The Usefulness Of Online Questionnaire System Among Students In Higher Learning Institution

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ABSTRACT

Questionnaires are used in a wide range of settings to gather information about the views and behavior of individuals to inform people about the specific issues. Feedbacks of the questionnaires are used by the researcher to find an accurate result with supporting of statistical analysis functionalities. However, the resulting from the questionnaire is lack supported by the analyzing functionality. In addition, the overall trends and the performance of each question are analyzed by using the offline equations of the statistics analysis. This research focuses on the development of the questionnaire system by focusing on the 'built-in' statistical analysis functionalities to facilitate as a test bed. The Online Questionnaire System (OQS) is developed in order to reduce loss of papers, time and effort. The general design methodology is represented by using Unified Model Language (UML). 29 students from higher learning institutions has been selected as a respondents to evaluated this system based on the usability and flexibility of the system. Mostly 44.8% persons very agree that the statistical analysis functions in Online Questionnaire website need to be implemented.

Keywords:Questionnaire, Online Questionnaire.

I INTRODUCTION

A questionnaire is a research instrument consisting of a series of questions and other prompts for the purpose of gathering information and opinions of the respondents (Chaudhuri, Ghosh, &Mukhopadhyay, 2009). Questionnaire also mean the method of collecting data for descriptive research by using a list of questions. Questionnaire is one of the ways that are often used by the researcher to finish their research or to conduct a survey of expectations for future to assess the quality of many institutions such educational institutions (Kitagaki, Tomita, &Hikita, 2004). Consequently, a survey by questionnaire for some demographic groups may not be practical (Mondal, 2010).

The questionnaire procedure isprobably the best option for primary data collection. This method is suitable to obtain information which enables the analysis of a more easy. The online questionnaire is one of the most widely research tools used and widespread. It is intended to collect information from respondents (Sudman, Bradburn, & Schwarz, 1996). Since 1995, the online questionnaire is increased in the field of social and behavioral sciences (Birnbaum &Reips, 2005). Online questionnaires have many advantages like flexibility, locality, synchronism, representativeness, self-selection, and uncontrolled circulation (Batinic, 2001).

Collecting data from participants through web pages it is the best and most effective way. The participants were notified by sending the questionnaire via e-mail. Therefore, this project contributes the design and develops processes ofthe online questionnaire system. This system enables users (the researchers) to create an online questionnaire, and analyze it easily. In addition, they can managed, respond and present the result of the questionnaire.

A. Problem Statement

Currently, the online survey system establishes the questionnaires and distributes it to the largest number of participant. However, the resulting from the questionnaire is lack supported by the analyzing functionality. Analyzing functionality is refers to the statistics analysis tools, which can't of collection of methods that used to process large amounts of data and report. In addition, the overall trends and the performance of each question are analyzed by using the offline equations of the statistics analysis. By using the statistics analysis tools, the researcher will be able to get the results of the research. Normally, the analyzing functionality is done manually or separate standalone software applications such as

the Statistical Package for Social Sciences (SPSS) software and Microsoft Excel, which is wasting time in transferring the data from online to offline.
According to Bruce Paul (2012), Vice President of International Research ACNielsen, the offline survey can contribute to bias situation. For example, the telephone interviewers can have different effects on respondents' answers if they are male/female or cheerful/droll or fast/slow but online research eliminates variations. Offline survey can slow the field work such as speaking so slow compared to online that can do more than hundreds of respondents in one time. Another problem that occurs are very expensive cost, not accurate responses, not greater recall, image and multimedia technology cannot be included in surveys and difficult to target lower incidence population.

B. Research Questions

The main questions for this research are:

a. What are the components of Online Questionnaire System (OQS)?
b. What are the analysis functionalities required by the researcher?
c. How to design and develop the OQS?
d. How to evaluate the usefulness of the OQS?

C. Research Objectives

The main objective of this research are:

a. To identify the components of OQS.
b. To define the analysis functionalities required by the researcher.
c. To design and develop the prototype of the OQS.
d. To evaluate the usefulness of the OQS.

