BUSINESS INFORMATION SYSTEMS
CASE STUDY: FOOT PROTECTION SERVICES (U) LTD

By
BS/015
BUSINESS SYSTEMS
DEPARTMENT OF INFORMATION TECHNOLOGY
FACULTY OF COMPUTING AND INFORMATION TECHNOLOGY

A Project Report Submitted to the Faculty of Computing and Information Technology for the Study Leading to a Project in Partial Fulfillment of the Requirements for the Award of the Degree of Bachelor of Information Technology of Makerere University.

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DECLARATION

We [BS/015] do hereby declare that this Project Report is original and has not been published and/or submitted for any other degree award to any other University before.

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ACKNOWLEDGEMENT

The Management Foot protection (U) Ltd,

Special thanks are conveyed to our supervisor Mr. Ejalu Ronald Lee not only for his guidance, advice, encouragement and patience with us without which this piece of work would not have come up but also became our mentor whose honor and acceptance was illuminated.

Thanks to group members who worked tirelessly to make it possible for this project to be a success. Heart felt gratitude to the management of FCIT who gave us the opportunity to put what we learnt into practice.

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<tr>
<td>BIS</td>
<td>Business Information System</td>
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<td>Acronym</td>
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<td>DFDs</td>
<td>Data Flow Diagram</td>
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<td>LTD</td>
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ABSTRACT

As one of the requirements to acquire a Bachelor’s degree in Information Technology, a student should do a project research to attain hands-on experience. To satisfy this requirement, we did our research in Foot protection services (U) Ltd, a company dealing in the manufacturing of footwear products in Uganda located on Plot 1069 Kaweesa Road Kireka. This is a report of our research in which we developed a Business Information System for the company.

Foot protection services (U) Ltd has a manual, with one computer in which excel was used for keeping company records. This resulted into difficulty with storing, retrieving, sharing information therefore there was a need for developing a business Information system that would store and efficiently avail all necessary information to the company.

The system developed for Foot protection services (U) Ltd, will ease keeping of records of all activities conducted by the company for example raw materials ordered, purchases made, products produced within a specific period of time and information pertaining existing competitors. The system was designed using MySQL for the database backend and PHP and HTML for the different interfaces.

With the new system, different departments in the company will be able to share and access information in addition to inputting, updating and deleting unnecessary information easily.
Chapter One

1. INTRODUCTION

1.1 Background

All over the world, human kind require special attention to their feet, this is why most people in both rural and urban centers, developed and developing countries are making an effort to trade quality shoes according to the variety of demands which involves babies, school going children, adults of various capacities. Different shoe types are designed for different needs, military people demand a different quality, and Students have different tastes.

In Uganda shoes are imported from China, Dubai, U.SA, India, to mention but a few. Bata, the major shoe selling company in Uganda sells variety of shoes imported from the above countries and those that are locally made within Uganda. Due to local demand for shoes, several companies have come up with a variety of locally manufactured shoes in Uganda, among these company includes; Foot Protection Services (U) Ltd, Crane Shoes, Leather Works (1986) Ltd, Tannery and Leather Improvement (U) Ltd.

Foot Protection Services (U) Ltd, a company dealing in the manufacturing of footwear

Products in Uganda located on Plot 1069 Kaweesa Road Kireka, was formed in March 2004 by 30 former employees of Bata Uganda Ltd. The company purchased assets/machinery from Uganda Shoe Company on understanding that Bata would be the potential customers/clients. Foot Protection Services (U) Ltd deals in production of footwear services like Boots, Children's shoes, Men's shoes, Military - Safety - Sandals and Women's shoes.

The current market coverage is still very small with Bata being the leading consumer and other individual local buyers. The main competitor of Foot Protection Services (U) is Crane Shoes located on 6th street, Industrial area. Other minor Competitors include; Leather Works (1986) Ltd, Tannery and Leather Improvement (U) Ltd. Record keeping and Information management
was done by one employee who is the company accountant as well. The company had only one computer and used Microsoft Excel and Access application program to keep all company’s records, which include employees, customer, suppliers, and competitors details. The Company also used manual system (information recorded in books).

