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

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

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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.

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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.

Participatory management is one of competing trends in community based organizations, and particularly in community organizing groups. Participatory management is the practice of empowering employees to participate in organizational decision making (Krywkow & Hare, 2008). Participatory management is a viable management style in today's global competition. The development of administrative systems at the university through use of participatory management technique would help in the promotion of participatory in management and education at the same time.

University Utara Malaysia is a dynamic organization that opens up the possibility of application to implement the technique of participatory management. This study will try to build an electronic system for participation in administrative decision-making within the School of Computing in University of Utara Malaysia to enable faculty members to participate in decision-making.

1.1 Problem Statement

e-Participation is aiming to provide the technologies and tools for more efficient public administration systems and more participatory decision processes. “In ensuring successful implementation of e-Participation in Malaysia, there is a need for awareness of some factors such as the process, the level of participation, the communication platform, the role of facilitation and consultation and the role of ICT” (Salamat, Hassan & Muhammad, 2011).

At the School of Computing, there are many faculty members, which make it difficult to hold meetings and access to all the problems and suggest ideas and discussed by all. Many academicians have been appointed to hold administrator posts in other departments and are often not free to come to

meetings. e-Participation helps to improve and accelerate decision-making process through access to all the problems at hand; contain the opinions and distribute a new ideas between the faculty members for more easier to discussion and reduce meeting time.

1.2 Research Question

The research questions can be formulated as:

1. What are the requirements of participation for faculty members to make decision system (FMDM) in School of Computing?
2. What is the design for faculty members to make decision system (FMDM)?
3. How to test the functionality of participation for administrative decision making in School of Computing?

1.3 Research Objective

The research objectives are written as follows:

1. To identify the requirement of participation for faculty members to make decision system (FMDM).
2. To develop a prototype of the application for faculty members to make decision system (FMDM).
3. To test the functionality of participation for faculty members to make decision system (FMDM) in School of Computing.

1.4 Scope of the Study

The domain of this study concerns with development of electronic participation application to support decision making in School of Computing of the e-Participation system to help faculty members for School of Computing to contribute through review of documents and to make decisions. Figures 1.1 illustrate the process of the study.

Figure 1. 1 : Process of FMDM

1.5 Significance of the Study

Participatory management is a type of management in which employees at all levels are encouraged to contribute ideas towards identifying and setting organizational-goals, problem solving, and other decisions that may directly affect them. Significance of this study lies in the possibility of the arrival of

proposals and ideas to management directly through the use of technology information and communication technologies to facilitate the process of decision-making. In addition, staff is a sense to participate in decision-making process, which contributes to the enhancement of belonging and the development of work within organizations.

1.6 Organization of the Project

This residue of the research is divided into six chapters. The actual chapter gives a brief background of the study whereby the problem of the research is put into light; the objectives and research questions are set. Moreover, the research scope and significance are also pointed out.

Chapter Two (2), provides a review of literature related to the design and development of an e-Participation for application decision-making for the School of Computing in UUM.

Chapter Three (3), emphasizes on the research methodology developed by Vaishnavi and Kuechler (2008), with the elaboration of its five stages (Awareness of the Problem, Suggestion, Development, Evaluation and Conclusion).

Chapter Four (4), presents the analysis and design of the FMDM that comprises the system users' requirements, system design and prototype development.

Chapter Five (5), provides the result for evaluation the FMDM system, its usability as well as ease of use and full assessment of the system.

Finally, chapter six (6), provides the concluding remarks on the system, its limitations as well as suggestions and recommendations for future research.

1.7 Summary

This chapter presents the brief background of the study. It includes the problem statement, Research objectives, the scope in the research and research significance. The objectives of this research are to design e-Participation for administrative decision-making for the School of Computing in UUM.

CHAPTER TWO

LITERATURE REVIEW

In this chapter, a review of literature related for building e-Participation model to develop the decision-making process in higher education. Section 2.1 starts with the overview about e-Participation concept. The framework of e-Participation is discussing in section 2.2. In the section 2.3 the researcher shows the approach of e-Participation. An overview of Malaysia's e-Participation approach is shown in section 2.4. Decision theory which was chosen for this study is appeared in section 2.5. Finally, a summary of this chapter was displayed in section 2.6.

2.1 e-Participation

e-Participation is part of e-Democracy (Andersen, 2006), and e-Participation includes by both demand side stakeholders and supply (UNKB, 2007). This is an Incremental, dynamic process, interactive and collaborative which needs important messages to be extracted from large assemblages of data produced by various stakeholders over time. Better design for e-Participation and e-Service is complementary to each other (Grönlund, 2006). Application ICT in

e-Participation is aims to participate more citizens via diverse modes of communicative skills and motivate and technical, that is will ensure broader participation in the policy process and make government more transparently through accessible information and real-time qualitative.

e-Participation term is calling it sometimes as grassroots digital democracy, which affirms the understanding of democracy and participation from the base to-up-process. That empowers people towards the decision-making process through the mobilization of resources and capacities (Fuchs, 2006). The state and its formal structure cannot impose the e-Democracy. Instead, it is spontaneous activity of e-Participation by a group of persons or organization for a specific need in a specific time which evolves through the transformation of informal structure. However, in both situations, it must be coordinated leadership to make participation more effective.

e-Participation has increased rising significance within the information society. Generally, participation means to be involved in it or to take part; with the exploitation of ICT, participation will be more of electronic nature known as e-Participation. Macintosh (2006) illustrated e-Participation as ICT-supported participation in processes concerned in governance and government. Processes may concern administration, policy making, decision-making and service delivery. It transforms relations between decision-makers and citizen, and those actions are predictable to aid and renew the representative model of democracy.

2.2 e-Participation Model

One of the quite new products of e-Governance it is the e-Participation under e-Democracy programs, and thus, the availability of internationally a commonly acceptable framework for this very limited in numbers (Rifkin &

Kangere, 2002). Ahmed (2003) argues that the concept e-Participation in nature is still experimental, and the outputs of this expected are up till now to be clearly defined. On the other hand, the following discussion tries to conceptualize the model illustrate the various aspects of participation.

According to Tambouris *et al.* (2007) there are five stages, which help in scoping e-Participation that focuses on the stages, beginning from the (Democratic process) which as a top of a country until (Technology) which has a down. At this point, the democratic layer, as from top down, contains all the acts as a catalyst by facilitating communication between policy makers (G2C) and the public (G2C) and between themselves (C2C and G2G) democratic process of a country. Furthermore, participatory techniques are used involve all the democratic stakeholders and in order to engage and address the issue of carrying out participatory processes Figure 2.1 shows the five-phase, top-down and bottom-up of the model.

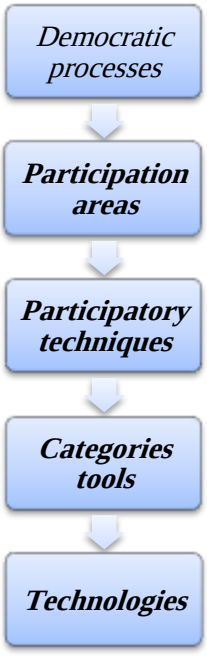

Figure 2.1 : The e-Participation Framework (Islam, 2008)

I. ***Democratic processes:*** as its starting point. These are construed broadly rather than narrowly. These processes include public debate and discussion, campaign financing, campaigning, civics education, voting, and processes within and between political parties, grassroots organizations, information intermediaries and communication between policy makers and the public (Lin & Inouye, 2001).

II. ***Participation areas:*** where citizens can interact with their representatives (G2C) or between themselves (C2C) or (G2G) and provide resources and social intelligence to the collective. Participation areas can be defined as the specific area or areas of citizen engagement and involvement in the democratic processes (Tambouris, Liotas & Tarabanis, 2007). They, therefore, address the issue of defining the context and the scope of the participatory process. Participation areas.

III. ***Participatory techniques:*** It defined as the methods used to engage and involve citizens (but also stakeholders, decision-makers and politicians) in the democratic process. Therefore, participatory techniques address the issue of "how" the participatory process is brought to bear. There are numerous techniques that have been employed to facilitate participation. A non-exhaustive list of these techniques includes 21st Century Meetings, consensus conferences, deliberative polling, Delphi, expert panels, focus groups, public hearings, participatory evaluations, planning cells, scenario workshops and others (Elliott, Heesterbeek, Lukensmeyer & Slocum, 2005).

IV. ***Categories tools***: ICT tools that can be used to enhance and support techniques. These tools consist of tools, components, products and

software applications, which are based on ICT technologies. Categories of ICT tools used to support e-Participation are: e-Participation discussion forums/boards, e-Participation chat rooms, virtual communities, decision-making games, e-Panels, online surgeries, e-Voting platforms, e-Consultation platforms, e-Deliberative Polling, e-Petitioning and suggestion tools for formal planning procedures (Islam, 2008). The introduction of tools and technologies in the traditional participatory process leads to electronic participation.

V. ***Technologies:*** It can result in the development of innovative ICT tools. New tools can lead to the introduction of new participatory techniques that were not previously possible in the absence of supporting technology. These tools can lead to a broadening of the participation activities and hence to new types of citizen participation. In this case, the use of ICTs is no longer simply supportive, but rather takes on a proactive role, which can result in a broadening and re-defining of the scope of the public participation domain. By the process described, it is also theoretically possible for new technologies to eventually instigate new democratic processes (Islam, 2008).

2.3 e-Participation Approach

Multi-perspective approach is one of the e-Participation approaches used in developing an e-Participation initiative.

2.3.1 The Politics and Organization Perspective

It is assumed that the involvement of citizens in the process of decision-making and implementation will make the public sector agencies more

responsive and effective. As such, the government needs to find ways in eliminating the gap between citizens and government. e-Participation could be an effective tool for collecting or disseminating information and knowledge from citizen, experts, and stakeholders. Currently, citizen participation through the Internet plays only a marginal role in the political process (Salamat, et al., 2011).

For example EVOICE project which aims of the were to increase and enhance political interest and engagement of European citizens in general political issues by using the potential of modern ICT tools to increase citizen participation and to access the administrative system. The EVOICE project was develop the multimedia dialogue approach, inventory and select the best tools, train the participants, apply the multimedia dialogue approach in pilots, evaluate the whole process, organize local democracy days, disseminate the results and publish a user manual.

Between 2004 and 2008, the resulting supposed multimedia dialogue approach (MMDA) became the umbrella of more than 30 e-Participation projects conducted in the municipalities of Dantumadeel, Groningen (both in the Netherlands), Bremen (Germany), Uddevalla, Ale and Härryda (Sweden) and in the regions of Kortrijk (Belgium) and Norfolk (UK). (Aichholzer & Westholm, 2009).

2.3.2 The Communication and Interaction Perspective

This perspective focuses more on the citizen participation process. This means that design and implementation of process are always studied in relation to the use context. Authorities should focus on interaction and

communication in both design processes and in the designed system. Developer should emphasize designing systems to contribute to quality in use by developing techniques for users to participate in the design process (Myers *et al.*, 1997).

2.3.3 The Technology and Infrastructure Perspective

This perspective considers system applications such as voting systems, poll, debate system, forums; people voice systems and others. Some applications are dependent on infrastructure either physical infrastructure or conceptual infrastructure. Infrastructure is an important aspect of concern because e-Participation needs a suitable infrastructure for effective implementation.

2.4 e-Participation Approach in Malaysia

e-Participation can be assumed as a mechanism that allows a citizen in a country to create a community for collecting information and sharing the knowledge, they know to increase the quality of a government process. Based on researchers' readings and opinions, e-Participation initiative in Malaysian environment should be carried out through three main resources: citizen, process and technology. These three resources must play their role together to make e-Participation effective as depicted in Figure 2.2.

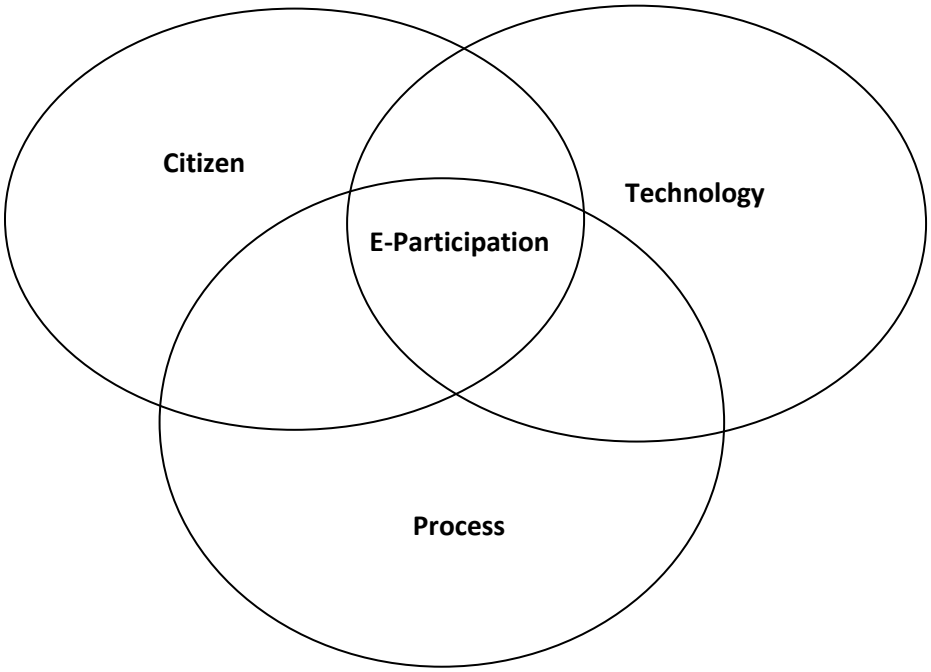

Figure 2.2 : Keys for Realization of E-Participation (Salamat, et al., 2011)

Citizen does not play a role in managing the information, but the government can structure policies and training to assist the interaction through e-Participation application. e-Participation initiative can include design that fosters professional cooperation by actively involving a citizen at every level of society in sharing information and knowledge of their opinion, idea or comment and suggestion for improvement. Looking at governments with developed e-Participation initiative in their country, it is proven that cooperation between citizen and government as one group will produce an excellent working style, more effective and improved democracy process. This working group will create a relationship, trust and expertise between citizen and government. As an

outcome of this resource, it will encourage development and facilities for communities of practice element.

The second key of e-Participation is processed; management process in government organization is it formal or informal, requires a flow of information. Most citizens do not realize the existence of such a process in some organization. The element of this process is in determining the ways of how to convey information by the government to the people and vice-versa. It also forms as a connection between technologies with citizen and becomes a resource to sustain the relationship between citizen and government. Many methods developed by other countries can be deployed into the Malaysian environment. This process will play an important role because people will see whether or not information delivered is accepted by the government and would further show whether the government is transparent or not. It should not only act as the relationship between government and people, but also to help establish ties between the people. The processes will help to produce the information needed by the government and to share the information for benefits.

Technology functions not only as a centre of a repository of resources and not only as reference in using e-Participation. Technology also acts as a tool and requires a contribution from the citizen to ensure a more effective government process. Effective technology in designing e-Participation initiative will create an archive for the targeted citizen in exchanging information with the government. Several countries have employed mobile technology as their process to make e-Participation more successful. The internet with Web-based system application is the best approach for a beginning in the running of e-Participation within the Malaysian environment.

In brief, knowledge process approach in e-Participation concept is an approach that requires commitment from every stakeholder for smooth and effective running of e-Participation. There is a crucial need in understanding how to integrate this collaboration approach within Malaysian environment. Conversely, an organization investing in new technology without first understanding the organization and their patents, will not achieve potential and profits from the investment made (Pet rides & Nodine, 2003).

2.5 Participative Decision-Making

According to Probst (2005), Participative Decision-Making (PDM) is the point to which encourage employees or employers allow to share or participate in organizational decision-making. Power-sharing arrangement is the fundamental notion involves in which workplace influence is shared among individuals who are otherwise hierarchical unequal's. Such power-sharing arrangements may involve different employee participation schemes resulting in a co-determination of, working conditions, problem solving and decision-making.

2.5.1 Participative Decision-Making Techniques

Organizations having diverse environments that mean to make are made differently. According to Griffin and Moorhead, (2011) participative decision making techniques involve individuals or groups in a process. As organizations move from centralized decision-making to a non-centralized one, it has become important for all concerned people to be involved in the decision-making process so that the decision is the best possible alternative. Participated decision making techniques range from no participation to participation of all concerned individuals. Participation

techniques are being applied formally and informally on an individual or a team basis or formally on a program basis.

Seinsheimer, Bayerl, and Wuestewald (2006) cited Huang as separating participative decision making into formal types and informal. They also emphasized that there are distinguished between three types of participative decision making: High Involvement, Job Involvement and Suggestion Involvement, High involvement participative decision making information sharing and entails power, in addition to advanced human-resource development performs.

Participative decision making techniques can be categorized into four sub-types: collective participative decision making, democratic participative decision making, autocratic participative decision making, and consensus participative decision-making as shown in Figure 2.3.

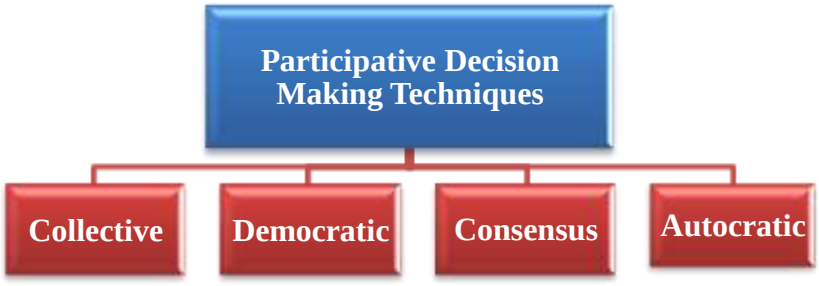

Figure 2. 3 : Categorize of Participative Decision-Making Techniques

I. ***Collective participative decision making:*** In style of a collective participative decision-making, the organization's members have some say in the decision process. That is the most ordinary kind used by organizations and is confirmed to be very effective. Even though the employees are inquired for their opinions and the final decision the makes by leader, have all control of how the decision will pan out, and take full liability for all the consequences (Connor & Becker, 2003).

II. ***Democratic participative decision making:*** In style of a democratic participative decision-making, the complete ownership of decision gives up to the leader and lets employees vote. The wins will be with the majority vote. This causes a fast and effective decision to be made. While the team might lead to a fast decision, if something goes wrong then no one takes liability for the decision, an employee can simply state that they did not vote for it (Robbins, Simonsen & Feldman, 2008).

III. ***Consensus participative decision making:*** In style of a consensus participative decision-making, complete control and responsibility of the decision gives up to the leader and leaves it to the members of the organization. Everyone must come to the same decision after agree. This might take a while, but the decisions are among the best since it engages the skills and ideas of many other persons. In this style the team work is important and must be the members are closer between together while trust and communication increase (Herrera-Viedma, Alonso, Chiclana & Herrera, 2007).

IV. ***Autocratic participative decision making***: In style of an autocratic participative decision-making, alike to the collective approach, the final decision takes control and liability from the leader. An autocratic style which is the difference, the leader will be responsibility about the outcome and the members of the organizations are not included. This is the best style to use in an emergency when an immediate decision is needed (Jones, 2003).

2.5.2 Participative Decision-Making Models

There are a large number of models of increasing employee participation. Some are very simple such as the use of suggestion boxes, an example of direct employee participation, others much more complex, such as involvement of worker's directors; for example representational employee participation. Whatever models are used the objectives are to increase efficiency, get the most out of human resources, and to motivate.

I. ***The diamond of participatory decision making:*** According to Oostvogels (2009) the diamond of participatory decision making which mean a schematic representation of the different stages in time through which a team has to move in order to develop a solution that is satisfactory to all; as shows in Figure 2.4 there are five stages for this model. ***First stage*** is business as usual; the team comes up with obvious solutions to the problem. They refrain from taking risks or being ambitious. A facilitator should pay attention to the quality and quantity of each person's participation. If not everyone supports the proposal, the facilitator can help the team to break out of the business as usual zone and move into the divergent zone.

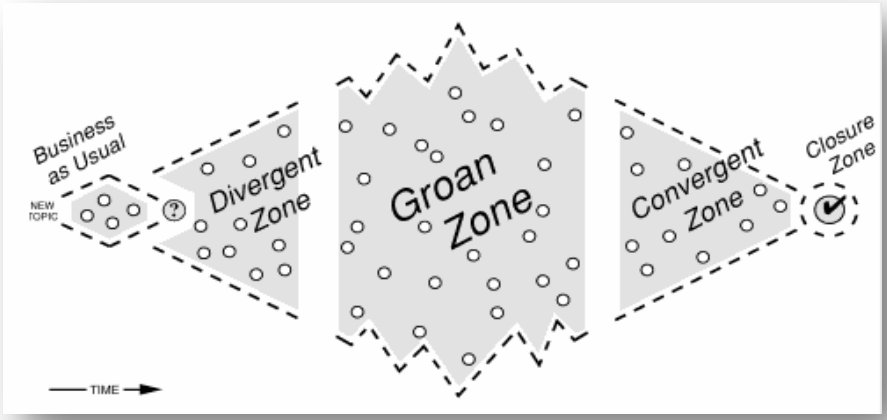

Figure 2. 4 : Model of the Diamond of Participatory Decision Making (Oostvogels, 2009)

Second stage is divergent zone in contrary to the business as usual zone; feelings are different in the divergent zone. People can be playful, curious, and nervous. The leader has to help the team in expressing their divergent points of view by using brainstorming; he has to help each person to express their thoughts clearly by using mirroring or paraphrasing. ***Third stage*** is groan zone once the team has expressed all points of view, often conflicts come forward due to not understanding each other's perspectives. The team can start on working on a shared framework of understanding, which will lead them to the convergent zone.

