DESIGN OF A WEB BASED BOOKSTORE MODEL: 'ONE STOP MALAYSIAN BOOKMALL'

A thesis submitted to the Graduate School in partial fulfillment of the requirements for the degree of

Masters of Science (Information Technology)

Universiti Utara Malaysia

by

M. Veera Vignesvaran

© M.Veera Vignesvaran, 2000. All rights reserved.



Sekolah Siswazah (Graduate School) Universiti Utara Malaysia

PERAKUAN KERJA KERTAS PROJEK (Certification of Project Paper)

Saya, yang bertandatangan, memperakukan bahawa (I, the undersigned, certify that)		
VEERA VIGNESVARAN A/L MARIMUTHU		
calon untuk Ijazah (candidate for the degree of) Sarjana Sains (Teknologi Maklumat)		
telah mengemukakan kertas projek yang bertajuk (has presented his/her project paper of the following title)		
DESIGN OF A WEB BASED BOOKSTORE MODEL:		
'ONE STOP MALAYSIAN BOOK MALL'		
seperti yang tercatat di muka surat tajuk dan kulit kertas projek (as it appears on the title page and front cover of project paper)		
bahawa kertas projek tersebut boleh diterima dari segi bentuk serta kandungan, dan meliputi bidang ilmu dengan memuaskan. (that the project paper acceptable in form and content, and that a satisfactory knowledge of the field is covered by the project paper).		
Nama Penyelia (Name of Supervisor): Prof. Madya Nazib Nordin		
Tandatangan (Signature):		
Tarikh (Date) : 12th June 2000		

PERMISSION TO USE

In presenting this thesis in partial fulfillment of the requirements for a post graduate degree from University Utara Malaysia, I agree that the University may make it freely available for inspection. I further agree that permission for copying of this thesis in any manner, on whole or in part, for scholarly purposes may be granted by my supervisor(s) or, in their absence, by the Dean of Graduate School. It is understood that any copying or publication or use of this thesis or parts thereof financial gain shall not be allowed without my written permission. It is also understood that due to recognition shall be given to me and to University Utara Malaysia for any scholarly use which may be made of any material from my thesis.

Requests for permission to copy or to make other use of materials in this thesis, in whole or in part, should be addressed to:

Dean of Graduate School

Universiti Utara Malaysia

06010 UUM Sintok

Kedah Darul Aman

ABSTRACT (BAHASA MALAYSIA)

Projek ini dihasilkan untuk memperkenalkan ciri-ciri model kedui buku Internet. Kedai buku muya ini akan membolehkan penerbit buku dan majalah di Malaysia melangkah ke era e-dagang. Perkembangan applikasi e-dagang kini adalah mahal dan berisiko tinggi kerana teknologi yang terhad. Sebagai contohnya, ketiadaan 'interoperability' pada tahap applikasi, standard untuk e-dagang dan kebolehgunaan applikasi e-dagang pada skala yang besar. Sejak kebelakang ini kedai buku Internet telah berkembang pesat dan ini telah mempengaruhi pengedar-pengedar dan kedai-kedai buku di Malaysia Walaubagaimanapun, kebanyakkan applikasi e-dagang dihasilkan secara persendirian mengikut keperluan masing-masing. Masalah yang timbul ukibut jni adalah kurangnya 'inter-operability' pada tahap tinggi.

Projek ini diperkenalkan untuk menghasilkan satu konsep rangkabina yang standard untuk permodelan kedai buku Internet. Model yang akan dihasilkan ini akan mengadaptasi konsep broker atau 'Clearinghouse' sebagi model perniagaannya. Akhirnyu, pandangan terhadap perkembangan masa depan bagi projek ini akan dibincangkan.

ABSTRACT (ENGLISH)

This project is developed to present design considerations of an online Internet based bookstore model. This virtual bookstore will cater for Malaysian book and magazine publishers to venture into e-commerce. The development **of** electronic commerce applications today is considered expensive and risky because **of** many technological limitations, such as the absence of application-level interoperability, industrial standards for electronic trading and large-scale reusability of electronic commerce applications. Within the past few years, online bookstores have been set up to promote and sell books over the Internet. representing a fledgling new generation of book distrib ors and shops in Malaysia. A large proportion of today's electronic commerce applications are custom developed. One of the most obvious problems of Web-based electronic commerce systems is the lack of high-level inter-operability

This project is initiated to developed a framework of standard modeling concept for the Online bused bookstore mode?. The model will adopt a Clearinghouse or broker concept as its business model. Finally, the project's view on future directions in web-bused development in the contest of electronic commerce will be discussed.