This made it difficult for the company to store transactions and inventory information thus requiring a more reliable, efficient and effective system that will solve the above problem. Bob Brown ‘2007’ suggests that “Renewable energy is proven technology, the price is dropping, and the rest of the world is going that way, that’s where our investment should be going as well.” Implying that the world is dropping manual systems to computer aided systems; therefore to copy up with the proven technology there was a need for a Business Information System for Foot Protection Services (U) Ltd.

1.2 Problem Statement

The system at Foot Protection Services (U) Ltd was manual, with one computer in which excel was used for keeping company records. This resulted into difficulty with storing, retrieving and sharing accounts, store and management information therefore there was a need for developing a business Information system that would store and efficiently avail all necessary information to the company.

1.3 Main Objective

To develop a business information system that will effectively and efficiently process, retrieve and store the company’s transactions and inventory information for better management by the company.
1.4 Specific Objectives

i. To investigate operations and procedures in the current system and find out existing inefficiencies and strengths in it.

ii. To review literature on business information systems that will enable the company to effectively affect the business activities.

iii. To design an effective and efficient business information system for record keeping.

iv. To test and validate the tool using a case study carried out at Foot Protection Services (U) Ltd

1.5 Scope

The study was focused on a business information system for the Accounts, Store and management departments of Foot Protection Services (U) Ltd located on Plot 1069 Kaweesa Road, Kireka, and a company is dealing in the manufacturing of footwear products in Uganda.

1.6 Significance

The system developed appropriately run all the business processes carried out by foot protection services (U) Ltd for example it will store the company’s transactions and inventory information.

Foot protection services (U) Ltd, was able to use the system developed to keep records of all activities conducted by the company for example raw materials ordered, purchases made, products produced within a specific period of time and information pertaining existing competitors.
The system developed helped in correcting the current inefficiencies in operations and procedures in Foot protection services (U) Ltd.

Professionals in IT who may need to carry on further research on business information systems and factors affect them will be able to use the system developed for reference.

By developing the system, management can make informed decision and opt to continue using the system or change to another system depending on benefits against costs of system.

Improved security because of the password that has to be provided before logging into the system.
Chapter Two

2. Literature Review

This chapter reviews the existing Business information systems in place, their benefits to organizations and why foot protection services (U) should adopt a Business information system.

2.1 Business Information system

Information Management [10] describes the means by which an organization efficiently plans, collects, organizes, uses, controls, disseminates and disposes off its information, and ensures that the value of that information is identified and exploited to the fullest extent.

Information management in an organization includes creating, capturing, registering, classifying, indexing, storing, retrieving and disposing of records and developing strategies to manage records. Also includes the acquisition, control and disposal of library and other information products, items kept for reference purposes, and the provision of services to internal and external customers, based on information resources. Footwear Protection Services (U) Ltd manages its information by the use of one computer that is used to collect, retrieve, and store and manage records.
According to Cheng, Millar and Ju Choi (2006) [1], the field of business and society has become increasingly prominent in the twenty-first century, due to the various corporate scandals involving corporations as Enron, WorldCom as well as professional service firms such as Andersen, which are seen as part of the more profit-oriented shareholder business system. Globalization and the development of information and communication technologies have increased the debate among corporations and policy makers on the nature of optimal business systems in today’s global business environment. This implies a fundamental need for “organizational change” for a substantial number of today’s major global corporations.

O’Brien (2001) [2] describes an information system as an organized combination of people, hardware, software, communication networks and data resources that collect, transform, and disseminate information in an organization. Organizations have relied on information systems to communicate using a variety of physical devices (hardware), information processing instructions and procedures (software), communication channels (networks) and stored data (data resources) since the dawn of civilization. Footwear services (U) Ltd will take advantage of current information system to compete in the footwear industry.

