ABSTRACT

These days, Enterprise Information Systems (EIS) have become part of most Medium Large Enterprise (MLE) infrastructures; hence their planning, management and support are crucial challenges. Enterprise Information Systems' Project Management Portfolio (EISPMP) is a unified system that provides all the necessary tools for an organization to plan, manage, design, test, train, support and develop IS in one database. EISPMP was designed based on concepts of Project Management Body of Knowledge (PMBOK) and Dynamic System Development Method (DSDM). It covers 63 inputs and outputs of the Project Management Body of Knowledge (PMBOK) for managing EIS projects. Moreover, it covers the Dynamic Systems Development Method (DSDM) principles and its deliveries, and also enhances Oracle Application Express (APEX) to provide agile online development. This project does not cover ordinary EIS modules, and focuses on the stages before implementation of ordinary EIS. EISPMP used agile prototyping methodology for developing its first stages. However, after the first implementation, EISPMP is defined as a project by itself where it can have constant improvement. Finally, it has been implemented as an online system in 11 modules for Organization strategic planning, portfolio and project management, IS analyze, design and testing, online system learning and support, document and change management functionality in one Oracle Database. It has been evaluated and tested by Arman Paya Communication and Profitera Corporation Sdn Bhd. Evaluation shows it reduce project risk by implement strong project monitoring and change management, beside decreasing support, learning and hardware cost by integrating tools and EIS.

ABSTRAK

Sistem Maklumat Enterprise (EIS) telah menjadi sebahagian daripada Medium Large Enterprise (MLE) infrastruktur bertujuan untuk mengurus dan menyokong projek-projek syarikat. Enterprise Information Systems' Project Management Portfolio (EISPMP) adalah suatu sistem bersepadu yang menyediakan semua alat yang diperlukan bagi suatu organisasi untuk merancang, mengurus, merekabentuk, menguji, melatih, menyokong dan mengembangkan Sistem Maklumat dalam satu pangkalan data. EISPMP direka berdasarkan konsep PMBOK dan DSDM. Ini meliputi 63 input dan output dari Project Management Body of Knowledge (PMBOK) untuk menguruskan projek EIS. Selain itu, EIS juga meliputi prinsip-prinsip dan penghantaran Dynamic Systems Development Method (DSDM), dan meningkatkan Oracle APEX untuk mencapai pembangunan pantas atas talian. Projek ini tidak meliputi modul EIS biasa, tetapi mereka mengikuti tahap untuk sebuah organisasi selepas melaksanakan sistem. EISPMP menggunakan metodologi prototaip pantas untuk pengembangan pada tahap pertama. Seterusnya, selepas prototaip pertama dan mendefinisikan EISPMP sebagai projek di dalam sistem, EISPMP digunakan untuk mengurus dan memperbaiki. Akhirnya, ini diterapkan sebagai sebuah sistem dalamtalian di 11 modul bagi perancangan strategik organisasi, pengurusan portfolio dan projek, analisa IS, rekacipta dan pengujian, sistem pembelajaran dalam talian dan sokongan, fungsi pertukaran pengurusan dan dokumen dalam satu pangkalan data Oracle. Hal ini dievalusi dan diuji oleh Arman Paya Communication dan Profitera Corporation Sdn Bhd. Pengujian menunjukkan ia mengurangkan risiko projek oleh pelaksanaan pemantauan projek dan pertukaran pengurusan, mengurangkan sokongan, pembelajaran dan kos peralatan oleh integrasi aplikasi dan EIS.

CHAPTER 1

PROJECT OVERVIEW

1.1 Introduction

After an era of implementing many big Enterprise Resource Planning (ERP), Customer Relation Management (CRM), and Business Intelligent or in general Enterprise Information Systems (EIS) projects, which has created a frenzy of research, papers and books on related subjects, we still hear about the unbelievable costs of EIS projects, or those projects which failed. Enterprise Information Systems' Project Management Portfolio (EISPMP) should be able to reduce both the high costs and failures related to EIS projects. Today, many companies are implementing EIS projects in different organizational contexts and climates, and of course, they use different tools and techniques to implement them – but why do some projects continue to fail? Moreover, how can organization ensure success, and whom should they let mitigate or control their projects' budget and scope? Management weakness is one of reasons that lead all IT leaders to focus on the theme of management information improvement (Gartner, 2009).