ACKNOWLEDGMENTS

I would like to thank my thesis project supervisor, Associate Professor Nazib Nordin for his guidance and knowledge throughout the development of this project. Secondly, I would like to thank Graduate School of UUM for giving me the chance to pursue my higher education at Universiti Utara Malaysia.

Finally, special thanks and apologies to my beloved wife, V.Bhavani who over the months has been neglected, even ignored during my deepest concentration.

TABLE OF CONTENTS

A A A	ERMISSION TO USE .BSTRACT (BAHASA MALAYSIA) .BSTRACT (ENGLISH) .CKNOWLEDGEMENT .IST OF FIGURES	iii iv v
1	INTRODUCTION	4
	1.1 BACKGROUND	4
	1.2 PROBLEM STATEMENT	
	1.3 OBJECTIVES	
	1.4 SCOPE AND LIMITATION OF THE PROJECT	
	1.5 THE SIGNIFICANCE OF THIS PROJECT	
	1.6 SOFTWARE AND HARDWARE REQUIREMENTS	
	1.6.1 Hardware requirements for this project are as below:	
	1.6.2 Software requirements for this project are as below:	
	1.7 SUMMARY	12
2	REVIEW ON DEVELOPMENT IN E-COMMERCE	13
	2.1 ARCHITECTURE AND COMPONENTS OF E-COMMERCE SYSTEMS	13
	2.2 What is Electronic Commerce?	
	2.2.1 Electronic Commerce Solution Features	
	2.3 Types of E-Commerce Solutions In The Market	
	2.3.1 Direct Marketing and Selling	
	2.3.1.1 Components for a Direct Marketing & Selling Solution:	
	2.3.2 Supply Chain Integration	
	2.3.2.1 Building Blocks for a Supply Chain Integration solution:	21
	2.3.3 Corporate Procurement	
	2.3.3.1 Building Blocks for a Corporate Procurement Solution:	23
	2.4 E-COMMERCE IN BOOK INDUSTRY	
	2.4.1 Current Issue in Online Bookstore – Patenting The Business of	m
	Web 25	
	2.4.2 Overseas based Virtual Bookshop – Amazon.Com	
	2.4.3 Local based Virtual Bookshops	
	2.4.3.1 Star Online Financial Bookshop	
	2.4.3.2 Asiabooks.com	
	2.4.3.3 Southbound.com	
	2.4.3.4 Other Virtual Bookshops in Malaysia	29
	2.5 COMMENT ON CURRENT E-COMMERCE SOLUTIONS FOR THE BOOK	•
	INDUSTRY	29

	2.6 SUMMARY	31
3	THE DEVELOPMENT METHODOLOGY	32
	3.1 METHODOLOGY	32
	3.2 PROCESS MODELING	
	3.2.1 What is Iterative and Incremental Development?	
	3.3 SPECIFICATION LANGUAGE	
	3.3.1 Unified Modeling Language (UML)	
	3.3.2 Development Project Artifacts	
	3.4 SUMMARY	
4	WEB BASED BOOKSTORE MODEL	42
	4.1 REQUIREMENT MODEL OF WEB BASED BOOKSTORE	42
	4.1.1 Business Model	
	4.1.2 System Architecture	45
	4.1.2.1 Definition of Actors	46
	4.1.3 The Use Cases Diagram	4 7
	4.1.3.1 Definition of Use Cases.	
	4.1.3.1.1 System Administrator	
	4.1.3.1.2 Customer	
	4.1.3.1.3 Credit Clearance Company	49
	4.1.3.2 Explanation of Use Cases	
	4.1.3.2.1 Maintenance	
	4.1.3.2.2 Generate customer sales database and report	
	4.1.3.2.3 Put up Advertisement	
	4.1.3.2.4 Buys Books	
	4.1.3.2.5 Signs up for Members Services	
	4.1.3.2.6 Secure Credit Cards Details	
	4.2 DESIGN MODEL OF A WEB BASED BOOKSTORE	
	4.2.1 Class Diagram	
	4.2.1.1 Main Class Diagram for Flat File Database Package	
	4.2.1.2 Main Class Diagram for System Administrator UI Package	
	4.2.1.2.1 Class Diagram for the Publisher Package	
	4.2.1.2.2 Class Diagram for The Member Services	
	4.2.1.3 Main Class Diagram for the Customer UI Package	
	4.2.1.3.1 Class Diagram for the Shopping Cart Package	
	4.2.1.3.2 Class Diagram for the Payment Package	. 58
	4.2.1.4 Main Class Diagram for the Credit Clearance Company UI	
	Package	. 59
	4.2.2 Sequence Diagram for the Model's Use Cases	
	4.2.2.1 Sequence Diagram for Maintenance (Update Publisher)	
	Sequence Diagram for Maintenance (Update Member Services)	61