O’Brien (2001) [2], found that, information systems must support the business strategies, business process and organizational structures and culture of an organization and increase the business value of the organization in a dynamic environment. For footwear protections services (U) Ltd, there is a vast requirement for information. Senior managers need information to help with their business planning. Middle management needs more detailed information to help them monitor and control business activities. Employees with operational roles need information to help them carry out their duties.

The footwear industry worldwide has taken to information systems for wide scale production for example, Universal Footwear, a growing fashion importer and distributor based in South Africa specializes in competitively priced footwear and accessories. Akinal Ayakkabicilik A.S - Manufacturers of injection molded polyurethane and PVC slippers and shoes, Action Shoes -
Casual and formal footwear for men, women and children, located in India. In Uganda footwear companies like Bata, Crane Shoes, Leather Works (1986) Ltd, Tannery and Leather Improvement (U) Ltd use information systems to produce, market, advertise.

2.2 Types of information systems

According to Shelly, Cashman and Vermaat; Course Technology (1999) [3], businesses tend to have several "information systems" operating at the same time and these include;

- Management Information Systems (MIS) generate accurate, timely and organized information so that managers and other users can make decisions, solve problems, supervise activities, and track progress. Because it generates reports on a regular basis, a management information system sometimes is called a management reporting system (MRS).

- Expert information systems (EIS) captures and stores the knowledge of human experts and then imitates human reasoning and decision-making processes for those who have less expertise. Expert systems are composed of two main components: a knowledge base and inference rules. A knowledge base is the combined subject knowledge and experiences of the human experts.

- Knowledge management systems (KMS) exist to help businesses create and share information. These are typically used in a business where employees create new knowledge and expertise, which can then be shared by other people in the organization to create further commercial opportunities. KMS are built around systems, which allow efficient categorization and distribution of knowledge.
• Strategic information systems (SIS) apply information technology to a firm’s products, services or business processes to help it gain a strategic advantage over competitors.

• Business information systems (BIS) focus on managerial and operational applications in support of basic business functions such as accounting or marketing.

2.3 Business Information System (BIS)

A business information system (BIS) [7] is a set of processes, policies and procedures designed to capture evidence of business activities undertaken by an organization. A business information system provides for the creation, capture and management of, and access to, an organization’s records, documents and other business information over time.

*International Journal of Business Information Systems (IJBIS) [8] suggests* that BIS brings business functions and information modules together for establishing effective communication channels, which are useful for making timely and accurate decisions. This places a tremendous pressure on Footwear protection services (U) Ltd to develop a suitable BIS in order to facilitate effective communication along the supply chain and in turn contribute to organizational productivity and competitiveness.

A BIS within Footwear protection services (U) Ltd supports one of the traditional functions of business such as marketing, transactions, production and they are divided into three categories, which include;

• Executive support systems (ESS)

ESS is designed to help senior management make strategic decisions. It gathers analyses and summarizes the key internal and external information used in the business.

• Decision support system (DSS)
DSS support analytical work in semi-structured or unstructured situations. They enable managers to answer "What if?" questions by providing powerful models and tools (simulation, optimization) to evaluate alternatives (e.g. evaluating alternative marketing plans). DSS are user-friendly and highly interactive. Although they use data from the TPS and MIS, they also allow the inclusion of new data, often from external sources, such as current share prices or prices of competitors.

- **Transaction processing system (TPS)**

TPS is designed to process routine transactions efficiently and accurately. A business will have several (sometimes many) TPS; for example:

  i. Billing systems to send invoices to customers.
  ii. Systems to calculate the weekly and monthly payroll and tax payments.
  iii. Production and purchasing systems to calculate raw material requirements.
  iv. Stock control systems to process all movements into, within and out of the business.

With the adaptation of transaction processing system, Footwear protection services (U) Ltd was able to effectively and efficiently carry out its daily operations thereby enhancing higher profitability over its competitors like Crane Shoes, Leather Works (1986) Ltd, Tannery and Leather Improvement (U) Ltd.

Marvin Gore [4] urges that BIS are vital to an organization because of its benefits which include:

- **Accuracy.**
BIS have greater potential accuracy in that, once the data is entered correctly into the system in a machine readable format; it reduces chances for error by reducing the numbers of times humans are involved and this will help Footwear protection services (U) Ltd to input data of accurately into the system.

