A REQUIREMENT MODEL FOR CUSTOMER COMPLAINT SYSTEM BASED ON CRM: A CASE OF UNIVERSITI UTARA MALAYSIA

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A REQUIREMENT MODEL FOR CUSTOMER COMPLAINT SYSTEM BASED ON CRM: A CASE OF UNIVERSITI UTARA MALAYSIA

A project submitted to Dean of Awang Had Salleh Graduate School in partial Fulfillment of the requirement for the degree of Master of Science (Information Technology)

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ABSTRACT

Customer complaints' play an important role in improving the services in higher institutions, and it is important to know how to handle them more efficiently in order to keep and maintain the relationships with the "customers" such as student, alumnae, staff members, faculty (college) members, and etc. At the moment, the customer can only lodge their complaints, but their problem might not be entertained. This project is focused on deriving a requirement model of the customer complaint system for universities based on CRM perspective. A prototype is developed based on the proposed requirement model and this prototype is evaluated by using perceived usefulness and ease of use where the respondents are from Universiti Utara Malaysia (UUM) students. The feedbacks from 50 respondents about the system prototype are quite good which are showed with 5.46 grand mean for perceived usefulness factor and 5.37 grand mean for perceived ease of use factor with the scale of 7. Therefore, it can be concluded that the prototype is useful and easy to use. This requirement model is expected to facilitate the other university to develop and enhance the system for customer complaint.

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TABLE OF CONTENTS

PERMI	ISSION TO USE	i
ABSTR	RACT	ii
ACKNO	OWLEDGEMENT	iii
TABLE	E OF CONTENTS	iv
LIST O	F TABLES	vi
LIST O	F FIGURES	vii
СНАРТ	FER ONE: INTRODUCTION	1
1.0	Introduction	1
1.1	Problem Statement	3
1.2	Research Questions	4
1.3	Objectives of Studies	4
1.4	Project Scope	4
1.5	Significance of Studies	5
1.6	Organization of the Report	5
СНАРТ	ΓER TWO: LITERATURE REVIEW	7
2.0	Introduction	7
2.1	CRM	7
2.1	1.1 The Objectives of CRM	8
2.1	1.2 The Components and Applications of CRM	9
2.2	CRM for University	11
2.3	Complaint	12
2.3	3.1 Significance of Complaints	13
2.4	Handling Customer Complaints	13
2.5	Summary	15
СНАРТ	TER THREE: METHODOLOGY	16
3.1	Awareness of Problem	17
3.2	Suggestion	18
3.3	Development	18
3.3	3.1 Platform Architecture for Prototype	20
3.3	3.2 Application Server	22
3.3	3.3 Database	2.2

3.4	Evaluation	23
3.5	Conclusion	24
3.6	Summary	24
СНАРТ	ER FOUR: REQUIREMENT MODEL AND EVALUATION	OF SYSTEM
PROTO	OTYPE	25
4.0	Introduction	25
4.1	UUM Current Complaint System	25
4.2	Software Requirement Specification	27
4.2	2.1 List of Requirements:	27
4.2	2.2 USECASE Specification	32
4.3	Evaluation of System Prototype	58
4.3	3.1 Population and Sample	58
4.3	3.2 Reliability Analyses	59
4.3	3.3 Analyses and Results	60
4.4	Summary	61
СНАРТ	ER FIVE: CONCLUSION	62
5.0	Introduction	62
5.1	Findings and Results	62
5.2	Limitation	64
5.3	Future Works	65
5.4	Conclusion	65
REFER	ENCES	66

LIST OF TABLES

Table 1: Respondent Demographic	59
Table 2: Reliability Analysis	59
Table 3: Perceived Usefulness	60
Table 4: Perceived Ease of Use	60