Fourth stage is a convergent zone now that everyone has a shared framework of understanding; discussions go smoother. Everyone gets the feeling that they are making progress again. Nonetheless, he should guard that every proposal is one that covers everyone's interests. ***Final stage*** is closure zone; a decision has to be making.

The leader has to guide the team in making that decision. It has to be clear to everyone what the decision embodies and how it is supported by all. An agreement scale can help to poll the support of a decision.

II. ***Role of information:*** Alter (2008) indicates that information should capture the essential nature of the information phenomena in a precise description. While making explicit the similarities between information phenomena and other related concepts such as meaning, certainty, or knowledge, at the same time it should bring forward the differences between these concepts. Right decisions depend on a better quantity of information to base the result on. Information can contain anything from questionnaires and charts to past sales reports and prior research. When making a decision primarily based on the information given from the organization, there are four different ways to do so as illustrated in Figure 2.5. First is decisive, one course of action and little quantity of information. Decisions are made fast, direct, and firmly. Second way is flexible, time is not an issue, but little information available, and they come up with many different courses of action. Third way is hierarchic; one course of action is made, but much information available. Last way is integrative; many decisions are made of it, and much information is available.

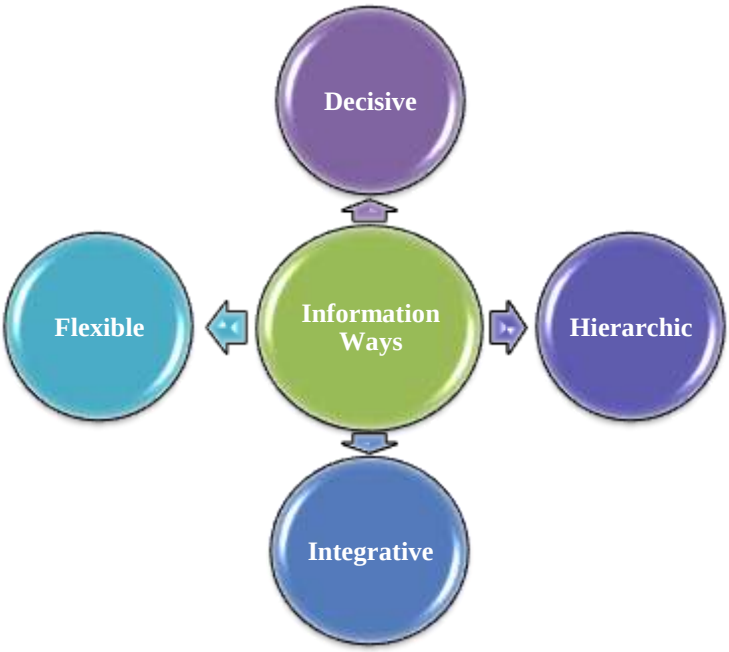

Figure 2. 5 : Information Ways for Decision Making

III. ***Role of Technology:*** communication through the computer is the new model of participative decision making, occasionally referred to as Decision-making through Computer-Mediated Technology. While a relatively new method, this method can engage endless possibilities in order to reach a major organizational decision. There is an important increase in more equal and active member participation. Persons can contact with many other persons at any time, regardless of geographic location and time zone. An organization on a virtual site developed can come together to make it easier to share ideas, where anyone can add their input by share presentations and even have a chat room. During a chat room, organizations' members have able to view what everyone says, and no one is uncreative from contribution their ideas. This technique also allows for a convenient archival of past decision-making activities (Berry, 2006).

Civic engagement through information and communications technology is a demand of time since the recent phenomena of public participation in civic affairs and especially in democratic elections exhibits a declining trend which may cause a serious crisis in democratic nations (OECD, 2001). Side by side, widespread adoption of ICT in the public governance pushes decision-makers to adopt electronic applications in the various segments of the governance seriously. This study provides a model of participatory management between employees, and the administration based on the use of information and communications technology tools.

2.6 Summary

After presenting this chapter, it will be clear to determine the requirement of e-Participation system and analysis all the dimension of the decision-making. However, Participation decision-making needs to determine the best model which can be used to development and accelerate a decision-making process.

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CHAPTER THREE

METHODOLOGY

Research methodology used in the project has described in this chapter. Section 3.2 provides overview of the methodology and in section 3.3 the executive summary for the methodology; conclusion for the chapter was placed at end of the chapter.

3.1 Research Methodology

According to Ishak & Alias (2005) methodology is a rule for resolve a problem, with specific components such as phases, tasks, methods, techniques and tools. Methodology is not just collections of method to perform a research (Kaplan & Maxwell, 2005). The research methods refer to the techniques and methods used by the researcher in performing the research, for example data processing techniques, instruments and data collection technique. Descriptive research seeks knowledge about the nature of reality whereas prescriptive research, also known as design science, seeks to improve the performance of a task or system (Egeberg, 2006).

Methodology used in a lot of studies to achieve many process such as gathering information and data, development, evaluation (Refsdal, 2008; Schmuller, 2002). Similar to these phases are important to make us fully awareness about the requirements of this study and the research problem. An agreeable method is used in this study, described, excellently chosen and accepted among many researchers in information system research design (Vaishnavi & Kuechler, 2008). The research is conducted in several steps. The following Figure 3.1 illustrates the major steps of the design research methodology.

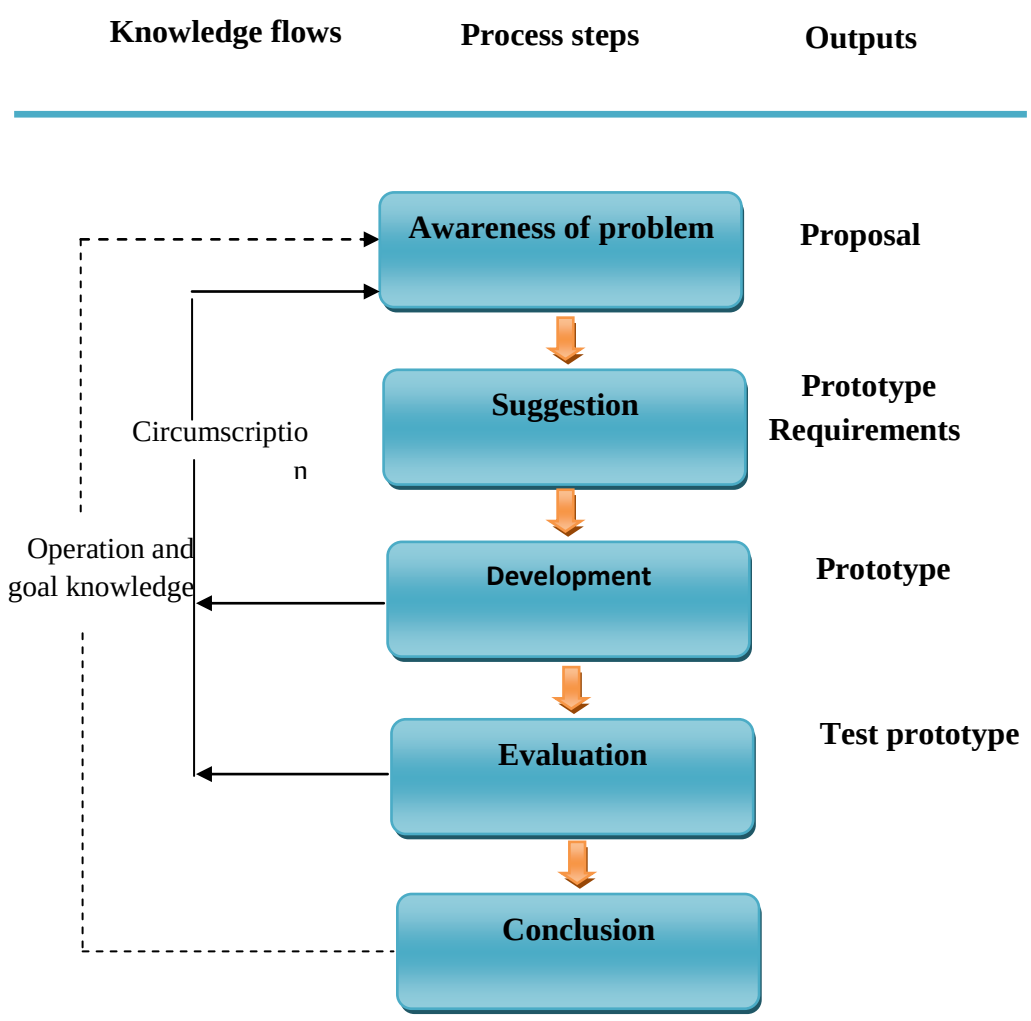

Figure 3.1 . : Research Design Methodology (Vaishnavi & Kuechler, 2008)

According to Vaishnavi and Kuechler (2008), the design research methodology or sometimes-called "Improvement Research" contained the major steps: Awareness of the Problem, Suggestion, Development, Evaluation and conclusion as shown in the previous figure.

3.2 Phases the Methodology

3.2.1 Awareness of Problem

The phase of an awareness of Problem is to understanding of the problem which needs to be solved, and exploring potential research topics in a chosen domain. Actually, the selection of domain was decided during this phase. Through discussion and related reviews of similar systems, a general idea of what should be included in the system was decided.

The requirement of the prototype was gathered by use two techniques review of the current system and questionnaire. The review of the current system, which is documented and obtained from a deeper, review from the literature in e-Participation; a wide analysis on previous study of e-Participation contents was conducted to establish a clear picture of the build and industry. As pointed out by Salamat *et al.* (2011) that there are many roles involved in the process of e-Participation, such as, facilitation, consultation and ICT, in Malaysia there is a need for awareness of the process.

Moreover, the data for the requirement of system was gathering by use questionnaire, the sample was selected is the staff of School of Computing and the results of the questionnaire as follows:

I. Most of responsive had been emphasized the importance of the use of e-Participation to facilitate and expedite the decision-making process.

II. All of participate in questionnaire was commendation to distribution of new idea for verification before being discussing in meeting.

III. Most of the participants expressed their desire to e-Vote on the decisions issued.

IV. The majority have chosen the specialization as a basis for the classification of participation in voting by the administration.

Table 3. 1 The Result of Questionnaire

	Yes	No
Q1	16	8
Q2	19	5
Q3	22	2
Q4	15	9
Q5	**All chose specialization**	

Firstly to come out with the objective of this research listed in chapter one, this research tried to understand the research domain, which is concerned with content delivery and adaptation for e-Participation decision-making for School of Computing in UUM and build prototype applied. The questionnaire form is in appendix A.

3.2.2 Suggestion

Software development approach adopted is one of the major influences on the quality of the systems developed. In this prototype development used a combination of object oriented approach and regular flowcharts. As information systems requirements are becoming increasingly complex, the use of combined

approach is more necessary. Object oriented offers conceptual structures that support the sub-division in the system. It also aims to provide a mechanism to support the reuse of program code, design and analysis design. While flowcharts provide easy to use easy to understand approach description of processes involved in the system.

However, the tentative design follows the proposal. The design of the system includes UML diagrams, flowcharts, and a sketch of the system's architecture. The UML diagrams involved are use case diagram, and sequence diagrams. The following section illustrates the design of the system. In designing the structure of the system, the research used the Object Oriented approach to view the whole of the e-Participation decision-making prototype processes. The Rational Rose 2000 Enterprise Edition's software was chosen as a tool to develop the diagrams which are use case diagrams, use case specifications and sequence diagrams and all of the system structure was implemented in Chapter 4.

3.2.3 Development

The most important phase of the methodology is development stage, which is the road to solve the problem (Hoffer, *et al.*, 2002). The technique was used to develop the prototype through development stage is spiral model, which was adopted by Boehm and Hansen (2001). The technique have four steps (understand the requirements, design the system, build in stage and test and evaluation) as illustrate in Figure 3.2.

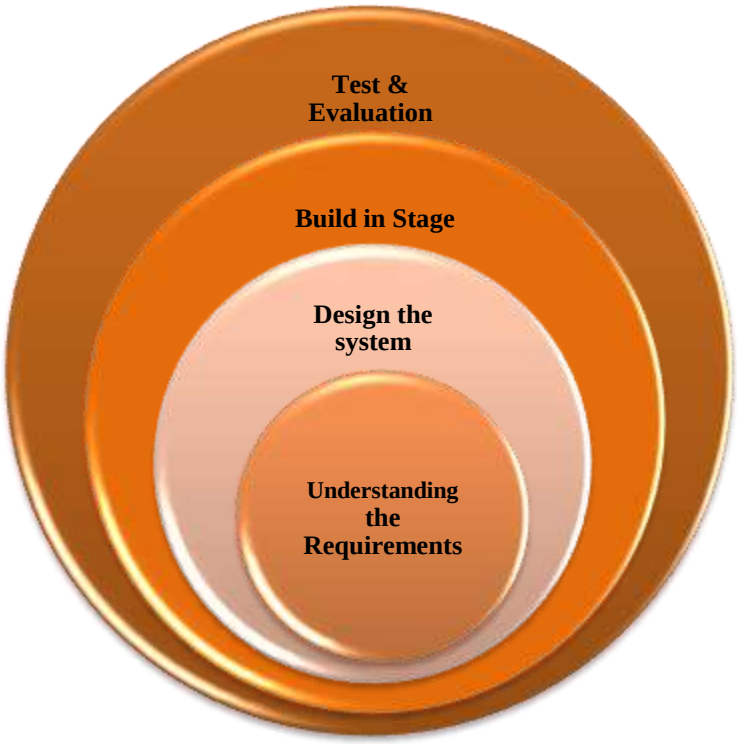

Figure 3. 2 : Spiral Development Model Steps (Boehm, & Hansen, 2001)

I. Understand Requirements

Depend on the requirements that recognized in the first stage of the methodology, the functionally of e-Participation prototype for faculty members to make decision in UUM was understood which was collected depending on the previous studies through literature review and questionnaire.

II. Design the System

Web applications' designers have facing many challenges during development stage of the systems. Most of these challenges are with data handling, organizing, or structuring of the web applications (Sridaran, Padmavathi & Iyakutti, 2009). The diagrams for the system were drawing by use rational rose 2000 tool.

III. 3.2.3Build in Stage

The e-Participation prototype functions were developed by using C# language and ASP.net environment. ASP.net is introduced as a unified software development platform that provides the services necessary for developers to build enterprise-class software applications (Esposito, 2002). According Troelsen (2010) the ASP.NET web pages, known officially as Web Forms, are the main building block for application development. Moreover, ASP.NET has many advantages over other platforms when it comes to creating Web applications. Probably the most significant advantage is its integration with the Windows server and programming tools. Web applications created with ASP.NET are easier to create, debug, and deploy because those tasks can all be performed within a single development environment Visual Studio .NET.

IV. Test and Evaluate

The prototype was test through a sample of about 28 users was selected from UUM's staff to measure the user satisfaction towered the e-Participation decision-making for UUM's staff.

3.2.4 Evaluation

The evaluation was performed to determine the level of usefulness and operability of the system after the system has been developed; it is tested through an expert's experience. The aim was to see the level of satisfaction and ease of use and operability of the prototype system. The e-Participation prototype for administrative decision making in UUM is evaluating by Computer Usability Satisfaction Questionnaires (CUSQ), psychometric evaluation and instructions for use presented in chapter five (Lewis, 1995).

3.2.5 Conclusion

The advantages and disadvantages of the proposed system and future work was be made in documentation. e-Participation services for UUM's staff are used to support the administrative to be more transparency in decision-making, in other hand, accessibility and satisfaction the staff with administrative decision.

3.3 Summary

The methodology for the study was discussed in this chapter, where the methodology was grouped according to five phases was based on the project objectives as follows: awareness of the problem phase, suggestion phase, development phase and evaluation phase.

The requirements of the e-Participation prototype were goatherd using two techniques a review of the current system and questionnaire with the staff of school of computing. The prototype is developing by using spiral model technique, which built under ASP.net environment; Computer Usability Satisfaction Questionnaires (CUSQ) evaluated the prototype with a sample of about 28 from UUM/s staff.

CHAPTER FOUR

ANALYSIS & DESIGN

The present chapter discusses proposal e-Participation decision-making for School of Computing in UUM (FMDM). The outcomes of this chapter are determined the requirements of the FMDM prototype and analysis the system using UML language to understand how the system works through designing use case diagram, class diagram, sequence and collaboration diagram. Finally, build the interface for e-Participation decision-making for school of computing.

4.1 System Requirements

4.1.1 Functional Requirements

Basically a system's utility is based on into functionality and nonfunctional characteristics, such as flexibility, interoperability, security, usability and performance (Chung & do Prado Leite, 2009). Table 4.1 illustrate summarizes of the functional requirements for the system and gives a short description of the different requirements.

- M – mandatory requirements (something the system must do)
- D – desirable requirements (something the system preferably should do)
- O– optional requirements (something the system may do)

Table 4. 1 : List of Functional Requirements

No.	Requirement ID	Requirement Description	Priority
	FMDM_01	**Login**	
1.	FMDM_01_01	To authenticate user (Admin, Staff) must enter validate his/her user name and password.	M
2.	FMDM_01_02	To inform invalid password and user name.	M
	FMDM _02	**Add Voting**	
3.	FMDM_02_01	Admin has ability to add a new question with select the classifications to reach the accuracy of resolution.	D
	FMDM_03	**View Previous Voting**	
4.	FMDM_03_01	Admin has ability to review the previous results of the old issues which voted from staff.	M
	FMDM_04	**Carry Vote**	
5.	FMDM_04_01	Staff has the ability to hold a vote on the questions that came from the administration through the choice of acceptance or rejection After reviewing the history of the case.	D

	FMDM_05	**Add New Idea**	
6.	FMDM_05_01	Staff has ability to add a new Idea by upload a file which has all the detailing about the ides to distribute before counselor meeting of school of computing.	M
	FMDM_06	**Download New Idea**	
7.	FMDM_06_01	User has ability to download new idea documents through the system.	D
	FMDM_07	**Display Rustles**	
8.	FMDM_07_01	User (Admin, Staff) can view all the voting result was applied from the staff and any details about the voting.	M
	FMDM_08	**Log out**	
9.	FMDM_08_01	The user make log out of the system.	M

4.1.2 Non Functional Requirements

Non-functional requirements are constraints on various attributes of these functions or tasks. Non-functional requirements are capture properties that are not primary for the system to work or features of the system that has to do with performance and quality (Chung & do Prado Leite, 2009). However, non-functional requirements can help the system gain competitive advantage over other systems and they are often features that highly desired by the user. Table 4.2 summarizes the non-functional requirements for the FMDM prototype.

Table 4. 2 : List of Non-Functional Requirements

No.	Requirement ID	Requirement Description	Priority
	FMDM_9	**Usability issues**	
10.	FMDM_9_01	The system must be easy to deal with.	M
11.	FMDM_9_02	The admin should be able to view assessment result in 4 second after click	O
	FMDM_10	**Maintainability requirements**	
12.	FMDM_10_01	In case of change or addition demand, the maintainability shall be easily done by integrating new modules and offering new software solutions.	D
	FMDM_11	**Operational requirements**	
13.	FMDM_11_01	The system will have server for the database and connection to the main database.	M
	FMDM_12	**Performance requirement**	
14.	FMDM_12_01	The system must have reasonable speed according to technology use to access many of users at the same time.	M
15.	FMDM_12_02	The system should be available 24x7.	O
	FMDM**_13**	**Security requirements**	
16.	FMDM_13_01	Only who has credit card and PIN code or using fingerprint can access the system.	M
17.	FMDM_13_02	Unauthorized person should not use the system.	M

18.	FMDM_13_03	No one can change the password without login to the system.	M

4.2 Use Case

Use case is a requirements description tool, as well as a useful in recommended means of aiding the transition from a problem domain-oriented view to a solution-oriented view of the system (Hasling, Goetz, & Beetz, 2008). In general, use case steps are written in an easy-to-understand structured narrative using the vocabulary of the domain. The primary elements and processes that form the system are identifying by use case diagram. The processes are called use cases and the primary elements are termed as actors. The Use case diagram shows interact between actors and each use case.

