helpful parties in handling migrant worker's issues
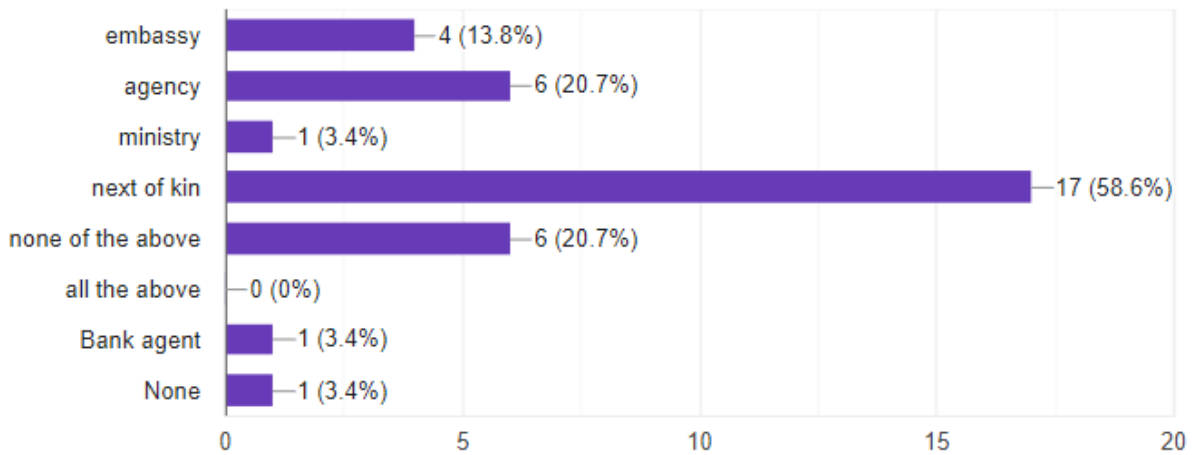

embassy — 4 (13.8%)
agency — 6 (20.7%)
ministry — 1 (3.4%)
next of kin — 17 (58.6%)
none of the above — 6 (20.7%)
all the above — 0 (0%)
Bank agent — 1 (3.4%)
None — 1 (3.4%)

Figure 4. 9: People involved in handling complaints.

27

4.2.5 The challenges faced while using the method(s) specified in table 4.6 above.
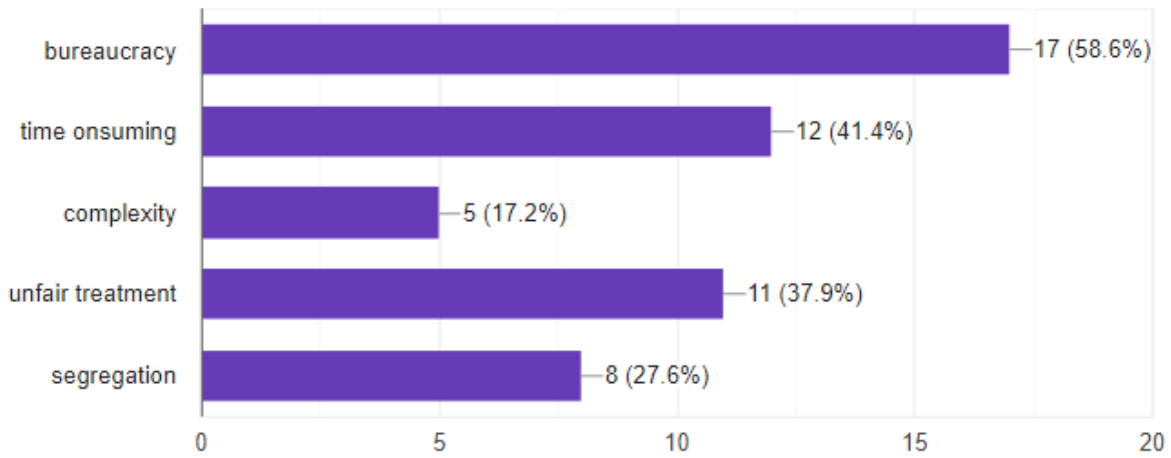

Figure 4. 10: Challenges of existing system

The respondents were asked about the challenges they face while using the methods they use to report their complaints and issues they faced as illustrated above.
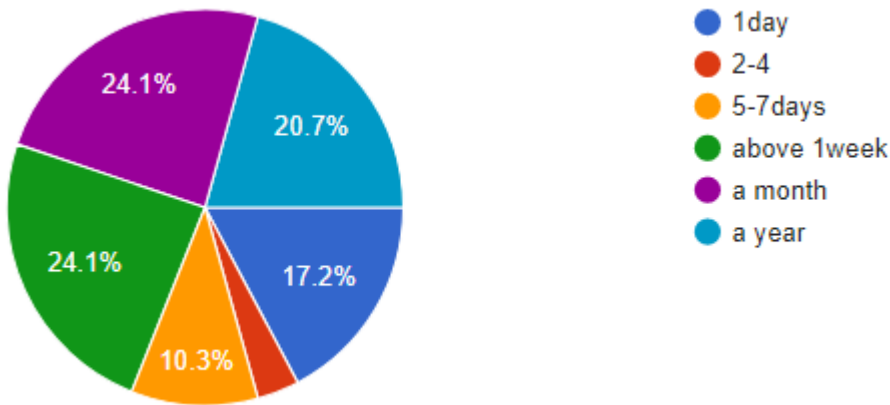
Time taken to solve one issue

Figure 4. 11: Time taken to solve complaint

Knowledge about any electronic information management system used to manage their Complaints.
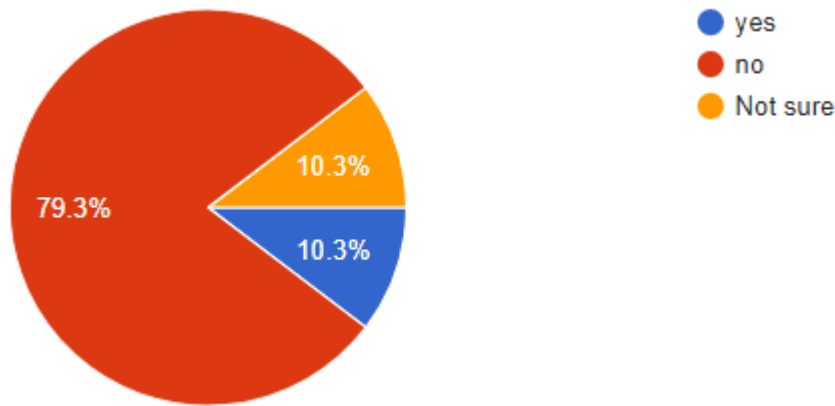

Figure 4. 12: Knowledge of electronic system

4.2.6 Recommendation for new system development.

All the respondents were finally asked to confirm whether they would use and adopt the use of Immigrant Workers Incident Management System if it was implemented. Their responses are as shown in table 4.7.

Table 4.3: Suggestion upon the implementation of an incident management system for migrant workers

Table 4. 3: Suggestion on IWIMS.