Current research shows that companies which excel in project delivery (the "winners") utilize four significant best practices (Schwalbe, 2007) which are:

- Use an integrated toolbox
- Grow project leaders
- Develop a streamlined project delivery process
- Measure project health using metrics

This study aims to help immature organizations which still have no ERP, CRM or integrated Information System (IS) by exploring how they can manage the development of their own EIS. In short, this project covers how to begin EIS development projects and use related tools as an integrated solution.

Today, one of the most effective strategies for reducing IT costs in one organization is the centralization and consolidation of IT systems. This removes the redundancy of many costs, such as applications, facilities, hardware, software and infrastructure. Centralization of IS in one DB brings other trade-offs in the organization's structure, processes, infrastructure and mind-set (Lopez and Genovese, 2009). For achieving this objective, EISPMP has to implement integrated management, development and support software infrastructures based on standardized management concepts and frameworks, in order to develop and manage all EIS projects in one system and database.

1.2 Background of problems

In the real IS/IT project management world, we have strict time limitations, and rarely an experienced team member or project manager. Lack of strategic alignment is common, which leads to IT projects being canceled before they have started, due lack of auditable mapping between the project objective and the business objectives of the organization (Yager, 2009). Further problems are caused by wrong prioritizing of EIS projects or requirements, and no alignment of IS projects with the enterprises business strategy and objectives, which bring less ROI (James and Burke, 2005).

On the other hand, in new projects, analyzers are unfamiliar with company concepts, and the company does not know about the reality of IT or what functionality they really need (unclear scope). Most of the projects have vague requirements, which mean that for every step taken, the project takes four steps backward (Yager, 2009). Many IT projects fail because of lack of user input, incomplete and changing requirements, or poor executive support (Schwalbe, 2007). Moreover, lack of integrated toolbox increases cost and risk of EIS development (Barbara, 2004). Independent information systems with different architecture, DB and technology exist in one enterprise also lead to data overlapping, waste of hardware, software license issues, and huge support costs (Lopez and Genovese, 2009).

1.3 Statement of the problems

The necessary applications and tools that should be used for managing EIS projects are not integrated or sophisticated; this leads to data overlapping or wasted time in planning, communication, analyzing and testing systems for EIS projects. At the same time, ignoring alignment of projects and their requirements with organization strategy and real business needs results in less ROI or project failure.

Other major problems are:

- Communication breakdown between team members and end users cause unclear project goals and objectives (Yager, 2009).
- EIS projects have unclear and undocumented requirements (Yager, 2009).
- Most EIS projects fail because they take a long time to deliver.

Therefore, the statement of the problem is:

- How can a system that can effectively managed enterprise level project be developed?
- What are its features and functionalities?
- How effective is such a system in managing enterprise wide system development?

1.4 Project objectives

The main objective of this system is to use an integration of well known methodologies to manage development and centralizing of all IS of one organization into one enterprise system that sharing a single database.

- To study current applications and methodologies of project management for enterprise level systems.
- To design a system for managing and developing EIS.
- To develop system for managing and developing EIS for an enterprise.

1.5 Scope

- Only modules for developing and managing EIS projects covered.
- Normal EIS modules are not covered. EIS modules are defined and developed later by the body of enterprise based on their real needs and plan.
- Only PMBOK input and output is covered, except risk management's knowledge area.
- Focused on existing enterprise that has own IT department.
- System and target IS will be developed with Oracle APEX in one database.
- Mostly based on 20% efforts 80% results rule.

1.6 Importance of the project

Reducing EIS projects failure risk and cost by integrating practical project management and software engineering methodology and tools into EIS life cycle.

Without any doubt about the usefulness of enterprise information systems, provided these were correctly implemented. There is no benefit for “reinventing a wheel” when implementing an enterprise information systems by trials and mistakes. Such an approach connected to a high risk of failure and would be very costly. Rather than, the “good practice” examples and experience should be ideally used. Following the practical methodology in managing EIS projects will permit an enterprise to perform expected benefits from their information and reduce risks (Vrana, 2004).

1.7 Summary

This project is designing and developing an online portfolio for managing and developing EIS projects with Oracle APEX under Oracle, PMBOK and DSDM concepts in one database to reduce data and tools overlapping cost, bring strategic alignment to projects and business requirements, and apply IS management principles to EIS projects

TABLES OF CONTENTS

CHAPTER.	CONTENT	PAGE
	TITLE	**I**
	DECLARATION	**II**
	DEDICATION	**III**
	ACKNOWLEDGEMENT	**IV**
	ABSTRACT	**V**
	ABSTRAK	**VI**
	TABLES OF CONTENTS	**VII**
	LIST OF TABLES	**XIII**
	LIST OF FIGURES	**XIV**
	LIST OF ABBREVIATIONS	**XVI**
	LIST OF APPENDICES	**XVIII**
1	**PROJECT OVERVIEW**	**19**
	1.1 Introduction	19
	1.2 Background of problems	21
	1.3 Statement of the problems	22
	1.4 Project objectives	23
	1.5 Scope	23
	1.6 Importance of the project	24
	1.7 Summary	24

