WEB-BASED CUSTOMER RELATIONSHIP MANAGEMENT

UMADEVI MARAPPAN

UNIVERSITI UTARA MALAYSIA
2001
WEB-BASED CUSTOMER RELATIONSHIP 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.
PERAKUAN KERJA KERTAS PROJEK
(Certification of Project Paper)

Saya, yang bertandatangan, memperakukan bahawa
(I, the undersigned, certify that)

UMADEVI MARAPPAN

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)

WEB-BASED CUSTOMER RELATIONSHIP MANAGEMENT

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 Dr. Razman Mat Tahar

Tanda tangan
(Signature) : [Signature]

Tarikh
(Date) : 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

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.

1. 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.

4. 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

<table>
<thead>
<tr>
<th>CHAPTER 1: INTRODUCTION</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Project Background</td>
<td>1</td>
</tr>
<tr>
<td>1.2 Company Background</td>
<td>2</td>
</tr>
<tr>
<td>1.3 CRM Overview</td>
<td>3</td>
</tr>
<tr>
<td>1.3.1 Brief History of CRM</td>
<td>4</td>
</tr>
<tr>
<td>1.3.2 Why CRM is Necessary?</td>
<td>5</td>
</tr>
<tr>
<td>1.3.3 Market Leader</td>
<td>6</td>
</tr>
<tr>
<td>1.3.4 The Future of CRM</td>
<td>7</td>
</tr>
<tr>
<td>1.4 Problem Statement</td>
<td>8</td>
</tr>
<tr>
<td>1.5 Objective of Studies</td>
<td>9</td>
</tr>
<tr>
<td>1.6 Methodology</td>
<td>11</td>
</tr>
<tr>
<td>1.7 Project Scope</td>
<td>12</td>
</tr>
<tr>
<td>1.8 Project Outline</td>
<td>13</td>
</tr>
<tr>
<td>1.9 Summary</td>
<td>14</td>
</tr>
</tbody>
</table>
CHAPTER 2: LITERATURE REVIEW

2.1 Introduction 15
2.2 CRM Concept 16
2.3 Categories 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 Importance 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 Summary 39

CHAPTER 3: METHODOLOGY

3.1 Introduction 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
4.7 Infrastructure and Tools of CRM Architecture 101
   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

CHAPTER 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

CHAPTER 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

BIBLIOGRAPHY

APPENDICES
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Number</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 2.1</td>
<td>Customer Platform</td>
<td>17</td>
</tr>
<tr>
<td>Figure 2.2</td>
<td>Total CRM Software Market</td>
<td>28</td>
</tr>
<tr>
<td>Figure 2.3</td>
<td>Functionality of CRM</td>
<td>32</td>
</tr>
<tr>
<td>Figure 2.4</td>
<td>Economy Goals in Past and Future</td>
<td>35</td>
</tr>
<tr>
<td>Figure 2.5</td>
<td>Integration of People, Information and Technology</td>
<td>39</td>
</tr>
<tr>
<td>Figure 3.1</td>
<td>Integration of UCD and CRM Web-based Development Methodology</td>
<td>42</td>
</tr>
<tr>
<td>Figure 3.2</td>
<td>Task and Subtask Analysis</td>
<td>51</td>
</tr>
<tr>
<td>Figure 3.3</td>
<td>The Prototype Process</td>
<td>57</td>
</tr>
<tr>
<td>Figure 3.4</td>
<td>CRM Web-based Development Model</td>
<td>60</td>
</tr>
<tr>
<td>Figure 3.5</td>
<td>CRM Development Model</td>
<td>70</td>
</tr>
<tr>
<td>Figure 4.1</td>
<td>Four Process of CRM</td>
<td>75</td>
</tr>
<tr>
<td>Figure 4.2</td>
<td>Functional Components of a CRM Architecture</td>
<td>76</td>
</tr>
<tr>
<td>Figure 4.3</td>
<td>GainKnowledge.com E-commerce</td>
<td>79</td>
</tr>
<tr>
<td>Figure 4.4</td>
<td>GKED’s Entity Relationship Diagram</td>
<td>83</td>
</tr>
<tr>
<td>Figure 4.5</td>
<td>GKED’s Data Flow Diagram (DFD)</td>
<td>90</td>
</tr>
<tr>
<td>Figure 4.6</td>
<td>Flow Chart of GKED Web Site</td>
<td>94</td>
</tr>
<tr>
<td>Figure 4.7</td>
<td>Navigation Bar</td>
<td>95</td>
</tr>
<tr>
<td>Figure 4.8</td>
<td>Graphic Text Links</td>
<td>97</td>
</tr>
<tr>
<td>Figure 4.9</td>
<td>Graphic Push Button</td>
<td>97</td>
</tr>
<tr>
<td>Figure 4.10</td>
<td>Examples of Icon Used in The Site</td>
<td>97</td>
</tr>
<tr>
<td>Figure 4.11</td>
<td>An example of Login Page</td>
<td>100</td>
</tr>
<tr>
<td>Figure 4.12</td>
<td>An example of Main Page</td>
<td>101</td>
</tr>
<tr>
<td>Figure 4.13</td>
<td>System Architecture of a Web-Based Database System</td>
<td>102</td>
</tr>
<tr>
<td>Figure 4.14</td>
<td>Elements of ASP</td>
<td>105</td>
</tr>
<tr>
<td>Figure 5.1</td>
<td>Customer Service Web Page</td>
<td>112</td>
</tr>
<tr>
<td>Figure 5.2</td>
<td>GKED Homepage</td>
<td>113</td>
</tr>
<tr>
<td>Figure 5.3</td>
<td>Sales Detail Web Page</td>
<td>115</td>
</tr>
<tr>
<td>Figure 5.4</td>
<td>Customer Contact Web Page</td>
<td>116</td>
</tr>
<tr>
<td>Figure 5.5</td>
<td>Inventory Web Page</td>
<td>117</td>
</tr>
</tbody>
</table>
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Number</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 2.1</td>
<td>Road to Customer-centric CRM</td>
<td>35</td>
</tr>
<tr>
<td>Table 3.1</td>
<td>Marketing Value</td>
<td>48</td>
</tr>
<tr>
<td>Table 3.2</td>
<td>Data Gathering</td>
<td>61</td>
</tr>
<tr>
<td>Table 5.1</td>
<td>CRM Integration Requirements and Actual System Performance</td>
<td>119</td>
</tr>
</tbody>
</table>
CHAPTER ONE
INTRODUCTION

1.1 Project Background

This project is initiated upon the request of course TZ.6996 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

URL: http://www.cinterface.com/issues/2000_07/crmfocus_rightmodel.htm

URL: http://www.clickz.com/article/cz.3641.html

URL: http://www.grad.math.uwaterloo.ca/~madkhan/ui/user-centered
design.htm

URL: http://www.tech-bridge.ucid.html

URL: http://www.iea.fmi.uni-sofia.bg/hci/book/c18/index.html

URL: http://www.agricola.umn.edu/Library/UserCentered.htm


URL: http://www.tri.sbc.com/hfweb/cloyd/cloyd.html


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


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


URL: http://www.crmguru.com/content/features/Lee02.html

132
URL: http://www.webcemo.com/what_is_crm/erm/html

Leng, A. B. (1999, November). *Companies Gear Up for CRM.*  

URL: http://www.crmforum.com/crm_forum_whitepapers/crpr/ppr.htm

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


URL: http://www.techguide.com

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


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