WEB-BASED CUSTOMER RELATIONSHIP MANAGEMENT

UMADEVI MARAPPAN

UNIVERSITI UTARA MALAYSIA 2001

WEB-BASED	CUSTOMER REI	ATIONSHIP MANAGEMENT

A	thesis submitted to the Graduate School in partial fulfillment of the requirements for
	the degree Master of Science (Information Technology), Universiti Utara Malaysia

By Umadevi Marappan

Copyright © 2001 Umadevi Marappan. All rights reserved.



(Date)

Sekolah Siswazah (Graduate School) Universiti Utara Malaysia

PERAKUAN KERJA KERTAS PROJEK (Certification of Project Paper)

	UMADEVI MARAPPAN
calon untuk Ijazah (candidate for the degree of)	Sarjana Sains (Teknologi Maklumat)
telah mengemukakan kertas ¡ (has presented his/ her project	projek yang bertajuk
WEB-BASED CUST	TOMER RELATIONSHIP MANAGEMENT
(as it appears on the bahawa kertas projek tersebu dan meliputi bidang ilmu den	ble in form and content, and that a satisfactory
Nama Penyelia (Name of Supervisor) : Prof	Madya Dr. Razman Mat Tahar
Tandatangan (Signature)	Sothwamsklill
Tarikh	\bigcup

: 30 September 2001

PERMISSION TO USE

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

Request for permission 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 Sintok Kedah Darul Aman

ABSTRAK

Projek ini bertujuan untuk membangunkan satu prototaip bagi aplikasi Pengurusan Perhubungan Pelanggan (Customer Relationship Management atau CRM) di dalam web untuk e-dagang syarikat. Aplikasi ini diharap boleh membantu memenuhi permintaan maklumat oleh agen jualan untuk mengautomatikkan jualan, pemasaran, khidmat dan sokongan pelanggan. CRM atau lebih dikenali sebagai eCRM adalah satu infrastruktur untuk mewujudkan kesetiaan pelanggan dan mengekalkan hubungan yang baik dengan pelanggan. Pengimplementasian CRM mempunyai kesan yang amat besar kepada perkembangan organisasi di arena perniagaan yang penuh dengan persaingan. Justeru itu, syarikat GainKnowledge.com yang berorientasikan e-dagang telah diwujudkan untuk menunjukkan bagaimana CRM boleh membantu meningkatkan penjualan peralatan e-buku secara berkesan dengan mengekalkan pelanggan lama sambil menarik pelanggan baru. Projek ini dibangunkan berdasarkan metodologi User Centered Design dan CRM Web based development metodologi. Bagi membina system ini, dua platform telah digunakan: platform maklumat pelanggan and platform interaksi pelanggan. Akhir sekali, projek ini membincangkan tentang pencapaian, kekangan dan cadangan untuk masa depan.

ABSTRACT

The aim of this project is to develop a prototype of Web-based Customer Relationship Management (CRM) application for an e-commerce company. This application will help to assist in meeting the information requirements of the sales agents in e-commerce business to automate sales, marketing, customer service and support. CRM or more specifically eCRM is basically the infrastructure for creating customer loyalty and ultimately, establishing and maintaining a one-to-one relationship with customers. If implemented appropriately, CRM can have a profound impact on an organization's survival and growth in this competitive business world. Hence, GainKnowledge.com, an e-commerce based company was virtually created to demonstrate on how CRM can help in selling e-book devices efficiently by retaining the old customers and attracting new customers. This application has been developed using User Centered Design and CRM Web based development methodologies. In order to build this system, two platforms were used; there are customer information platform and customer interaction platform. Finally, this project discusses some fulfillments, constraints and recommendations for future development of CRM system.

ACKNOWLEDGEMENTS

Praise to Lord Muruga, for the blessings through this life, especially for giving me the courage and strength to complete this project paper. I could not have completed it without the support, commitment, and sacrifices of my supervisor, my beloved family, my colleagues, and friends. I would like to express my heartfelt gratitude and appreciation in particular to the following people and institutions for making this study possible.