• Data collection and communication.
Methods for collecting and communicating with data are faster and more efficient. Modern computers allow data communication network to be established to collect data and to respond to inquires. Footwear protection services (U) Ltd will have a faster and efficient rate of data collection with the adoption of BIS.

• Data storage
Data can be stored and accessed. In computer-oriented systems, data is kept in master files, usually magnetic in a machine-readable format. A collection of related files form a database. There by eliminating the need for multiplicity of redundant files and this will reduce the occurrence of redundant data in Footwear protection services (U) Ltd

• Speed of response.
The time required for the information to be available, can be greatly improved by use of computers. Systems are able to make information available as needed.

According to Kadiyala and H. Kleiner [5] today’s competitive world, BIS will provide competitive advantage to Footwear protection services (U) Ltd. BIS have a strategic impact by reducing production costs and identifying the potential market segments. BIS go a long way in simplifying things for a business by effective management of information.

2.4 Critique of the existing literature
To be successful in today's competitive marketplace, foot protection services (u) Ltd needs to access a business information system that produces accurate and targeted information about customers, markets and competitors but establishing a superior business information system presents multiple challenges which include;

- Karandikar and Freidbergt [6] emphasize that, the challenge facing most business systems today is how to increase, or at least maintain, an acceptable level of profitability while continuing to fill the increasingly specialized needs of the customer base. The customers have become more technically demanding while, at the same time, expecting lower costs.
- The chance of missing important information is high, and the probability of getting important information to all the right people at the right time is low.
- Finding a business information system that can be easily integrated into an existing information infrastructure or enterprise portal is complicated.

Chapter Three

3. Methodology

The various fact-finding techniques were used to carry out a detailed study and we reviewed the existing system to achieve the objectives of the proposed system such as methods, processes and techniques to be deployed in data collection, analysis, design and implementation. It also looks at the different technologies that were used to implement the proposed system, that is, the BIS, and also the reasons for the choice of the respective technologies.

3.1 Data Collection

  a) Interviews
Interviews were conducted with the administrators for example the accountant (Mr. Opoka) of foot protection Uganda LTD and some current employees to find out what difficulties they encountered with their existing system. During the interviews, we found out that vital
information for the company was regularly lost and difficult to update due to the manual system in place. These interviews were held to verify the information collected since there was room to probe for further information during the interview.

b) Naturalistic Observation
Personal observations were carried out to observe how users interact with the system in order to understand how the current system works. We managed to see the pile of papers in the accountant’s office and one computer that used excel and access and was mainly used by the accountant. Information gathered in interviews was verified for accuracy after this process.

c) Document review
The efficiencies and inefficiencies of the current system were reviewed by studying the documentations in the accountant’s office that showed inventories and transactions carried out. This helped us to establish the requirements of the proposed system.

3.2 Technologies
The technologies used in implementing the system were;
3.2.1 MySQL

MySQL is characterized as a free, fast, reliable open source relational database. This was used in the construction of a DBMS to set, update and also retrieve the necessary data from the system’s database. It was chosen because of the following reasons;

- It provides quick retrieval of large amounts of data.
- It has well defined standards.
- There is no coding required incase you want to move an application between DBMSs (that adopt the standard).
- Because of MySQL’s well-defined standards, portability is easy.

3.2.2 PHP

PHP is a simple, dynamic server side, interpreted, robust, secure, very high-performance, architecture neutral, portable, dynamic scripting language. PHP was used because;

i. It is an open source.
ii. It is easily learned syntax.
iii. Has broad database connectivity.
iv. Contains a massive library of contributed extensions.
v. It is a general purpose scripting language much superior to PERL, VB script.

Chapter Four

4. System Design and Implementation

The system will have a number of unique individual requirements. These requirements are divided into user requirements, functional requirements and non-functional requirements.
4.1 User Requirements

The requirements of the users of the system are:

- The system should allow the user to generate reports
- The system should allow the user to insert, update and delete information.