Implementation of the new system	Frequency	Percentage
Yes	26	89.6
No	3	10.4
Total	29	100.0%

Table 4.3 shows that 89.6 % which was the majority of the respondents recommended that Immigrant Worker Incident Management Systems should be implemented while only since they were not contented with the current system that involves phone calls to agency / next of kin, filling in physical complaint forms which are then later taken to the respective offices. Therefore, it was realized that the majority of the respondents suggested for the development of the Immigrant Worker Incident Management System.
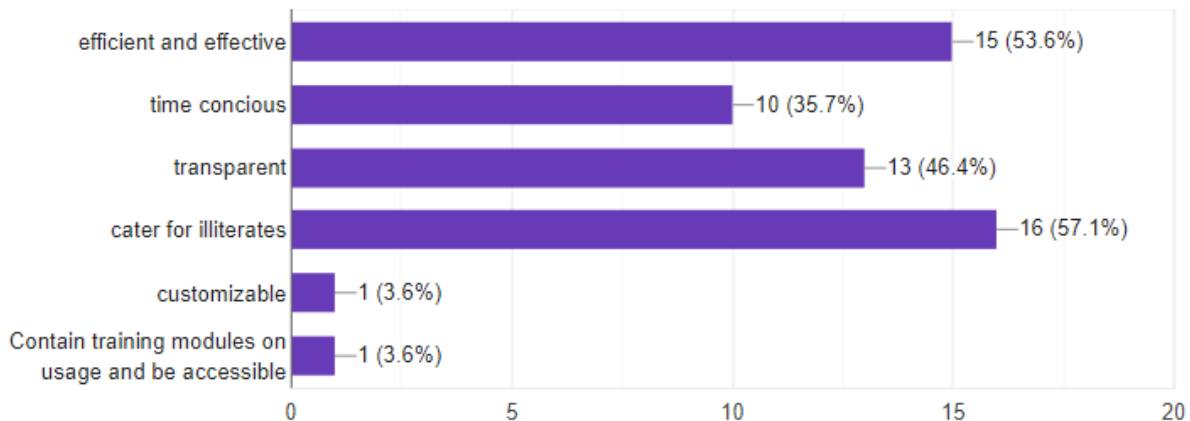
Their expectations

Figure 4. 13: Expectations of new system

4.3 Requirement Specification

4.3.1 User Requirements

These are requirements that the user of the proposed system want to accomplish and they are expressed in the user terminology and perspective. The intended users of the Immigrant Workers Incident Management System are migrant workers, MoGLSD and recruitment agencies. The users' requirements include a system that is user friendly to extent that it enables migrant workers both literate an illiterate to instantly report incidents with ease and handle storage and management efficiently and effectively.

4.3.2 Functional requirements

These describes what the system should do, and the functionalities it should provide. Researchers used interviews, questionnaires and observation methods and identified the following functional requirements:

    i.   The system should allow users to login and logout with valid user details.

    ii.   The system should instantly report migrant worker's complaints or incidents in real time at a button press.

    iii.   The system should automatically generate official letters addressed to the MoGLSD where agencies are reporting migrant incidents.

    iv.   The system should allow the Ministry to create and approve agency accounts.

v.   The system should allow the agency to create and approve the migrant workers accounts.

vi.   The system should allow multiple data-type information processing and transfer for example text, images, videos and audio.

vii.   The system should allow progress tracking of all incidents and complaints reported at all times.

viii.   The system should allow access control through authentication means like user registration and login.

ix.   Legal or Regulatory Requirements. The system should provide legal guidelines or instructions for users to follow while using it.

4.3.3 Non-functional requirements

This includes constraints that must be adhered to during the system development for example operational costs, performance, reliability and others.

i.   User friendly: The system interface shall be composed of common and easy to understand interface metaphors, good colors and common terminologies.

ii.   Easy to update. The system should be easy to maintain and allow functionalities to be added if need be to enhance its operations.

iii.   Security. The system should restrict access to system information by unauthorized users.

iv.   The system should track all users who try to login/logout of the system.

v.   Performance – for example Response Time, Throughput, Utilization and Static Volumetric constraints should all be properly calculated and tuned in the system.

vi.   Availability and reliability. The system should work 24/7 or when needed.

vii.   The system should meet economic need of users.

4.3.4 Software requirements.

The system runs on the following set of software tools. These were researched in order to ensure maximum compatibility.

ITEM	MINIMUM REQUIREMENT.
Operating system	Windows xp, 2007, Linux (Ubuntu)
Security.	Passwords and antiviruses
Browser.	Chrome
Internet connection	Always conneted.
DBMS	MongoDB

4.3.5 Hardware requirements.

The system has a certain set of hardware requirements in runs on. These were identified a researchers did tests on the system.

ITEM.	MINIMUM REQUIREMENT.
Memory (RAM)	512 MB
Storage space/hard disk storage.	10 GB
Processor	1.9GHz x 4

4.4 System Design.

The researchers modelled the processes of the system using Data Flow Diagrams (DFDs), and performed data modelling using Entity Relationship Diagrams (ERDs). This section includes the system architecture, process model and data model of the IWIMS.

4.4.1System Architectural Design

The architectural design was used by designers to provide a high level description of the system. It indicates the layout of the system in the three tier architecture.
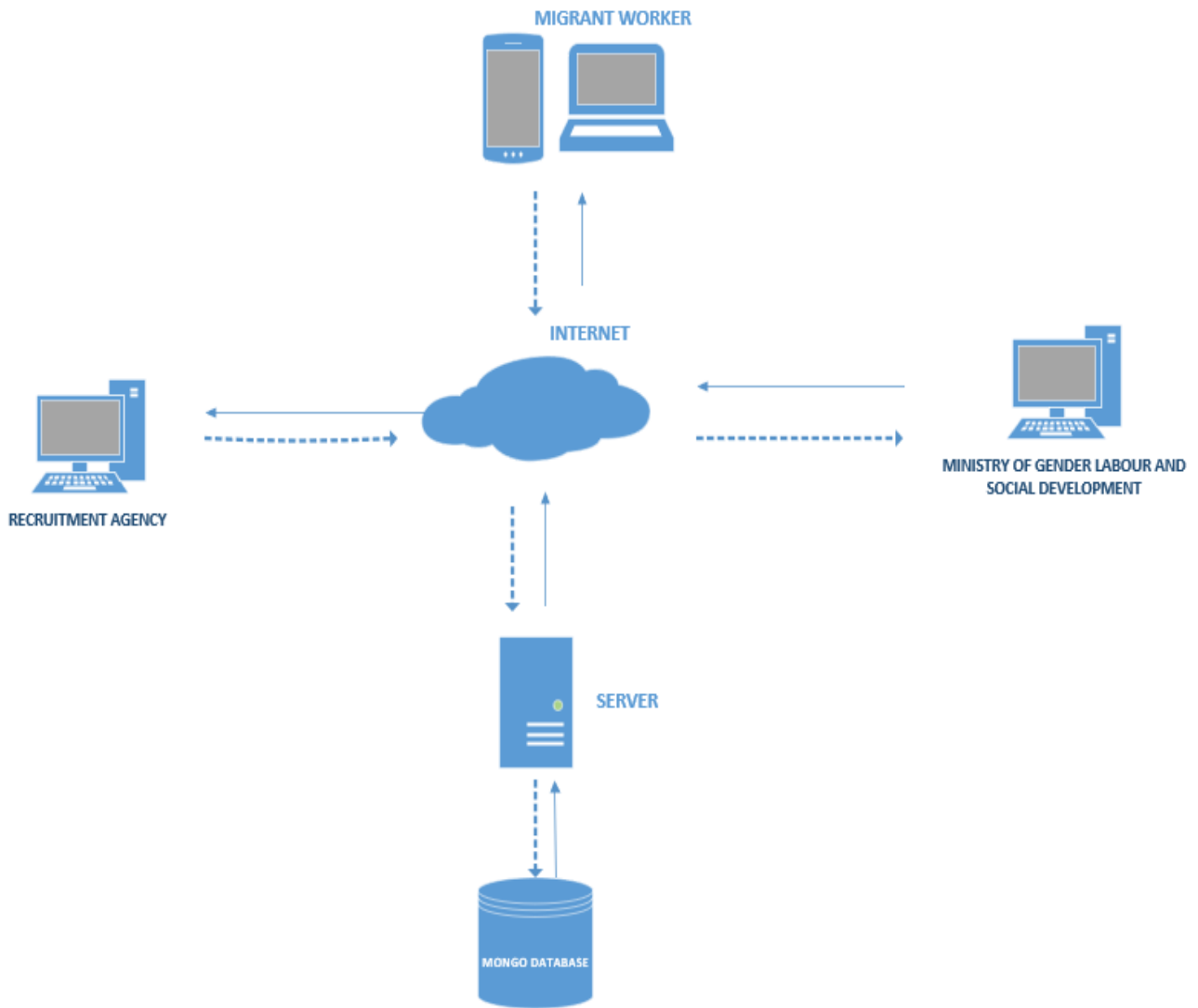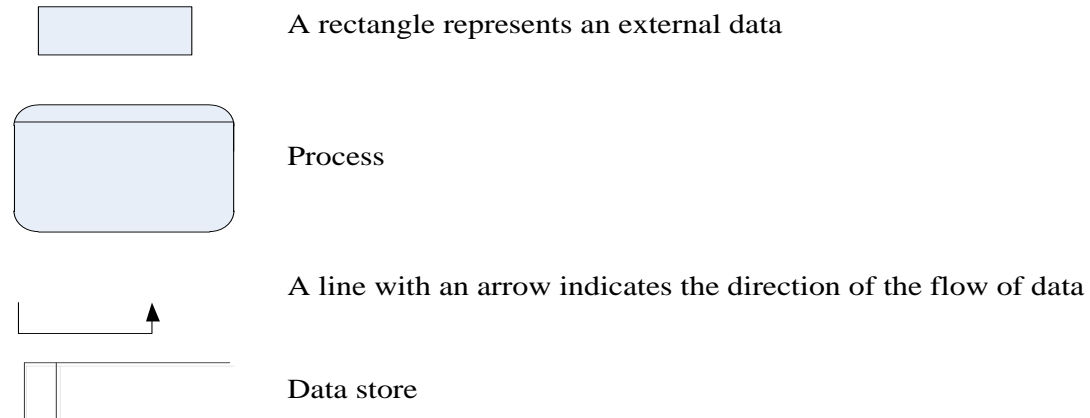
Figure 4. 14: System Architecture of IWIMS

