

Established 2000

Midlands State University



FACULTY OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION SYSTEMS

NAME: TINASHE

SURNAME MUDENGE

REGISTRATION NUMBER: R08577T

MODULE CODE: HCS 401

MODULE NAME: DISSERTATION

YEAR: 2012

LEVEL: 4

PROJECT TITLE: _____

TRAINING TIME SCHEDULER FOR ZIMASCO SHURUGWI AND SOUTH DYKE
DIVISION.



ABSTRACT

The basis of this project was to develop a Training time Scheduler for Zimasco Shurugwi and South dyke division (Training department). The main focus of the system is to try to curb problems that are associated with scheduling of courses, facilitators and venues throughout the whole year. Every year end the department gathers necessary training information from the training needs and begin the scheduling process. This is done on a spreadsheet on rows and columns. To derive an annual training plan it demands a dedicated three weeks (working hour basis) at most. With this at hand it has created an opportunity for me to have an in-depth research on how to computerize and ease the burden that the training department is experiencing.

There were various fact gathering methodologies that were carried out to come up with a comprehensive detail of how the manual system works, the challenges that they face and also their hopes of computerization. The results of the fact gathering clearly highlighted that surely there is a need for developing a computerized training time scheduler that meets the current problems. The system development process came just on time, when Zimasco was upgrading to Microsoft Office 2010. The upgrade managed to integrate the Microsoft Outlook with the training time scheduler allowing the system to auto-generate notifications that will be send to users once scheduled for an event.

The training department adopted the final application and have implemented it on a parallel run to evaluate its benefit. Time and resources were a major drawback to many modifications and enhancements to the system hence I recommend that more time and resources must be given to work on additional modules such as incorporating an sms gateway that automatically notifies specific users over mobile networks. After the system has been fully appreciated it then calls for the department to implement it in other divisions.

DECLARATION

I, TINASHE MUDENGE, hereby declare that I am the sole author of this dissertation. I authorize Midlands State University to lend this dissertation to other institutions or individuals for the purpose of scholarly research.

Signature _____

Date: 25 October 2012

APPROVAL

This dissertation entitled "Training Time Scheduler System" by **TINASHE MUDENGE** meets the regulations governing the award of the degree of Information Systems Honors of the Midlands State University, and is approved for its contribution to knowledge and literal presentation.

Supervisor: Mr. P.T. Denhere.

Signature:.....

Date: 25 October 2012

Acknowledgements

I would like to express my appreciation and gratitude to the following people who contributed immensely to the success of this thesis:

- My supervisor, Mr. PT Denhere who directed me throughout the research with his meticulous criticism and objective comments. His motivation was valuable towards the success of this project.
- Zimasco Shurugwi and South Dyke division training department for their unwavering support and in believing on my determination to deliver my first software application for the company.

Dedications

I dedicate this project in loving memory of the late Minister of higher and tertiary education Dr. I.S.G Mudenge who had a dogmatic character that contributed indirectly to the molding of who I am. With this on mind I can proudly quote his words - "Fortune and love favour the brave and who dares wins".

Table of Contents

<i>Abstaract.....</i>	<i>i</i>
<i>Declaration.....</i>	<i>ii</i>
<i>Approval.....</i>	<i>iii</i>
<i>Acknowledgement.....</i>	<i>iv</i>
<i>Dedication.....</i>	<i>v</i>
<i>List of Acronyms.....</i>	<i>ix</i>
<i>List of Tables.....</i>	<i>x</i>
<i>List of Figures.....</i>	<i>xi</i>
<i>List of Appendices.....</i>	<i>xii</i>
CHAPTER 1: INTRODUCTION.....	1
1.0 INTRODUCTION.....	1
1.2.1 Background Of The Organization.....	1
1.2.2 Organisational Structure.....	3
1.2.3 Vision.....	3
1.3 PROBLEMDEFINITION.....	4
1.4 AIM.....	4
1.5 OBJECTIVES OF THE PROPOSED SYSTEM.....	4
1.6 HYPOTHESIS.....	5
1.7 JUSTIFICATION.....	5
1.8 CONCLUSION.....	6
CHAPTER TWO: PLANNING.....	7
2.1 INTRODUCTION.....	7
2.2 WHY BUILD THE SYSTEM.....	7
2.3 BUSINESS VALUE.....	7
2.4 FEASIBILITY STUDY.....	8
2.4.1 Technical Feasibility.....	8

