

**e-PARTICIPATION OF FACULTY MEMBERS IN DECISION
MAKING IN SCHOOL OF COMPUTING IN UUM (FMDM)**

ALA' SALAMEH FALAH ALSARDIA

**UNIVERSITI UTARA MALAYSIA
2012**

**e-PARTICIPATION OF FACULTY MEMBERS IN DECISION
MAKING IN SCHOOL OF COMPUTING IN UUM (FMDM)**

A dissertation submitted to Dean of Awang Had Salleh Graduate School in
Partial Fulfilment of the requirement for the degree
Master of Science of Information Technology
Universiti Utara Malaysia

By
ALA' SALAMEH FALAH ALSARDIA

Copyright © Ala' Salameh, February 2012. All Rights Reserved

PERMISSION TO USE

In presenting this project in partial fulfillment of the requirements for a postgraduate 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 project in any manner, in whole or in part, for scholarly purpose may be granted by my supervisor(s) or, in their absence by the Dean of Postgraduate and Research. It is understood that any copying or publication or use of this project 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 project.

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

Dean of Awang Had Salleh Graduate School
College of Arts and Sciences
Universiti Utara Malaysia
06010 UUM Sintok
Kedah Darul Aman
Malaysia

ABSTRACT

e-Participation has gained increasing significance within the information society. Generally, participation means to take part or to be involved in it; with the exploitation of ICT. e-Participation will improve better decision making process in public sector by speed, reduced costs, reach more people. In this case, the School of Computing in UUM has many faculty members, which make it difficult to hold meetings and access to all the problems and suggest ideas and discussed by all. Through this study will design participatory management prototype for faculty members of School of Computing to improve and accelerate decision-making process through access to all the problems at hand. Contain the opinions, distribute new ideas between the faculty members for easier discussion, and reduce meeting time; this prototype will develop via using C# language as the solution we present in this study by following the spiral development methodology. The evaluation of prototype based on usability testing by using Computer Usability Satisfaction Questionnaires (CUSQ), psychometric evaluation and prototype was assessed through a sample consists of twenty eight employees from UUM; and the results have been positive.

ACKNOWLEDGEMENT

I am most grateful to Allah and to those who have helped me during the process of my research.

*I am heartily thankful to my supervisor, **Prof. Dr. Wan Rozaini Sheik Osman**, whose encouragement, guidance and support from the initial to the final level enabled me to develop an understanding of the project.*

Deep gratitude goes to my parents, my family, for their love, support and encouragement.

Finally, I offer my regards and blessings to all of those who supported me in any respect during the completion of the research.

TABLE OF CONTENTS

| | |
|------------------------|----|
| ABSTRACT..... | IV |
| ACKNOWLEDGEMENT | V |
| TABLE OF CONTENTS..... | VI |
| LIST OF TABLES | IX |

CHAPTER ONE: INTRODUCTION

| | |
|---------------------------------------|---|
| 1.1 Problem Statement | 2 |
| 1.2 Research Question | 3 |
| 1.3 Research Objective | 3 |
| 1.4 Scope of the Study | 4 |
| 1.5 Significance of the Study | 4 |
| 1.6 Organization of the Project | 5 |
| 1.7 Summary | 6 |

CHAPTER TWO: LITERATURE REVIEW

| | |
|------------------------------------------------------------------|----|
| 2.1 e-Participation | 7 |
| 2.2 e-Participation Model..... | 8 |
| 2.3 e-Participation Approach | 11 |
| 2.3.1 <i>The Politics and Organization Perspective</i> | 11 |
| 2.3.2 <i>The Communication and Interaction Perspective</i> | 12 |
| 2.3.3 <i>The Technology and Infrastructure Perspective</i> | 13 |
| 2.5 Participative Decision-Making | 16 |
| 2.5.1 <i>Participative Decision-Making Techniques</i> | 16 |
| 2.5.2 <i>Participative Decision-Making Models</i> | 19 |
| 2.6 Summary | 23 |

CHAPTER THREE: METHODOLOGY

| | | |
|-------|-----------------------------------|----|
| 3.1 | Research Methodology | 24 |
| 3.2 | Phases the Methodology | 26 |
| 3.2.1 | <i>Awareness of Problem</i> | 26 |
| 3.2.2 | <i>Suggestion</i> | 27 |
| 3.2.3 | <i>Development</i> | 28 |
| 3.2.4 | <i>Evaluation</i> | 30 |
| 3.2.5 | <i>Conclusion</i> | 31 |
| 3.3 | Summary | 31 |