A use case diagram captures the business processes carried out in the system. The system depend on the use case diagram has two main components (actor/use case). In this study two actors represent by admin and staff. The user (admin, staff) has to login to the system before able to do any functions. The admin can add new voting and review the passive vote, as well as the user (admin, staff) can view the voting result. On other hand, the staff participate decision-making by voting and he/she can upload a new idea before counselor meeting to download from admin. The use case it represented in the following Figure 4.1:

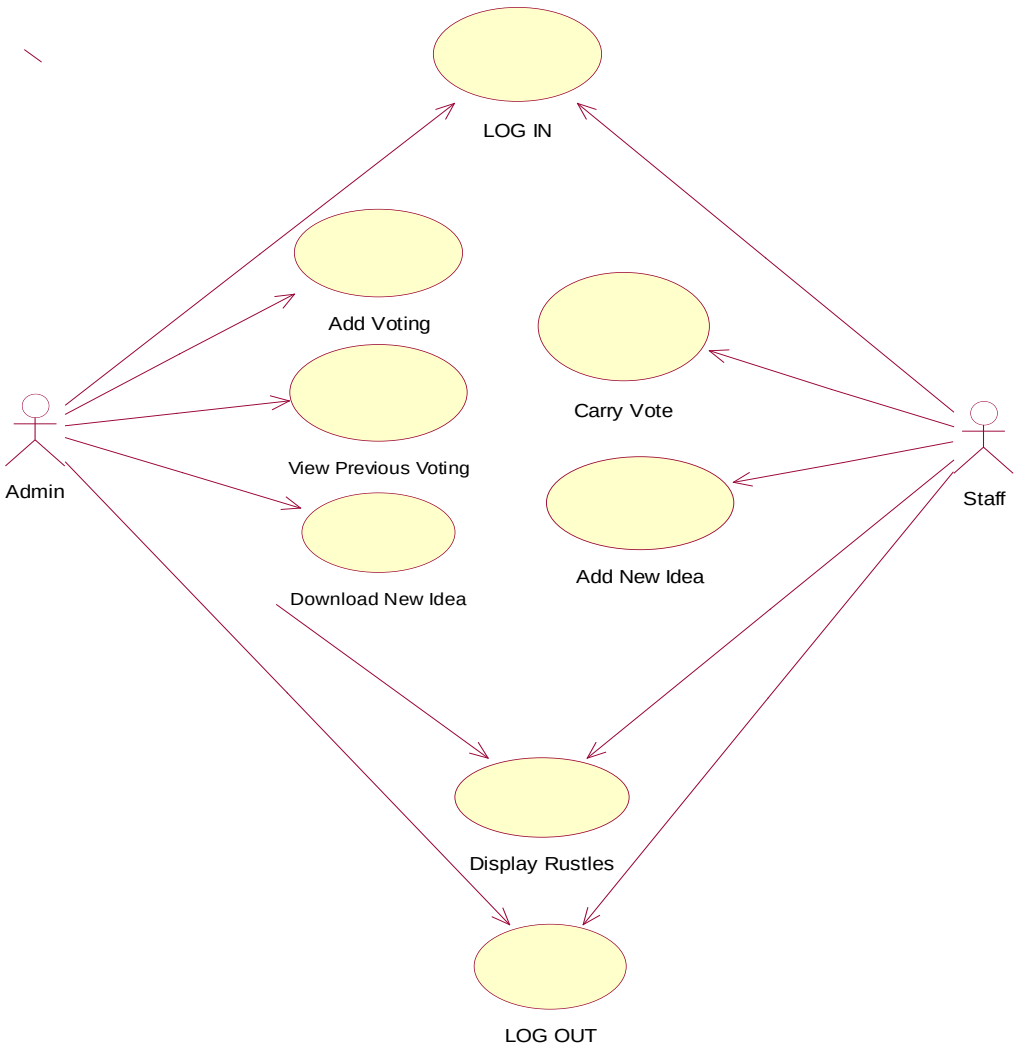

Figure 4. 1 : Use Case Diagram of FMDM

4.3 Activity Diagram

Activity diagram represents is a dynamic diagram that shows the activity and the event that causes the object to be in the particular state; it is the business and operational workflows of a system. Figure 4.2 and Figure 4.3 describe the activity diagram for (admin & staff) e-Participation decision-making for school of computing prototype.

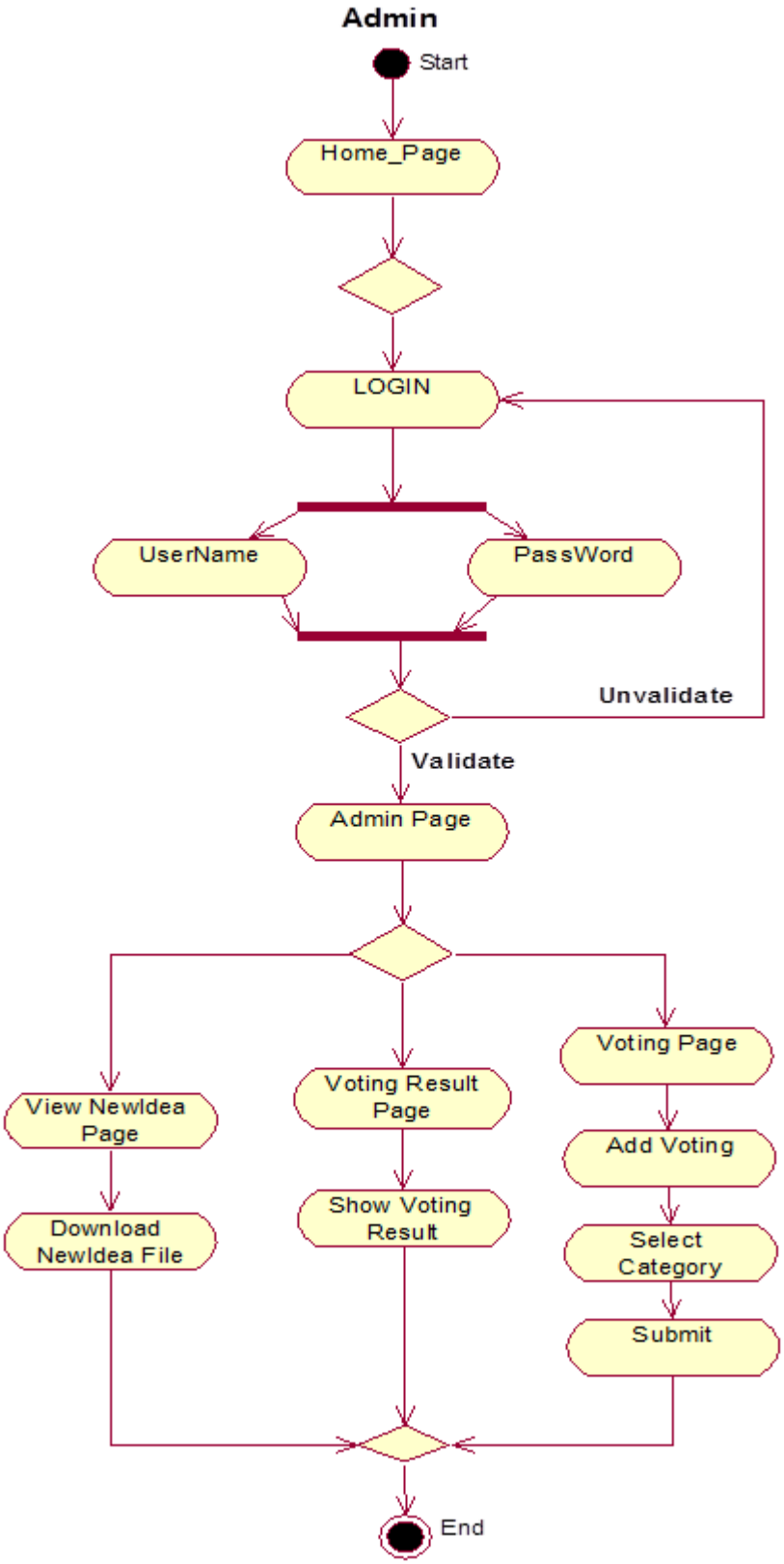

Figure 4. 2 : Description the Activity Diagram for Admin

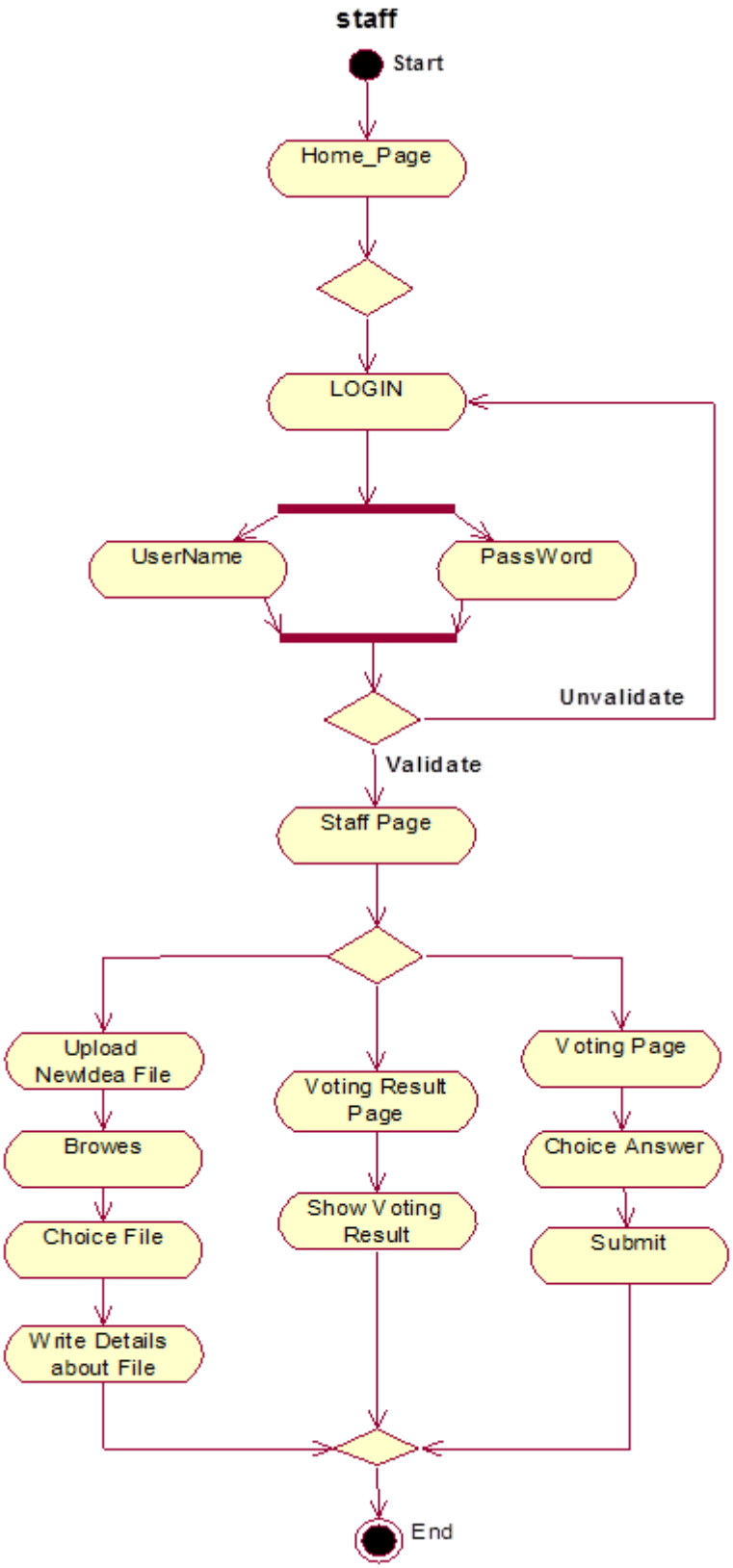

Figure 4. 3 : Description the Activity Diagram for Staff

4.4 Sequence and Collaboration Diagram

According to Ying, Ye, & Guo (2009) sequence diagram are explains the groups of objects collaborate in accomplishing some system behavior; the collaboration is describes a series of messages between objects. Typically, a sequence diagram illustrates the detailed implementation of a single use case (or one variation of a single use case). Sequence diagrams are not useful for showing the behavior within an object. Consider using state-transition diagrams for that purpose.

Login

The sequence and collaboration diagram for system login are describe in Figure 4.4 and Figure 4.5; users (admin, staff) can access to system by login his/her validate username and password.

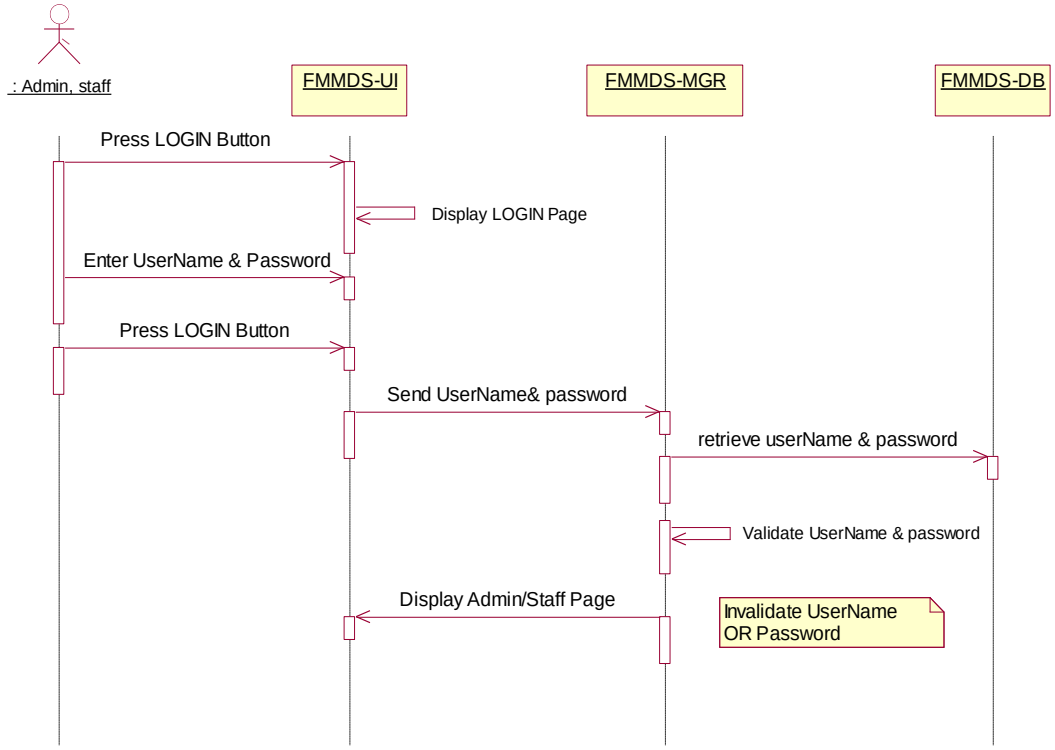

Figure 4. 4 : Login Sequence Diagram

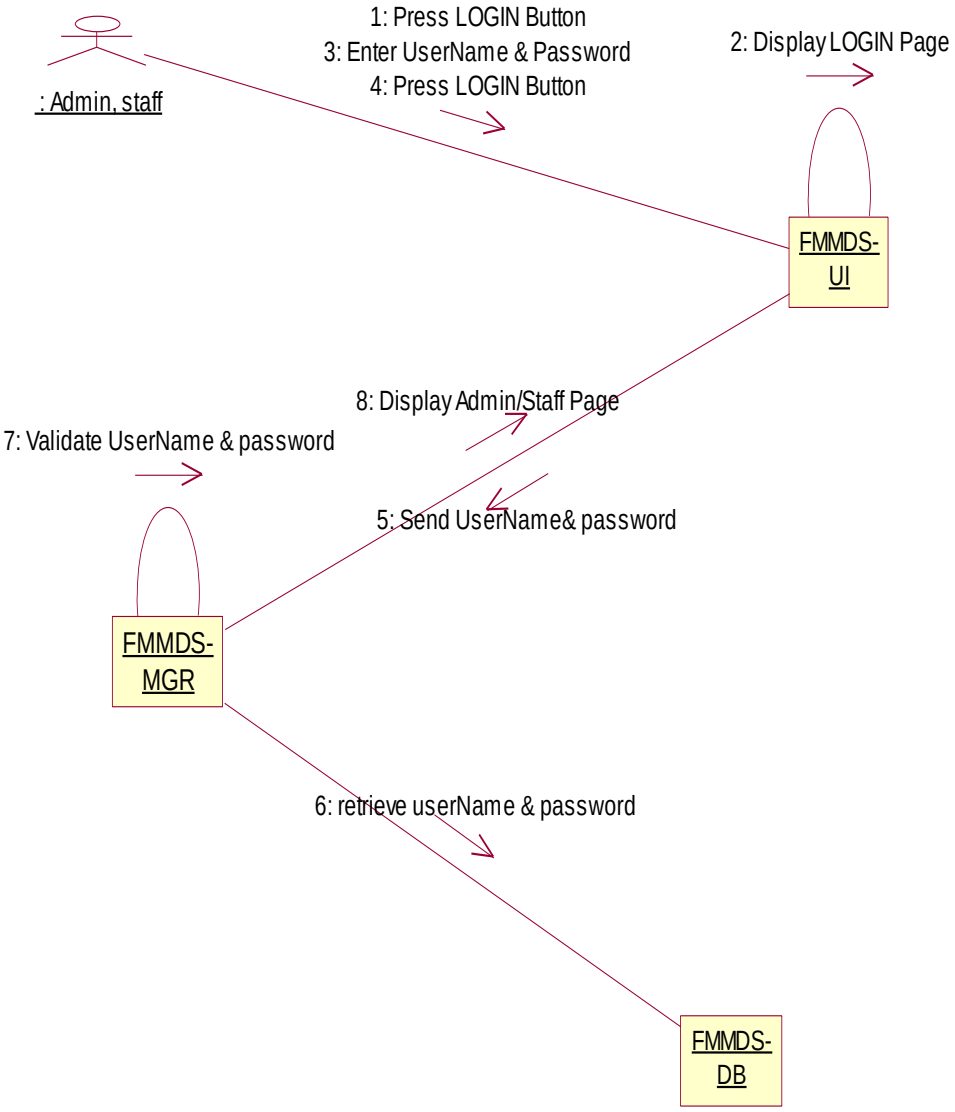

Figure 4. 5 : Login Collaboration Diagram

Add Voting

The admin has ability to add a new question for voting from staff, Figure 4.6 and Figure 4.7 describe the sequence diagram and collaboration for add voting use case.

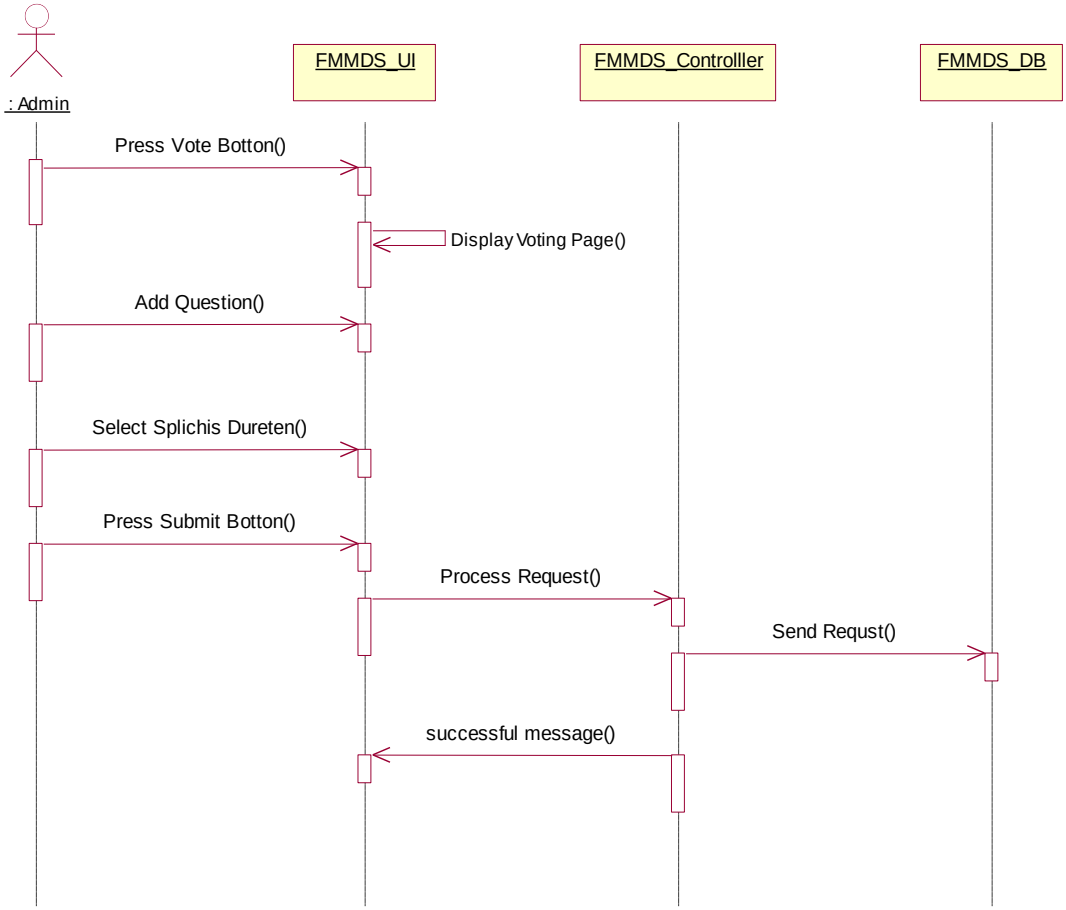

Figure 4. 6 : Add Voting Sequence Diagram

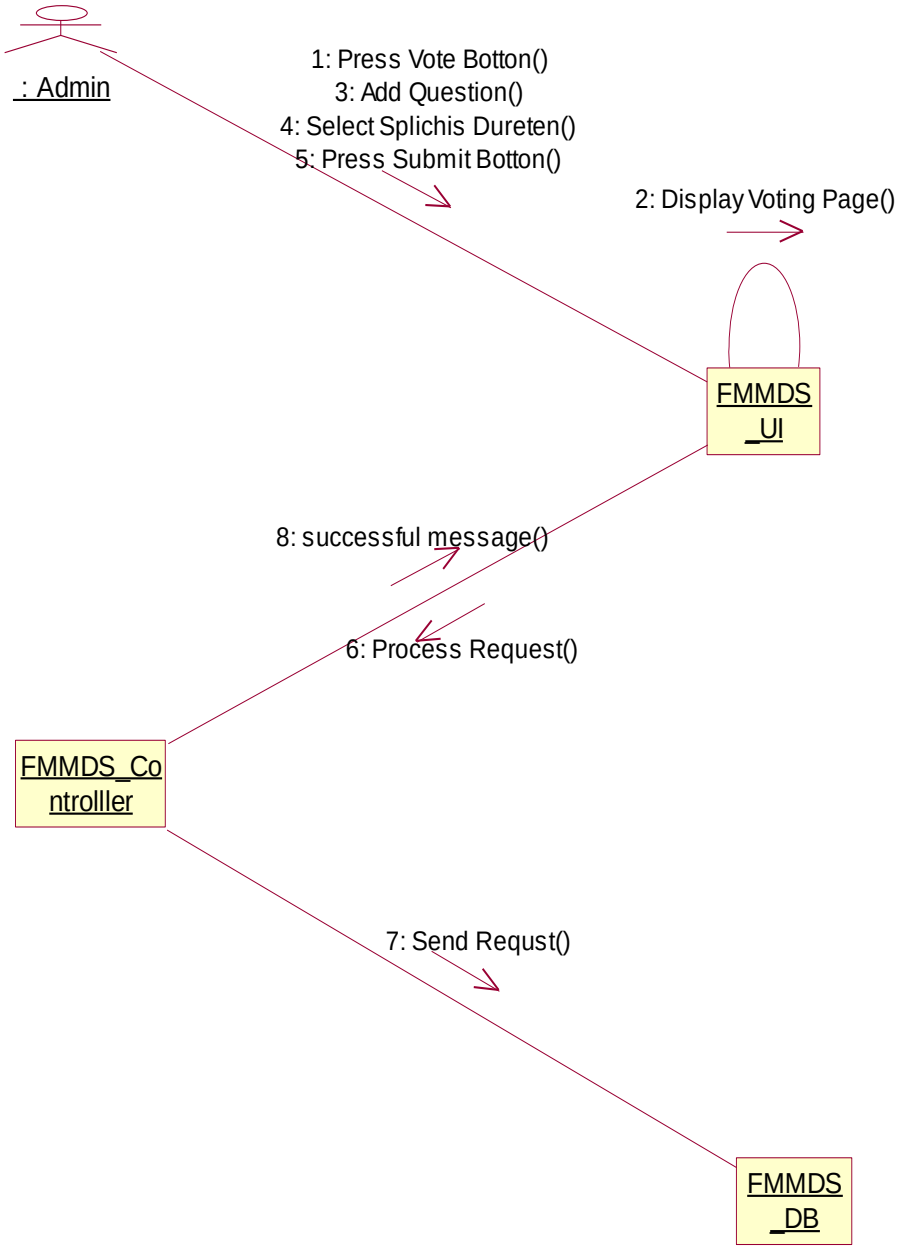

Figure 4. 7 : Add Voting Collaboration Diagram

Views Previous Voting

The admin has ability to review the previous issues which is voted from the staff, Figure 4.8 and Figure 4.9 illustrated the process of view previous voting use case