4.4.2 Modeling processes

Data flow within the system was captured by means of process modeling. It was done to show data manipulation processes and their corresponding outputs.

Symbols used in process modelling

▭	A rectangle represents an external data
⬭ (rounded rectangle)	Process
→	A line with an arrow indicates the direction of the flow of data
⬓	Data store

a) Context Diagram

This is a high-level system overview. It describes the system and its external entities (MoGLSD, Migrant Worker and Recruitment Agency) and how they interact.
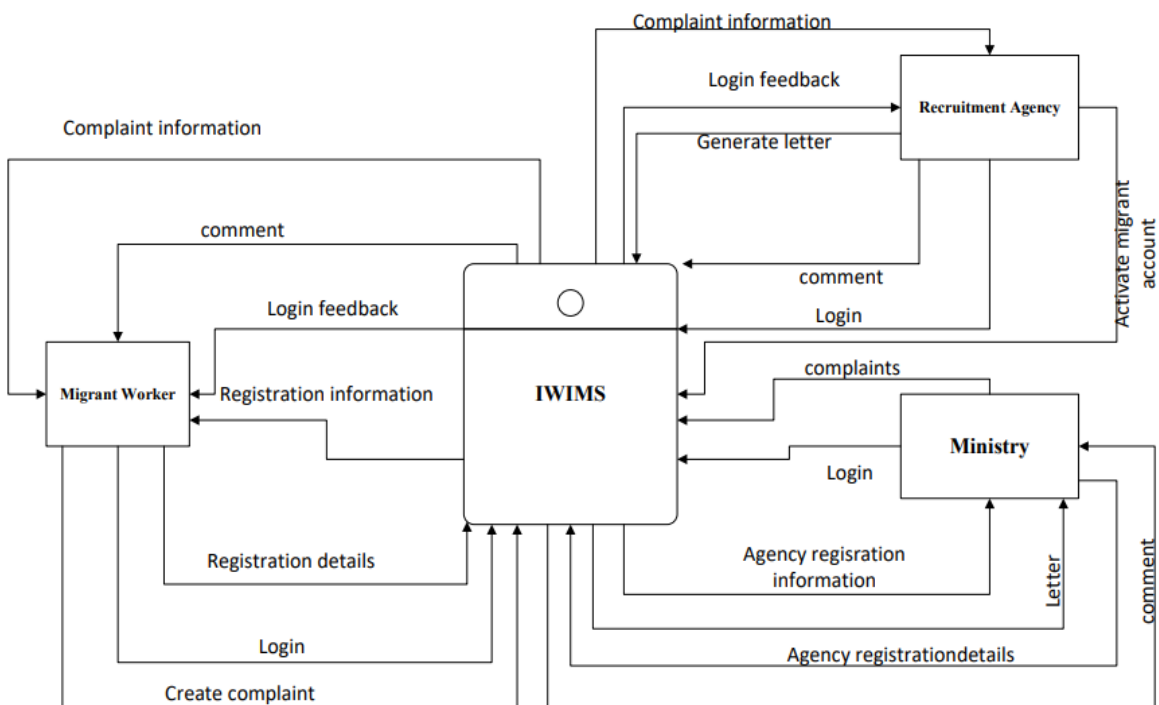
Context diagram for the IWIMS

Figure 4. 15: Context Diagram of IWIMS.

34
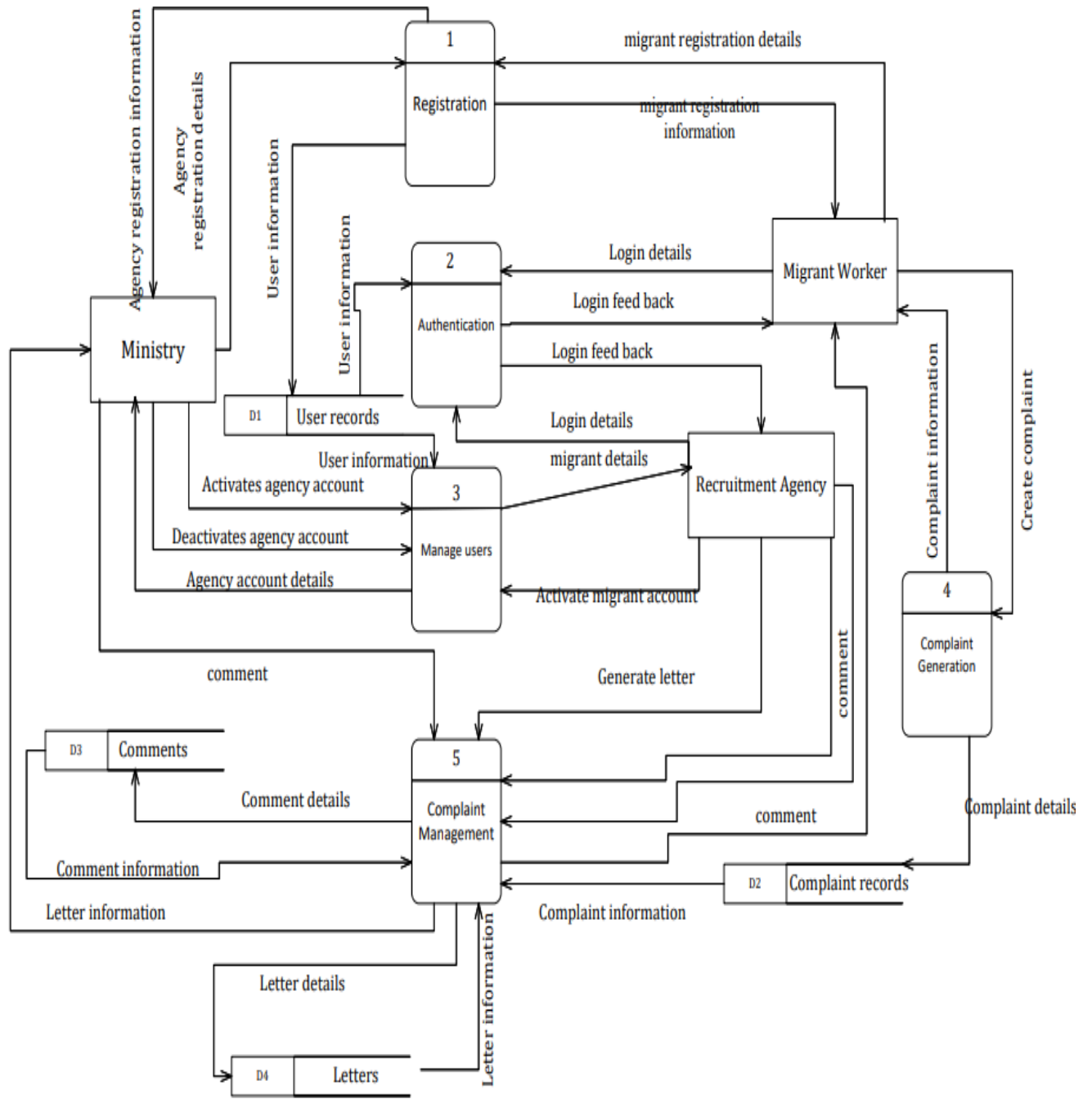
b) Level 1 Diagram.