LIST OF FIGURES

Figure 2.1: CRM Systems for Handling Customer Complaint Process	9
Figure 2.2: Complaint Handling Process	
Figure 3.1: The General Methodology of Designing research	.16
Figure 3.2: Gantt Chart	
Figure 3.3: Prototyping based Methodology	.19
Figure 3.4: MVC Architecture	.21
Figure 4.1: Usecase Diagram	.30
Figure 4.2: Database of CCS Prototype	.32
Figure 4.3: Usecase for Register	.30
Figure 4.4: Register Page	.32
Figure 4.5: Usecase for Login	.34
Figure 4.6: Login Page	.35
Figure 4.7: Homepage - Administrator	.35
Figure 4.8: Homepage - Technician	.36
Figure 4.9: Homepage - Customer	.36
Figure 4.10: Usecase for Manage Users	.37
Figure 4.11: View Users Page	.38
Figure 4.12: Add Users Page	.39
Figure 4.13: Edit Users Page	.39
Figure 4.14: Usecase for Manage Complaint	.40
Figure 4.15: Complaint via Phone Page	.41
Figure 4.16: Complaint cvia SMS Page	.42
Figure 4.17: Usecase for Create Complaint	.42
Figure 4.18: Create new Complaint Page	.44
Figure 4.19: View Complaint Page	.44
Figure 4.20: Usecase for View Complaint	.45
Figure 4.21: View Complaint Page - Technician	.46
Figure 4.22: Usecase for create feedback	
Figure 4.23: Feedback Page	.48
Figure 4.24: Usecase for Create Warning Message	.48
Figure 4.25: Warning Page	
Figure 4.26: Usecase for View Warning Message	.50
Figure 4.27: View Warning Page - Technician	.51
Figure 4.28: Usecase for Manage FAQ	
Figure 4.29: View FAQ Page	.53
Figure 4.30: Add/edit FAQ Page	.54
Figure 4.31: Delete FAQ Page	.54
Figure 4.32: Usecase for View FAQ	
Figure 4.33: View FAQ Page	
Figure 4.34: Usecase for View Profile	
Figure 4.35: View Profile Page	

CHAPTER ONE

INTRODUCTION

1.0 Introduction

Customers' complaints play very important role for any organizations including universities. Complaints could bring benefits to the organizations such they may identify areas that needed improvement, provide opportunities for customer to voice their opinion on certain matters, and also provide quality service and satisfaction to the customers. So, it is very important to handle a costumer's complaint, because it may lead to an improvement for customer service in the organization.

A complaint is a statement that shows unsatisfactory/unacceptable (http://oxforddictionaries.com/definition/complaint), or it also may define as a description of a problem and procedures that a person follow in order to resolve that problem before reaching the point where he or she does not know how to proceed (http://uk.ask.com/what-is/what is a complaint). Those whoever receiving the complaints usually view them as negative attacks by disaffected people, however, complaints can also bring advantages.

One of the areas of study that deals with customer complaints is Customer Relationship Management (CRM). CRM is a business strategy that combines the

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5.3 Future Works

In the future, may be the requirement can be expanding based on the universities that want to use this proposed requirement model. For example, the complaint system can have more functions like integrating with email (Email Complaint), and etc. Additionally the prototype of system has been used in this project were JSP/Java and MySQL for storing the data, for the future it also possible to develop the system/system prototype using other technology like PHP, ASP.NET, and using ORACLE, MS-SQL for storing the data.

One function that should be added as the future work is to notify the customer through their mobile phone (SMS) so it can make them feel the system is more useful for them, and know whether their complaint is handled or not. In addition, the evaluation of the system in this project only has the sample of 50 respondents, for the future work it can be evaluated by more respondents so that the sample population reflects the actual population.

5.4 Conclusion

Complaint is very important for the organization including university. Every customer has the rights to give complaint and feedback to the university so the university should know how to maintain the relationship with these customers. The requirement model that produced by this project is hoped to facilitate the other university to develop and/or enhance the system for customer complaint. By using the prototype that has been developed, the university can try to use the system prototype before they can develop or enhance their complaint system.

REFERENCES

- Abdullah, A., Saleem, F., & Ullah. Z.v(2009). Efficient Implementation of Data Mining: Improve Customer's Behaviour. *IEEE/ACS International Conference on Computer Systems and Applications*, *AICCSA* 2009, 7 10.
- Amy J.C.T., et al. (2010). A Framework of Customer Complaint Handling System.

 7th International Conference on Service Systems and Service Management (ICSSSM), 2010, 1-6.
- Anderson, K., & Kerr, C. (2002). *Customer Relationship Management*. New York: McGraw-Hill.
- Becker, J.U. et al, (2009). The impact of technological and organizational implementation of CRM on Customer acquisition, maintenance and retention.

 International Journal of Research in Marketing, 26, 207-215
- Bolfing, C.P., (1989). How do Customer Express Dissatisfaction and What Can Service Marketers do About it?. *Journal on Services Marketing*, 3 (2), 5-23.
- Carcillo, F., Moro, S., Epifani, P., & Diero, A., (2010). Lessons from Adoption of Open Source Trouble Ticket System in Turin Municipality to Manage Citizens' Requests. eChallenges e-2010 Conference Proceedings Paul Cunningham and Miriam Cunningham (Eds) IIMC International Information Management Corporation,.
- Cho, Y., Im, I., Ferjemstad, J., & Hiltz, R. (2002). An Analysis of Online Customer Complaints: Implications for Web Complaint Management. *Proceedings of the 35th Hawaii International Conference on System Sciences*.
- Cho, Y., Im, I., Ferjemstad, J., & Hiltz, R. (2001). An Analysis of Pre- and Post-Purchase Online Customer Complaining Behavior. *Proceedings of Conference on Customer Satisfaction, Dissatisfaction & Complaining Behavior*.