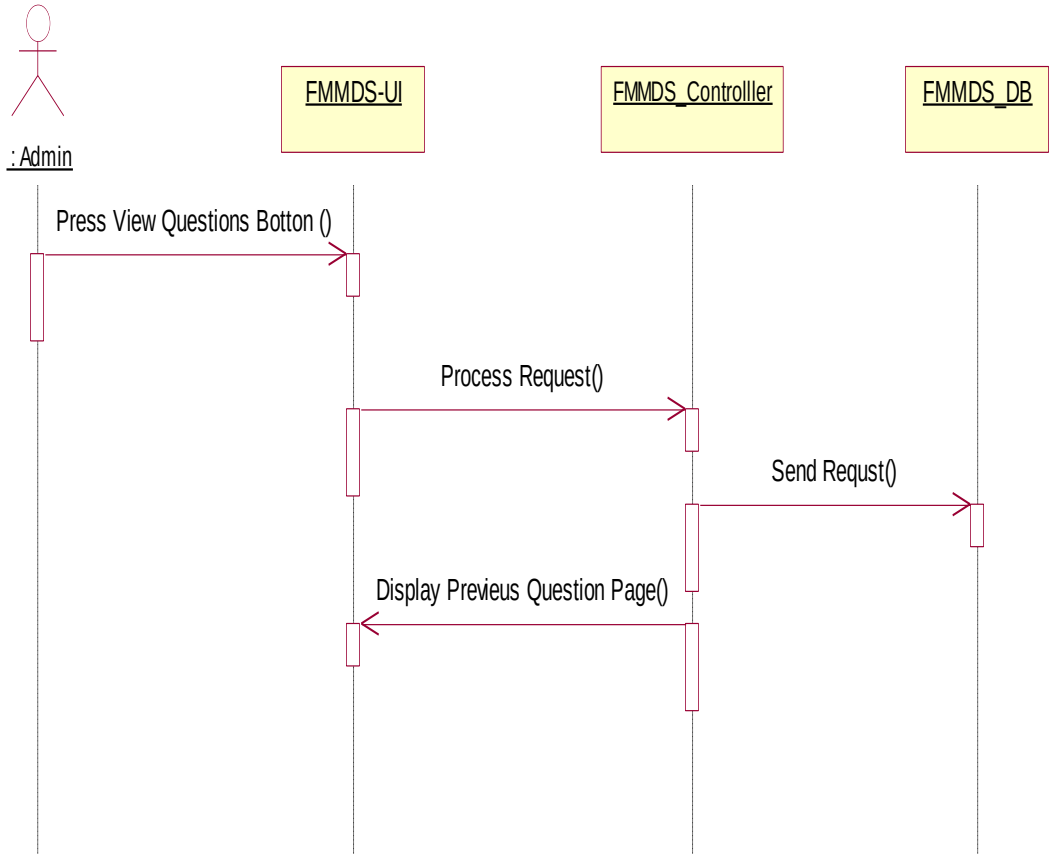

Figure 4. 8 : Views Previous Voting Sequence Diagram

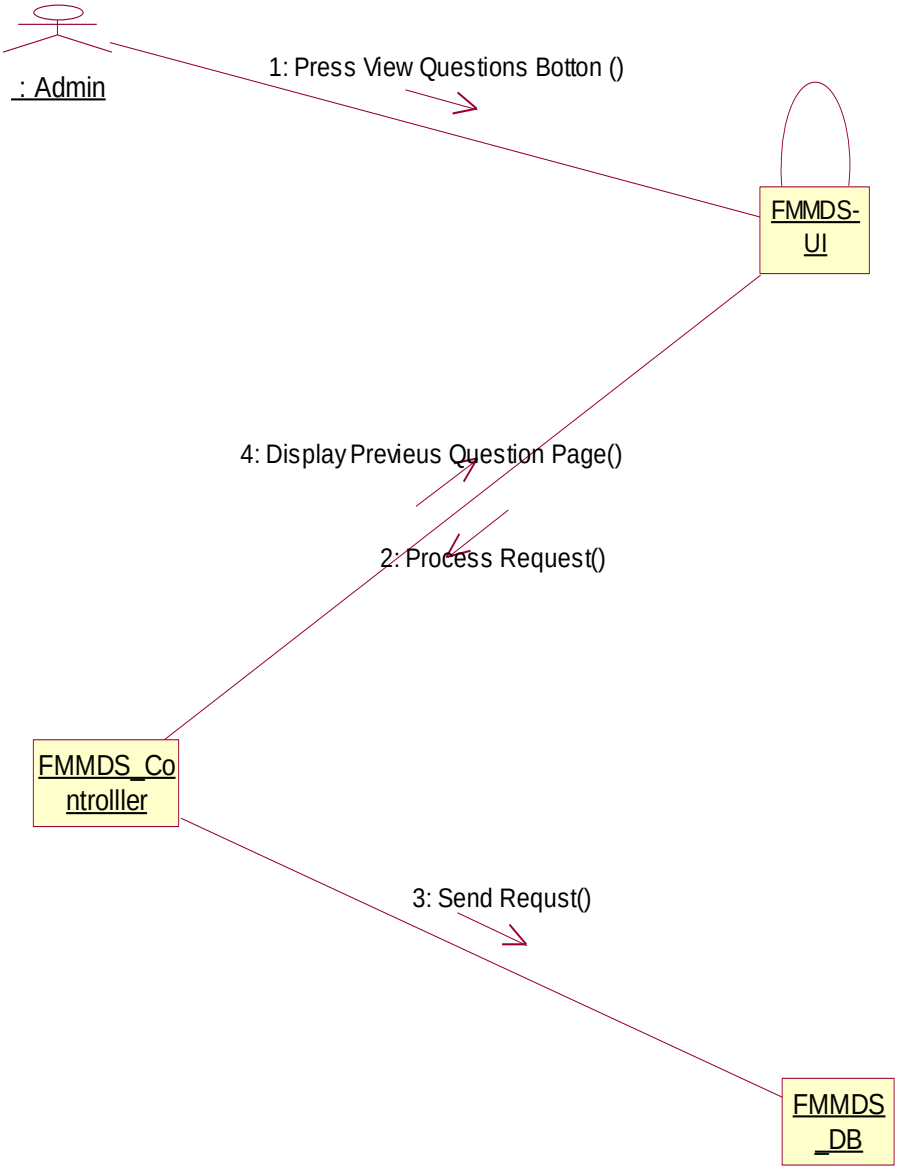

Figure 4. 9 : Views Previous Voting Collaboration Diagram

Carry Vote

The staff has ability to participate decision-making administrative for school of computing by select the answer which sent from the admin; Figure 4.10 and Figure 4.11 shows the sequence diagram and collaboration diagram the process of carry vote use case.

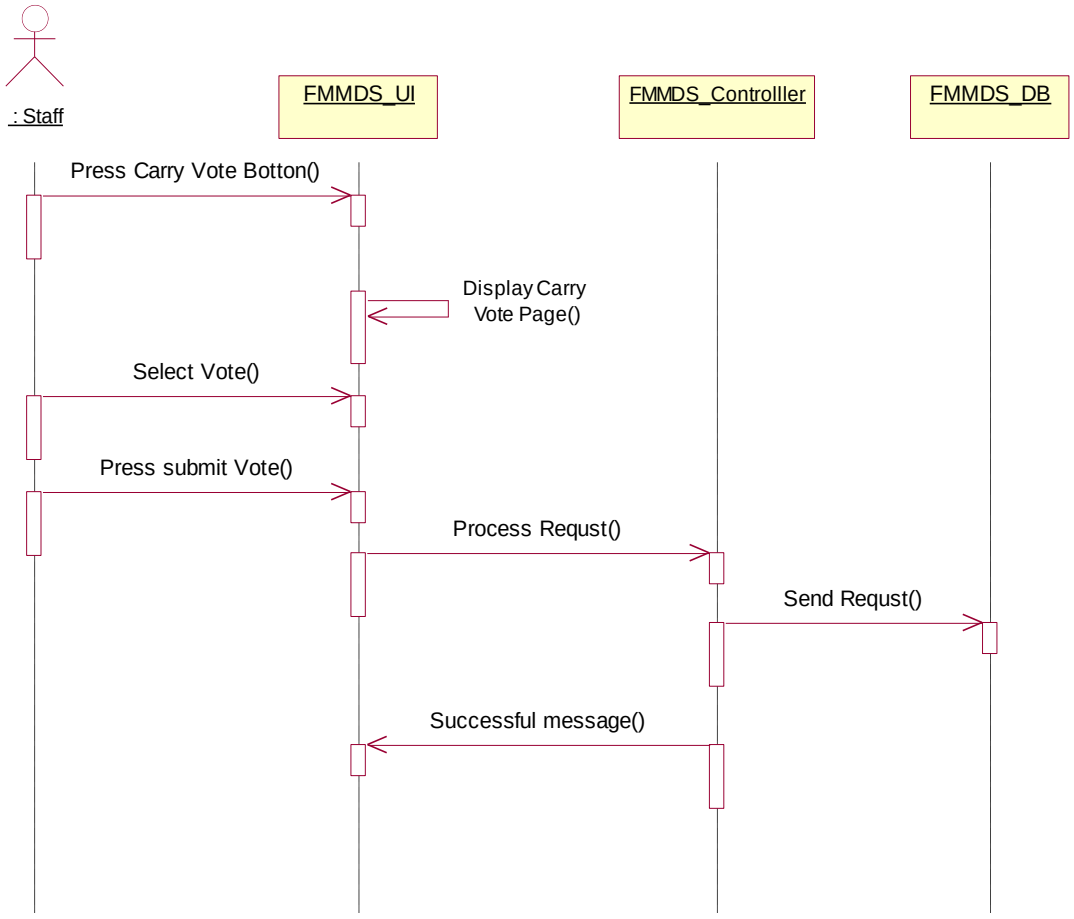

Figure 4. 10 : Sequence Diagram for Use Case Carry Vote

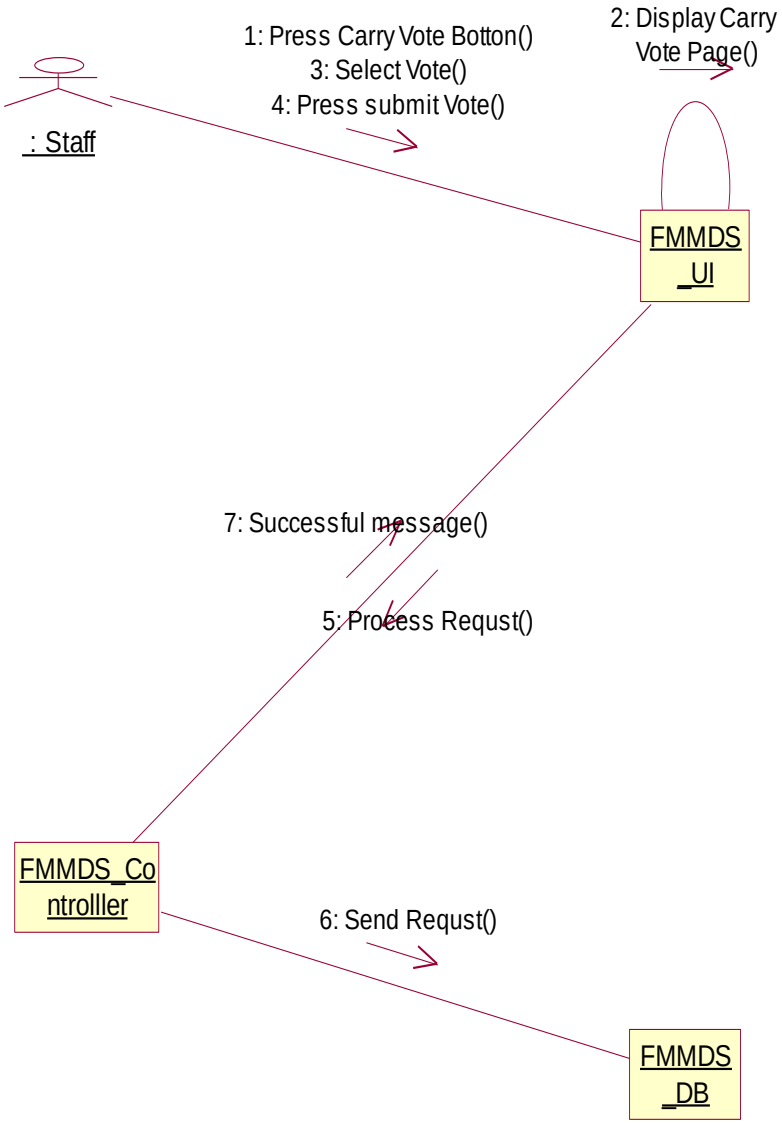

Figure 4. 11 : Collaboration Diagram for Use Case Carry Vote

Add New Idea

The staff has ability to upload a file description the new idea to distributed before discuses in the counselor meeting; Figure 4.12 and Figure 4.13 illustrated the sequence diagram and collaboration diagram the process of add new idea use case.

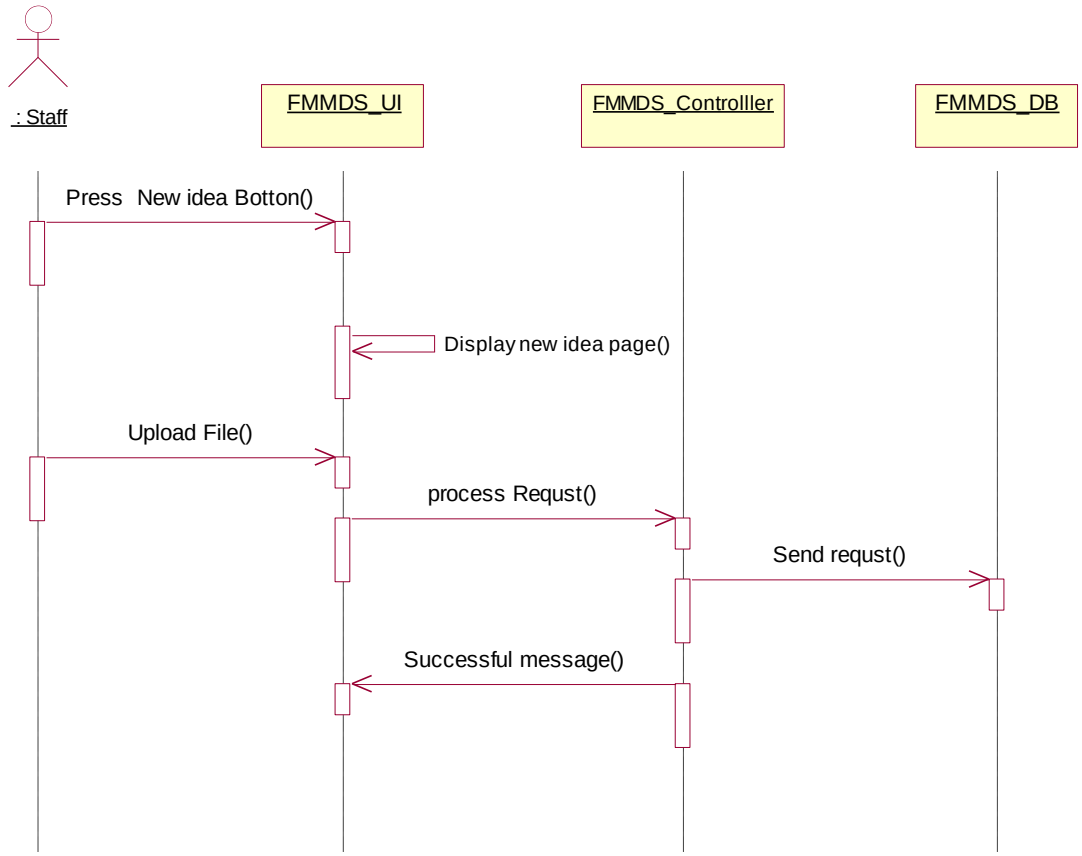

Figure 4. 12 : Sequence Diagram for Add New Idea Use Case

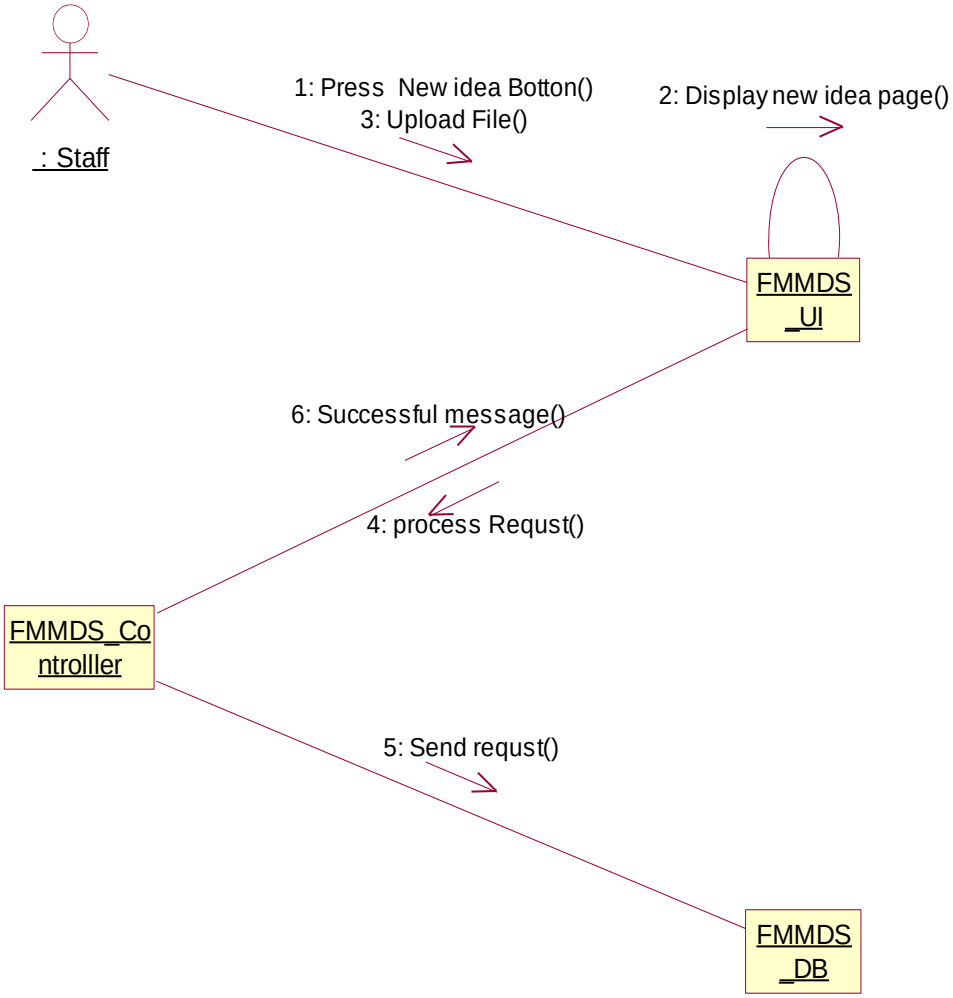

Figure 4. 13 : Collaboration Diagram for Add New Idea Use Case

Download New Idea

The admin has ability to view and download the new idea that uploaded from the staff, Figure 4.14 and Figure 4.15 described the sequence diagram and collaboration diagram the process of download new idea use case.