D. Research Scope

This research focuses on the designing and development of the OQS to facilitate and support the researcher's tasks. The user of this system refers to students in High Learning Institute who wants to establish a questionnaire and distributed to a group of participants, that mean participant may refer to student or staff or researcher or others. The system is proposed, used to collect and analyze the data online. The results of the analysis will be presented in the system via the Internet. The system will analyze the questionnaire for descriptive research and depends on a Likert scale, which contains a range of answers where the participant has chosen the correct answer for them. This system covers some analysis functionalities, such as frequencies, mean, median, mode, standard deviation, T-Test, statistics, reliability test and correlation.

E. Significant of the Research

The significance of this research is to support the students in easier way to develop the questionnaire and published in large numbers of respondents, as well as enables the researcher to collect these responses, and the possibility of data analysis without the needed the application software to perform the statistical analysis.

II LITERATURE REVIEW

A. Introduction

A questionnaire is a list of questions designed to collect specific information. or can be defines it is a group of printed questions used to collect information from the people who answer them usually called respondents (Newsted, 1988). In the end, everyone agreed that the questionnaires are an inexpensive way to gather data from a potentially large number of respondents (Garelli, Bisconcin, Maso, Pucci, &Filocamo, 2000). Questionnaire is used for research work by scientists and businesses among others. This is the only way to reach large number of reviewers to allow statistically analysis of the results (Dörnyei& Taguchi, 2010). Although the questionnaires may be cheap to manage compared with other methods of data collection, they are every bit as costly in terms of design time and interpretation (Williams, 2003). The web is defined a highly programmable environment that allows mass customization throws the immediate deployment of a large and diverse of application to millions of global user (Conallen, 1999). New surveys technologies are trying to test the feasibility and usability of using computer networks, particularly in the WWW. Also covered the review of computer-assisted survey techniques, and the comparisons among different survey methods (Chou, Chang, & Jiang, 2000). The advent of handy Internet building tools, online questionnaire are becoming a promising alternative to mail-based surveys and traditional paper to collect data and analysis for questionnaire (Singh, Taneja, &Mangalaraj, 2009).

B. Web Application and Java Server Pages

A web application is a set of applications that can be accessed over the network, whether from the Internet or Intranet. In recent years, web applications have become scattered around the world (Yang, Huang, Wang, & Chu, 1999), because the spread of web browsers, ease of use,

speed of implementation and interaction with the client. Web applications have the ability to update and maintenance without installed software and distributing on thousands of computer equipment. Communication provides a platform to facilitate services for a variety of clients regardless of their sites, software or hardware. This in turn can merge several systems and also joint work among heterogeneous applications.

Java environment provides a good infrastructure for the development of web services. Java has a powerful feature of being platform independent programming language. Hence has the potential to provide a number of XML APIs, which can be used in the development of web applications (Dezhgosha& Angara, 2005). Java makes an ideal choice for programming web services applications because Java provides robust security features like symmetric and asymmetric for the key encryption techniques. Some tools such as GUI and to test data been merged with Web browsers to allow for testing data (Liu, Kung, Hsia, & Hsu, 2000). Java Server Pages (JSP) is one of the languages code that proved its existence and which occupies a great deal in the global WEB development domain, which are based on the principle of splitting JSP pages into parts for ease of control and to maintain data (Nakaike, Kondoh, Nakamura, Kitayama, & Hirose, 2004) as shown in Figure 1.

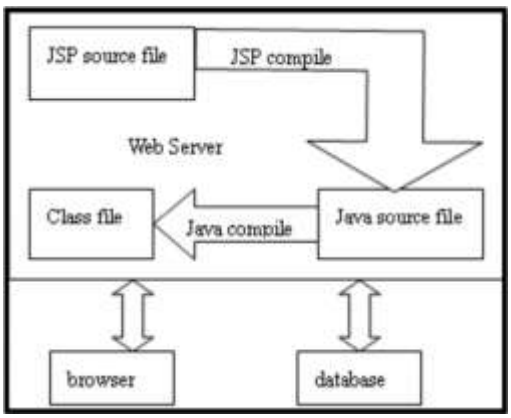

Figure 1. A JSP web server (Nakaike, Kondoh, Nakamura, Kitayama, & Hirose, 2004).