- Cho, Y., Im, I., Ferjemstad, J., & Hiltz, R. (2001). Causes and Outcomes of Online
 Customer Complaining Behaviour: Implications for Customer Relationship
 Management (CRM). Proceedings of the 2001 Americas Conference on
 Information Systems. Paper 175.
- Constantinos, J. S., Cristos, S., & Amalia S., (2003). CRM and Customer centric knowledge management: an empirical research. *Business Process Management Journal*, 9(5),617 634.
- Cristopher, A., & Otto, P.,(2003). *Evaluation of CRM System Success*. Retrieved from http://ecom.fov.uni-mb.si/merkurday2003/presentations/Christoph%20Auer.pdf, Accessed on October 2011.
- Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16(3), 297-334.
- Cronbach, L.J., & Shavelson, R.J. (2004). My Current Thoughts on Coefficient Alpha and Successor Procedures. *Educational and Psychological Measurement* 64, 3 (June 1), 391-418. doi:10.1177/0013164404266386.
- Davidow, M., (2003). Organizational Responses to Customer Complaints: What Works and What Doesn't. *Journal of Service Research*, 5(3), 225-250.
- Davis, D.F., (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*, 13(3), 319.
- Dennis, A.A., Nelson, R.R., & Peter A. T., (1992). Perceived Usefulness, Ease of Use, and Usage of Information Technology: A Replication. *MIS Quarterly*, (16) 2, 227-247.
- Dyche, J. (2002). The CRM handbook: a business guide to customer relationship management. Boston: Addison-Wesley Professional.

- Faed, A. (2010). Handling e-Complaints in Customer Relationship Management Using FMEA as a Qualitative System. 6th International Conference on Advanced Information Management and Service (IMS). 205 209.
- Faed, A. (2010). A Conceptual Model for Interactivity, Complaint and Expectation for CRM. *International Conference on Computer Information Systems and Industrial Management Applications (CISIM)* 314 318.
- Goodman, J. (2006). Manage Complaints to enhance loyalty. *Quality Control and Applied Statistics*, 51, 536.
- Hair, J.F., Anderson, R.E., Tatham, R.L. & Black, W.C. (1998). *Multivariate Data Analysis*. New Jersey: Prentice Hall.
- He, Yi., & Zhique Liu., (2006). Process Computing of Complaint Service Management in Reverse Logistics. *Proceedings of the 2006 IEEE Asia-Pacific Conference on Services Computing*, 315 322.
- Henneberg, S.C. et al., (2009). Complaint Management Expectations: An Online laddering analysis of small versus large firms. *Industrial Marketing Management*, 38, 584-598.
- Heung, V., & Lam, T., (2003). Customer Complaint behavior towards hotel restaurants services. *International Journal of Contemporary Hospitality Management*, 15, 283-289.
- Idris, A., Samad, A., & Nur Hanisah Zubir.,(2009). An Application of SMS Technology for Customer Service Centre. 2009 International Conference of Soft Computing and Pattern Recognition, 633-636.
- Jahangir, N., & Begum, N., (2008). The Role of Perceived usefulness, perceived ease of use, security and Privacy, and customer attitude to engender customer

- adaptation in the context of electronic banking. *African Journal of Business Management*, 2 (1), 032-040,
- Jaideep, S., (2006). Data Mining for Customer Relationship Management. Advances in Knowledge Discovery and Data Mining 10th Pacific-Asia Conference, PAKDD 2006, Singapore, April 9-12, 2006.
- Kalakota, R., & Marcia, R. (2001). *E-Business Roadmap for Success*. Boston: Addison-Wesley Professional.
- Levesque, T. J., & McDougall, G. H. (1996). Customer Dissatisfaction: The Relationship Between Types of Problems and Customer Response. *Canadian Journal of Administrative Sciences*, 13(3), 264-276.
- Li, Z., Li, L., He, B., & Liu J.L., (2010). Experimental Study on Logistics Customer Complaint Management. *International Conference on E-Product E-Service and E-Entertainment (ICEEE)*, 2010, 1-5. IEEE 978-1-4244-7161-4/10
- Liu, J.L., Kang, J., Bai, Y., & Zhang X., (2006). The Study of Customer Complaints Management based on System Dynamics: Modeling and Simulation. *Proceedings* of the Fifth International Conference on Machine Learning and Cybernatics, page 2040 - 2046.
- Liu, Y. & Shrum L., (2002). What is interactivity and is it always such a good thing? Implications of definition, person, and situation for the influence of interactivity on advertising effectiveness. *Journal of Advertising*, 31, 53-64.
- Marappan, U. (2001). Web-Based Customer Relationship Management. Masters thesis, Universiti Utara Malaysia.
- Murdock, P., F., D., & Lawrence, H. (2009). Best Practice Guide Report for CRM4UNI. Retrieved September 10, 2011, from Google Docs: https://docs.google.com/Doc?id=dg85q6dr_10gbnf5ngv