4.2 Functional Requirements

The system shall have the following functional requirements:

- The system should be able to register and store user’s details in the database.
- The system should be able to log registered users into their accounts.
- The system should let users browse and view all available information.
- The system should allow registered administrators to log in and update the database.

4.3 Non-Functional requirements

The system will have the following non-functional requirements that are not directly concerned with delivered functions of the system:

- Only authenticated users may log into the system.
- The system must be flexible.

The requirements for the proposed system were analyzed and identified. This led to the development of the appropriate models that helped in meeting the desired system functionality. Some of the structured approaches that were used here to structure data into useful information included the following techniques;
4.3.1 Use Case diagram

The use case model uses "Actors" and "use cases". An Actor is the representation of a person or system which exists outside the system under study and who (or which) performs a sequence of activities in a dialogue with the system.

A Use Case represents a single interaction between a primary actor (who initiates the interaction) and other (secondary) actors, and the system itself. The interaction is presented as a sequence of simple steps.

We used use case diagrams because; they put requirements in context, describing them in a clear relationship to business tasks, Use cases are easily translated into scenarios ("stories") which express the analyst’s understanding of the business need in a way which the business user can understand on their own terms, use case represent the interactions between the user and the system (others will represent interactions between systems) make it possible for user interface designers to become involved in the development process either before or in parallel with software developers (although use cases are also said to discourage inappropriate premature design).
**USE CASE DIAGRAM**

**CASE ACTIVITY FOR ACCOUNTANT**
- Accountant logs into the system.
- He manages transactions, that is to say: edit, modify, deletes transactions.
- He/she is also able to view and edit transactions.

**CASE ACTIVITY FOR STORE MANAGER**
- Store manager logs into the system.
- He manages inventory, that is to say: edit, modify, delete inventory.
- He/she is also able to view inventory.
4.3.2 Context diagram

- This provides the summarized overview of the system and the external entities with which it interacts with. We used context diagrams because; it clarifies to the user audience the analyst’s understanding of the scope of the proposed system, the kinds of users the system will have, and the data coming out from and going into the system.
4.3.3 Dataflow Diagrams (DFDs)

A dataflow diagram is a graphical representation of the flow data through an information system. Hence this tool was used to model the flow of data/information through the different processes. It was chosen because of its few constructs, which could provide a means of easy interpretation to any interested individual, hence providing a way of promoting transparency,
simple but powerful graphic technique which is easily understood and represents an information system from the viewpoint of data movements, which includes the inputs and outputs to which people can readily relate.
DATA FLOW DIAGRAM FOR STORE MANAGER
4.3.4 Entity Relationship Diagrams (ERD)

This is the method that was used in the data modeling process. It provided a way of identifying the major entities that were important for any effective constructed data source (database) for the proposed system. It was the choice basically because its concepts and constructs are based on in the DBMS used to develop the actual physical proposed system’s database.
4.4 Programming Paradigm

The system was technically implemented as follows;

Basing on the models developed during Systems Analysis and Design, a general database for foot protection services (U) Ltd was created using MySQL. Technical knowledge was relied on in this, in order to apply the different constraints for transparency and safety purposes but also aiming at completeness, consistency and integrity.

A simplified expressive Graphical User Interface was developed, this time focusing marjorly on the user ideas for easy interactivity with the system. Finally, amalgamation of the front end (user interface) and back end (database) was done by one of the Framework’s programming languages (MySQL), into what became a BIS. For efficient and effective performance, this system was to be suited for an intranet for entire management within the company atmosphere.

The screenshots showing the various dimensions is presented in the ‘Appendix’.
4.5 Deployment / Testing

This was the last part in the series and it involved a thorough testing of the system to make sure that it was free of errors and also to prove whether it produced the expected results when supplied with the correct inputs. Finally the effect of the system under pilot usage was analyzed to see how it operates.