CHAPTER FOUR: ANALYSIS & DESIGN

| | | |
|-------|------------------------------------------|----|
| 4.1 | System Requirements..... | 32 |
| 4.1.1 | <i>Functional Requirements</i> | 32 |
| 4.1.2 | <i>Non Functional Requirements</i> | 34 |
| 4.2 | Use Case..... | 36 |
| 4.3 | Activity Diagram | 37 |
| 4.4 | Sequence and Collaboration Diagram | 40 |
| 4.5 | Class Diagram | 55 |
| 4.6 | System Interface..... | 56 |
| 4.6.1 | <i>System Interface</i> | 56 |
| 4.6.2 | <i>Admin Interface</i> | 58 |
| 4.6.3 | <i>Staff Interface</i> | 62 |
| 4.7 | Summary | 63 |

CHAPTER FIVE: EVALUATION & RESULTS

| | | |
|-----|--------------------------|----|
| 5.1 | General Information..... | 64 |
| 5.2 | Evaluation of User | 68 |
| 5.3 | Summary | 89 |

CHAPTER SIX: CONCLUSIONS

| | | |
|------------------|-------------------|-----|
| 6.1 | DISCUSSION | 90 |
| 6.2 | CONTRIBUTION..... | 92 |
| 6.3 | FUTURE WORK..... | 92 |
| 6.4 | CONCLUSION..... | 93 |
| REFERENCES | | 95 |
| APPENDIX A..... | | 101 |
| APPENDIX B | | 102 |

LIST OF TABLES

| | |
|---------------------------------------------------------------------------------------------------------|----|
| Table 3. 1 The Result of Questionnaire | 27 |
| Table 4. 1 : List of Functional Requirements..... | 33 |
| Table 4. 2 : List of Non-Functional Requirements | 35 |
| Table5. 1: Distribution of Respondents Based on Gender..... | 65 |
| Table 5. 2 : Distribution of Respondents Based on Age..... | 66 |
| Table 5. 3 : Distribution of Respondents Based on Working Experience | 67 |
| Table 5. 4 Statistics for All Elements | 69 |
| Table 5.5 : Q1 Overall, I Am Satisfied with How Easy it is to Use This System ... | 70 |
| Table 5. 6 : Q2 It Was Simple to Use This System | 71 |
| Table 5. 7 : Q3 I Could Effectively Complete the Tasks and Scenarios Using this System..... | 72 |
| Table 5.8 : Q4 I Was Able to Complete the Tasks and Scenarios Quickly Using This System..... | 73 |
| Table 5.9 : Q5: I Was Able to Efficiently Complete Tasks and Scenarios Using this System..... | 74 |
| Table 5.10 : Q6 I Felt Comfortable Using This System | 75 |
| Table 5. 11 : Q7 It was Easy to Learn to Use This System | 76 |
| Table 5.12 : Q8 I Believe I Could Become Productive Quickly Using This System | 77 |
| Table 5.13 : Q9 Whenever I made a Mistake Using the System, I Could Recover Easily and Quickly | 78 |

| | |
|-----------------------------------------------------------------------------------------------------------------------------------------------|----|
| Table 5.14 : Q10 The Information (Such as On-Line Help, On-Screen Messages and Other Documentation) Provided With This System was Clear | 79 |
| Table 5.15 : Q11 The system gives error messages that clearly tell me how to fix problems..... | 80 |
| Table 5.16 : Q12 It was Easy to Find the Information I Needed | 81 |
| Table 5. 17 : Q13 The Information Provided for the System was Easy to Understand | 82 |
| Table 5. 18 : Q14 The Information was Effective in Helping me Complete the Tasks and Scenarios | 83 |
| Table 5. 19 : Q15 The Organization of Information on the System Screens was Clear | 84 |
| Table 5.20 : Q16 The Interface of This System was Pleasant | 85 |
| Table 5.21 : Q17 I Liked Using the Interface of This System | 86 |
| Table 5.22 : Q18 This System Has all the Functions and Capabilities I Expect it to Have | 87 |
| Table 5.23 : Q19 Overall, I Am Satisfied with This System | 88 |