RUP	Rational Unified Process
SAAS	Software As A Service
SDLC	System Development Life Cycle
SQA	Software Quality Assurance
SSDLC	Secure System Development Life Cycle
TOGAF	The Open Group Architecture Framework
UAT	User Acceptance Testing
UTM	Universiti Teknologi Malaysia
WBS	Work Breakdown Structure
XP	Extremely Programming

LIST OF ABBREVIATIONS

BI	Business Intelligent
CRM	Customer Relationship Management
DFD	Data Flow Diagram
DSDM	Dynamic System Development Method
EA	Enterprise Architecture
EIM	Enterprise Information Management
EIS	Enterprise Information System
EISPMP	Enterprise Information Systems' Project Management Portfolio
ERD	Entity Relationship Diagrams
ERP	Enterprise Resource Planning
ESF	Enterprise Software Framework
FAQ	Frequently Asked Questions
IS	Information System
IT	Information Technology
KM	Knowledge Management
MLE	Medium Large Enterprise
MOSCOW	Must, Should, Could, And Would
OADP	Oracle Architecture Development Process
OFM	Oracle Fusion Middleware
PDCA	Plan-Do-Check-Act
PMBOK	Project Management Body Of Knowledge
PMI	Project Management Institute
RAD	Rapid Application Development

5.3	Test cases example from system	115
5.4	Inserting test plan	115
5.5	Test plan example from system	116
5.6	Test scenario example from system	117
5.7	Example of system screen layout	119
5.8	Example of report layout	120
5.9	Example of form layout	121
5.10	User evaluation involving statistic by the number of evaluated pages	129
5.11	New requirements	129
5.12	Requirement review	130
5.13	Page comments	130

LIST OF FIGURES

FIGURE NO.	TITLE	PAGE
2.1	Enterprise architecture process mode	35
2.2	EIM and the relationship to enterprise eachitecture	37
2.3	Sample architectural perspectives and outputs	38
2.4	The information centric infrastructure within the context of the EIM	40
2.5	Fixed vs. variable delivered functionality	43
2.6	DSDM phases	48
2.7	Project management process interactions	56
2.8	Project management process groups and knowledge areas mapping	57
3.1	Operational Framework	68
3.2	Project Gantt Chart	80
4.1	Simple in house IS project flow	85
4.2	Data state flow in 10 area of EISPMP	92
4.3	EISPMP Use case diagram	95
4.4	EISPMP requirements DFD (process state)	96
4.5	EISPMP DFD	97
4.6	EISPMP's Architecture	98
4.7	ERD of EISPMP in level primary key only V1.1.2	100
4.8	EISPMP portfolio modules	104
5.1	Test case framework	114
5.2	Inserting test case	114

LIST OF TABLES

TABLE NO.	TITLE	PAGE
2.1	Top 4 EA Methodologies (Roger, 2007)	33
2.2	Top ten project management tools (TopTenReviews, 2009)	60
3.1	Example of community feed back as new requirement	71
3.2	Example of community feedback as page comments	72
3.3	Project WBS level 1 and 2	78
3.4	Project meetings	81
4.1	High priority user requirements	86
4.2	EISPMP Database Tables List	101
5.1	GUI Test Cases	118
5.2	Standard for testing reports	120
5.3	Testing form standards	121
5.4	Result of testing DB schema	122
5.5	Involved users in testing	128
5.6	User acceptance result for system modules	131
5.7	User acceptance test result for technical and conceptual	132
6.1	Supported DSDM products (Deliveries)	139
6.2	PMBOK knowledge area consideration	140
6.3	EISPM supported PMBOK inputs and outputs	141
6.4	Constraint and solution	147
6.5	Future works	149