Figure 4. 16: Level Diagram of IWIMS

c) Data dictionary of the IWIMS

i) Data dictionary showing the description of Processes in the level 1 Data Flow Diagram

Table 4. 4: Processes in Level 1 DFD

Process ID	Process name	Description
1	User registration.	A process that enables users to create accounts on the system. This can be a ministry account, a worker's account or agency account.
2	Authentication.	A process that enables the registered Migrant worker, recruitment agency and Ministry of Gender Labor and Social Development to log in.
3	Manage users.	Process that enables the Ministry of Gender Labor and Social Development to manage agency accounts for example approves an account for recruitment Agencies, also enables the recruitment agency to approve accounts for the migrant workers
4	Complaint generation.	A process that enables migrant workers to make their complaints.
5	Complaint management.	A process that enables agencies to view, manipulate and forward workers' complaints to the Ministry of Gender Labor and Social Development which can as well get reports on the complaints made by the migrant workers.

ii) External Entities description for IWIMS.

Table 4. 5: External entities of DFD

Entity	Description
Ministry of Gender labor and Social Development.(MoGLSD)	This entity manages the complaints made by the migrant workers, generate complaint reports and also approves accounts for the recruitment agencies.
Migrant Worker.	This is the entity that makes complaints.
Recruitment Agency.	This entity approves accounts, views complaints made by their recruited migrant workers and either work on them or forward them to the ministry as a formal letter.

i) Data stores for IWIMS

Table 4. 6: Data Stores.

Data store	Name	Description
D1	User records.	Stores all the information about user accounts such as usernames and passwords.
D2	Complaint records.	Stores all the information about the various complaints.

4.4.3 Modelling data

Designers used entity relation diagrams to capture data entities and their relationships.

a) **Identification of entities.**

Entity.	Description.	Attributes
Ministry.	This is the ministry of gender labor and social development in Uganda	Ministry ID (PK), userId (FK)
Agency.	This is a local labor export agency in Uganda	Agency ID (PK), name, status

Migrant worker.	A Ugandan migrant worker in outside countries.	Migrant workerId (PK), userId (FK), first name, last name, passport number, account status, agency
Complaint.	Can be text, audio or a video in which a migrant worker expresses his/her complaint.	Complaint ID(PK), userId(FK), full name, reason, view, video, audio, status, agency}
comment	This is a reply by the ministry or agency on a complaint it is attached sent back to the worker.	Complaint ID(FK), commentID(PK), comment, comment date}

b) **Relationships between entities and multiplicities.**

Key symbols used in data modeling diagrams.

Symbol	Meaning
1..1	One entity occurrence
1..*	One or many entity occurrences
0..*	Zero or many entity ocurrances

c) **Identification of entity relationships.**

Designers used entity relationship sets to describe the entities, relationships as well as multiplicities of the system and their corresponding relationships as shown below.

i) Recruitment Agency to Migrant worker relationship.

A recruitment agency approves zero or many accounts while a migrant worker is approved by a recruitment agency. Cardinality 1: M.

Ministry of Gender Labour and Social Development (MoGLSD) to Migrant Worker relationship
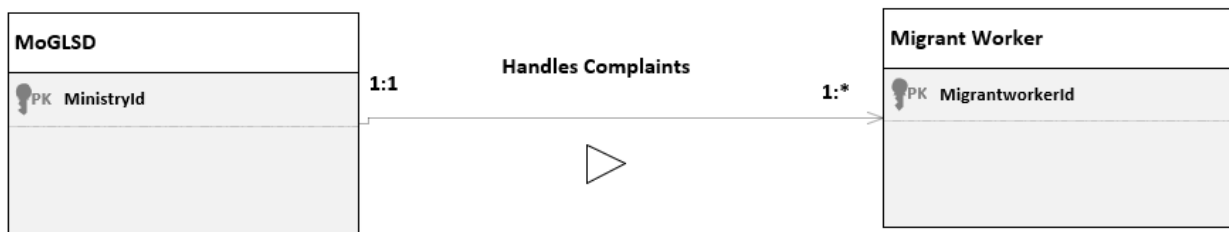
The MoGLSD handles zero or many migrant workers complaints while migrant workers complaints are managed by MoGLSD. Cardinality 1: M.

Recruitment Agency to Migrant Worker relationship

Recruitment Agency recruits zero or many migrant workers while a migrant worker is recruited by one agency. Cardinality 1: M.

Migrant worker to complaint relationship

A migrant worker makes zero or many complaints while a complaint is made by strictly one migrant worker.

Cardinality is 1: M.

Ministry of Gender Labour and Social Development to complaint relationship

The MoGLSD manages zero to many complaints while complaints are managed by MoGLSD. Hence cardinality 1: M.

Ministry of Gender Labour and Social Development to recruitment agency relationship

The MoGLSD creates zero to many recruitment agencies accounts while a recruitment agency account is created by the MoGLSD.