2.4.2.1 Cost Benefit Analysis.....	10
2.4.2.2 Return On Investment (R.O.I).....	12
2.4.2.3 Net Present Value.....	13
2.4.3 Social Feasibility.....	14
2.4.4 Operational Feasibility.....	15
2.6 CONCLUSION.....	17
CHAPTER THREE: ANALYSIS PHASE.....	18
3.1 INTRODUCTION.....	18
3.2 INFORMATION GATHERING METHODOLOGIES.....	18
3.2.1 Interviews.....	18
3.2.2 Questionnaires.....	19
3.2.3 Observation.....	20
3.3 ANALYSIS OF EXISTING SYSTEM.....	21
3.4 PROCESS ANALYSIS.....	22
3.6 WEAKNESSES OF THE CURRENT SYSTEM.....	26
3.7 EVALUATE ALTERNATIVES.....	26
3.7.1 Outsource.....	26
3.7.3 Development.....	28
3.8 REQUIREMENTS ANALYSIS.....	29
3.8.1 Functional Requirements.....	29
3.8.2 Non-Functional Requirements.....	31
3.9 CONCLUSION.....	32
CHAPTER 4: DESIGN PHASE.....	33
4.1 INTRODUCTION.....	33
4.2 SYSTEM DESIGN.....	33
4.2.1 Description Of The Proposed System.....	33
4.2.3 DFD Of The Proposed System.....	36
4.3 ARCHITECTURAL DESIGN.....	37
4.5 DATABASE DESIGN.....	39
4.5.1 Enhanced Entity Relationship Diagram.....	40
4.5.2 Database Tables.....	42
4.6.2 Class Diagram.....	49
4.6.3 Sequence Diagram.....	40
4.7 INTERFACE DESIGN.....	51

4.7.1 Main Menu Design.....	51
4.7.2 Input Design.....	52
4.7.3 Output Design.....	55
4.8 CONCLUSION.....	56
CHAPTER 5: IMPLEMENTATION PHASE.....	57
5.1 INTRODUCTION.....	57
5.2 CODING (PSEUDO CODE).....	57
5.3 TESTING.....	59
5.3.1 Unit Testing.....	60
5.3.1.1. Logical Testing (White Box Testing).....	61
5.3.1.2 Functional Testing (Black Box Testing).....	61
5.3.2 Module Testing.....	62
5.3.3 System Testing.....	63
5.3.4 Acceptance Testing.....	64
5.3.4.1 Alpha Testing.....	64
5.3.4.2 Beta Testing.....	64
5.3.4.3 Defect Testing.....	65
5.3.5 Validation.....	66
5.3.6 Verification.....	67
5.4 INSTALLATION.....	68
5.4.1 Installation Plan.....	68
5.4.2 Conversion Process.....	68
5.4.2.1 Pilot Conversion.....	68
5.4.2.2 Direct Changeover.....	69
5.4.2.3 Phased Conversion.....	69
5.4.2.4 Parallel Conversion (Recommended Strategy).....	69
5.4.3 User Training.....	70
5.4.3.1 Training Plan.....	70
5.5 MAINTENANCE.....	71
5.5.1 CorrectiveMaintenance.....	72
5.5.2 Adaptive Maintenance.....	72
5.5.3 Perfective Maintenance.....	72
5.5.4 Preventive Maintenance.....	73