A	PPENDIX	101
B	BIBLOGRAPHY	.98
	6.5 SUMMARY	
	6.4 FUTURE DESIGN AND DEVELOPMENT CONSIDERATIONS	
	6.3 MODEL DESIGN ISSUES	
	6.1 REVIEW OF THE OVERALL PROJECT DEVELOPMENT6.2 PROBLEMS AND LIMITATION	
•		
6	CONCLUSION	.92
	5.4 SUMMARY	
	5.3 RESULTS AND DISCUSSION	
	5.2.5 E-Commerce Evaluation	
	5.2.4 Performance Consistency, Response Times	
	5.2.3 Page Relationships	
	5.2.2 Table and Form Consistency	
	5.2.1 Page Consistency	
	5.1 WEBSITE TEST AND VALIDATION	
~	5.1 WEBSITE TEST AND VALIDATION	
5	EVALUATION	. 86
	4.2.7 Flat File Database – Add Delete Item Module	
	4.2.6 Flat File Database - Add Delete Publisher Category Module	
	4.2.5.1 Shopping Cart Module	
	4.2.5 Main Modules Algorithm	
	4.2.3.3 Detail Class Diagram for Credit Clearance Company UI 4.2.4 Java Wallet 1.0	
	4.2.3.2 Detail Class Diagram for Customer UI Package (Payment)	
	Customer Web Interface for Member Services	
	Customer Web Interface for Browsing Publisher	
	Customer Web Interface for Browsing Books by Subjects	
	4.2.3.1.1 Web Interface	68
	4,2.3.1 Modeling Extension for Web Based Customer User Interface	e67
	4.2.3 Main Class Diagram Details	
	Sequence Diagram for Secure Credit card Details	
	Sequence Diagram for Sign Up for Member Services	
	Sequence Diagram for Buy Books	
	4.2.2.4 Sequence Diagram for Generate Sales Report	
	4.2.2.3 Sequence Diagram for Put Up Advertisement	62

LIST OF FIGURES

Number P	age'	
Figure 2.1: Illustrates the Interaction Between These Services (Adapted		
From Commerce Solutions for DNS Enabled Enterprises by		
Microsoft.com)	15	
Figure 2.2: Multiple Different Commerce Communication and Solution		
Possibilities (Adapted from Commerce Solutions for DNS Enabled	ł	
Enterprises by Microsoft.com)	17	
Figure 2.3: Direct Marketing and Selling	18	
Figure 2.4: Supply Chain Integration	20	
Figure 2.5: Corporate Procurement	22	
Figure 3.1 Time based phases in Rational Unified Process	33	
Figure 3.2: Iterative and Incremental Model	34	
Figure 3.3: Use Case Diagram Example	36	
Figure 3.4: Class Diagram Example	37	
Figure 3.5: Sequence Diagram Example	38	
Figure 3.6: Collaboration Diagram Example	39	
Figure 4.1 Business model for the system	44	
Figure 4.2: System Architecture of the 'One Stop Malaysian Book Mal	ľ	

Figure 4.3: Use Case Diagram for the design of the 'One Stop Malaysian	
Book Mall'	47
Figure 4.4: Main Class Diagram	51
Figure 4.5: Flat File Database Class Diagram	52
Figure 4.6: Main Class Diagram For The System Administrator UI	53
Figure 4.7: Class Diagram For The Publisher Package	54
Figure 4.8: Class Diagram For Member Services	55
Figure 4.9: Main Class Diagram For The Customer UI	56
Figure 4.10: Class Diagram For The Shopping Cart Package	57
Figure 4.11: Class Diagram For The Payment Package	58
Figure 4.12: Main Class Diagram For The Credit Clearance Company	ıy UI
	59
Figure 4.13: Sequence Diagram For Update Publisher	60
Figure 4.14: Sequence Diagram For Update Member Service	61
Figure 4.15: Sequence Diagram For Put Up Advertisement	62
Figure 4.16: Sequence Diagram For Generate Sales Report	63
Figure 4.17: Sequence Diagram For Buy Books	64
Figure 4.18: Sequence Diagram For Sign Up For Member Services	65
Figure 4.19: Sequence Diagram For Put Up Advertisement	66
Figure 4.20: Class Diagram For The Main Web Interface	68
Figure 4.21: Class Diagram For Browse Subject UI	69

Figure 4.22: Class Diagram For Browse Subject	70
Figure 4.23: Class Diagram For Member Services	71
Figure 4.24: Detail Class Diagram For Payment Package	72
Figure 4.25: Main Class Diagram For The Credit Clearance Comp	any UI
	73
Figure 4.26: Commerce Java Beans Interfaces Class Diagram	77

Chapter 1

INTRODUCTION

This chapter gives an overview of online bookshop scene both local and overseas based. It will cover problems faced by the local users and the need to develop a new standard for the e-commerce development in the book industry in Malaysia. It will also cover the requirement, scope and limitation of the project.