C. Statistical Analysis

Statistical analysis refers to a collection of methods used to process large amounts of data and report (Cowan, 1998). It is particularly useful when deal with huge data and to provide appropriate reports to the conclusion of the information and data collected. Moreover, it is deals with the aspects of study, collect, analyze, interpret and organize data, including planning for data collection in the design of surveys and experiments (Dodge, Cox, &Commenges, 2006). Usually, the used of statistical analysis is to examine the huge amounts of data that are readily available in our daily lives (Mandel, 1984).This due to the need of statistical analysis, especially in the field of research that required providing reports on the results and testing results.

D. Questionnaires

Questionnaires are frequently used in social research and quantitative marketing research. They are a valuable method for collecting a wide range of information from a large number of individuals that often referred to as respondents. For example, in some cases, the questionnaire is designed to assess the level of students' knowledge and expertise in a specific topic using a mobile phone application (de-Marcos et al, 2010). Then, the results is use to design the system which can offer a consultation environment that previously not available. Moreover, staff members can build questionnaires and allow pupils to complete the form anonymously and analyses the results in a collated form (Milne, Gibson, Gregor, &Keighren, 2003). In research field, the researcher collects information directly from participants. However, this tack is difficult to implement because of the number of participants is too large. Set of studies have proven that the best method to primary data collection is to use the online questionnaire system (Birnbaum &Reips, 2005).

The questions in the questionnaire can be divided into open ended and closed questions. Open-ended questions are a set of questions that can be answer by participants, which are not subject to specific answers, but it is free to give their own response. It allows participants to give their own opinions, without compliance to the rules specified. Closed questions are quicker to complete and easier to analysis. Answers are predetermined and the participants have chosen the correct answer for them. Questions may contain a mixture of questions or statements that respondent can answer them (Yes - No) or depend on a Likert scale. The types of survey most frequently used including interviews, telephone interviews, email surveys and internet surveys. Internet surveys is the best approach because it is easy administer, which the sample data can be a large number of participants and relatively low cost compared with the geographical area, whatever their defects, and the response rates are good (Williams, 2003).A

questionnaire design greatly depends on the knowledge and previous experience of the design (Dong-Xiao, Changyong, Wen-En, Ya-Di, Xin, & Wei, 2008).

The advantages of computer-network surveys are faster (Oppermann, 1995), less cost delivery (Anderson &Gansneder, 1995), flexible (Chou, 1997), less paper (Saltzman, 1993) and convenient communication between respondent and researchers (Fisher, Margolis, &Resnick, 1996). The limitations are online surveys must be able to access the internet, respondents may lack the internet experience(Evans &Mathur, 2005) and poorly designed (Granello& Wheaton, 2004) and the cost of time to download and open e-mail (Cho & Larose, 1999).

E. Online Questionnaires

The online questionnaire is one of the most used widely research tools for collect information from respondents (Sudman, Bradburn, & Schwarz, 1996). Since 1995, the use of online questionnaires is increased rapidly, expertly in the field of social and behavioral sciences (Birnbaum &Reips, 2005). Online questionnaires have many advantages such as flexibility, locality, synchronism, representativeness, self-selection, and uncontrolled circulation (Batinic, 2001). Furthermore, using script languages to gather data that are already built in web browsers is inconspicuous. Most users do not realize that data are being collected only. Thus, there are not motivations to monitor the behavior of participants (Stieger&Reips, 2010).

III METHODOLOGY

The research methodology used in this study was general Research Design Methodology (Vaishnavi&Kuechler, 2008) that containing five phases namely awareness of a problem, suggestion, development, evaluation and conclusion as shown in Figure 2.

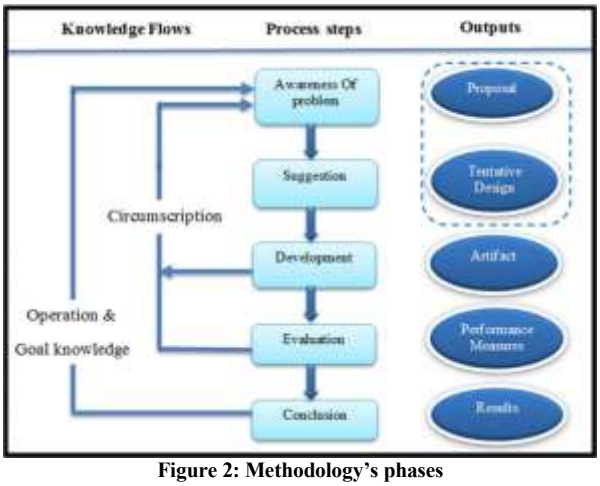

Figure 2: Methodology's phases

A. Awareness of problem

The first stage involved recognizing the requirements of the prototype. This stage concerned with the understanding of the objectives and the scope of the problem. Also involving literature survey from the available sources such as books, journals and reports.