- Musico, C. (2008). Market Focus: Education -Making CRM Mandatory for University Administration. Retrieved September 11, 2011, from destinationcrm: http://www.destinationcrm.com/Articles/Columns-Departments/Insight/Market-Focus-Education-----Making-CRM-Mandatory-for-University-Administration-50142.aspx
- N. Philip, X.H. Wang, R.S.H Istepanian, T. Geake, & H. Wayne. (2006). Medical Complaints: A solution based on Internet. IET 3rd International Conference On Advances in Medical, Signal and Information Processing, 2006. MEDSIP 2006, page 1-5
- Najar, A. S., Al-Sukni, H. A., & Aghakhani, N. (2010). The Application of Service-Oriented Architecture in E-Complaint System. Second International Conference on Communication Software and Networks, 280-283.
- Ndubisi, N.O., & Ling, T.Y., (2006). Complaint behavior of Malaysian Customers. *Management Research New*, 29, 65-76.
- Perlman, G., User Interface Usability Evaluation with Web-Based Questionnaires. http://hcibib.org/~perlman/question.html, Accessed on November 2011.
- Ramayah, T., & Ignatius, J., (2011). Impact of Perceived Usefulness, Perceived ease of Use and Perceive Enjoyment on Intention to Shop Online. Retrieved from: www.ramayah.com/journalarticlespdf/impactpeu.pdf, on October 2011.
- Razulaimi, R., Nizam, K., & Jusoff, K. (2011). Quality Improvement of Services in Universiti Teknologi Mara Pahang from a Management Perspective. *Management Science and Engineering*, pp. 71-80.
- Reinartz, W., Thomas, J.S., &Kumar, V., (2005). Balancing acquisition and retention resources to maximize customer profitability. *Journal of Marketing*, 69, 63-79.

- Robert, A., Maksimchuk, R., Engle, M., Young, B., Conallen, J., & Houston, K. (2007). *Object-Oriented Analysis and Design with Applications*. New York: Random House.
- Roberts-Witt, S. L. (2000, June 27). It's the Customer, Stupid! *PC Magazine*, pp. 6-22.
- Tax, S. S., Brown, S. W., & Chandrashekaran, M. (1998). Customer Evaluations of Service Complaint Experiences: Implications of Relationship Marketing. *Journal* of Marketing, 62, 60-76.
- The Editors of CRM magazine, Who owns the social customer?. http://www.destinationcrm.com/Articles/Editorial/Magazine-Features/Who-Owns-the-Social-Customer-54028.aspx Accessed October 2011.
- Tunggal, A. W. (2002). Konsep Dasar Customer Relationship Management. Jakarta: Harvarindo.
- Ueno, S. (2006). The impact of Customer Relationship Management. Retrieved September 11, 2011, from USJP Occasional Paper 06-13: http://www.wcfia.harvard.edu/us-japan/research/pdf/06-13.ueno.pdf
- UUM Service Desk, http://servicedesk.uum.edu.my, accessed October 2011.
- Vaishnavi, V., & Kuechler, W. (2004, January 20). Design Research in Information Systems. Retrieved September 2008, 2011, from Design Research org: http://desrist.org/design-research-in-information-systems
- Yong, Li., (2010). The research of personal customer relationship management for commercial banks: based on multidimensional model of customer loyalty. 2010 International Conference on E-Business and E-Government, 3168-3171

- Zhang, S. (2011). Solving the potential complaints of customers in CRM.

 International Conference on Business Management and Electronic Information

 (BMEI), 2011 13-15 May 2011, 752-755.
- Zirtiloglu, H., & Yolum, P. (2008). Ranking semantic information for e-government: complaints management. In *Proceedings of the first international workshop on Ontology-supported business intelligence*. ACM, NY, USA, Article 5, 7 pages. DOI=10.1145/1452567.1452572 http://doi.acm.org/10.1145/1452567.1452572