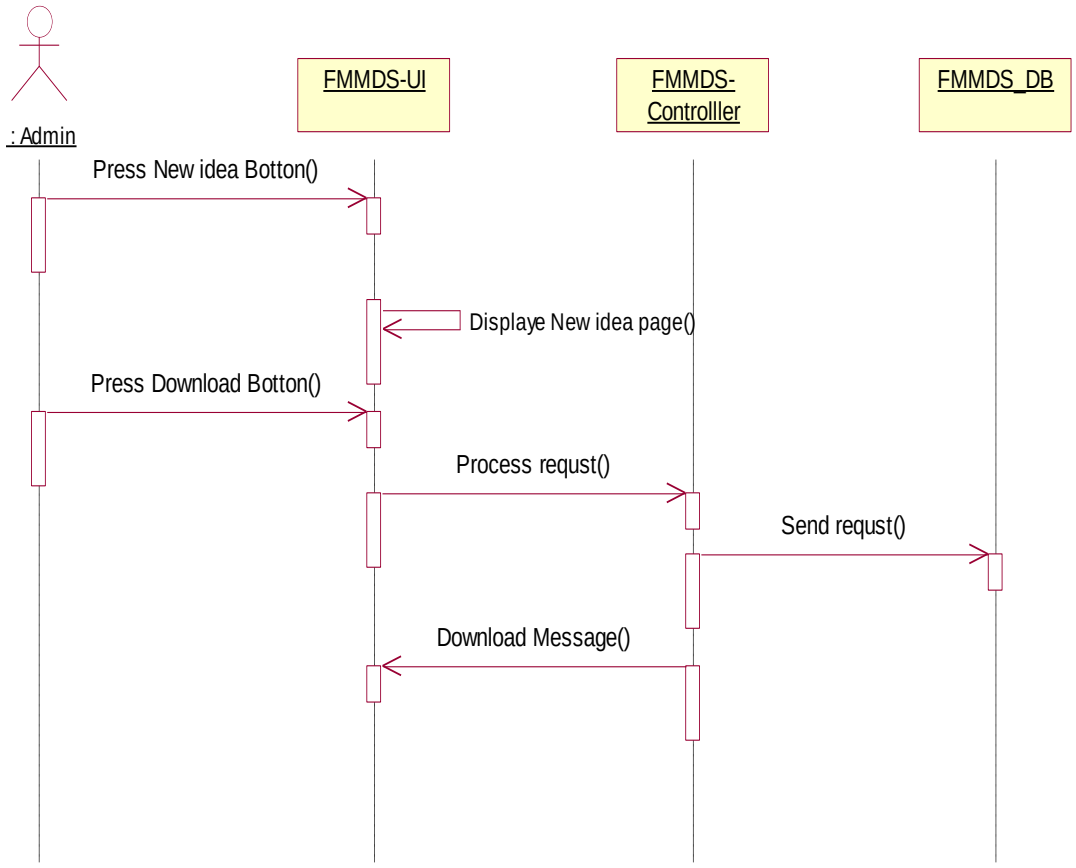

Figure 4. 14 : Sequence Diagram for Download New Idea Use Case

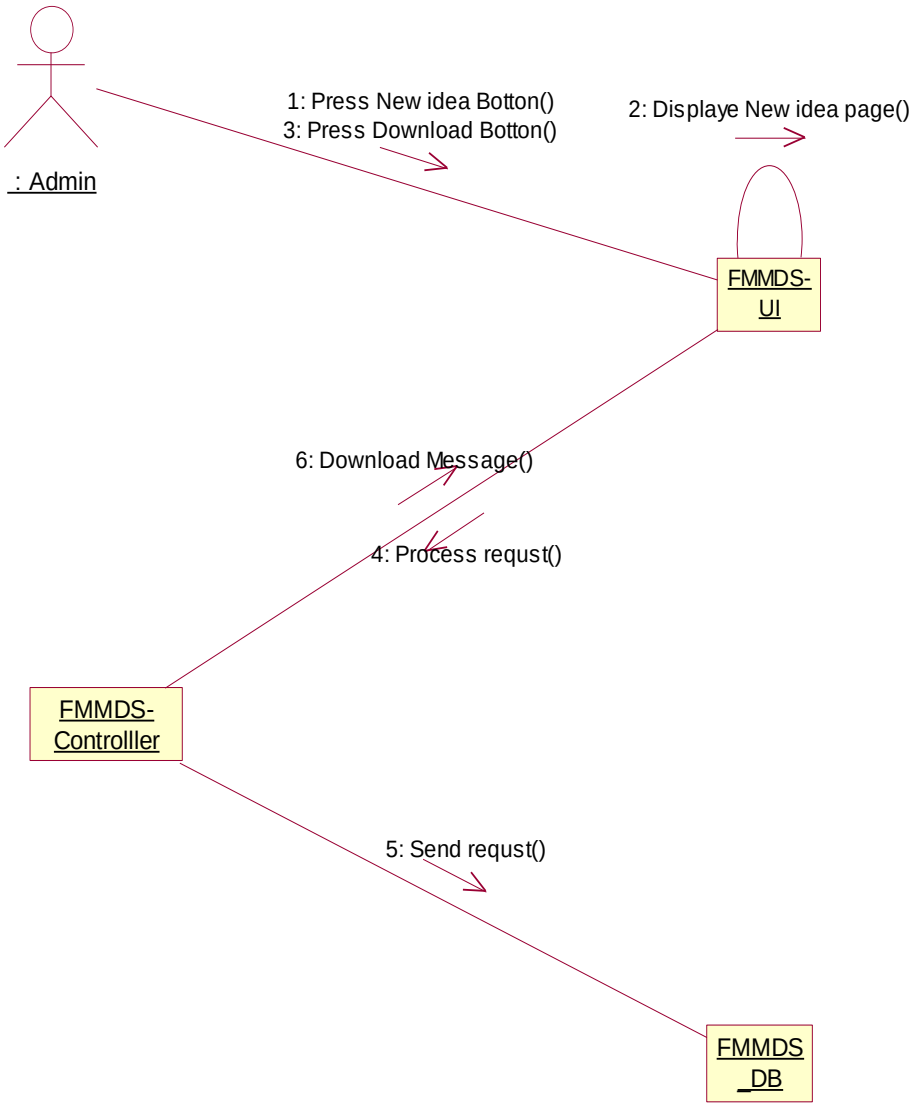

Figure 4. 15 : Collaboration Diagram for Download New Idea Use Case

Display Rustles

The user (Admin and Staff) has ability to display the resulted of the voting, Figure 4.16 and Figure 4.17 described the sequence diagram and collaboration diagram the process of display rustles use case.

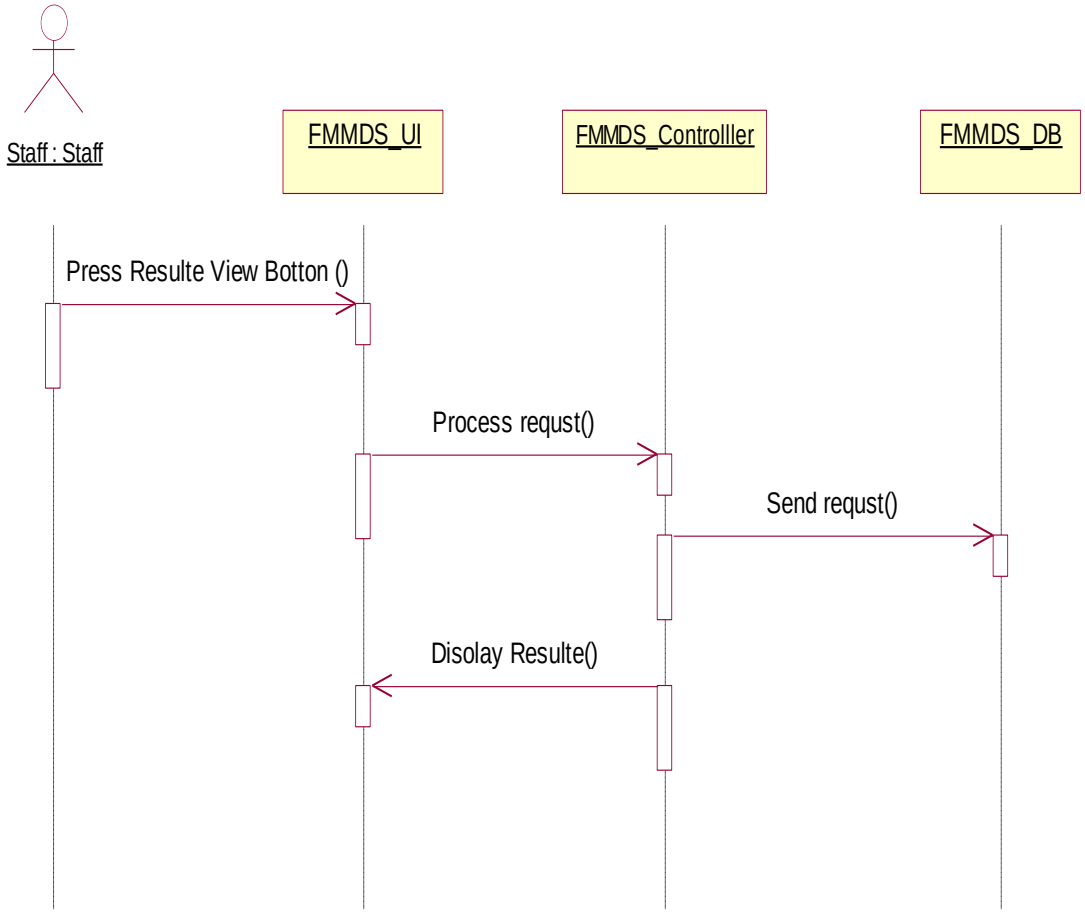

Figure 4. 16 : Sequence Diagram for Display Result Use Case

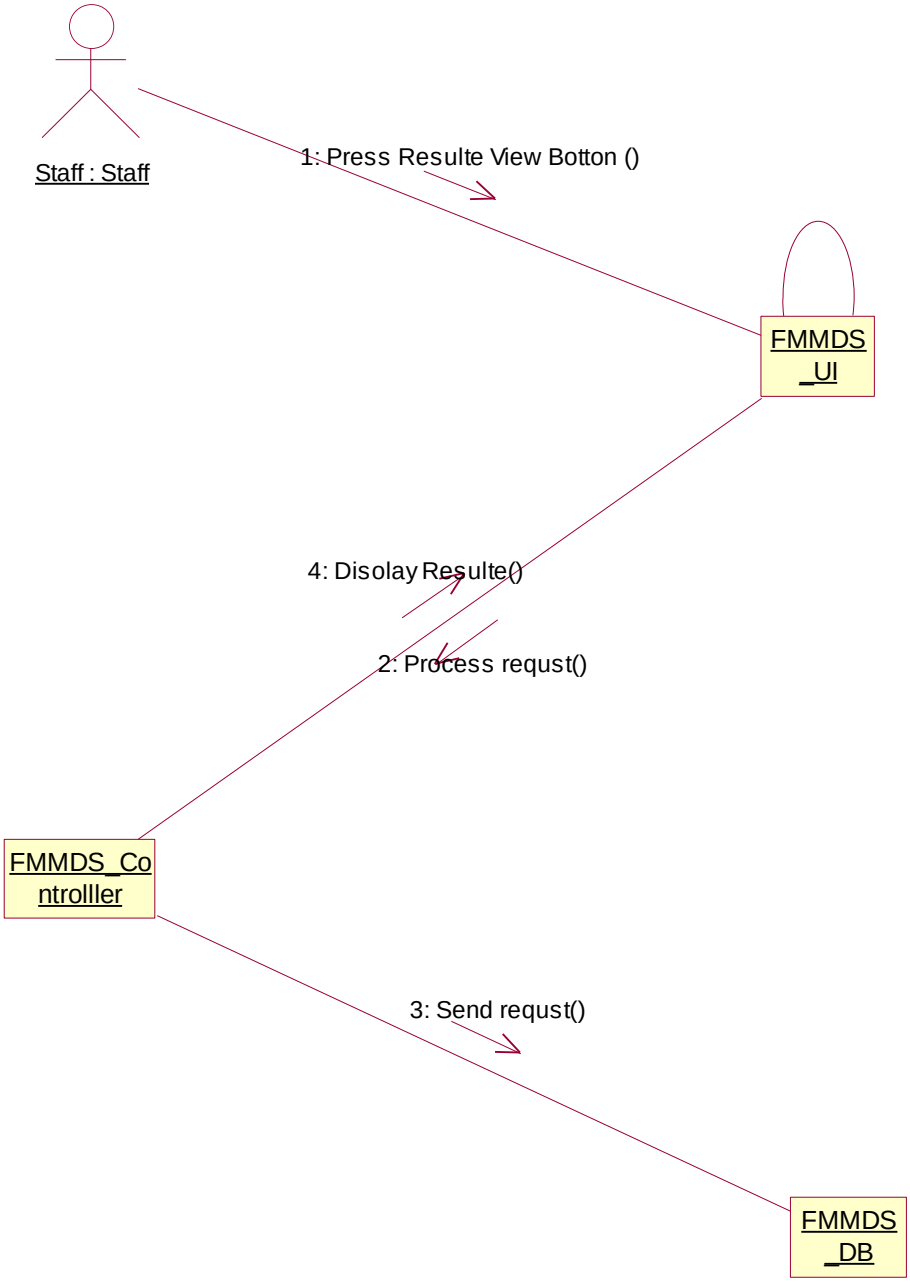

Figure 4. 17 : Collaboration Diagram for Display Result Use Case

Logout

The user (Admin, Staff) has the ability to logout from the system and goes to home page. Figure 4.18 and Figure 4.19 shows when the user selects logout button and how this process was been done.

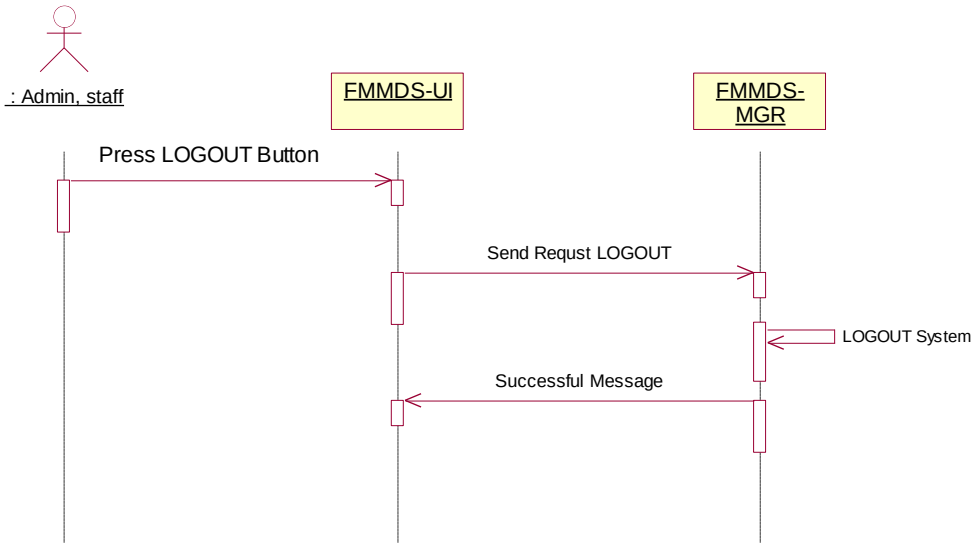

Figure 4. 18 : Logout Sequence Diagram

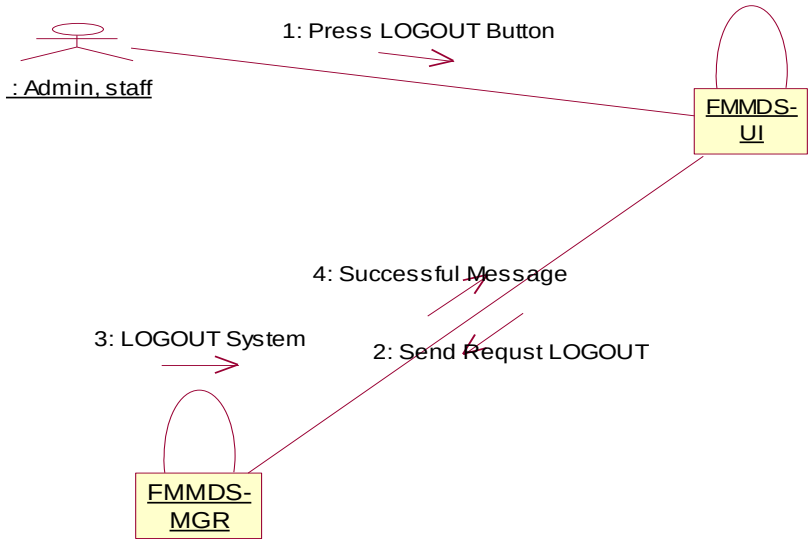

Figure 4. 19 : Logout Collaboration Diagram

4.5 Class Diagram

Class diagrams are discretion of the relationships and source code dependencies among classes (Cabot, Clarisó, & Riera, 2008). The class diagram of the system was illustrated in Figure 4.20.

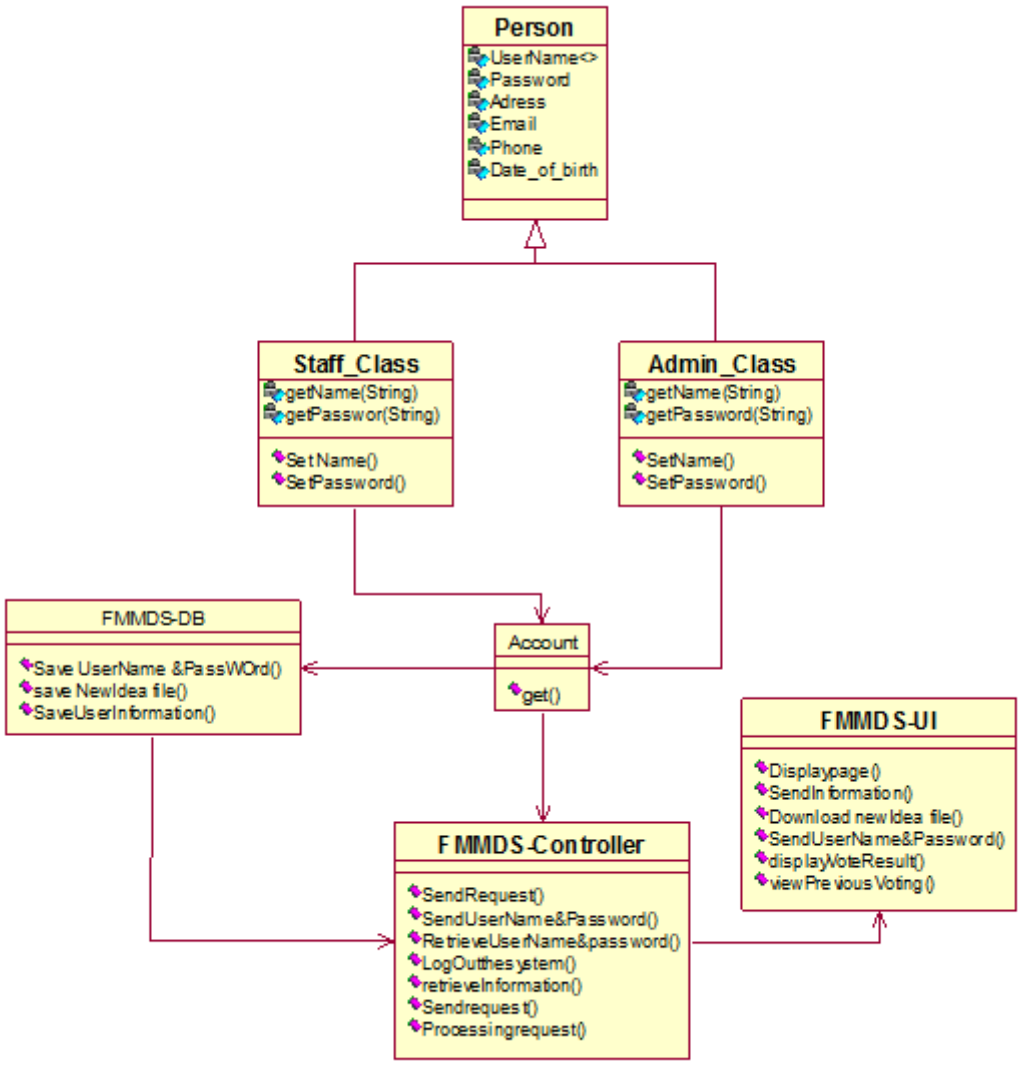

Figure 4. 20 : Class Diagram for FMDM

4.6 System Interface

4.6.1 System Interface

Homepage Interface

The homepage of the prototype was automatic transmission to the login page of the system illustrated in Figure 4.21.