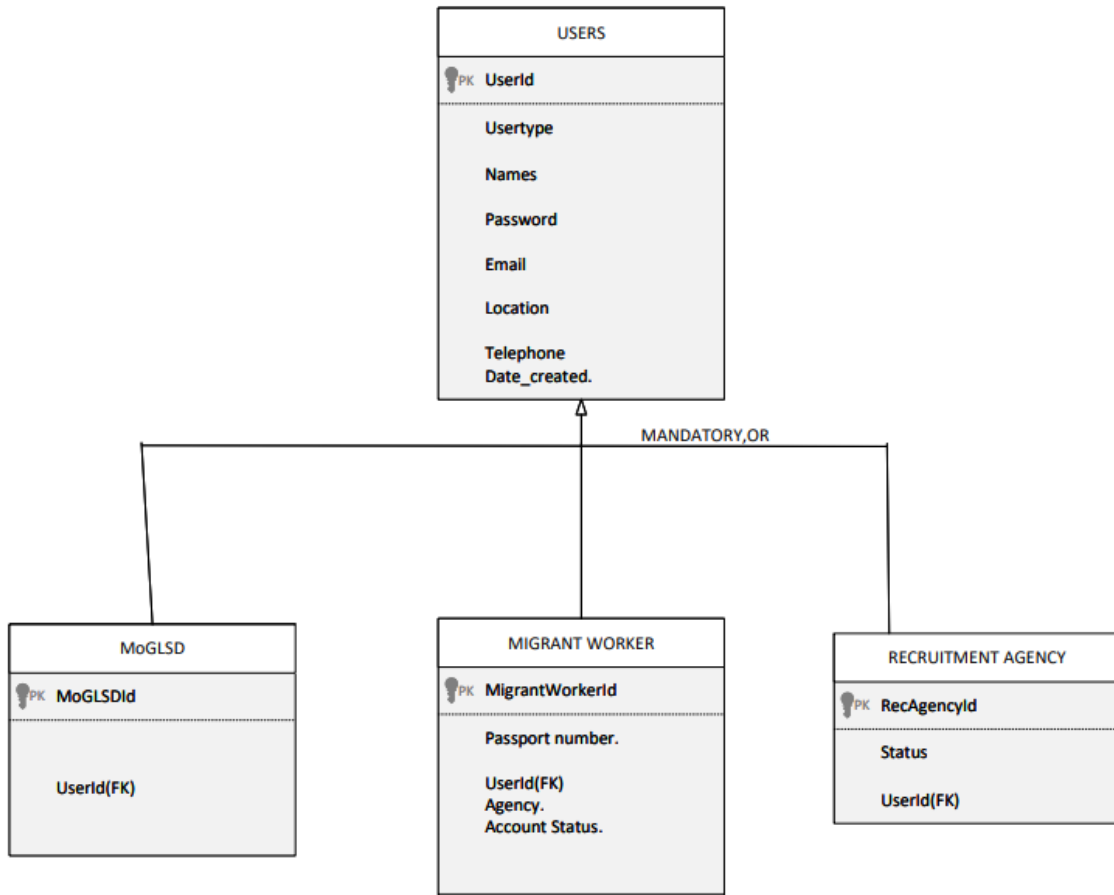## Ministry to Complaint relationship

Ministry comments on zero or many complaints while a complaint is commented on by the ministry.

Agency to complaint relationship

The agency comments on zero to many complaints while a complaint is commented on by an agency.

4.4.3.1 User- MoGLSD/Migrant worker/Recruitment Agency Relationship.

USERS

PK	**UserId**
	Usertype
	Names
	Password
	Email
	Location
	Telephone
	Date_created.

MANDATORY,OR

MoGLSD

PK	**MoGLSDId**
	UserId(FK)

MIGRANT WORKER

PK	**MigrantWorkerId**
	Passport number.
	UserId(FK)
	Agency.
	Account Status.

RECRUITMENT AGENCY

PK	**RecAgencyId**
	Status
	UserId(FK)

4.4.3.2The Enhanced Entity Relationship Diagram (EERD) for the system

The researchers used an EERD to represent the entities and the relationships between them, their occurrence (multiplicities) and attributes.
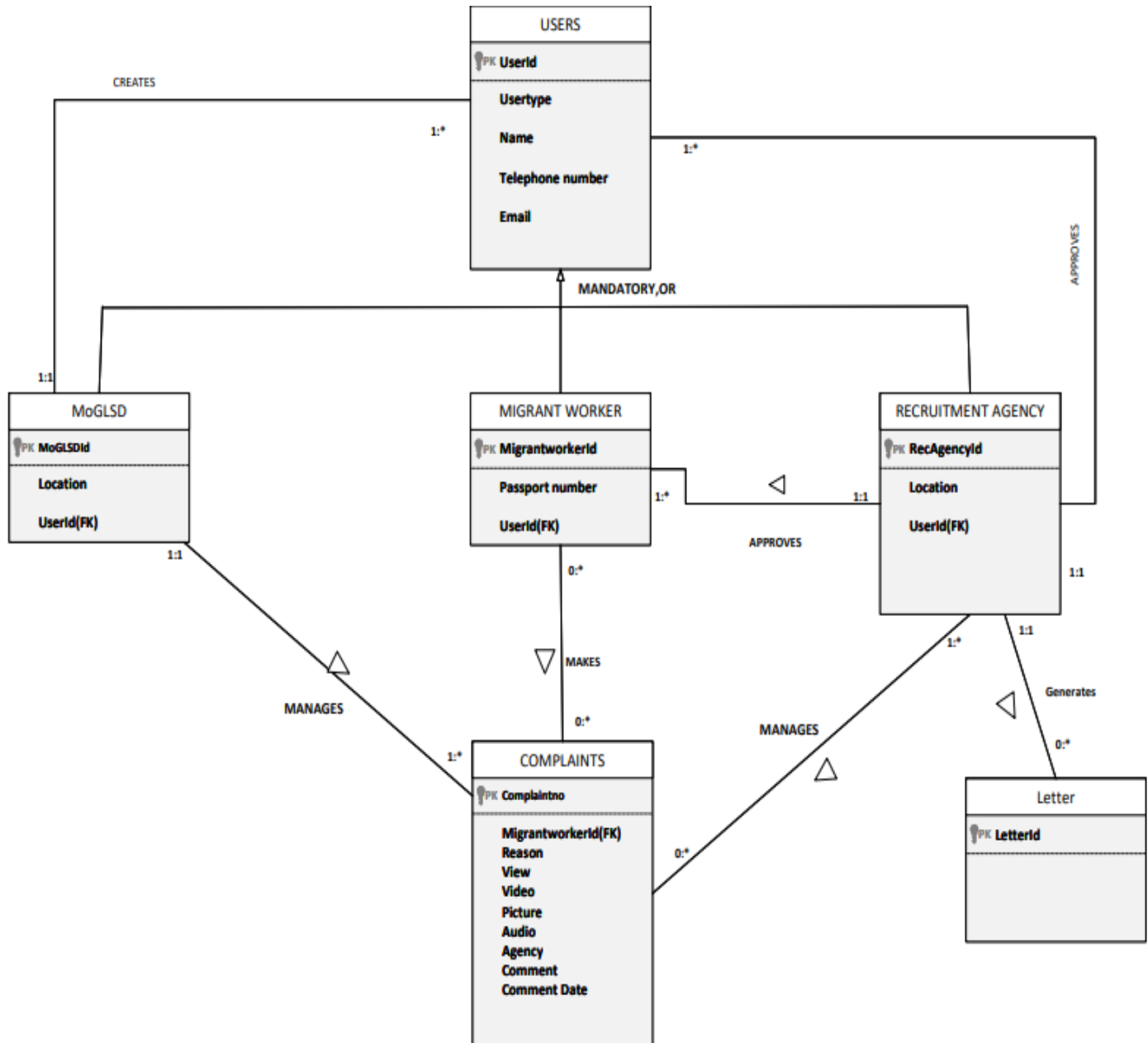
4.4.4 Logical Design

The logical design of the database used for the Immigrant Worker Incident Management System included the following tables: user, Ministry of Gender Labour and Social Development, Recruitment Agency, Immigrant Worker, complaint. Each of them has a primary key and a number of foreign keys. These tables are displayed below:

i)   User {userId (PK), email, password, username, phone , location, date, user type}

Primary key: userId

Foreign key: None

ii) MoGLSD {Ministry ID (PK), userId (FK)}.

Primary key: Ministry ID.

Foreign key: userId.

iii) Migrant worker {migrant workerId (PK), userId (FK), first name, last name, passport number, account status, agency}.

Primary key: migrant WorkerId.

Foreign key: userId.

iv) Recruitment Agency {Agency ID (PK), name, status}

Primary key: Agency ID.

Foreign key: userId

v) Complaint {Complaint ID(PK), userId(FK), full name, reason, view, video, audio, status, agency, comment, comment date}

Primary key; complaint ID

Foreign key: userId

4.4.5 Physical Database Design

This section presents the data dictionary of the Enhanced Entity Relation Diagram, which is the structure of the relations that were constructed in the database during implementation.

i) **Structure of User relation**

Table 4. 7: User Relation.