B. Suggestion

The questionnaire was used to collect the through the web site and were analyzed based on of the information. The analyzed and design of the questionnaire wasusing object-oriented approach and supported by the Unified Modeling Language (UML) diagrams as shown in Figure 3. Java Server Pages (JSP) programming language was written after completing designing UML diagram.

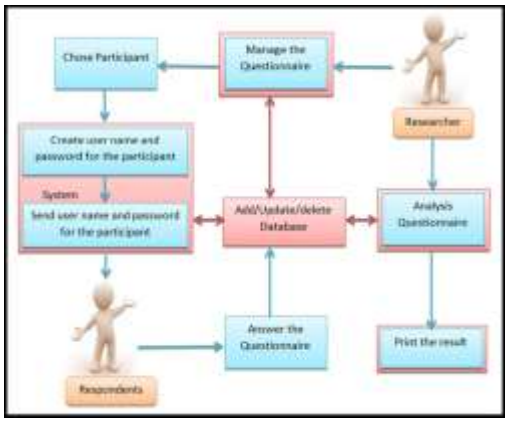

Figure 3: Tentative design processes for the OQS

C. Development

The prototype of the OQS was develop system using an approach by Beck and Andres (2004) called Extreme Programming (XP) shown in Figure 4. XP's steps are planning phase, analysis phase, design phase, develop prototype phase and usability testing.

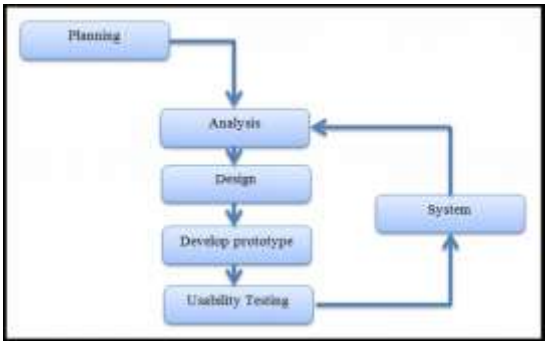

Figure 4: Extreme programming adopted from Beck and Andres (2004).

D. Evaluation

The OQS prototype was evaluated using usability aspects. The method to measure users' usefulness was applied in this research. The system evaluated using questionnaires answered by researcher (students) who decide to use this system in the future. The data wascollected and analyzed using the SPSS software. To get an accurate result,the measurement of usability was tested as long as a link between the users' capabilities and requirements, and the application itself was fulfilled.

E. Conclusion

This phase is the final phase in the research effort. The results will be consolidated and led to the future works that may unify with this application to implement the overall in prototype.

IV FINDINDS

A usability testing is one of the most accepted methods that used in the evaluation phase, because the users are asked to use the real data of the product. The users are usually asked to think while doing the testing. The evaluation is based on usability testing questionnaires (Williams, 2003). The questionnaires have two section, general information and existing practice on using statistical analysis functions. The prototype was assessed through a statistical analysis that distributed of questionnaire for a sample of 29 respondents. Descriptive analysis was choose because it can summarize a data set, rather than use the data to learn about the population that the data are thought to represent.

A. Demographic Data

The first section of the questionnaire focuses on general information about the respondents. The gender chosen based on 17 (58.6%) of the respondents were male and 12 (41.4%) were female. The age ranges between 20-24 years old with 7 (24.1%), 25-29 years old with 9 (31.1%), 30-34 years old with 8 (27.6%) and 35-39 years old with 5 (17.2%). The education level are 7 (24.1%) of the respondents were B.Sc., 17 (58.6%) of the respondents were Master and 5 (17.3%) were PHD.