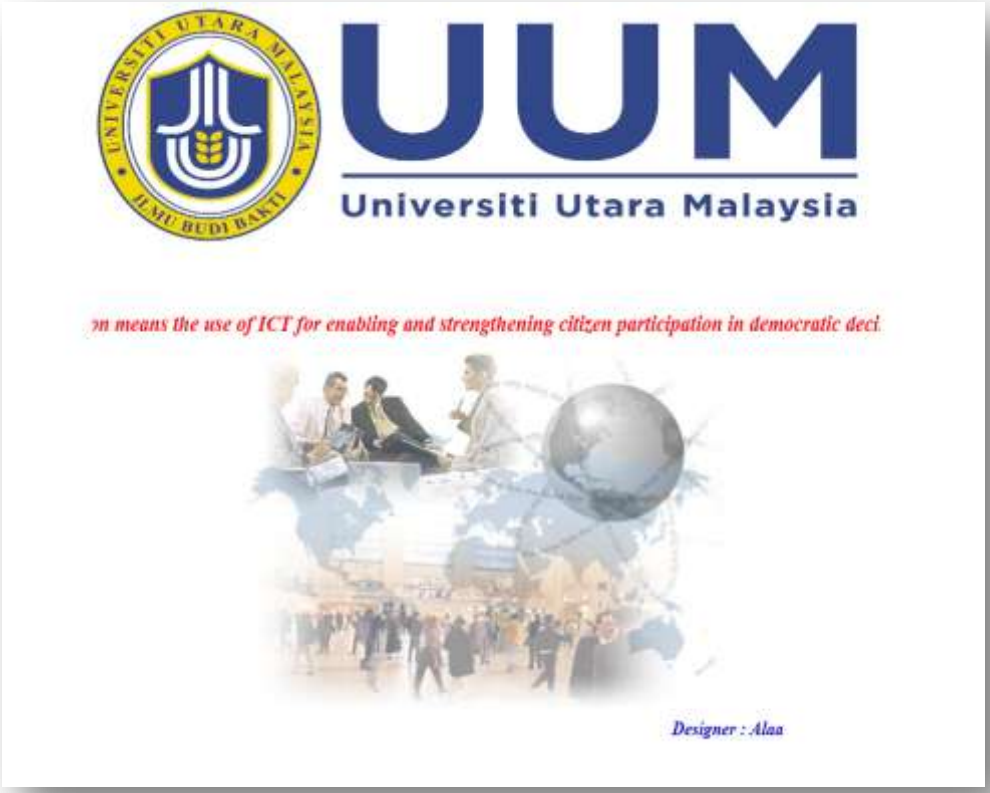

Figure 4. 21 : Homepage Interface

Login Interface

The user (Admin, Staff) can select the way to enter the system, and he/she must have validated username and password as shows in Figure 4.22 and Figure 4.23.

Figure 4. 22 : Main Login Interface

Figure 4. 23 : Specific Login Interface

4.6.2 Admin Interface

Add Voting Interface

The admin has ability to participate administrative decision-making with staff by send the issue which need to make voting in, and he/she select the specific voter depend on the specialization of voter as shows in Figure 4.24.

Figure 4. 24 : Add Voting Interface

Views Previous Voting Interface

The admin can review all the issues was voted before by enter the Previous Voting Interface and he/she can keep or delete the issue as illustrated in Figure 4.25.

Figure 4. 25 : Views Previous Voting Interface

Display Result

The user (Admin, Staff) has ability to view the voting result about the issue which raised by the administration, Figure 4.26 discretion the interface of this process.

Figure 4. 26 : Views Previous Voting Interface

Download New Idea Interface

The admin can make download for the new idea file, which uploaded from the staff, the interface shows the subject of file and the name of sender as illustrated in Figure 4.27.

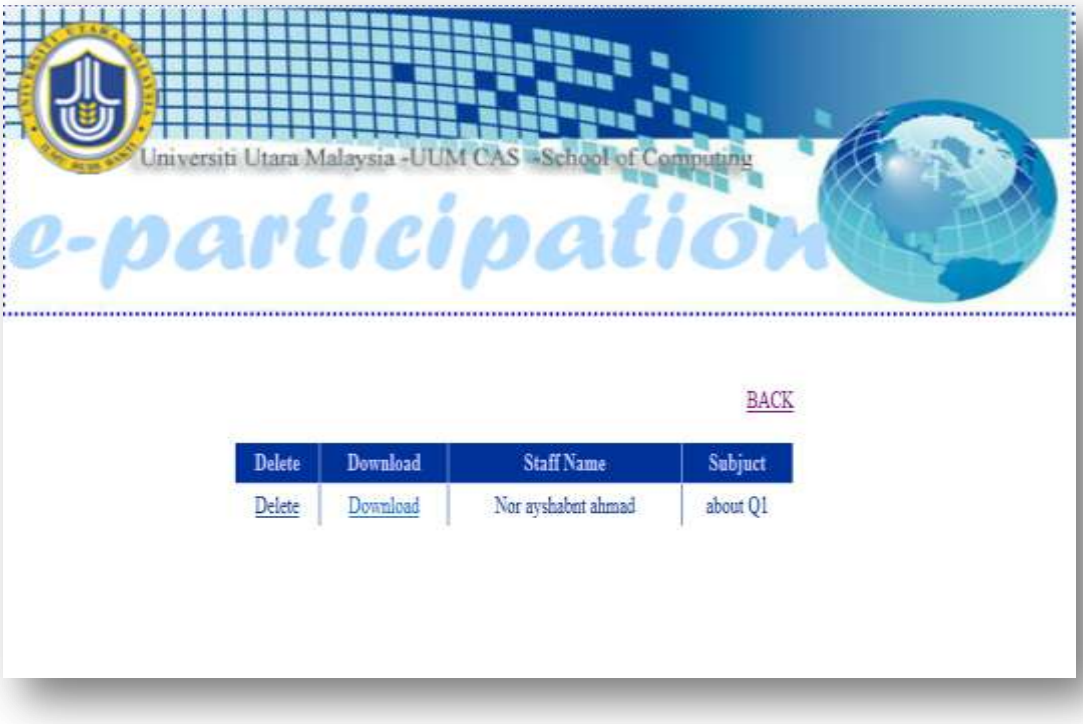

Figure 4. 27 : Download New Idea Interface

4.6.3 Staff Interface

Current Vote Interface

The staff has ability to participate administrative decision-making by select the voting answer and press voting button, the interface of current vote shows the voting question and date send and the name of admin as illustrated in Figure 4.28.

Figure 4. 28 : Current Vote Interface

Add New Idea

The staff has ability to upload file content the idea which wants to discusses in the counselor meeting; the interface of add new idea shows the subject name of file and the path of file as illustrated in Figure 4.29.

Figure 4. 29 : Add New Idea Interface

4.7 Summary

Chapter four are content the analysis about the prototype, the requirement, use cases and the entire diagram which describe the function of e-Participation administrative decision-making system for School of Computing. The output of chapter four is design and builds the prototype.

CHAPTER FIVE

EVALUATION & RESULTS

A prototype of FMDM was designed and implemented as explained in chapter four. This chapter discusses the evaluation of the developed prototype. Usability testing was done based on Computer Usability Satisfaction Questionnaires (CUSQ) proposed by Lewis (Lewis, 1995); a questionnaire consists of 19 questions and psychometric theory scale consisting from one to seven degrees the terms "Strongly disagree" for 1 and "Strongly agree" for 7, and a Not Applicable (N/A) point outside the scale (Zaharias & Poylymenakou, 2009). A sample of 28 users was selected randomly to measure user satisfaction towards the FMDM. The questionnaire consists of two sections, i.e. general information section and user evaluation section.

5.1 General Information

The Statistical Package for Social Sciences (SPSS) version 19 is used to perform statistics analysis for the collected data as well as to conclude the frequencies of each question. However, the histogram has been provided in this

assessment. 12 (42.86%) are female respondents and 16 (57, 14%) are male; Table 5.1 and Figure 5.1 represent this data in tabular and graphical format respectively.

Table5. 1: Distribution of Respondents Based on Gender

Gender	Frequency	Percentage (%)
Male	16	57.14%
Female	12	42.86%

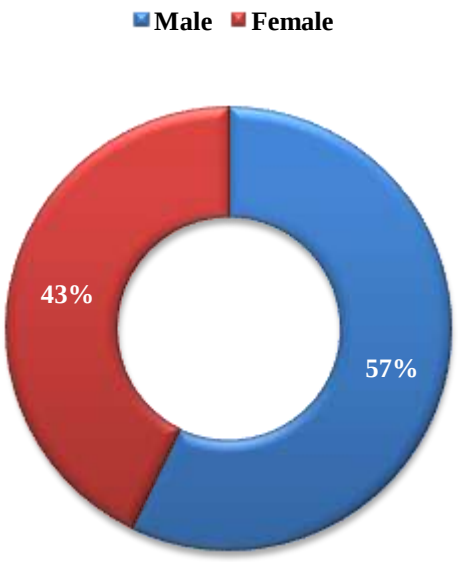

Figure 5. 1 : Distribution of Respondents Based on Gender

Respondents' age is varied in the survey, 3 (10.7%) of the respondents are 25-29 years old and 6 (21.4%) are 30-39 years old; as well as and 12 (42.9%) are 40-49 years old and 7 (25%) of respondents are above 50. Table 5.2 and Figure 5.2 represent the information in tabular and graphical format respectively.

Table 5. 2 : Distribution of Respondents Based on Age

Age	Frequency	Percentage (%)
25-29	3	10.7%
30-39	6	21.4%
40-49	12	42.9%
Above 50	7	25%

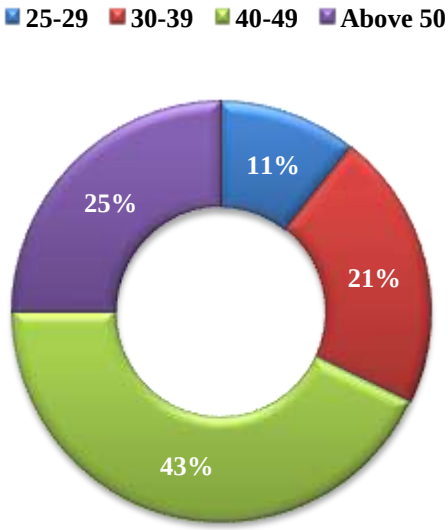

Figure 5. 2 : Distribution of Respondents Based on Age

The Respondents' working experience in this survey divided into, ten of respondents have more than 10 years experiences with (35.7%), on other hand, eleven of respondents have experiences between 5-10 years by (39.3%). Seven of respondents have experiences less than 5 years by (25%); Table 5.3 and Figure 5.3 illustrated the data.

Table 5. 3 : Distribution of Respondents Based on Working Experience

Education	Frequency	Percentage (%)
Less 5 years	7	25%
5-10 years	11	39.3%
Above 10 years	10	35.7%

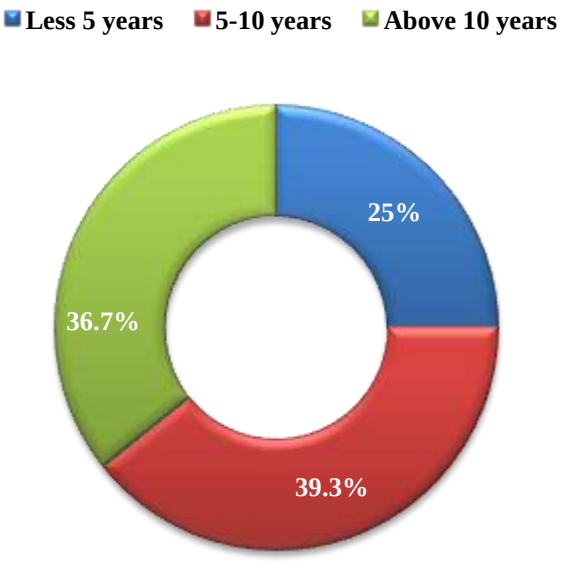

Figure 5. 3 : Distribution of Respondents Based on Working Experience

5.2 Evaluation of User

Maguire (2001) pointed out that International Standard Organization (ISO) it as the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use. The usability focuses on users' goals (effectiveness), the speed with which goals are achieved (efficiency), and users' satisfaction with the system within a specified context.

Effectiveness, a system is only useful if its users are able to achieve intended goals. Effectiveness is measured by whether users are able to complete a particular task or not. This approach is appropriate for most studies where a task consists of a single step that can be achieved through a single path. Satisfaction, while objective analysis of usability analysis of systems is common, users' subjective assessment is crucial to a systems success (Sasse, 2007). Efficiency, while users may use a system to achieve a specific goal, achievement in itself is not sufficient. The goal must be achieved within an acceptable amount of time and effort (Kainda, Flechais & Roscoe, 2010).

Measure the performance of any system depends mainly on the assessment of users. For FMDM prototype, the system should be assessing by the staff of UUM. To design the questionnaire, nineteen questions were chosen to demonstrate this survey; each question in the measurement has a rate from 1 to 7. The result illustrates that the mean for every question is above five, Table 5.4 gives the mean, standard deviation and standard error of mean for all of the 19 questions of the survey. The questionnaire form and other details are in appendix B.

Table 5. 4 Statistics for All Elements

	Mean	Std. Error of Mean	Std. Deviation	Variance
1	6.0714	.20528	1.08623	1.180
2	6.1429	.20389	1.07890	1.164
3	6.2500	.13239	.70053	.491
4	6.1071	.15718	.83174	.692
5	6.2500	.15105	.79931	.639
6	6.1429	.16031	.84828	.720
7	6.3571	.14741	.78004	.608
8	6.1786	.13660	.72283	.622
9	6.3214	.14596	.77237	.697
10	6.0714	.21162	1.11981	1.254
11	5.8929	.22619	1.19689	1.433
12	6.0357	.22112	1.17006	1.369
13	6.1071	.20145	1.06595	1.136
14	5.9643	.24388	1.29048	1.665
15	6.2500	.15105	.79931	.936
16	6.3929	.13934	73733.	.544
17	6.1786	.17100	.90487	.819
18	6.1786	.14596	.77237	.597
19	6.2857	.18443	.97590	.952

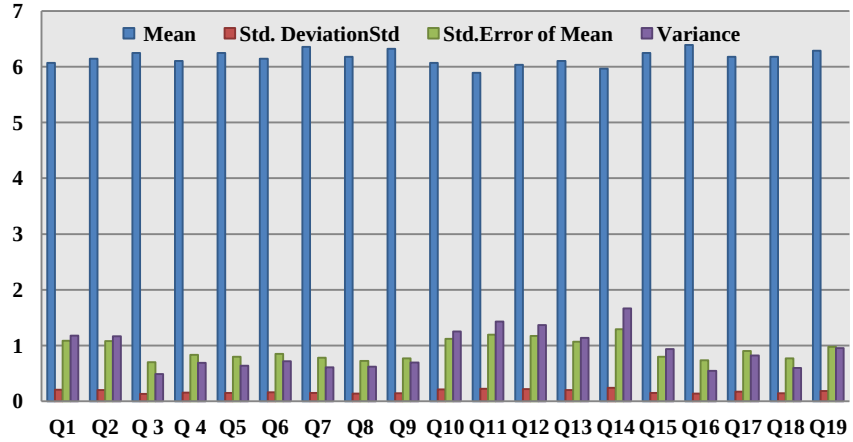

Figure 5. 4: Statistics for All Elements

Table 5.5 and Figure 5.5 are illustrated the analysis of the first question, which shows four levels of responses. Most of the responses (50%) are satisfied with how the system is easy to use; on other hand, around (10.7%) responses were not sure about that.

Table 5.5 : Q1 Overall, I Am Satisfied with How Easy it is to Use This System

Scale	Frequency	Percent
4.00	3	10.7
5.00	6	21.4
6.00	5	17.9
7.00	14	50.0
Total	28	100.0

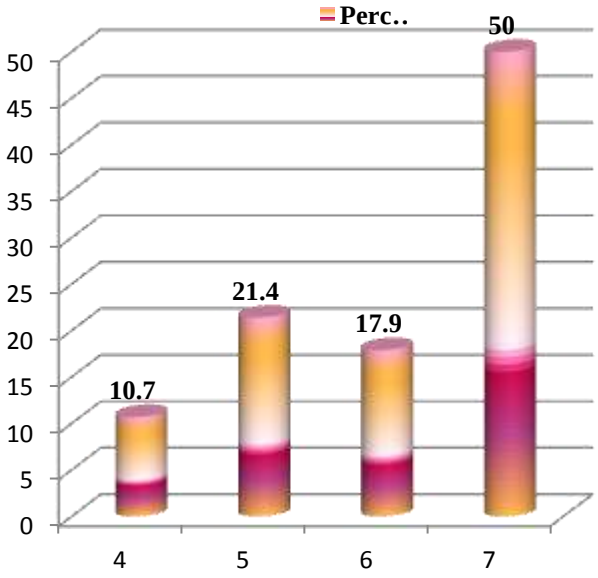

Figure 5. 5 : Statistics for Question One

Table 5.6 and Figure 5.6 are shows the analysis for second question, there are five levels of responses, half of the participants select strongly agree level, mention to system is simple to use, but only one of participant is disagree, which means that the FMDM is simple to use.

Table 5. 6 : Q2 It Was Simple to Use This System

Scale	Frequency	Percent
3.00	1	3.6
4.00	1	3.6
5.00	5	17.9
6.00	7	25.0
7.00	14	50.0
Total	28	100.0

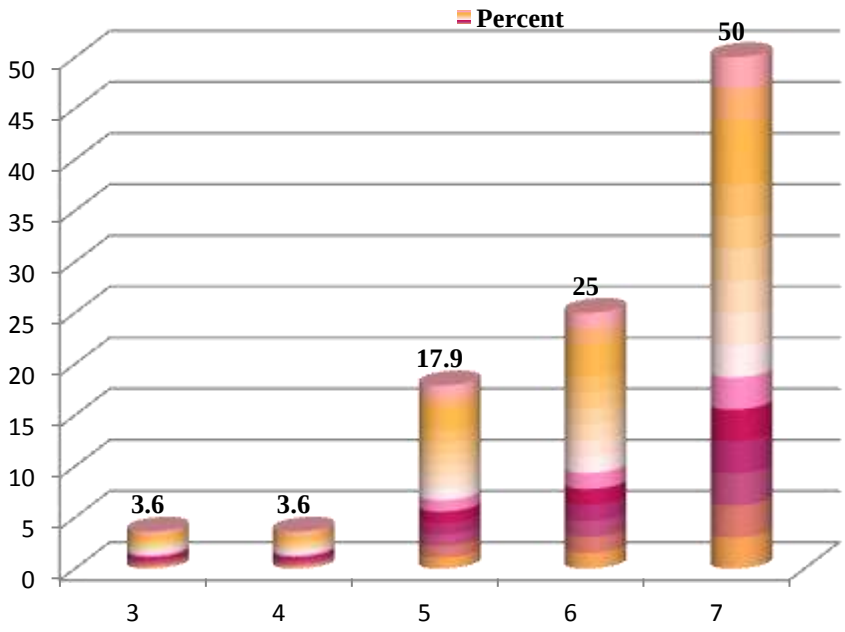

Figure 5. 6 : Statistics for Question Two

Table 5.6 and Figure 5.6 are describe the analysis for third question, which shows three levels of responses, all of the responses are agree and strongly agree with the effectively complete the tasks and scenarios of the FMDM.

Table 5. 7 : Q3 I Could Effectively Complete the Tasks and Scenarios Using this System

Scale	Frequency	Percent
5.00	4	14.3
6.00	13	46.4
7.00	11	39.3
Total	28	100.0

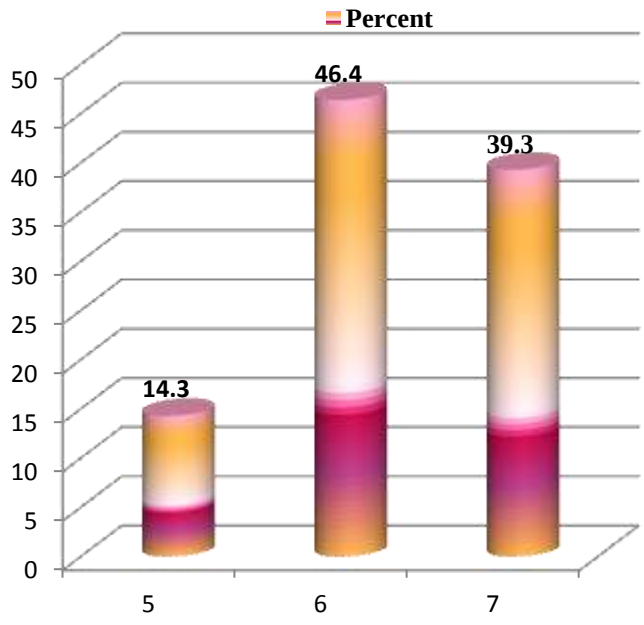

Figure 5. 7 : Statistics for Question Three

Table 5.7 and Figure 5.7 are shows the analysis for the fourth question, which describe three levels of responses, the strongly agree level is the first with (39.3%) meant (11) users gave 7, then the second level is agree with (32.1%) meant (9) users give 6. Eight of responses gave 5 with (28.6%); that mean using FMDM prototype is an able to complete the tasks quickly.

Table 5.8 : Q4 I Was Able to Complete the Tasks and Scenarios Quickly Using This System.