LIST OF FIGURES

| | |
|------------------------------------------------------------------------------------|----|
| Figure 1. 1 : Process of FMDM | 4 |
| Figure 2.1 : The e-Participation Framework (Islam, 2008) | 9 |
| Figure 2.2 : Keys for Realization of E-Participation (Salamat, et al., 2011) | 14 |
| Figure 2. 3 : Categorize of Participative Decision-Making Techniques..... | 17 |
| Figure 2. 4 : Model of the Diamond of Participatory Decision Making | 20 |
| Figure 2. 5 : Information Ways for Decision Making | 22 |
| Figure 3.1 . : Research Design Methodology (Vaishnavi & Kuechler, 2004)..... | 25 |
| Figure 3. 2 : Spiral Development Model Steps (Boehm, & Hansen, 2001) | 29 |
| Figure 4. 1 : Use Case Diagram of FMDM | 37 |
| Figure 4. 2 : Description the Activity Diagram for Admin..... | 38 |
| Figure 4. 3 : Description the Activity Diagram for Staff | 39 |
| Figure 4. 4 : Login Sequence Diagram | 40 |
| Figure 4. 5 : Login Collaboration Diagram..... | 41 |
| Figure 4. 6 : Add Voting Sequence Diagram..... | 42 |
| Figure 4. 7 : Add Voting Collaboration Diagram | 43 |
| Figure 4. 8 : Views Previous Voting Sequence Diagram | 44 |
| Figure 4. 9 : Views Previous Voting Collaboration Diagram..... | 45 |
| Figure 4. 10 : Sequence Diagram for Use Case Carry Vote | 46 |
| Figure 4. 11 : Collaboration Diagram for Use Case Carry Vote..... | 47 |
| Figure 4. 12 : Sequence Diagram for Add New Idea Use Case..... | 48 |
| Figure 4. 13 : Collaboration Diagram for Add New Idea Use Case | 49 |

| | |
|-----------------------------------------------------------------------------|----|
| Figure 4. 14 : Sequence Diagram for Download New Idea Use Case | 50 |
| Figure 4. 15 : Collaboration Diagram for Download New Idea Use Case | 51 |
| Figure 4. 16 : Sequence Diagram for Display Result Use Case | 52 |
| Figure 4. 17 : Collaboration Diagram for Display Result Use Case..... | 53 |
| Figure 4. 18 : Logout Sequence Diagram | 54 |
| Figure 4. 19 : Logout Collaboration Diagram..... | 54 |
| Figure 4. 20 : Class Diagram for FMDM | 55 |
| Figure 4. 21 : Homepage Interface..... | 56 |
| Figure 4. 22 : Main Login Interface | 57 |
| Figure 4. 23 : Specific Login Interface | 57 |
| Figure 4. 24 : Add Voting Interface | 58 |
| Figure 4. 25 : Views Previous Voting Interface | 59 |
| Figure 4. 26 : Views Previous Voting Interface | 60 |
| Figure 4. 27 : Download New Idea Interface..... | 61 |
| Figure 4. 28 : Current Vote Interface..... | 62 |
| Figure 4. 29 : Add New Idea Interface..... | 63 |
| Figure 5. 1 : Distribution of Respondents Based on Gender | 65 |
| Figure 5. 2 : Distribution of Respondents Based on Age | 66 |
| Figure 5. 3 : Distribution of Respondents Based on Working Experience | 67 |
| Figure 5. 4: Statistics for All Elements | 69 |
| Figure 5. 5 : Statistics for Question One..... | 70 |
| Figure 5. 6 : Statistics for Question Two | 71 |
| Figure 5. 7 : Statistics for Question Three | 72 |

| | |
|--------------------------------------------------------|----|
| Figure 5. 8 : Statistics for Question Four | 73 |
| Figure 5. 9 : Statistics for Question Five | 74 |
| Figure 5. 10 : Statistics for Question Six | 75 |
| Figure 5. 11 : Statistics for Question Seven..... | 76 |
| Figure 5. 12 : Statistics for Question Eight..... | 77 |
| Figure 5. 13 : Statistics for Question Nine..... | 78 |
| Figure 5. 14 : Statistics for Question Ten | 79 |
| Figure 5. 15 : Statistics for Question Eleven | 80 |
| Figure 5. 16 : Statistics for Question Twelve..... | 81 |
| Figure 5. 17 : Statistics for Question Thirteen..... | 82 |
| Figure 5. 18 : Statistics for Question Fourteen | 83 |
| Figure 5. 19 : Statistics for Question Fifteen | 84 |
| Figure 5. 20 : Statistics for Question Sixteen..... | 85 |
| Figure 5. 21 : Statistics for Question Seventeen | 86 |
| Figure 5. 22 : Statistics for Question Eighteen | 87 |
| Figure 5. 23 : Statistics for Question Nineteen | 88 |