- Prof. Madya Dr. Razman Mat Tahar, Dean of School of Quantitative Sciences, UUM, my supervisor for his assistance, constructive comments and ideas to undertake this project.
- 2. The Graduate School, University Utara Malaysia.
- 3. All Information Technology School lectures who have taught me in the MSc.(IT) program.
- My dearest friends, Ishantini, Selvan, Shobana, Kali and Cheng Yee for their encouragement, inspiration and sacrifices throughout the study.
- 5. Finally I acknowledge my deepest and loving appreciation to my parents, sisters, brothers and in-laws for their support, encouragement and unceasing prayers for my success.

TABLE OF CONTENTS

			PAGE
PE	RMISS	ION TO USE	i
ABS	STRAK		iį
ABS	STRAC	T	iii
AC	KNOW	LEDGEMENTS	iv
TAI	BLE O	F CONTENTS	v
LIS	T OF F	IGURES	ix
1 15	-) Т ()F Т	TABLES	xi
	. 01 .		Ai
CH	APTER	R 1: INTRODUCTION	
1.1	Projec	et Background	1
1.2	Comp	any Background	2
1.3	CRM	Overview	3
	1.3.1	Brief History of CRM	4
	1.3.2	Why CRM is Necessary?	5
	1.3.3	Market Leader	6
	1.3.4	The Future of CRM	7
1.4	Proble	em Statement	8
1.5	Objec	tive of Studies	9
1.6	Metho	odology	11
1.7	Project	t Scope	12
1.8	Project	t Outline	13
1.9	Summ	nary	14

CH	APTEF	R 2: LITERATURE REVIEW	
2.1	Introd	duction	15
2.2	CRM	Concept	16
2.3	Categ	ories of CRM Application	21
	2.3.1	Web-Based CRM Application	21
	2.3.2	CRM Software Application	22
	2.3.3	Call Center CRM Application	23
2.4	Impor	rtance and Functionality of CRM	24
	2.4.1	Importance of CRM	24
	2.4.2	Functionality of CRM	29
2.5	CRM	Evolution	32
2.6	CRM	Strategies	36
2.7	Sumn	nary	39
CHA	APTEF	R 3: METHODOLOGY	
3.1	Introd	luction	41
3.2	User (Centered Approach	43
	3.2.1	Collection Of Data	44
	3.2.2	Market Definition	45
	3.2.3	Task Analysis	48
	3.2.4	Competition Evaluation	55
	3.2.5	Design and Prototyping	56
	3.2.6	Evaluation & Testing	58
	3.2.7	Benchmark Assessment	59
3.3	CRM	Web-based Development Methodology	59
	3.3.1	Assessment Phase	60
	3.3.2	Planning Phase	62
	3.3.3	Design Phase	63

	3.3.4	Development Phase	67
	3.3.5	Implementation	67
3.4	Mode	l Development	68
	3.4.1	Customer Interaction Platform	69
	3.4.2	Customer Information Platform	71
	3.4.3	IT Interface Infrastructure	71
3.5	Sumn	nary	72
CHA	APTEF	R 4: SYSTEM ARCHITECTURE	
4.1	Introd	uction	73
4.2	Custo	mer Relationship Architecture	74
4.3	CRM	Business Model	78
	4.3.1	Accessing Information of e-book devices.	79
	4.3.2	Gathering Customer Details	80
	4.3.3	Gathering Customer Response	80
	4.3.4	Call Center	81
	4.3.5	Chat	81
4.4	Conce	eptual Database Design	81
	4.4.1	Entity Relationship Diagram	82
	4.4.2	Data Flow Diagram	89
4.5	Web S	Site Design	92
	4.5.1	Navigation	95
	4.5.2	Linking: Text, Buttons and Icons	96
	4.5.3	Page Types and Layouts	97
	4.5.4	Text	98
	4.5.5	Colors, Images and Background	98
4.6	Datab	ase Access	99

