

**INTEGRATED SCHOOL COOPERATIVE MANAGEMENT
(ISCOOP)**

**P.KHIDMAT MAKLUMAT AKADEMIK
UNIMAS**



**BONG LOK LEONG
THEN MOI JIN
POH SOK NGO**

**This project is submitted in partial fulfilment of
the requirements for the degree of Bachelor of Education with Honours
(Information Technology)**

**Faculty of Information Technology
UNIVERSITI MALAYSIA SARAWAK
2004**

ACKNOWLEDGEMENTS

We would like to express our deepest gratitude and appreciation to those people who have contributed directly or indirectly towards the completion of this project. Firstly, our appreciation goes to the Faculty of Science Computer and Information Technology, Universiti Malaysia Sarawak for providing us the golden opportunity to incorporated what we have learnt from the last three years into this final year project. In fact, we have gathered much marvelous knowledge and experiences during the course to help us to accomplish this project. With that, we would like to extend our sincere thanks to our supervisor, Associate Professor Dr. Wang Yin Chai for his continuous guidance and advice in helping us complete this project eventually.

Apart from that, our gratitude also goes to all FSCIT lecturers and tutors who have rendered their experiences and knowledge that benefited our group members so much.

These advices and opinions have helped us to overcome many problems and weaknesses during the course and towards the completion of this project.

In addition, we would also like to express our personal gratitude and appreciation to all our friends and course mates for offering their ideas and knowledge. However, there are too many

to mention by names. Their inspiration and sharing of knowledge have put us into a better position for success. Finally, we would also like to congratulate each other in our group for contributing their hard work and encouraging each other throughout the whole course of this final year project.

Table of Contents

ACKNOWLEDGEMENTS	ii
Table of Contents	iv
List of Figures	xi
List of Table	xv
List of Table	xv
ABSTRACT	xvi
CHAPTER ONE: AN OVERVIEW	1
1.1 Introduction	1
1.2 Literature Reviews	2
1.3 Problem Statements	5
1.4 Objectives	5
1.5 Scope	6
1.6 Procedure/Methodologies	6
1.6.1 Phase I: System Planning	7
1.6.2 Phase II: System Analysis	8
1.6.3 Phase III: System Design	8
1.6.4 Phase IV: System Implementation and Development	9
1.6.5 Phase V: System Testing, Maintenance and Support	9

1.7	Expected Outcomes	10
1.8	Significance of Research	11
1.8.1	Information is organized	11
1.8.2	Error Control	11
1.8.3	Paperless and user friendly	11
1.8.4	Ease of data entry	12
1.8.5	Reports and report generator	12
1.8.6	To trace inventory level	12
1.8.7	To trace daily income	12
1.8.8	Provide information sharing	13
CHAPTER TWO: LITERATURE REVIEWS		14
2.1	Introduction	14
2.2	Concepts and Definitions	14
2.3	Current Systems	17
2.3.1	Current System Components	18
2.3.2	Mycoop Components	19
2.3.3	Proposed System Components (ISCOOP)	20
2.4	Comparison of the Reviewed Systems	21

2.4.1	Comparison of Technology	21
2.4.2	Comparison of System Features and Functionality	21
2.4.3	Comparison of System Interfaces	22
2.5	Implementation Tools Study	23
2.5.1	Programming Tools	23
2.6	Databases	27
2.6.1	Microsoft Access 2000	27
2.6.2	Microsoft SQL Server 2000	28
2.6.3	Oracle8	29
2.6.4	Comparison between Different Databases	30
2.7	Graphic Tools	31
2.7.1	Microsoft Image Composer	32
2.7.2	CorelDraw	32
2.7.3	Comparison between the Graphical Tools	33
2.8	Proposed Improvement of Current Systems after Review	34
2.9	Summary	37
CHAPTER THREE : REQUIREMENTS ANALYSIS AND SPECIFICATIONS		39
3.1	Introduction	39