CHAPTER ONE

INTRODUCTION

Growth of Information and Communication Technology (ICT) has revolutionized the social, administration and political life. These technologies gives many advantages such as, speed, reduced costs, reach more people. They are now essential for Public Administration to provide services and communicate directly with citizens. ICT improves citizen participation by allowing them to better interact with the Administration. This is called e-Participation. e-Participation initiatives aim to improve citizen access to information and public services and their participation in public decision-making (Moon, 2002).

e-Participation is about reconnecting ordinary people with policy-making, politics and decision making process. It is easier to follow this through the use of new ICT and understand; it can be concluded that work is needed on both sides of agents to enable wider communication and benefits; although e-Participation could challenge to facilitate and implement it (Sanford & Rose, 2007). The education sector is always whole leading in the areas of development of societies; purpose of the study is to increase awareness of the importance of participation in decision-making.

The contents of
the thesis is for
internal user
only

REFERENCES

- Aichholzer, G., & Westholm, H. (2009). Evaluating e-Participation projects: practical examples and outline of an evaluation framework. *European Journal of ePractice*, 7, 27-44.
- Alter, S. (2008). Defining information systems as work systems: implications for the IS field. *European Journal of Information Systems*, 17(5), 448-469.
- Andersen, K. V. (2006). e-Participation Management: Policy-input from DEMO-Net. Copenhagen Business School, Department of Informatics, Exploiting the Knowledge Economy: Issues, Applications, Case Studies, Paul Cunningham and Miriam Cunningham (Eds), IOS Press, Amsterdam.
- Berry, G. R. (2006). Can computer-mediated asynchronous communication improve team processes and decision making? Learning from the management literature. *Journal of Business Communication*, 43(4), 344.
- Boehm, B., & Hansen, W. (2001). The spiral model as a tool for evolutionary acquisition. *CrossTalk*, 14(5), 4-11.
- Cabot, J., Clarisó, R., & Riera, D. (2008). *Verification of UML/OCL class diagrams using constraint programming*. Paper presented at the IEEE International Conference on Software Testing Verification and Validation Workshop, ICSTW '08, Lillehammer
- Chung, L., & do Prado Leite, J. (2009). On non-functional requirements in software engineering. *Conceptual modeling: Foundations and applications*, 363-379.
- Connor, P. E., & Becker, B. W. (2003). Personal value systems and decision-making styles of public managers. *Public Personnel Management*, 32(1), 155-180.

- Dawes, S. S., Cresswell, A. M., & Pardo T. A. (2009). From “need to know” to “need to share.” Tangled problems, information boundaries, and the building of public sector knowledge networks. *Public Administration Review*, 69(3), 392-402.
- Elliott, J., Heesterbeek, S., Lukensmeyer, C., & Slocum, N. (2008). Participatory Methods Toolkit. A practitioner’s manual. *King Baudouin Foundation, Flemish Institute for Science and Technology Assessment*.
- Esposito, D. (2002). *Building web solutions with ASP .NET and ADO .NET*: Microsoft Press Redmond, WA, USA.
- Griffin, R. W., & Moorhead, G. (2011). *Organizational behavior*. USA: South-Western Pub.
- Grönlund, Ä. (2006). E-Participation and eGovernment, EGov’06 PhD Colloquium, DEMO-net, European Commission, Krakow, Poland.
- Hasling, B., Goetz, H., & Beetz, K. (2008). *Model based testing of system requirements using UML use case models*. Paper presented at the 1st International Conference on Software Testing, Verification, and Validation Lillehammer.
- Herrera-Viedma, E., Alonso, S., Chiclana, F., & Herrera, F. (2007). A consensus model for group decision making with incomplete fuzzy preference relations. *Fuzzy Systems, IEEE Transactions on*, 15(5), 863-877.
- Ishak, I. S., & Alias, R. A. (2005). Designing a strategic information systems planning methodology for Malaysian institutes of higher learning. *International Association for Computer Information Systems*, 5(1).
- Islam, M. S. (2008). Towards a sustainable e-Participation implementation model. *European Journal of ePractice*, 5, 1-12.