4.7	Infrastructure and Tools of CRM Architecture	10
	4.7.1 Microsoft Internet Explorer 5.0: Web Client	102
	4.7.2 Microsoft Personal Web Server: Web Server	103
	4.7.3 Microsoft Active Server Pages: Script	104
	4.7.4 Microsoft Access 2000 : External Database	105
	4.7.5 Database Connections	106
	4.7.6 Microsoft FrontPage2000	107
	4.7.7 Flash 5 and ADOBE Photoshop 5.5	108
4.6	Summary	108
CHA	APTER 5: IMPLEMENTATION AND	
	EVALUATION	
5.1	Introduction	109
5.2	Components of the CRM Development Model	110
5.3	Evaluations of the System Design	118
	5.3.1 System Requirements Testing And Results	119
	5.3.2 Evaluation	121
5.4	Summary	122
CHA	APTER 6: CONCLUSION	
6.1	Introduction	123
6.2	Fulfillment of Issues	124
6.3	Limitation and Problem Encountered	126
6.4	Suggestions	128
6.5	Conclusion Remarks	129
BIBI	JOGRAPHY	

APPENDICES

LIST OF FIGURES

Number	Title	Page
Figure 2.1	Customer Platform	17
Figure 2.2	Total CRM Software Market	28
Figure 2.3	Functionality of CRM	32
Figure 2.4	Economy Goals in Past and Future	35
Figure 2.5	Integration of People, Information	39
	and Technology	
Figure 3.1	Integration of UCD and CRM Web-based	42
	Development Methodology	
Figure 3.2	Task and Subtask Analysis	51
Figure 3.3	The Prototype Process	57
Figure 3.4	CRM Web-based Development Model	60
Figure 3.5	CRM Development Model	70
Figure 4.1	Four Process of CRM	75
Figure 4.2	Functional Components of a CRM	76
	Architecture	
Figure 4.3	GainKnowledge.com E-commerce	79
	Business Architecture	
Figure 4.4	GKED's Entity Relationship Diagram	83
Figure 4.5	GKED's Data Flow Diagram (DFD)	90
Figure 4.6	Flow Chart of GKED Web Site	94
Figure 4.7	Navigation Bar	95
Figure 4.8	Graphic Text Links	97
Figure 4.9	Graphic Push Button	97
Figure 4.10	Examples of Icon Used in The Site	97

Figure 4.11	An example of Login Page	100
Figure 4.12	An example of Main Page	101
Figure 4.13	System Architecture of a Web-Based	102
	Database System	
Figure 4.14	Elements of ASP	105
Figure 5.1	Customer Service Web Page	112
Figure 5.2	GKED Homepage	113
Figure 5.3	Sales Detail Web Page	115
Figure 5.4	Customer Contact Web Page	116
Figure 5.5	Inventory Web Page	117

LIST OF TABLES

Number	Title	Page
Table 2.1 Table 3.1	Road to Customer-centric CRM Marketing Value	35 48
Table 3.2	Data Gathering	61
Table 5.1	CRM Integration Requirements and	119
	Actual System Performance	

CHAPTER ONE

INTRODUCTION

1.1 Project Background

This project is initiated upon the request of course TZ6996 as one of the graduation requirements of MSc(IT). The aim of this project is to assist in meeting the information requirements of the sales agents in e-commerce by using Customer Relationship Management (CRM) system to automate sales, marketing, customer service and support.

For the purpose of this study, an e-commerce company was virtually created to show how CRM can help them selling their products efficiently by retaining the old customer and attract the new customers. Named by GainKnowledge.com this company selling e-book devices online in the Internet.

The contents of the thesis is for internal user only

REFERENCES

- Advanstar Communications (1996-2000). CRM Focus: Finding the Right Model.
 - URL: http://www.cinterface.com/issues/2000_07/crmfocus_rightmod_el.htm
- Allen, C. (2001). CRM: A Way of Thinking About Customers. URL: http://www.clickz.com/article/cz.3641.html
- Anonymous. (2000). Elements of Interface Design.