Scale	Frequency	Percent
5.00	8	28.6
6.00	9	32.1
7.00	11	39.3
Total	28	100.0

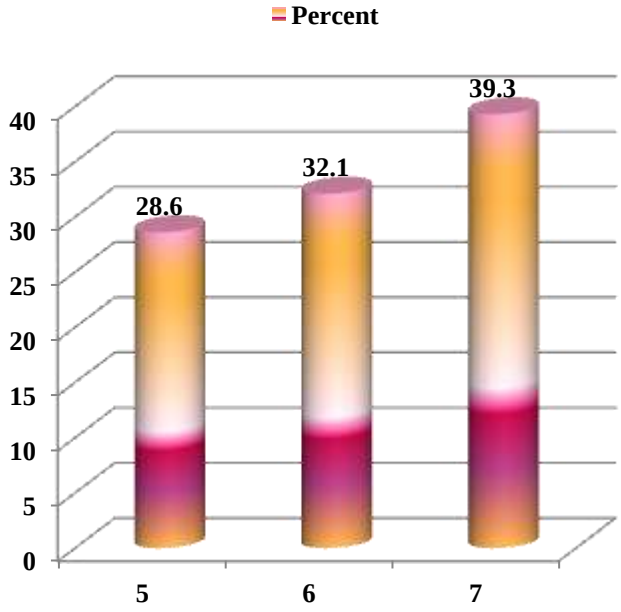

Figure 5. 8 : Statistics for Question Four

Table 5.8 and Figure 5.8 are shows the analysis levels of responses for the fifth question. The strongly agree level is the highest level with (46.4%) meant 13 users gave 7, then the second level is agree with (32.1%) meant 9 users gave 6. Six of responses gave 5 with (21.4%). In general, FMDM prototype was able effective to complete the tasks.

Table 5.9 : Q5: I Was Able to Efficiently Complete Tasks and Scenarios Using this System

Scale	Frequency	Percent
5.00	6	21.4
6.00	9	32.1
7.00	13	46.4
Total	28	100.0

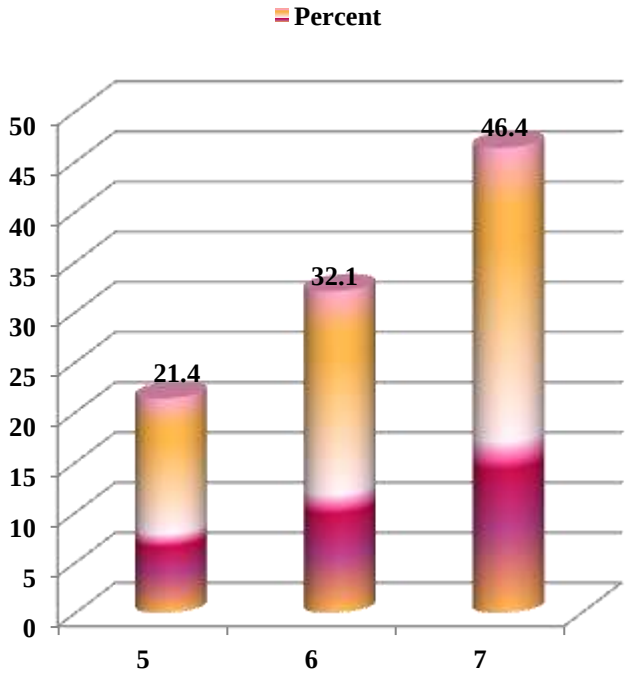

Figure 5. 9 : Statistics for Question Five

Table 5.9 and Figure 5.9 are illustrates the analysis levels of responses for the sixth question, which shows three levels of responses, the strongly agree level is the highest level with (42.9%) means that (12) responses gave 7. The second level is the agree level with (28.6%) means that (8) users give 6 and also happened with the third levels. That means the system was comfortable to the user.

Table 5.10 : Q6 I Felt Comfortable Using This System

Valid	Frequency	Percent
5.00	8	28.6
6.00	8	28.6
7.00	12	42.9
Total	28	100.0

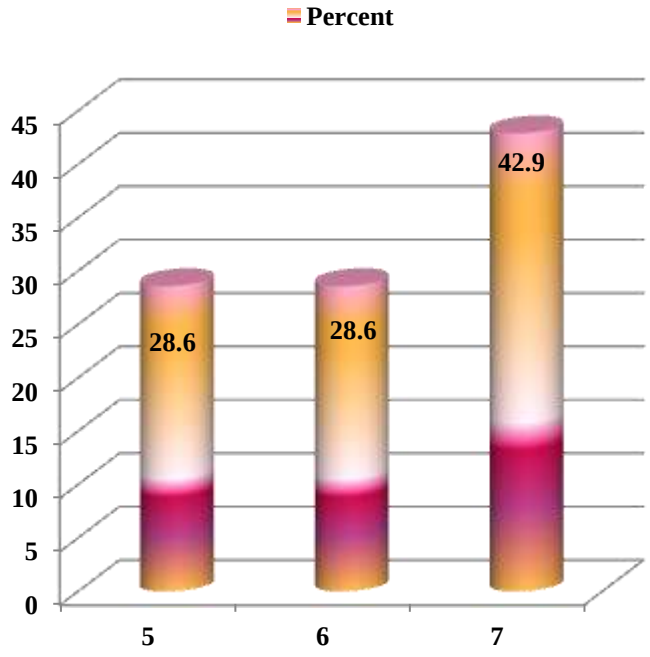

Figure 5. 10 : Statistics for Question Six

Table 5.10 and Figure 5.10 are describes the analysis for the seventh question. It also three levels, the strongly agree level is the highest level with (53.6%) meaning that (15) users gave 7. The other level is agree with (28.6%) meaning that (8) responses gave 6 in answering this question. That means the FMDM is easy to learn.

Table 5. 11 : Q7 It was Easy to Learn to Use This System

Scale	Frequency	Percent
5.00	5	17.9
6.00	8	28.6
7.00	15	53.6
Total	28	100.0

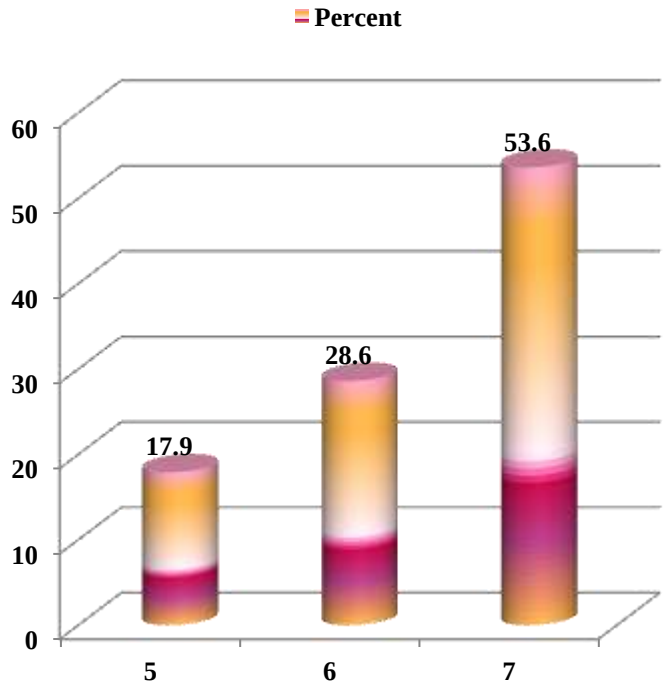

Figure 5. 11 : Statistics for Question Seven

Table 5.11 and Figure 5.11 are shows the analysis for the eighth question, which illustrate three levels of responses, the agree level is the highest level having (46.4%) means that (13) responses gave 6, then the second level is the strongly agree level with (35.7%) means that (10) users gave 7. Five responses choose five to answering this question means that (17.9%). This means that the system help the user to be productive quickly.

Table 5.12 : Q8 I Believe I Could Become Productive Quickly Using This System

Scale	Frequency	Percent
5.00	5	17.9
6.00	13	46.4
7.00	10	35.7
Total	28	100.0

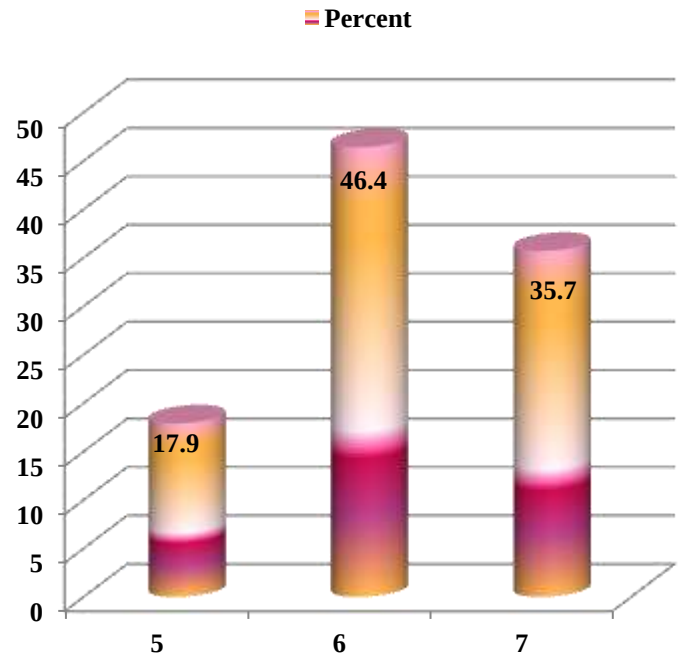

Figure 5. 12 : Statistics for Question Eight

Table 5.12 and Figure 5.12 are describing the analysis for ninth question is shows in by illustrating three levels of responses. Half of participates find the system is easily and quickly recover, when they make mistake. That means that FMDM prototype is clear and understandable among most of responses.

Table 5.13 : Q9 Whenever I made a Mistake Using the System, I Could Recover Easily and Quickly

Scale	Frequency	Percent
5.00	5	17.9
6.00	9	32.1
7.00	14	50.0
Total	28	100.0

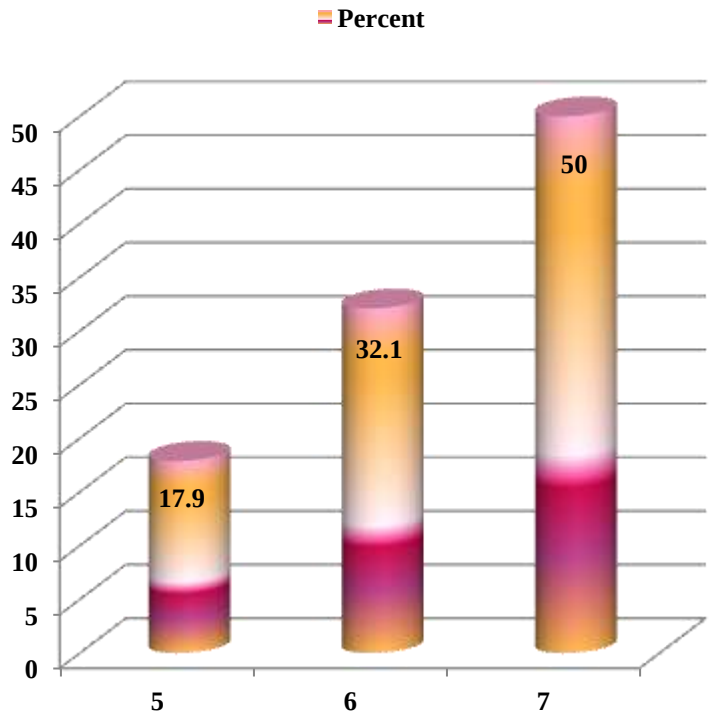

Figure 5. 13 : Statistics for Question Nine

Table 5.13 and Figure 5.13 are illustrating the analysis for tenth question. Half of responses strongly agree, meaning that (14) users gave 7; on other hand, four of users not sure that the system was provide the clear information about on-line help, on-screen messages and other documentation.

Table 5.14 : Q10 The Information (Such as On-Line Help, On-Screen Messages and Other Documentation) Provided With This System was Clear

Scale	Frequency	Percent
4.00	4	14.3
5.00	4	14.3
6.00	6	21.4
7.00	14	50.0
Total	28	100.0

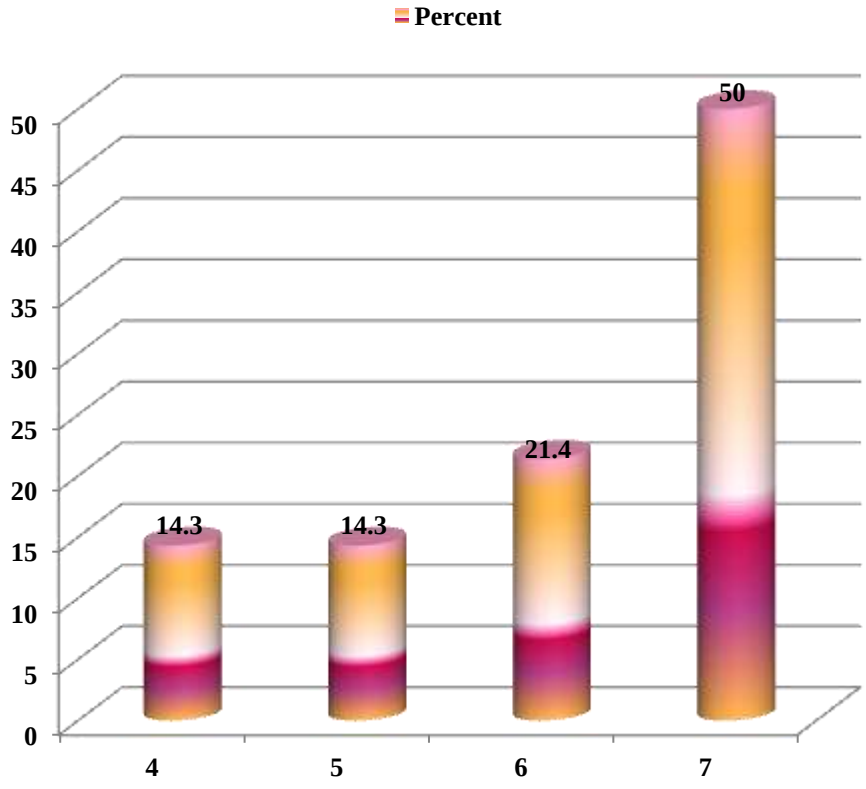

Figure 5. 14 : Statistics for Question Ten

Table 5.14 and Figure 5.14 are shows the analysis for question eleven, which is illustrating four levels of responses. Most of the responses select agree level (32.1%) meaning that (11) responses gave 6; and strongly agree level with (39.3%) meaning that (11) responses gave 7, this pointed that the system gives error messages to the user described the way to solve the problem.

Table 5.15 : Q11 The system gives error messages that clearly tell me how to fix problems

Scale	Frequency	Percent
3.00	1	3.6
4.00	4	14.3
5.00	3	10.7
6.00	9	32.1
7.00	11	39.3
Total	28	100.0

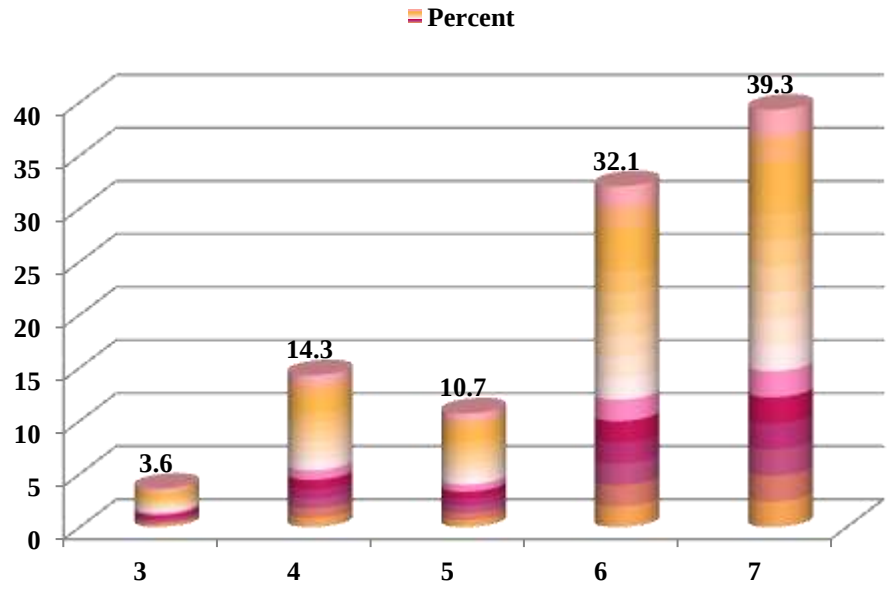

Figure 5. 15 : Statistics for Question Eleven

Table 5.15 and Figure 5.15 are shows the analysis for questions twelve, which illustrate the levels of responses; most of responses are strongly agree with (46.4%) meaning that (13) users gave 7, and agree with (28.6%) meant (9) users gave 6; this refers to, that FMDM prototype gives easy way to find the information to the user.

Table 5.16 : Q12 It was Easy to Find the Information I Needed

Scale	Frequency	Percent
3.00	1	3.6
4.00	3	10.7
5.00	3	10.7
6.00	8	28.6
7.00	13	46.4
Total	28	100.0

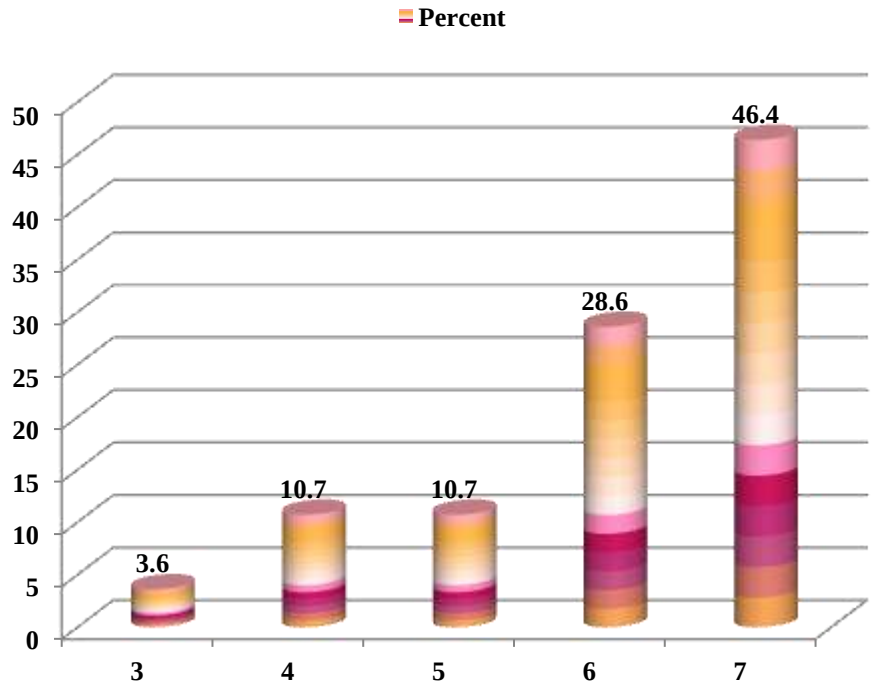

Figure 5. 16 : Statistics for Question Twelve

Table 5.16 and Figure 5.16 are describing the analysis for thirteenths question. Half of responses strongly agree, meaning that (14) users gave 7; on other hand, three of users not sure that the system provide clear information to understand.

Table 5. 17 : Q13 The Information Provided for the System was Easy to Understand

Scale	Frequency	Percent
4.00	3	10.7
5.00	5	17.9
6.00	6	21.4
7.00	14	50.0
Total	28	100.0

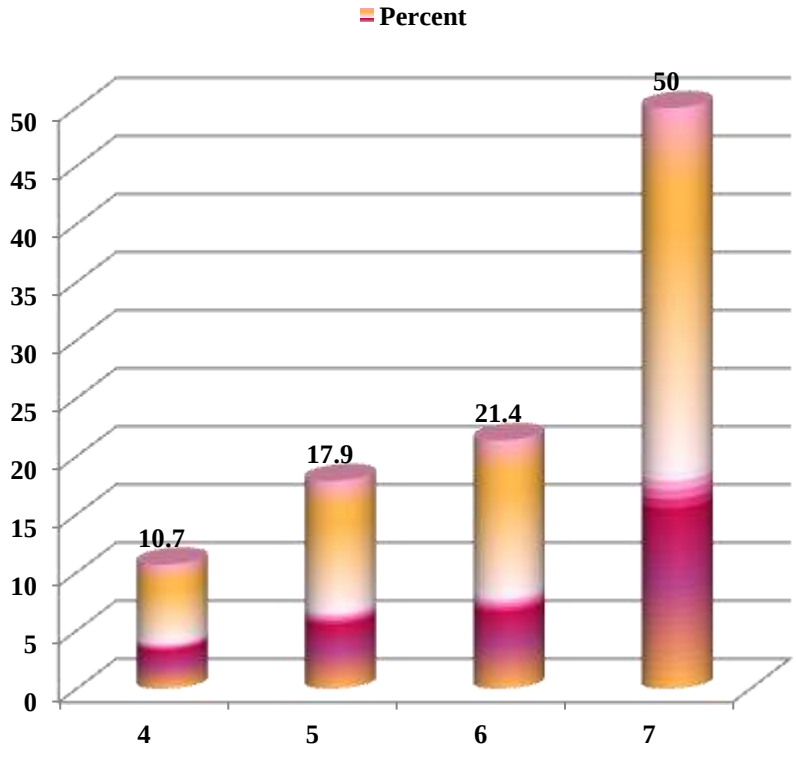

Figure 5. 17 : Statistics for Question Thirteen

Table 5.17 and Figure 5.17 are shows the analysis for questions fourteenths, which illustrate five levels of responses; half of responses are strongly agree with (50%) meaning that (14) users gave 7, and agree with (17.9%) meant (5) users gave 6; this refers to, that FMDM gives effective information to help user for complete the tasks.