- Jones, O. (2003). The persistence of autocratic management in small firms: TCS and organisational change. *International Journal of Entrepreneurial Behaviour & Research*, 9(6), 245-267.
- Krywkwow, J., & Hare, M. (2008). *Participatory process management*. Paper presented at the International Environmental Modelling and Software Society (iEMSs).
- Lee, M. N. (2004). Global trends, national policies and institutional responses: Restructuring higher education in Malaysia. *Educational Research for Policy and Practice*, 3(1), 31-46.
- Lewis, J. R. (1995). IBM computer usability satisfaction questionnaires: psychometric evaluation and instructions for use. *International Journal of Human-Computer Interaction*, 7(1), 57-78.
- Lin, H., & Inouye, A. (2001). Democratic Processes in the Age of the Internet: A Framework for Action. *CSTB Division on Behavioural and Social Sciences and Education, National Research Council The National Academies*.
- Macintosh, A. (2004). Characterizing E-Participation in Policy-Making. In proceedings of the 37th Hawaii International Conference on System Sciences. International Teledemocracy Centre, Napier University, UK
- Macintosh, A., & Whyte, A. (2008). Towards an evaluation framework for E-participation . *Transforming Government: People, Process and Policy*, 2(1), 16-30.
- Maguire, M. (2001). Methods to support human-centred design. *International Journal of Human-Computer Studies*, 55(4), 587-634.

- Moon, M. J. (2002). The Evolution of E Government among Municipalities: Rhetoric or Reality? *Public administration review*, 62(4), 424-433.
- Myers, B. L., Kappelman, L., & Prybutok, V. (1997). A comprehensive model for assessing the quality and productivity of the information systems function: toward a contingency theory for information systems assessment. *Information resources management journal*, 10(1), 4-33.
- Oostvogels, N. (2009). *Facilitator's guide to participatory decision-making*. USA: Jossey-Bass.
- Organization for Economic Co-operation and Development –OECD (2001). Citizens as partners: OECD handbook on information. Consultation and public participation in policy-making, OECD, Paris.
- Papa, M. J., Daniels, T. D., & Spiker, B. K. (2007). *Organizational communication: perspectives and trends*. USA: Sage Publications, Inc.
- Petrik, K. (2009). *Participation and e-democracy how to utilize web 2.0 for policy decision-making*. Paper presented at the 8th International Conference of Digital Government Society of North America, NY, USA.
- Robbins, M. D., Simonsen, B., & Feldman, B. (2008). Citizens and Resource Allocation: Improving Decision Making with Interactive Web-Based Citizen Participation. *Public Administration Review*, 68(3), 564-575.
- Salamat, M. A. B., Hassan, S. B., & Muhammad, M. S. B. (2011). Electronic Participation in Malaysia. *Journal of e-Government Studies and Best Practices*, 2011, 1-11.
- Sanford, C., & Rose, J. (2007). Characterizing e-Participation. *International Journal of Information Management*, 27(6), 406-421.

- Sasse, M. A. (2007). Red-eye blink, bendy shuffle, and the yuck factor: A user experience of biometric airport systems. *IEEE Security & Privacy*, 5(3), 78-81.
- Scherer, S., Schneider, C., Wimmer, M. A., & Shaddock, J. (2008). *Studying E-participation in Government Innovation Programmes: Lessons from a Survey*. Paper presented at the Proceedings of the 21st Bled eConference:Overcoming through Multi-Channel interaction, 15-18 June 2008, 483-497.
- Tambouris, E., Liotas, N., & Tarabanis, K. (2007). *A framework for assessing e-Participation projects and tools*. Paper presented at the 40th Annual Hawaii International Conference on System Sciences, Hawaii.
- Troelsen, A. (2010). Building ASP. NET Web Pages. *Pro C# 2010 and the .NET 4 Platform*, 1379-1428.
- UNKB -United Nations EGovernment Readiness Knowledge Base (2007). Overview: E-Participation. Retrieved on September 10, 2011 from http://www.unpan.org/egovkb/egovernment_overview/Participation.htm
- Kuechler, B., & Vaishnavi, V. (2008). On theory development in design science research: anatomy of a research project. *European Journal of Information Systems*, 17(5), 489-504.
- Verma, N., Singh, S., & Misra, D. P. (2007). *Citizen Participation in the process of ICT enabled Governance: A Case Study*. Paper presented at the Proceeding of 1st International Conference on Theory and Practise of electronic governance (ICEGOV), 371-379.

- Xu, W., Deng, L., & Liu, Y. (2010). *A resource-based approach to formalize use case specification for web applications*. Paper presented at the IEEE International Conference on Progress in Informatics and Computing (PIC), Shanghai.
- Ying, Y. Z., Ye, L. J., & Guo, Y. X. (2009). Transformation from UML Sequence Diagram to Petri Net Based on XML. *Jisuanji Gongcheng/Computer Engineering*, 35(22), 84-87.
- Zaharias, P., & Poylymenakou, A. (2009). Developing a usability evaluation method for e-learning applications: Beyond functional usability. *Intl. Journal of Human-Computer Interaction*, 25(1), 75-98.