5.5.5 Suggested Improvements.....	73
5.5.6 Recommendations.....	73
5.6 CONCLUSION.....	73
BIBLIOGRAPHY.....	96

List of Acronyms

AFS	ALLOY FROM SLAG
APP	ALLOY PRODUCTION & PROCESSING
BBS	BEHAVIOUR BASED SAFETY
GUI	GRAPHICAL USER INTERFACE
CAT5	CATEGORY 5
CEO	CHIEF EXECUTIVE OFFICER
ERP	ENTERPRISE RESOURCE PLANNING
GIGO	GARBAGE IN GARBAGE OUT
GM	GENERAL MANAGER
HOD	HEAD OF DEPARTMENT
HOS	HEAD OF SECTION
ICT	INFORMATION COMMUNICATION AND TECHNOLOGY
IMAP	INTERNET MAIL ACCESS PROTOCOL
LAN	LOCAL AREA NETWORK
MTA	MAIL TRANSFER AGENT
MUA	MAIL USER AGENT
OSP	ORE SUPPLY AND PREPARATION
RDBMS	RELATIONAL DATABASE MANAGEMENT SYSTEM
SMTP	SIMPLE MAIL TRANSFER PROTOCOL
TTC	TRAINING TIME SCHEDULER
UK	UNITED KINGDOM
VB	VISUAL BASIC
WGPO	WORK GROUP POST OFFICE
ZIMASCO	ZIMBABWE MINING AND SMELTING COMPANY

List of Tables

Table	TABLE NAME	PAGE	Table	TABLE NAME	PAGE
2.1	<i>Hardware Requirements</i>	8	4.4	<i>Training need</i>	43
2.2	<i>Software requirements</i>	9	4.5	<i>Training program</i>	43
2.3	<i>Manpower requirements</i>	9	4.6	<i>Designation</i>	44
2.4	<i>Cost –Benefit Analysis</i>	11	4.7	<i>Log trail</i>	44
2.5	<i>Calculation of R.O.I</i>	12	4.8	<i>Privileges</i>	44
2.6	<i>Net Present value</i>	14	4.9	<i>Training venue</i>	45
2.7	<i>Work plan</i>	16	4.10	<i>Venue</i>	45
2.8	<i>Gantt Chat</i>	16	4.11	<i>Training nominee</i>	45
3.1	<i>Interview list</i>	18	4.12	<i>Facilitator</i>	46
4.1	<i>User</i>	42	4.13	<i>holidays</i>	46

4.2	<i>Department</i>	42	4.14	<i>Schedule dates</i>	46
4.3	<i>Program objectives</i>	43	4.15	<i>scheduler</i>	46

List of Figures

Figure	ACTUAL FIGURE (Fig)	PAGE	Figure	ACTUAL FIGURE (Fig)	PAGE
1.1	<i>ZIMASCO Shareholding</i>	2	4.10	<i>Structure of the system</i>	51
1.2	<i>Organogram</i>	3	4.11	<i>Log in form</i>	52
2.1	<i>ROI Bar Graph & trend line</i>	12	4.12	<i>Training need form</i>	52
3.1	<i>Activity diagram of the current System</i>	23	4.13	<i>Users</i>	53
3.2	<i>Context diagram of the current system</i>	24	4.14	<i>Holiday selector</i>	53
3.3	<i>DFD of the current System</i>	25	4.15	<i>Departments</i>	53
3.4	<i>Use Case diagram of the proposed system</i>	30	4.16	<i>Designations</i>	54

4.1	<i>Proposed system context diagram</i>	35	4.17	<i>Set privileges</i>	54
4.2	<i>DFD of the proposed system</i>	36	4.18	<i>Training program</i>	54
4.3	<i>3-tier server architecture</i>	37	4.19	<i>Quarterly schedule output form</i>	55
4.4	<i>Physical design</i>	39	5.1	<i>Unit testing</i>	60
4.5	<i>DB architecture</i>	40	5.2	<i>Password validation</i>	60
4.6	<i>EER Diagram</i>	41	5.3	<i>Access Level Validation</i>	63
4.7	<i>Package Diagram</i>	48	5.4	<i>Process involved in defect testing</i>	65
4.8	<i>Class diagram</i>	49	5.5	<i>Training need Form</i>	66
4.9	<i>Sequence diagram</i>	50	5.6	<i>Scheduler Form</i>	67

List of Appendices

APPENDIX A: User Manual.....	74
APPENDIX B: Interview Checklist.....	79
APPENDIX C: Questionnaire Checklist.....	80
APPENDIX D: Observation Score Sheet.....	82
APPENDIX E: Snippet Of Code.....	83
APPENDIX F: Training Needs Form.....	91
APPENDIX G: Monthly Training Plan.....	93

APPENDIX H: Monthly Training Schedule.....94

APPENDIX I: Annual Training Plan.....*See A1 Insert*95