6.3 EISPMP Strength 147

6.4 EISPMP Weakness and Limitations 148

6.4.1 Absence of a Practical Operational Concept and Framework 148

6.4.2 Dependency to Oracle Database and Technologies 149

6.5 Suggestion for Future Work Future plan 149

6.6 Summary 150

REFERENCES **151**

APPENDICES A-F **153**

4.11 Hardware Requirements 111

4.12 Summary 112

5 TESTING 113

5.1 Introduction 113

5.2 Testing Framework 113

5.3 Test Plan 116

5.4 Test Scenario 117

5.5 Unit and System Testing 117

5.5.1 Graphical User Interface Testing 118

5.5.2 Testing Reports' Pages 119

5.5.3 Testing Forms' Pages 121

5.5.4 DB Schema Testing 122

5.6 Integration Testing 127

5.7 Acceptance Testing 127

6 DISCUSSION AND ACHIEVEMENTS 133

6.1 Achievement 133

6.1.1 Integrated Development System 134

6.1.2 Continued Improvement System 134

6.1.3 Integration with the target ISs 135

6.1.4 Low Cost Start 135

6.1.5 Implement DSDM Principles 136

6.1.6 Produce DSDM product (Deliveries) 138

6.1.7 PMBOK Knowledge Area and Inputs and Outputs Support 140

6.1.8 Strong Change Management 146

6.2 Constraints and Challenges 147

3 METHODOLOGY 66

3.1 Introduction 66

3.2 Operational Framework 67

3.2.1 Project initiation 69

3.2.2 Analysis 69

3.2.3 System Development 70

3.2.4 User Acceptance Testing 73

3.2.5 Phase Descriptions 75

3.3 Project Schedule 78

3.4 Project meetings 81

3.5 Summary 82

4 ANALYSIS AND DESIGN 83

4.1 Introduction 83

4.2 Organizational Analysis 84

4.3 Current Process 84

4.4 User Requirements 85

4.5 Conceptual Design 90

4.6 Business Process and Data Model 93

4.6.1 Top Functionality and Process 93

4.6.2 Use Case Diagram 95

4.6.3 Requirement Process and Cycle 96

4.6.4 EISPMP DFD 97

4.7 System Architecture 98

4.8 Database Design 99

4.9 Program Structure Chart 104

4.10 Detailed Modules and Features 105

2.7.2.6 All changes during development are reversible 46

2.7.2.7 Needs are baseline at a high level47

2.7.2.8 Testing is integrated throughout the life cycle 47

2.7.2.9 A collaborative and cooperative approach among all stakeholders is essential 47

2.7.3 DSDM Life Cycle 48

2.7.3.1 Pre-Project 49

2.7.3.2 Feasibility Study 49

2.7.3.3 Business Study 50

2.7.3.4 Functional Model Iteration 50

2.7.3.5 Design and Build Iteration 51

2.7.3.6 Implementation 52

2.7.3.7 Post Project 52

2.8 Project Management Body of Knowledge (PMBOK) 53

2.8.1 Project Management Process Groups 54

2.8.2 PMBOK Project Management Knowledge area 57

2.8.3 PMBOK Input/Outputs 59

2.9 Existing Project Management Software 59

2.9.1 Existence Online and client base Project Management tools 60

2.9.2 Common Functionality and their modules 61

2.10 Oracle APEX 61

2.10.1 Developing with Oracle APEX 63

2.10.1.1 Understanding Oracle Application Express Architecture 63

2.10.1.2 About the Application Express Engine 64

2.11 Summary 64

2 LITERATURE REVIEW 25

2.1 Introduction 25

2.2 Centralization and Integrating Existing IS 26

2.2.1 Harmonizing and Consolidating IT Environments 26

2.2.2 Principles and associated actions 27

2.3 Information Infrastructure 28

2.4 Enterprise Architecture Framework 31

2.5 Enterprise Information Management 33

2.5.1 Enterprise Architecture Process Model 35

2.5.2 Relationship of Enterprise Information Management to Enterprise Information Architecture 36

2.5.3 Managing Information as a Discipline in the Organization 38

2.5.4 The Infrastructure and Technology for Managing Information 39

2.6 Agile Software Development Methodologies 41

2.7 Dynamic Systems Development Method (DSDM) 42

2.7.1 Variable Functionality 43

2.7.2 DSDM Principles 44

2.7.2.1 Active user involvement is imperative 44

2.7.2.2 DSDM teams must be empowered to make decisions 45

2.7.2.3 The focus is on frequent delivery of products 45

2.7.2.4 Fitness for business intention is the vital measure for undertaking of deliverables 45

2.7.2.5 Iterative and incremental development is needed to unite a precise business solution 46

LIST OF APPENDICES

APPENDIX.	TITLE	PAGE
A	Software Products Comparison	152
B	Modules Entity Relationship Diagrams (ERD)	159
C	Implemented Pages and Components Stats	170
D	User Acceptance Test Questionnaire	180
E	All PMBOK Inputs and Outputs	182
F	Test Cases, Plan and Scenario of EISPMP	186