The table shows the data dictionary of users

Field Name	Data type	Constraint
userId	String	Not null. Primary key
Name	String	Not null.
Email	String	Not null.
Password	String	Not null
Account status	String	Not null
Phone	String	Not null
gender	String	Not null.

ii) Structure of MoGLSD relation.

Table 4. 8: Ministry Relation.

The table shows the data dictionary of MoGLSD

Field Name	Data type	Constraint
Ministry ID(PK)	String	Not null. Primary key
userId(FK)	String	Not null. Foreign key references User (userId)

iii) Structure of Recruitment Agency relation.

Table 4. 9: Agency Relation.

The table shows the data dictionary of the Recruitment Agency.

Field Name	Data type	Constraint
Agency ID (PK)	Varchar (6)	Not null. Primary key
userId(FK)	Varchar (5)	Not null. Foreign key references user (userId)
Status	String	Not null.

iv) Structure of Migrant worker relation.
Table 4. 10: Migrant worker relation.

The table shows the data dictionary of the Migrant Worker.

45

Field Name	Data type	Constraint
Migrant Worker Id (PK).	Varchar (5)	Not null. Primary key
Passport number.	String	Not null
AgencyId	String	Not null. Foreign key
Account Status	String	Not null.

v) Structure of Complaint relation

Table 4. 11: Complaint relation

The table shows the data dictionary of Complaint

Field Name	Data type	Constraint.
Complaint ID(PK)	Int	Not null. Primary key
Migrant WorkerId (FK)	Int	Not null. Foreign key references migrant worker (migrantworkerId).
Reason	String	Not null.
View	String	Not null.
Video	String	Not null.
Picture	String	Not null.
Audio	String	Not null
Status	String	Not null
Agency	String	Not null
Comment	String	Not null
Comment Date	Date	Not null

Chapter Five

System Implementation, Testing and Validation

5.0 Introduction

This chapter presents the results of implementation, testing and validation of the Immigrant Worker Incident Management System.

5.1 The Architecture and Modules of the system

5.1.1 Three-tier Architecture

The Immigrant Worker Incident Management System has a three-tier architecture which consists of the front-end, the middle-end and the back-end.

The front-end is the presentation layer which is content rendered by the browser and includes the graphical user interfaces from which the Ministry of Gender Labour and Social Development and migrant workers can interact with the system through accessing the Immigrant Worker Incident Management System. The front-end was implemented using various technologies which make it fully responsive and dynamic. These include Hypertext Markup Language, Cascading Style Sheets ,JavaScript, Cascading Style Sheets which are all open source and easy to use. The system is fully adaptable to all devices available today, thus, the user can access and use the system using smart mobile phones, tablets, personal computers among others, provided they are connected to the internet.

The middle-end layer was implemented by node java script, an easy-to-use open-source server-side scripting tool. It is the logical layer of the system which creates easy accessibility between the Migrant worker, Ministry of Gender Labour and Social Development, recruitment agency and the sever. Thus, improve interactivity with the users of the system.

The back-end is the database that comprises of data sets and the database management system (DBMS) software that manages and provides access to the data. Information is stored and retrieved from the database. Mongo DB was used to implement the back-end layer. Mongo DB is a relational database system that is designed to work with multiple systems. This tool was used to manage information in the database of the system. Therefore, all the data is stored in various tables in the database, for clear purposes.

5.1.2 System Modules

5.1.2.1 The graphical user interfaces.

This is a feature that allows all users in three categories to interact with the system. It authenticates users to gain access to the data is meant for them whenever they need it. The GUI allows users log onto the system to perform tasks that are meant for them according to the access rights each one has.
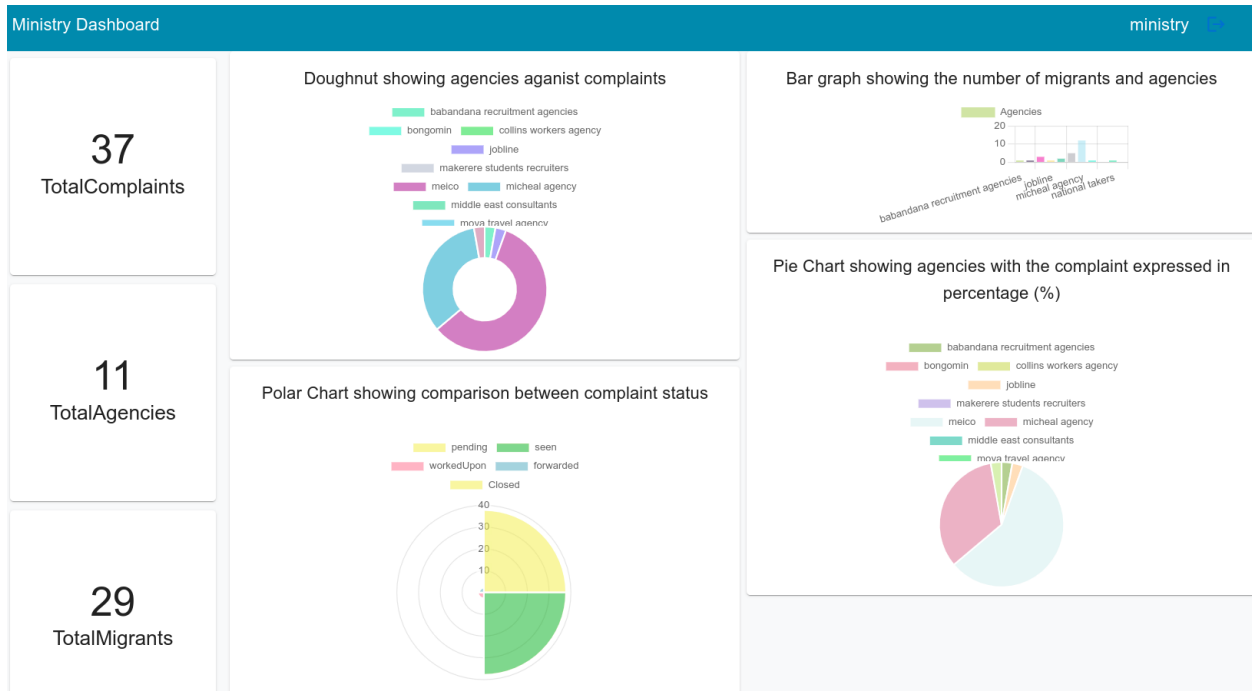
Ministry dashboard