B. Statistical Analysis Functions in OQS

The summary of the descriptive statistic of the variables is shown in Table 1. All variables were measured using Likert scale (1, 2, 3 and 4 points).The greatest number of respondents (72.4%) said the Internet is the best way to establish the questionnaire. The highest number of respondents (75.9%) agreed that the Internet is the best way to collect data from participants. Most participants (69%) said statistical analysis functions that provide in OQSis sufficient, on the other hand 9 of the participants (31%) said it is not sufficient.Most of the participants (75.9%) conduct the analysis questionnaire necessary to find results, with 24.1%, find it the analysis questionnaire not necessary.

Table 1: The summary of the descriptive statistic of the variables

Questions	Mean	Median	Std. Deviation	Minimum	Maximum
Is the questionnaire on the Internet the best way from the way normal?	1.2759	1	0.4549	1	2
Do you think the use of the Internet to collect data from participants the best possible way?	1.2414	1	0.4355	1	2
Are the statistical analysis functions that provide Online Questionnaire website is sufficient?	1.3103	1	0.4708	1	2
Do you conduct the analysis necessary to complete the usefulness of the questionnaire?	1.2414	1	0.4355	1	2
What is the appropriate method used to analyze the data questionnaire?	1.5172	2	0.5086	1	3
What is your opinion on send an invitation to answer the questionnaire via e-mail?	1.6897	2	0.6038	1	4
What is your opinion on having statistical analysis functions in Online Questionnaire website?	1.5517	2	0.5061	1	4
Do you agree if the statistical analysis functions are used in Online Questionnaire website?	1.6897	2	0.6038	1	4

The results were comparable to the best means used for analysis of the questionnaire and15 persons (51.7%) said it is good to use via computer software. On the other hand, 14 (48.3%) persons said via internet website are the best. The 55.2% of respondents think that send an invitation by e-mail to answer the questionnaire will be useful, and 37.9% of them say it is very useful. Only two participants (6.9%) said it is not useful. Most of the participants (55.2%) say that the useful to insert statistical analysis functions in OQS website. On theother hand, (44.8%) said it is very useful. Most of participants support the use statistical analysis

functions in OQS website. 55.2% of the respondents agreed with the suggestion and 37.9% said that they strongly agree with the idea. Only two participants (6.9%) said it is not agreed with the suggestion.

C. Summary

Validation and evaluation is important take in the development process. The responses of eight questions is to find how the usefulness of OQS. Based on the feedback the view is very encouraging. 55.2% say that the useful is to insert statistical analysis functions in OQS website. On the other hand, 44.8% said it is very useful and 55.2% of the respondents agreed with use statistical analysis functions in OQS website and 37.9% said that strongly agree with this idea. These results above confirm the importance of this study and support the possibility of using OQS.

V CONCLUSION AND FUTURE WORK

The OQS system helps researchers by establishment of a questionnaire and distributed it to the participants to answer this questionnaire. By the way, the statistical analysis functions provided to help the researcher reach the result faster. The feedbacks are encouraging and the respondents agreed to have analytical functions in the OQS.

A. Problems and Limitations

There are many limitations of OQS, such as the researcher must know who the participants and able to access the internet. In addition, respondents may have difficulty in reading or understand the questionnaire, this leads to random answers. In addition, there is cost of time to download and open e-mail and effort to establish and maintain the internet connection. The difficulty identity the participants email in order to send an invitation for the questionnaire is use of the crucial limitation.

B. Future Work

Based on the results obtained from the assessment, the future work is to use the OQS system with UUM learning zone. This well helps studentsand researchers to create questionnaire and distribute to a group of students, and stats in UUM database. Therefore, the researchers are able to collect and analyze information easily, which does not take much time when compared with the normal way.

C. Conclusion

The increasing of internet usage led to use an online questionnaire system to collect the data. The design depends on many factors. Each factor has an impact on quality of the data. The factors are available question formats, administration of the questionnaire, and analysis of the questionnaire results. OQS can be applied in to gather with the UUM learning zone and the researchers need to register to set service on this website. The OQS provides an efficient and effective system to help researchers to create questionnaire as online. The system also enables researchers to analyze questionnaires in a high level, without spend much time to run statistical functions, because the system has supported by SPSS features. According the results of the assessment system, the user prefers to use OQS for developing and using the questionnaire. This is proved the OQS can be used on the web environment.

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