Table 5. 18 : Q14 The Information was Effective in Helping me Complete the Tasks and Scenarios

Scale	Frequency	Percent
3.00	2	7.1
4.00	2	7.1
5.00	5	17.9
6.00	5	17.9
7.00	14	50.0
Total	28	100.0

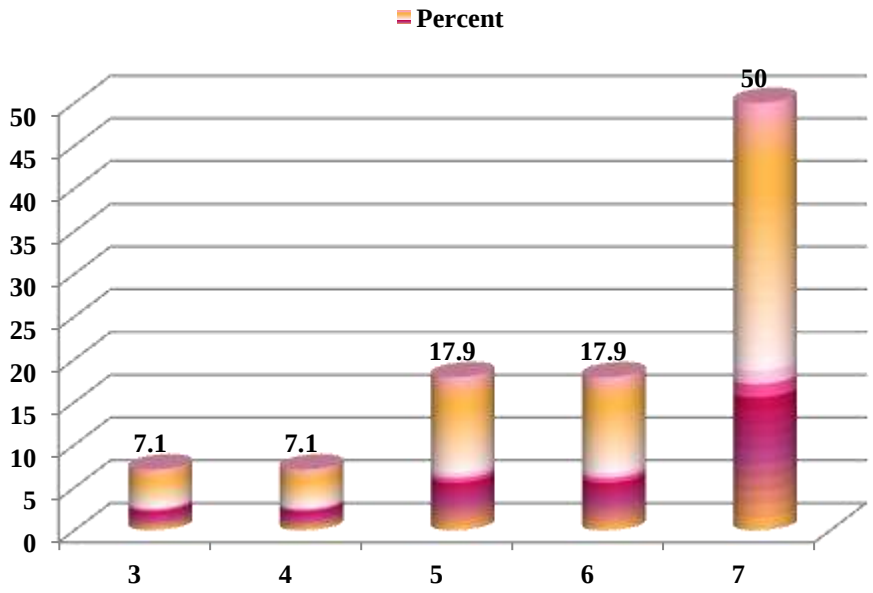

Figure 5. 18 : Statistics for Question Fourteen

Table 5.18 and Figure 5.18 are illustrating the analysis for the fifteenths question, which shows three levels of responses, the strongly agree level is the highest level with (46.4%) means that (13) responses gave 7, then the second level is the agree level with (32.1%) means that (9) responses gave 6. Six responses choose 5 to answering this question means that (21.4%). This refers to that the system has clear organization of information on the system screens.

Table 5. 19 : Q15 The Organization of Information on the System Screens was Clear

Scale	Frequency	Percent
5.00	6	21.4
6.00	9	32.1
7.00	13	46.4
Total	28	100.0

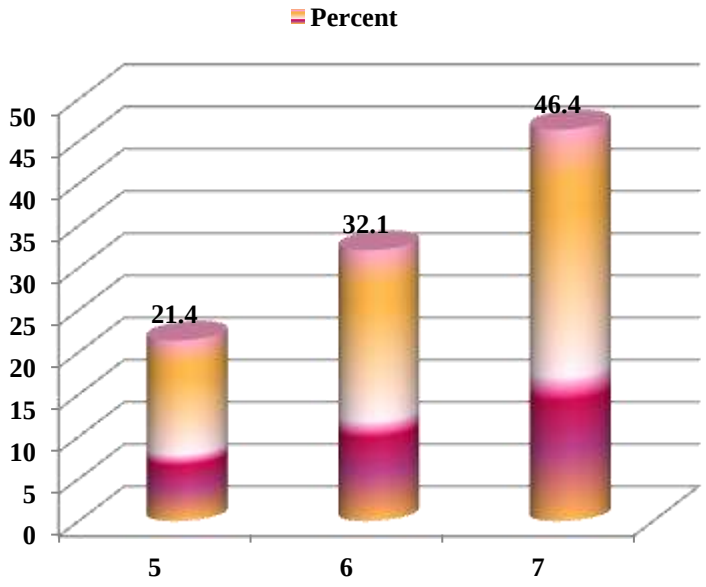

Figure 5. 19 : Statistics for Question Fifteen

Table 5.19 and Figure 5.19 are shows the analysis for questions sixteenths, which illustrate the levels of responses; most of responses are strongly agree with (50%) meaning that (14) responses gave 7, and agree with (42.9%) meant (12) responses gave 6; this refers to, that FMDM prototype has pleasant interface.

Table 5.20 : Q16 The Interface of This System was Pleasant

Scale	Frequency	Percent
4.00	1	3.6
5.00	1	3.6
6.00	12	42.9
7.00	14	50.0
Total	28	100.0

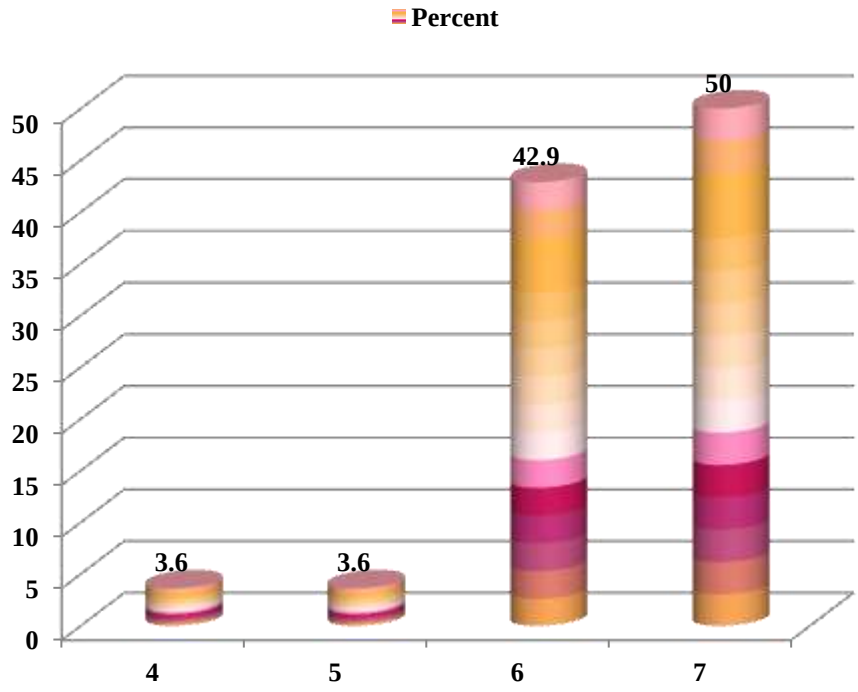

Figure 5. 20 : Statistics for Question Sixteen

Table 5.20 and Figure 5.20 are describing the analysis for seventeenths question. Most of responses strongly agree with (46.4%) meaning that (13) responses gave 7, which mean they liked use interface system; on other hand, one response is not sure to like use the interface of the system.

Table 5.21 : Q17 I Liked Using the Interface of This System

Scale	Frequency	Percent
4.00	1	3.6
5.00	6	21.4
6.00	8	28.6
7.00	13	46.4
Total	28	100.0

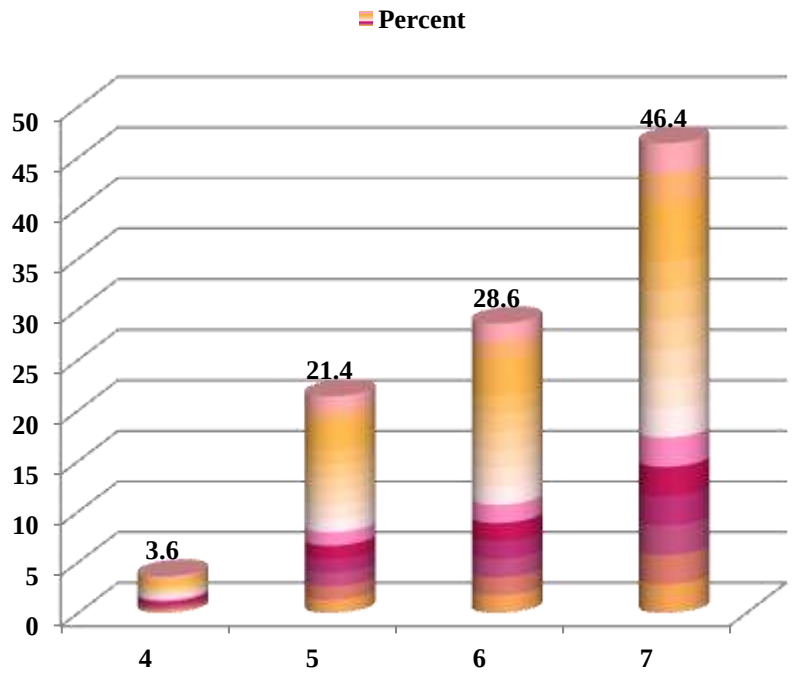

Figure 5. 21 : Statistics for Question Seventeen

Table 5.21 and Figure 5.21 are illustrating the analysis for the eighteenths question, which shows three levels of responses, the strongly agree level and agree level are the highest levels with (39.3%) for each level. Six responses choose 5 to answering this question means that (21.4%). This refers to that the system has all the function and capabilities expected from responses.

Table 5.22 : Q18 This System Has all the Functions and Capabilities I Expect it to Have

Scale	Frequency	Percent
5.00	6	21.4
6.00	11	39.3
7.00	11	39.3
Total	28	100.0

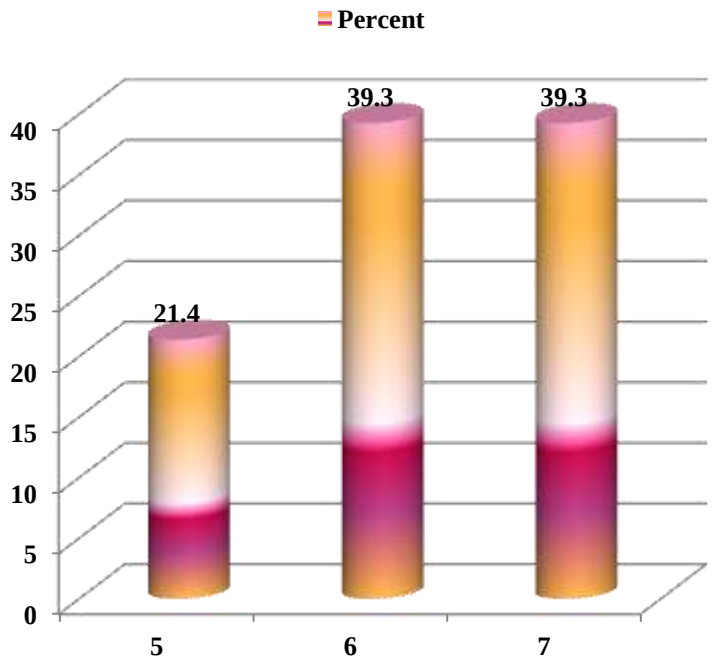

Figure 5. 22 : Statistics for Question Eighteen

Table 5.22 and Figure 5.22 are illustrating the analysis for nineteenths question. Most of responses strongly agree with (53.6%) meaning that (15) responses gave 7, which mean most of responses are satisfied with the system; on other hand, three responses are not sure the system is satisfied for them.

Table 5.23 : Q19 Overall, I Am Satisfied with This System

Scale	Frequency	Percent
4.00	3	10.7
5.00	1	3.6
6.00	9	32.1
7.00	15	53.6
Total	28	100.0

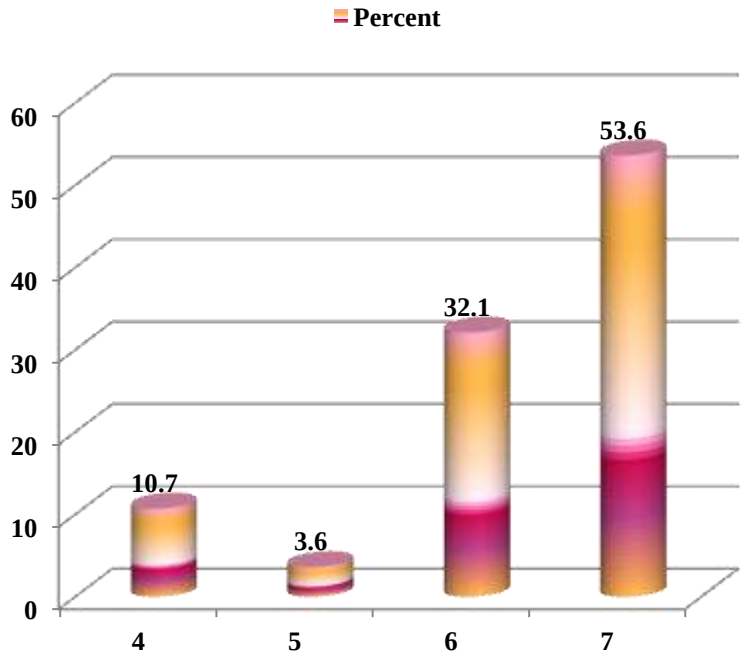

Figure 5. 23 : Statistics for Question Nineteen

5.3 Summary

Assessment function to any system is very important part in the development of system. It help to defects uncover usability early during the design. Furthermore, usability evaluate to redesign applications by actual users must be conducted to be aware of the user's assessment for such applications. The outcome of FMDM evaluation is indicating that the system is success to carrying out the functions performed, but always improvement is definitely need.

CHAPTER SIX

CONCLUSIONS

This chapter beginning with a discussion of the study results, and it's follow by the conclusions which are drawn from this research labor. In section 6.2 describe the contribution of study. The recommendations for future research are made in section 6.3; finally, the conclusion of the study.

6.1 DISCUSSION

The purpose of this research is to identify the following:

- What are the requirements of e-Participation system for school of computing.

Depending on the study result, will discuss how the findings coincide with the objective of the study. This study focuses on the e-Participation; which aiming to provide the technologies and tools for more efficient public administration systems and more participatory decision processes. At the School of Computing, there are many faculty members, which make it difficult to hold meetings and access to all the problems and suggest ideas. Through e-Participation system can reduces the effort and time of meetings and allows the effective participation of the staff, that's what the study aims to achieve.

Objective 1:

First aim of this study is to determine the requirements of e-Participation system for the administrative of school of computing, the result of the objective have been identified the following requirements.

Admin enters the system by using username and password, system will display main page with all services, then the admin have ability to add the question for voting from staff and the question can be directed to a specific category. As well as, the admin can receive the new idea from the staff. On other hand, the staff has ability to send the new idea document to the admin; in addition, the staff has ability to voting for the question which sends from the admin, and review the background about the issue which needs to vote.

Objective 2:

e-Participation system is a multi-functional system, which mean there are many function can implemented in this system; The ASP.net environment with C# language have ability to provides the possibility of the implementation of many of the tasks, FMDM prototype was implemented by use this language and the database designed by using SQL, the system is compatible with all operating system.

Objective 3:

Applications always need to prove the validity of the functionality, by testing the performance and functionality of the system and find out the weaknesses in the system before its adoption. The e-Participation prototype for school of computing is evaluating by Computer Usability Satisfaction Questionnaires (CUSQ), psychometric evaluation proposed by Lewis (Lewis,

1995). The questionnaire was assessed twenty eight respondents for UUM staff; and the results have been positive.

6.2 CONTRIBUTION

This study obtained the following contributions in the e-Participation, field of e-Government:

a) Use of the facilities in the ICT to development of the process administrative to participate all the levels of employees in policy and decision-making.

b) This study contributes to the development of awareness of the need for participation by individuals in the process of administration decision- and policy-making.

6.3 FUTURE WORK

These days, with the ICT tools have become opportunities to develop methods of treating the administrative problems and give the real legitimacy of administrative decisions. This study focuses on building a prototype helps to improve the administration of school of computing through the participation of school staff in presenting the real opinions and ideas to management, which reduces the time and effort of the meetings. On other hand, give staff greater opportunity to understand and realize the problem before help make the final decision or vote, the future research in this field covers the followings:

a. The development of e-Participation system to cover all administrative aspects of the University not only within the school individually; which helps to benefit from the participation of all employees and reflect their views in a university policy-making and decision-making.

b. e-Participation needs many channels to implemented, and awareness of people of the importance of e-Participation to help the administration in directing its policy and its decisions, that can been implemented in the university as one of the important channels to educate people through the building of e-participation system for students to contribute in the management of university policy.

6.4 CONCLUSION

Electronic 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.

Participatory management is one of trend has been competing trends in community based organizations, and particularly in community organizing groups. Participatory management is the practice of empowering employees to participate in organizational decision making. Power-sharing arrangement is the basic concept involves in which workplace influence is shared among individuals who are otherwise hierarchical unequal's. Such power-sharing arrangements may entail various employee involvement schemes resulting in a co-determination of decision-making, working conditions, and problem solving.

During this study was designed e-Participation system for school of computing to provide the administration better way to take the right decision and understand the. Prototype was developing by using ASP.net environment with C# language. Moreover, was assessment 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.

Finally, the rapid development of virtual community was accelerates to open many channels for government to measure the opinions and attitudes of society, but the people still in the first steps to understand the importance of e-Participation, that will need more work to awareness people and more tools to open participate channels.

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APPENDIX A

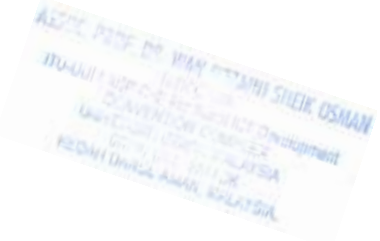
Questionnaire's Form for Requirements System

UNIVERSITI UTARA MALAYSIA
COLLEGE OF ATRS AND SCIENCES
SCHOOL OF COMPUTING

e-Participation of Faculty Members in Decision Making in school of computing in UUM (FMDM)

Supervisor: Prof. Dr. Wan Rozaini Sheik Osman

I am a Master of Science (Information Technology) student at final semester, in University Utara Malaysia. Currently, I am performing this questionnaire to help me gain a requirement of. This questionnaire aims to understand general information about system users; the results from this questionnaire will help me to understand the system requirements for developing an E-participation system for school of computing.



MSc. IT Candidate

Ala' Salameh
Falah Alsardia

I. General information

Name: …….

II. QUESTIONNAIRE

1. Do you think there is a wasting of time and effort in meetings that occur to make decisions within the school of computing?

Yes ☐ No ☐

2. Do you think that the use of electronic participation will facilitate and expedite the decision-making process within the School of Computing?

Yes ☐ No ☐

3. Do you favor the distribution of new ideas for verification by the members, before being discussed in meetings of the School of Computing?

Yes ☐ No ☐

4. Do you favor the use of electronic voting to participate in the decision-making process within the School of Computing?

Yes ☐ No ☐

5. What are the classifications that can be adopted to reach the accuracy of resolution presented by the Dean of the School of Computing?

Specialization ☐ Experience ☐ Academic Rank ☐

APPENDIX B

Questionnaire's Form for Evaluation Prototype

UNIVERSITI UTARA MALAYSIA

COLLEGE OF ATRS AND SCIENCES

SCHOOL OF COMPUTING

e-Participation of Faculty Members in Decision Making in school of computing in UUM (FMDM)

Supervisor: Prof. Dr. Wan Rozaini Sheik Osman

I am Master of Science (Information Technology) student at final semester in Universiti Utara Malaysia. Currently, I am performing this questionnaire to help me gain an understanding of the user who used eParticipation administrative decision-making for school of computing. This questionnaire aims to understand general information about system user's and the usability of the system. The results from this questionnaire will help me to understand the system requirements for developing an eParticipation administrative decision-making for school of computing.

All your information will be held in strictest confidence and it will be used for research purpose only. Your insights a feedback in making this study successful is highly appreciated. If you have any queries or if you like to know the result of this study, please do contact me at 014-2212492or through the e-mail: alaasla86@yahoo.com. This questionnaire consists of two sections:

- Section A - General Information
- Section B - System Usability

This questionnaire is adopted from Lewis,(1995) IBM Computer Usability Satisfaction Questionnaires: Psychometric Evaluation and Instruction for Use

Thank you for your valuable time and help in completing this questionnaire.

MSc. IT Candidate

Ala' Salameh Falah Alsardia

QUESTIONNAIRE

System to Be Evaluated:

e-Participation of Faculty Members in Decision Making in school of computing in UUM (FMDM)

Objective:

Obtain your view on the evaluation of prototype.

Please answer **all** questions from each segment.

1) General Information

This segment is about your background information. Please fill up the blanks and mark [√] where appropriate.

1. Gender: [ ] Male [ ] Female

2. Age: ———— Years.

[ ] 25-29 years [ ] 30-39 years [ ] 40-49 years [ ] above 50 years

3. Working Experience ———— Years.

[ ] Less 5 years [ ] 5.10 years [ ] above 10 years

4. Do you think a ICT tools can reduces the pressure of meetings?

[ ] Yes [ ] No

2) FMDM Prototype Evaluation

Please rate your agreement with these statements.

- Try to respond to all the items.
- For items that are not applicable, use: **NA**

Over All Reaction To The Website		Strongly disagree	1	2	3	4	5	6	7	Strongly agree	NA
1	Overall, I am satisfied with how easy it is to use this system.										
2	It was simple to use this system.										
3	I could effectively complete the tasks and scenarios using this system.										
4	I was able to complete the tasks and scenarios quickly using this system.										
5	I was able to efficiently complete the tasks and scenarios using this system										
6	I felt comfortable using this system.										
7	It was easy to learn to use this system.										
8	I believe I could become productive quickly using this system.										
9	Whenever I made a mistake using the system, I could recover easily and quickly.										
10	The information (such as on-line help, on-screen messages and other documentation) provided with this system was clear.										
11	The system gives error messages that clearly tell me how to fix problems.										
12	It was easy to find the information I needed.										

13	The information provided for the system was easy to understand.										
14	The information was effective in helping me complete the tasks and scenarios.										
15	The organization of information on the system screens was clear.										
16	The interface of this system was pleasant.										
17	I liked using the interface of this system.										
18	This system has all the functions and capabilities I expect it to have.										
19	Overall, I am satisfied with this system.										