Figure 5. 1: Ministry dashboard

5.2 User roles

To access any of the modules and functionalities of the service technician information system, every user has to have registered. They always have to login first by entering the username with its corresponding password. If a user provides a wrong username or password, the system should deny him/her accessibility with a suitable failure notice and the guideline on what to do next.
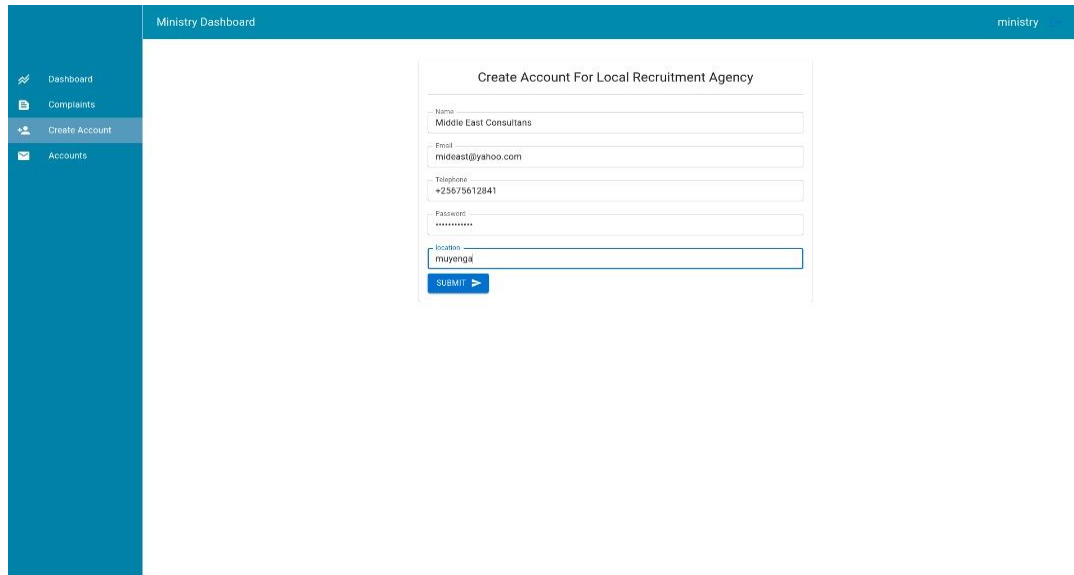
Figure 5. 2: Login Page

i) MoGLSD.

The Ministry has the following authorities; registers recruitment agencies, views and comments on complaints and also receives complaint letters.

The Ministry creates account for the recruitment agency.

Figure 5. 3: Registration Agency Account

ii) Recruitment Agency

The recruitment agency has the following authorities: approves registered migrant workers of that agency, receives complaints and comments on them.

 The recruitment agency adds or approves a migrant workers account.

Figure 5. 4: Approval Migrant Worker.

The recruitment agency generates letters on complaint made by the migrant workers.

Figure 5. 5: Generation of letter.

ii)   Migrant worker.

The migrant worker registers his/ her account and waits for approval by the recruitment agency, make a complaint in text, audio and video format.

Create Account

firstname: mugabi   lastname: Isaac

email: mugabi@gmail.com

Tel: +256 784242189

Password: •••••••••

Passport No.: A238497481

NationalID: CM0238FV23AD8A

Gender: ◉ Male   ○ Female

Age: 18   Tribe: Muganda   Religion: Born Again

Marital Status: ◉ Married   ○ Single

Agency ▾

REGISTER

Figure 5. 6: Migrant worker registration.

After registering the migrant worker has registered, he/she waits for approval by the recruitment agency.
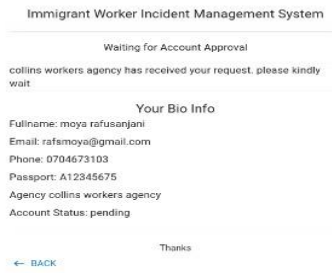
Figure 5. 7: Waiting for account approval.

After the migrant worker has been approved he/she can make a complaint in text, audio and video and then click the submit button to send the complaint.
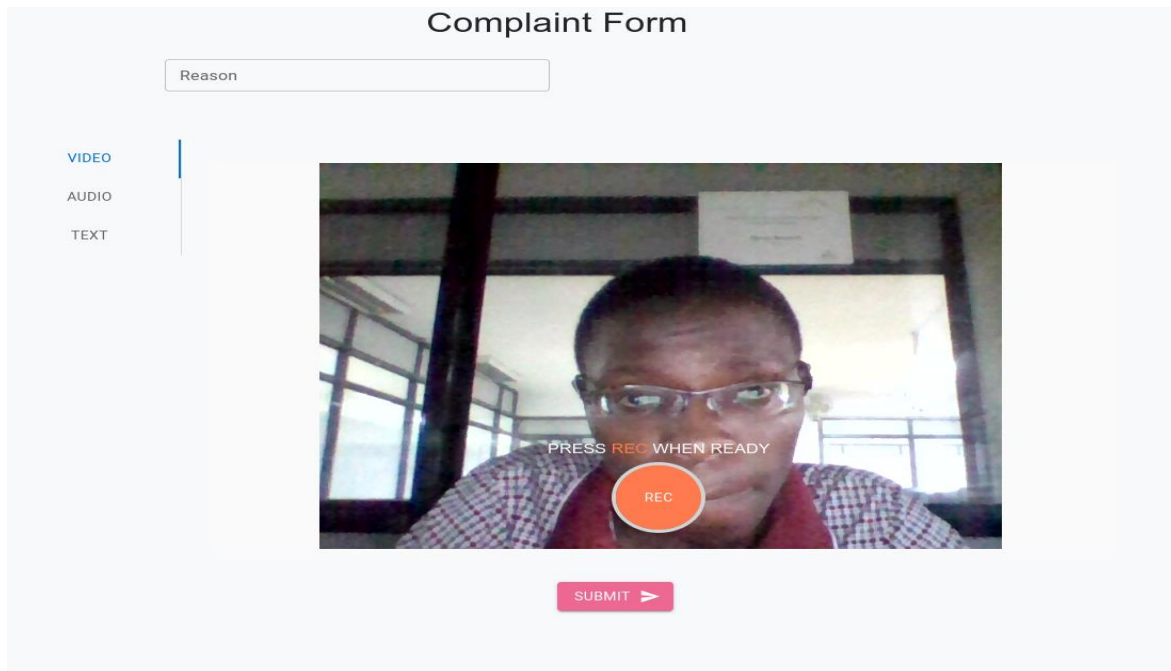
Figure 5. 8: Complaints page.

53

5.3 System Testing and Validation

The Immigrant Worker Incident Management System was both tested and validated so that it is successfully ready for it's users.

5.3.1 System Testing

A test plan was the document that the researchers prepared to show how the testing process was carried out, considering the features and environment in which the system would be running. Therefore, a test plan was drafted to achieve effective and efficient unit and integration testing. Consequently, the researchers were able to identify errors which were debugged to ensure that the system is error free and ready to use.

Testing of the Immigrant Worker Incident Management System was tested in two categories; unit and integration testing. Therefore, to achieve an effective and efficient unit testing as well as integration testing the researchers used a test plan, which was the document that they prepared to show how the testing process was carried out. As a result, the errors that were identified were debugged to ensure that the system is free from errors and is ready to use. It was also important as faults were discovered before the system's complexity could increase through system integration. Both the black-box and white-box methods were therefore used in the unit testing.

5.3.2 System Validation

In validation testing, the researchers presented the prototype of the Immigrant Worker Incident Management System to users such as the MoGLSD, recruitment agency and migrant workers. The researchers used an interview guide to collect first-hand data on whether the system was meeting the user requirements. The collected data was analysed using excel spreadsheets and the results are presented in table 5.1.

Table 5. 1: Results of system validation

Feature	User requirement	Score (%)
Scalability	The Immigrant Worker Incident Management System can enable many and additional users to use it without any additional cost.	86.7%
Authentication	The Immigrant Worker Incident Management System cannot allow unauthorized users to use it. Every user must first login with a correct username with a corresponding password.	96.7%
Efficiency	The Immigrant Worker Incident Management System can enable a user to access information about specific entities.	100%
Effectiveness	The Immigrant Worker Incident Management System can enable users to generate to manage complaints.	100%
User friendliness	The Immigrant Worker Incident Management System is easy to use by any novice user.	86.7%
Flexibility	The Immigrant Worker Incident Management System can enable many users to use it concurrently.	90.0%
Average score		**93.4%**

Table 5.1 shows that Immigrant Worker Incident Management System has an average acceptance score of 93.4%, which implies that it enables the users to conveniently access information about complaints made and eventually supports migrant workers to make their complaints electronically. Thus, the system is user friendly, effective, scalable, efficient, flexible and authenticates users

Chapter Six

Discussion, Conclusions and Recommendations

This chapter highlights the summary and conclusions about the Immigrant Worker Incident Management System as well as the recommendations about what needs to be improved in the project by other researchers in future.