3.2	Requirements Analysis Techniques	39
3.3	Requirements Specifications	42
3.3.1	User Requirements	42
3.3.2	Functional Requirements	46
3.3.3	Software Requirements	50
3.3.4	Hardware Requirements	51
3.4	Summary	52
CHAPTER FOUR: SYSTEM DESIGN		53
4.1	Introduction	53
4.2	ER Diagram	54
4.3	Data Flow Diagram	55
4.3.1	Context Diagram	55
4.4	Data Dictionary	60
4.5	Data Normalization	61
4.6	Input and Output Design	61
4.6.1	Input Design	62
4.6.2	Output Design	75
CHAPTER FIVE: PROTOTYPING		86

5.1	Introduction	86
5.2	Coding of Prototype Designed	91
5.2.1	Implementation of the Purchase Module	92
5.2.2	Stock Module	95
5.2.3	Sales Module	99
5.2.4	Point Module	101
5.2.5	Member Module	102
5.2.6	Enquiry Module	104
5.2.7	Setting Module	105
CHAPTER SIX: SYSTEM TESTING AND EVALUATION		111
6.1	Introduction	111
6.2	Functional Testing With Test Data	112
6.3	Evaluation on Functional Test Result	113
6.4	Compatibility Testing	116
6.5	Evaluation on Compatibility Test Results	117
6.6	Usability Testing With Test Data	117
6.7	Evaluation on Usability Test Results	118
6.8	User Acceptance Testing With Actual Data	118

6.9	Evaluation on User Acceptance Test Results	119
6.10	Summary	120
CHAPTER SEVEN: CONCLUSION AND FUTURE WORKS		121
7.1	Introduction	121
7.2	Achievements	121
7.3	Contributions of ISCOOP	123
7.4	Conclusion	124
7.5	Future Works	125
List of Reference		128
APPENDIX A Questionnaire		129
APPENDIX B Interview Questions		138
APPENDIX C Interview Process		144
APPENDIX D Survey Result		147
APPENDIX E Data Structure		154
APPENDIX F Organization Chart		160
APPENDIX G Data Normalization		161
APPENDIX H Functional Testing		162
APPENDIX I Compatibility Testing		164

APPENDIX J Usability Testing

168

APPENDIX K User Acceptance Testing

170

List of Figures

Figure 4.1 Entity Relationship Diagram	54
Figure 4.2 Context Diagram	55
Figure 4.3 O Diagram	56
Figure 4.4 Child Diagram for Process 1.0	57
Figure 4.5 Child Diagram for Process 2.0	58
Figure 4.6 Child Diagram for Process 3.0	59
Figure 4.7 Child Diagram for Process 4.0	60
Figure 4.8 New Purchase Form of Purchase Module	63
Figure 4.9 Select Invoice Form for Stock Module	65
Figure 4.10 Stock Out Form for Stock Module	66
Figure 4.11 New Sales Form of Sales Module	67
Figure 4.12 Payment Form of Sales Module	68
Figure 4.13 Bonus Point Form of Point Module	69
Figure 4.14 Member Registration Form of Member Module	70
Figure 4.15 Member Query Form of Enquiry Module	71
Figure 4.16 Category Setting of Setting Module	72
Figure 4.17 Stock Code Setting of Setting Module	73

Figure 4.18 Vendor Setting of Setting Module	74
Figure 4.19 System Setting of Setting Module	75
Figure 4.20 Invoice List of Purchase Module	76
Figure 4.21 Stock Information of Stock Module	77
Figure 4.22 Stock Alert of Stock Module	78
Figure 4.23 counter Stock Alert of Sale Module	79
Figure 4.24 Counter Stock of Sale Module	80
Figure 4.25 Today's Sale and All Sales of Sale Module	80
Figure 4.26 Member of Point Module	81
Figure 4.27 Member Enquiry of Enquiry Module	82
Figure 4.28 Vendor Listing of Purchase Module	83
Figure 4.29 Stock Listing of Stock Module	84
Figure 4.30 Member Listing of Point Module	84
Figure 5.1 ISCOOP's Client-server Architecture	87
Figure 5.2 ISCOOP's Interaction with Access Database via VB and ADO	89
Figure 5.3a/b Universal Data Link Configuration for ISCOOP database Server	90
Figure 5.4 Database Server connection initialization	91
Figure 5.5 The main Form of ISCOOP	92