 URL: http://www.grad.math.uwaterloo.ca/~madkhan/ui/user-centered-design.htm
- Anonymous. (2000). *User-Centered Information Design*. URL: http://www.tech-bridge.ucid.html
- Anonymous. (1994). Methods for User-centered Design.
 URL: http://www.iea.fmi.uni-sofia.bg/hci/book/c18/index.html
- Anonymous. (2000). *User Centered Design*. URL: http://www.agricola.umn.edu/Library/UserCentered.htm
- Chan, A. (2001, June). Malaysia's CRM Software Market. IT Malaysia, p.17-24.
- Cloyd, M. H. (2000). *Creating a User-driven Development Process*. URL: http://www.tri.sbc.com/hfweb/cloyd/cloyd.html
- Corinoly, T. M. And Begg, C. E. (1999). Database Systems: A Practical Approach to Design, Implementation and Management (2nd ed.). Addison Wesley.
- Copyright © 2001 Information Technology Toolbox, Inc. (2001). CRM

Overview.

URL: http://www.ittoolbox.com/help/crmoverview.asp

CRM.Guru. (2000). What is CRM?

URL: http://www.crmguru.com/contact/answers/whatiscrm.html

DeDad, A. (2000). CRM for Call Centers Heralds Profits

URL: http://www.businesssolutionsmag.com/Articles/2000_07/000704.htm

Emigh, J. (1999, November). Customer Relationship Management: The Next ERP. ComputerWorld Malaysia. p.26-27.

Francis, Fedorov, Harrison, Homer, Murphy, Sussman, Smith and Wood. (1998). *Active Server Pages 2.0.* Wrox Press Ltd. p.523-531.

Gow, D. And Hills, B. (2000). Customer Relationship Portals-Managing in an

E-Business World.

URL: http://www.crmproject.com/wp/gow.html

Jefferey, R. (1994). Handbook of Usability Testing: How to Plan, Design and Conduct Effective Tests. John Wiley & Sons, New York.

Kendall & Kendall. (1999). System Analysis and Design (4th ed.). Prentice Hall. p.199-216.

Khorramshahgol, R. (2001). *Application of Total Quality Management in Implementing and Managing CRM*. MESM'2001: 3rd Middle East Symposium on Simulation and Modelling.

Lee, D. (2001). Four Steps to Success with CRM.
URL: http://www.crmguru.com/content/features/Lee02.html

- Lee, T. (2000). What is CRM?

 URL: http://www.webcmo.com/what_is_crm/crm/html
- Leng, A. B. (1999, November). Companies Gear Up for CRM. ComputerWorld Malaysia. p.24-25.
- Meltzer, M. (1998). Using Data Warehouse to Drive Customer Retention, Development and Profit.

 URL: http://www.crmforum.com/crm_forum.whitepapers/crpr/ppr.htm
- Menconi, P. (2000). CRM101-Building a Great CRM Strategy. URL: http://www.crmproject.com/crm.html
- Pind, L. (2001). User-Centered Design: What is This All About?
 URL: http://www.developer.arsdigita.com/acs-java/user-centered
- Techguide.com. (2000). Building a Successful CRM Environment.

 URL: <a href="http://www.techguide.zdnet.com/html/bldgcrm/bldgc
- Techguide.com. (2000). Achieving Business Success Through CRM. URL: http://www.techguide.com
- Techguide.com (2000). Building a Customer Centric Contact Center. URL: http://www.techguide.zdnet.com/centric/index.shtml
- Thomas, C. And Williamson, A. (2000). Putting Customers at The Center of CRM.

 URL: http://www.crmproject.com/wp/thomas.html
- Whitten, J.L. And Bently, L. D. (1998). System Analysis and Design Methods (4th ed.). McGraw-Hill.

- Wong, L. C. (2000, August 1). CRM Adoption Here is Lagging. The Star/In-Tech.p.35.
- Zingale, T. (2000). The Death of Customer Satisfaction: CRM in the Internet Age.

URL: http://www.crmproject.com/wp/zingale.html