6.1 Discussion

This sub-section highlights the summary about how the objectives of the study were addressed during the different stages of project implementation, which include preliminary investigation about the performance of the current system and data analysis, system analysis and design, system development, system testing and validation.

The objective of preliminary study was achieved by using both primary and secondary data collection methods. These include; interviews, and questionnaires. Using an interview guide, the researchers posed face-to-face questions to three respondents at the Ministry of Gender Labour and Social Development and answers were not biased. The researcher also administered questionnaires to the respondents in order to collect first hand data about the strengths and weaknesses of the existing system or the ways through which they were making complaints. The collected data was analyzed using excel spreadsheets.

For system analysis and design of the system, the researcher identified the requirement specifications from the first phase and designed the system using use case diagrams, data flow diagrams (DFDs) for process modeling and the entity relationship diagram (ERDs) for data modeling.

The system was developed using software technologies; HTML, react java script, Cascading Style Sheets, JavaScript and Mongo DB. This open source and easy to use technologies made the system fully responsive and dynamic. And thus, the developers were able complete the implementation.

The system was tested by using the method of benchmarking, were units of the application were run and tested independently in order to identify and debug syntax errors among others. The different modules of the system were also integrated and tested as a whole while for system validation, the prototype version of the system was given to the test users to use in order to prove whether it meets the user requirements or not.

6.2 Conclusions.

A web-based software system that is the Immigrant Worker Incident Management Information System (IWIMIS) was successfully developed. The system enables the migrant worker to make complaints for-example through text, video, audio and the Ministry of Gender Labor and Social Development to view and generate reports on the complaints made in order to take further action as well a for future use and review, statistics and also the recruitment agencies view the complaints made by the migrant workers.

The Immigrant Workers Incident Management System is a comprehensive solution to the problems faced by the manual procedure of handling the immigrant workers complaints at the ministry .It has qualities such as reduction in complaint processing protocol, reduction in time spent while making complaints as well as generation of complaint reports as well as provision of easy means of extending the complaint to the ministry. This makes it superior to the previous ways through which the migrant workers or the next of kin had to physically go to these offices to make complaints that involved a series of steps.

The Immigrant Worker Incident Management System was successfully developed, tested, and found to be working as expected. The system was developed using software technologies; HTML, CSS, node JavaScript and Mongo Database.

6.3 Recommendations.

In the view of the challenges associated with the Immigrant Worker Incident Management System, the researcher made the following recommendations:

The Immigrant Worker Incident Management System can be used alongside the existing manual system and the migrant workers, Ministry of Gender Labour and Social Development. , recruitment agencies gradually adopt it as the new technology. This is good in case of loss of hardcopy complaints brought to MoGLSD and there is need to access them.

All the stakeholders must be computer literate and own a smartphone because the system is hosted on a network, such as the internet.

Existence of the Immigrant Worker Incident Management System should be made to sensitize people about its significance especially to the migrant workers abroad and also aiding the Ministry

of Gender Labour and Social Development, recruitment agencies to take action on reported complaints.

Benchmark research must be carried out by researchers to evaluate the performance of the Immigrant Worker Incident Management System.

The Ministry of Gender Labour and Social Development, recruitment agencies should incorporate the use of the Immigrant Worker Incident Management System into their regulations. Thus, the Immigrant Worker Incident Management System should be recommended.

6.4 Future research.

A better Immigrant Worker Incident Management System should be developed to enhance flexibility in operation, although this solution can be viewed on only a computer.

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Appendices

Appendix A: Interview Guide

We are students of Makerere University from the College of Computing and Information Sciences (COCIS) offering a Bachelor of Science in Information Systems and Technology in our third year conducting a survey on migrant workers complaints/incident management. We plan to automate the whole process of incident/complaint management for Ugandan migrant workers and to integrate the whole system we are to develop with any existing system(s) for both academic excellence and service improvement in handling migrant workers' complaints. The information collected will be provided will be treated with at most confidentiality.

1. Through what means or how do migrant workers report their complaints to the ministry?

2. Do you have any electronic information system you use for handling migrant workers complaints as of now? If any, please give a brief description of how it works.

3. Who is/are responsible for handling migrant workers' complaints within the ministry, what department?

4. What is the procedure for handling a migrant worker's complaints when they?

5. Who is involved in the incident management process and how? Please give a brief description of what all participants do in the process to solve an incident. Please talk about migrant workers, labour export agencies and embassies as well.

6. How do you evaluate solutions to complaints? What criteria do you use to establish solved and unsolved cases? How do you come to conclusion that a case is solved?

7. What data do you collect from migrant workers when they are reporting an incident? Is there a secondary source of that same data like any ministry or organisation?

8. Do you see any loopholes or weaknesses in the currently used system? Are there any improvements you want to be done in your current system? Please give a brief description of each if any.

9. Do you think your clients the migrant workers are satisfied with the current system of reporting and managing incidents that happen to them while abroad?

10. Are satisfied your current system, or would you support us if we came up with a system or modifications in your current system to improve your services?

11. What would be your expectations if we came up with a system for managing migrant workers' complaints?

Appendix B: Questionnaire.

We are students of Makerere University from the College of Computing and Information Sciences (COCIS) offering a Bachelor of Science in Information Systems and Technology in our third year conducting a survey on migrant workers complaints/incident management. We plan to automate the whole process of incident/complaint management for Ugandan migrant workers and to integrate the whole system we are to develop with any existing system(s) for both academic excellence and service improvement in handling migrant workers' complaints. The information collected will be provided will be treated with at most confidentiality. Please fill this questionnaire so as to aid our research. You are requested to give your opinion on facts and experiences on each statement in the questionnaire.

1)Have you or a person you know ever gone abroad to work?

☐ Me

☐ A person I know

☐ None of the above

2)If yes, what age is the person?

☐ 18-25 years.

☐ 26-35 years.

☐ 36 years and above.

3)Are they/u literate?(the person who worked from the diaspora)

☐ Yes

☐ No

☐ Somehow

4)Did they/you have a smartphone?

☐ Yes

☐ No

5)Did you/they face any issues while there?

☐ Yes

☐ No

6)What kind of problem was it?

☐ Financial

☐Refund

☐Run away

☐Torture

☐Sickness

  Other:_____

7)If yes, who did you/they contact for help?

☐Agency

☐Embassy

☐Ministry of gender, labor and social development

☐Next of kin.

  Other:_____

8)If you got any help, who helped you?

☐ Embassy

☐ Agency

☐ Ministry

☐ Next of kin

☐ None of the above

☐ All the above

   Other:_____

9)How long did it take for the issue to be settled?

☐1day

☐2-4

☐5-7days

☐Above 1week

☐A month

☐A year

10)What means did you/they use to report the issue?

☐Electronic information

☐Social media

☐Phone call/sms

☐Police/Interpol

Other:_____

11)Do you know any electronic system that handles migrant worker's incidents/complaints?

☐Yes

☐No

☐Not sure

If yes, name it;

Your answer

_____

12)What are the issues faced in the process of incident/complaint handling?

☐Bureaucracy

☐Time consuming

☐Complexity

☐Unfair treatment

☐Segregation

  Other:_____

13)Is information pertaining complaint management made accessible?

☐Yes

☐No

☐Maybe

14)How did you get to know about where to find help in times of danger while in diaspora?

☐Through social media

☐Through a friend

☐Through TV/radio

☐Told by agency/ministry officials

  Other:_____

15)What expectations you hold for a new migrant worker's incident/complaint system?

☐Efficient and effective

☐Time concious

☐Transparent

☐Cater for illiterates

  Other:_____

Appendix C: Letter from the Ministry Approving Data Collection at the Ministry.