1.1 Background

Within the past few year, online bookstores have been set up to promote and sell books over the Internet, representing a fledgling new generation of book distributors and shops in the world. Many of the market major players and also small number of Malaysian pioneers are drawn to the 'Net' by a number of factors:

- The low cost of establishing a virtual bookstore.
- The potential of reaching a global rather than local clientele.
- The possibility of increasing revenue by selling directly to the customer (particularly in the case of publishers).
- Increased efficiency and accuracy through automated order-processing, inventory control, billing, shipping, and so forth
- Better forecasting of customer needs for goods and services

The contents of the thesis is for internal user only

BIBLIOGRAPHY

- [1] Mark Berman, Glenn Scott, Caesar Samsi, Mark Kapczynski, Lori Kingery and Mukesh Agarwal. ("Things to consider when building Commerce solutions with Microsoft technologies"), Commerce Solutions for DNS Enabled Enterprises". Microsoft Corp., 1998.
- [2] Philipe Krutchen, "A Rational Unified Process", White paper, Rational Software Corp., 1998.
- [3] Grady Booch, Ivar Jacobson, and James Rumbaugh, "Unified Modeling Language 1.3", White paper. Rational Software Corp., 1998.
- [4] Jim Conallen, "Modeling Web Applications With UML", White paper,, Conallen Incorp., 1999.
- [5] Grady Booch, Jim Rumbaugh, and Ivar Jacobson, Unified Modeling Language-User's Guide, Addison-Wesley, 1999.
- [6] Philippe Kruchten, "Rational Unified Process-An Introduction", Addison-Wesley, 1999.
- [7] D. L. Parnas, & P. C. Clements, "A Rational Design Process: How and Why to Fake It," IEEE Trans. on Soft. Eng., SE-12 (2), February 1986, pp. 251-257.
- [8] "An Open, Extensible Framework for Electronic Commerce in the Java TM Programming Language", White Paper, JavaSoft, Sun Microsystems, Inc. 1999.

- [9] Segev, A. and Bichler, M. "Component-based electronic commerce", *Handbook of Electronic Commerce*, 1998.
- [10] Schlueter, C.; Shaw, M.J. "A strategic framework for developing electronic commerce." *IEEE Internet Computing*, Nov.-Dec. 1997, vol.1, (no.6):20-8.
- [11] J. Rumbaugh et al. Object-Oriented Modeling and Design. Englewood Cliffs,

Prentice Hall, 1991.

- [12] F. A. de Lima; R. T. Price. Towards an Integrated Design Methodology for Internet-based Information Systems. Fifth International Workshop on engineering Hypertext Functionality, International Conference on Software Engineering. Kyoto, 1998.
- [13] E. Gamma; R. Helm; R. Johnson; J. Vlissides. Design Patterns Elements of Reusable Object-Oriented Software. Reading: Addison Wesley Longman, 1995.
- [14] Berndtsson, M.; Chakravathy, S.; and Lings, B. "Extending database support for coordination among agents", *International Journal of Cooperative Information Systems*, Sep.-Dec. 1997, Vol. 6, (no. 3-4):315-39.
- [15] Dogac, A., "A Survey of the Current State-of-the-Art in Electronic Commerce and Research Issues in Enabling Technologies", *Euro-Med Net 98 Conference*, *Electronic Commerce Track*, March 1998.

- [16] J. P. Bailey and Y. Bakos, "An Exploratory Study of the Emerging Role of Electronic Intermediaries," International Journal of Electronic Commerce, Vol. 1, No. 3, Spring 1997.
- [17] J. M. Tenenbaum, T. S. Chowdhry, K. Hughes, "Eco System: An Internet Commerce Architecture", *IEEE Computer Journal* (1997) 48-55
- [18] Michael Arent, Kate Withey, "Java Wallet: User Interface Functionality", White Paper, JavaSoft, Sun Microsystems, Inc. 1999.
- [19] Arthur L. Coleman, "Java Commerce Business Perspective", White Paper, JavaSoft, Sun Microsystems, Inc. 1999.
- [20] Theodore Goldstein, "The Gateway Security Model in the Java Commerce Client", White Paper, JavaSoft, Sun Microsystems, Inc.1999.