The methods used for this were;

a) Unit Testing

Here each executable component of the system was thoroughly tested separately for the desired functionality and debugged accordingly to ensure that the different small parts of the system worked correctly before their amalgamation into the proposed system.
A random number of potential users (administrators) were selected to test the system and comment on its usability.

b) Functionality testing

Using real input data, finished system was tested for conformance to requirements specification.

Chapter Five

5. Presentation of Results/Findings

5.1 Overview.

This chapter outlines the difference between the old and new system. It also identifies the problems encountered during system development process. The proposed system tries to consolidate various departments into single database with various tables. Individual departments were not formerly well maintained and thus the need for the proposed system with centralized documentation.
5.2 Research Problems encountered.

When doing this research, some problems were encountered which hindered some expected achievements. Theses include;

➢ Time allocated for the research was not ample enough since researchers had other academic and work obligations to fulfill
➢ There was no concrete information strategy and this led to difficulty in determining future system requirements.
➢ We also encountered financial problems were by the group ran short of funds to carry out the necessary activities for the success of the project.

5.3 Findings

➢ The students who interacted with the system found it interesting and user friendly.
➢ The Foot Protection Service (U) Ltd management team was so excited with the system, they were especially attracted by the User interfaces and this has appealed them to use the system in their daily activities.
➢ During the testing phase of the system, some of the users found it hard using the system as compared to their old model

Chapter Six

6. Conclusion, Summary and Recommendations

This section gives the concluding remarks and recommendations of the entire research.

6.1 Concluding remarks.
This package fulfills most of the design objectives as outlined earlier. It is therefore a good starting point for Foot protection services (U) Ltd.

We have been able to achieve the following:

i. A user is well facilitated since using this system; he/she can instantly retrieve units in stock for each product.

ii. Store manager can now easily monitor stock, sales, stock purchase and stock balance daily

iii. Store manager can also generate information required for ordering new stock by use of queries in the database.

iv. The accountant can now calculate the total cost of stock quickly and when ever necessary.

6.1.1 Recommendations.

1. All staff should be retrained using this system and new employees should be trained on the same programme.

2. The system should reduce the amount of paper work currently used in the system. The existing system leads to duplication of work and excessive time spent on gathering and recording data.

3. Foot protection services (U) Ltd should re-enforce and encourage staff to use the system. This will serve as away of mastering and appreciating the system.

4. In case foot protection services (U) Ltd decides to use the system, they should use it parallel with the existing manual system.

5. The company should also buy at least three more computers to enable all the three mangers to share information.

References

[6]. Harshavardhan Karandikar, ABB Corporate Research, Ladenburg, Germany
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[7]. www.naa.gov.au/recordkeeping/control/tools/appendixB.html accessed on 08.05.07
Appendices

Appendix One.

System Home page with links for Management, Accounts, Inventory and Admin
Appendix Two

Management front page with menus and constraints for manager only
Appendix Three

Accountants Home page with menus and constraints for Accountants
Appendix Four

Inventory home page with links and constraints for store managers only
Appendix Five

Inventory Report showing for store managed by store manager

[Inventory report screenshot]
Appendix Six

Program Code for Home Page (index.php).
<table border="0" cellpadding="0" cellspacing="0" width="640" bordercolor="#4E3404" align="center">
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<img border="0" src="images/Logo.png" width="602" height="91" />
</td></tr>
</table>

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<tr><td align="center" bgcolor="#FED000" align="top">
<font color="#000000" face="Verdana, Arial, Helvetica, sans-serif, Tahoma">

Welcome to the MMS. This is the Intrinsinc MMS system for Foot Protection Services.
This system is for the manager, accountant and inventory manager to view and update transactions data.

Management, Click here to view detailed customer transactions and inventory management information.

Accountant, Click here to view, update and insert detailed customer transactions.

Store Manager, Click here to view, update and insert detailed inventory data.

</font>
</td></tr>
</table>

|<font size="3">|
Appendix Seven

Appendix Eight

Work Plan
DECLARATION

We [BS/015] do hereby declare that this Project Report is original and has not been published and/or submitted for any other degree award to any other University before.