Figure 5.6 The Main Interface of Purchase Module	94
Figure 5.7 New Purchase Form of Purchase Module	94
Figure 5.8 Vendor Listing of Purchase Module	95
Figure 5.9 Main Interface of Stock Module	96
Figure 5.10 Select Invoice Form of Stock Module	97
Figure 5.11 Stock Out Form of Stock Module	97
Figure 5.12 Stock Request of Stock Module	98
Figure 5.13 Stock Alert of Stock Module	98
Figure 5.14 Main Interface of Sale Module	100
Figure 5.15 Today's Sales and All Sales of Sale Module	100
Figure 5.16 New Sales Form of Sale Module	101
Figure 5.17 Main Interface of Point Module	102
Figure 5.18 Main Interface of Member Module	103
Figure 5.19 Member Registration Form of Member Module	103
Figure 5.20 Main Interface of Enquiry Module	104
Figure 5.21 Category of Setting Module	107
Figure 5.22 Stock Code of Setting Module	108
Figure 5.23 Vendor of Setting Module	108

Figure 5.24 Vendor of Setting Module	109
Figure 5.25 Vendor of Setting Module	109
Figure 5.26 Vendor of Setting Module	110
Figure 5.27 Vendor of Setting Module	110

List of Table

Table 2.1 Current System Component	18
Table 2.2 Mycoop Components	20
Table 2.3 Proposed System Components (ISCOOP)	20
Table 2.4 Comparison Between Different Types of Database	31
Table 3.1 Functional Modules of ISCOOP	47
Table 3.2 Recommendation of minimum hardware specification for ISCOOP	51
Table 6.1 Functionality Data Testing	116
Table 7.1 Achievement	122

ABSTRACT

In this information and communication technology (ICT) era of the twenty-first century, all organizations are gradually resorting towards the implementation of computerized information systems. For the past decades, information systems have proven their usefulness and accountability in enhancing productivity and profitability in numerous organizations, especially through the automation of some or most of the administrative works and routine tasks. With this in mind, most schools and colleges have also taken steps to integrate the various parts into an entire system with the facilities they possessed, especially computers and network technologies and expertise. Through the modernization brought by computer technologies, humans nowadays are looking forward to better living via automation and computerization.

In our final year project, we have proposed and developed an automated system for school cooperatives to increase productivity and enhance the existing manual system. This is done to improve the quality of cooperatives' administrative management and daily operation. The Integrated School Management System (ISCOOP) can support all major administrative works,

thus enabling it to integrate and share information in daily operations, and for effective and efficient planning and decision making throughout the system.

ISCOOP is aimed at eliminating redundant and repetitive data in the system. Specific data will be processed once and will be propagated throughout the whole system.

CHAPTER ONE: AN OVERVIEW

1.1 Introduction

In this fast-growing information society, various computer technologies and information systems have gained popularity in business, government and service organizations. Among them is school cooperatives which have been established to provide a sense of business concept in schools apart from giving services and facilities to students. In view of recent development in computer technologies, school cooperatives are also undergoing automation processes to increase performance and provide services to its clients. At the moment, school cooperatives are still engaging manual system which is rather time consuming. Upon encouragement from the education department, all schools have set up their school cooperatives to meet the demands of the school community. At the same time, a computerized system has also been introduced to cater for the increasing information needs. However, it was found that current systems are not user-friendly and the demands of management are not met. In view with this, we have proposed ISCOOP which is a more user-friendly system with various extra features that enable decision making and information sharing.

1.2 Literature Reviews

Inventory management has a tremendous influence on the ultimate cost of a product because it handles the total flow of material in an organization. The total flow can extend from supplier to production and subsequently through distribution centers to customers. Inventory exists because supply and demand are difficult to synchronize perfectly and it takes time to perform materials related operation. For several reasons, supplies and demands frequently differ in the rates at which they respectively provide and require stock. These reasons can best be explained by four functional factors of inventory- time, discontinuity, uncertainty and economy.

We are reviewing the current manual system of SMK ST. Augustine Cooperative Inventory Management System and the existing computerized system which are Chrysanth Inventory Manager 2001 and Small Business Inventory Control.

The purpose of SMK ST Augustine Cooperative Inventory Management System is to manage the inventory of the cooperative manually. The functions of the cooperative are stock management, purchase management and sales management.

Chrysanth Inventory Manager 2001 is designed specially to meet the demanding requirements of small to medium sized business environment, such as general retail and distribution channels, showroom based outlets and the like. Generally, Chrysanth Inventory Manager 2001 provides complete inventory management cycle, with the following features: Decision Support Analytical Reports, Intelligent Inventory Tracking System, Analytical Grid Layout, Bill Of Materials, Daily Business & Transaction Documents, Multiple price scheme management, Tracking stock flow, Multiple stock Evaluations, Prudential inventory level management, Multi-Dimensional Stock Movement Analysis.

Small Business Inventory Control is a year 2000 compliant business inventory application designed specifically for small and home based business owners or managers. This application combines an easy to use explorer-style interface with powerful features necessary to manage our business's inventory. The features of Small Business Inventory Control are Vendor Information, Item Information, Orders, Sales and Reports.

After reviewing existing systems, we make a comparison among these three systems based on their features, input/output and functions.

Functions	Features	SMK ST. Augustine Cooperative (Manually)	Chrysanth Inventory Manager 2001	Small Business Inventory Control
Purchase	Keeping Purchase Records	√	√	√
	Decision Support		√	√
	Making query		√	√
	Generate Purchase Reports		√	
	Generate Purchase Analysis Reports		√	
	Generate Purchase Notes			
Stock	Keeping Stock Records	√	√	√
	Decision Support		√	
	Making query		√	√
	Generate Stock Reports	√	√	
	Stock alert		√	
Sales	Keeping Sales Records		√	√
	Keeping Counter's Stock Records			√
	Decision Support		√	√
	Making query			√
	Generate Sales Reports		√	√
	Generate Sales Analysis Reports			√
	Generate Cash Delivery Notes	√		
	Identify customer performance		√	

Table1.1 Comparison of three existing systems

1.3 Problem Statements

The SMK ST. Augustine's school cooperative is still engaging the manual system of operating its daily business and inventory management. Consequently, its operations are restricted because there is no coordination between the different functions such as sales, purchase and order and stock keeping. Thus, the cooperative is facing ineffectiveness in its inventory management. As a result, it is hard to identify and detect the person who is actually in-charge of the stock-in and stock-out inventory, as well as difficult to track the amount or quantity of inventory for stock-in and stock-out purposes. Apart from this, there is no way to identify and differentiate the various categories that actually can be classified in the same inventory. This ineffectiveness is due to the lack of stocking alert for ordering, organized daily income and various reporting for decision-making.

1.4 Objectives

The objectives of this project are listed as below:

1. To study, understand, discover and identify the problems, requirements and specifications of the current inventory management in the SMK ST. Augustine's School Cooperative.

2. To analyze and design an Integrated School Cooperative Inventory Management System for SMK ST. Augustine, Betong, Sarawak.
3. To develop a working prototype of the Integrated School Cooperative Management System.(ISCOOP)

1.5 Scope

The scope of this project is to design and develop an information system for the school cooperative with SMK ST. Augustine's School Cooperative as our case study. The development of the Integrated School Cooperative Management System (ISCOOP) covers four basic modules, namely: stock inventory, purchase inventory, point-of-sales and bonus point. The functionality of ISCOOP is mainly to store, organize, process, manipulating transaction data and decision-making.

1.6 Procedure/Methodologies

The methodology used in building and constructing the proposed system, the Integrated School Cooperative Management System (ISCOOP) is the Systems Development Life Cycle (SDLC). System planning, System analysis, System design, System implementation and

System maintenance and support are the five basic phases in the System Development Life Cycle (SDLC).

1.6.1 Phase I: System Planning

In the planning stage, we have identified and responded to the various problems faced by SMK ST. Augustine's school cooperative since its establishment. After visiting the school, we have determined the objectives of our project through interviews which were held between us and the board of management of the school cooperative, especially with the Chairman of the cooperative, and the students in that school. At the same time, we determined the information requirements for our project. This includes sending out questionnaires to the people related to the project in order to find out the problems and their opinions toward the project. We also interviewed the school Principal, school cooperative committee members and the students responsible in carry out the daily operation of the cooperative. Furthermore, we also carried out a fact-finding activity to collect and gather information related to this project which includes samples of stock-keeping records, purchase records and invoices. In addition, we also observe the daily operation of the cooperative to help us to identify and determine the real problems that exist.