Information Quality Evaluation
of mobile-Government (mGovernment) Services

Ikhlas ZamZami, Murni Mahmud, and Adamu Abubakar

Human Centered Design Group, Department of Information Systems,
Kulliyyah of Information and Communication Technology,
International Islamic University, Malaysia
ikhlas_zamzami23@hotmail.com, murni@iium.edu.my

Abstract. The transactions between the government of a given country and businesses, services, employees' details and roles, the wellbeing of citizens and transactions with other governments is becoming faster and remotely through what is known as an eGovernment system. This system utilizes an information and communication technology platform to perform digital interaction in real time. The mGovernment system is a mobile platform extension of eGovernment, but unfortunately it has drawbacks in terms of gaining citizens' trust and willingness to embark on using the system. Previous studies have attributed this to the state of information quality as well as the privacy and security of transmitted information. This paper focuses on evaluating mGovernment information quality. The quantitative user study of a sample population is based on the assumption that knowledge about reality can be obtained through the eyes of the researcher. The result indicates that the representation format of mGovernment is tied to its information quality, whereas the accessibility, accuracy and relevance of information are also key attributes of mGovernment.

Keywords: mGovernment, Mobile devices, Information quality.

1   Introduction

Mobile communication makes it possible to make voice/video calls, send/receive messages, browse the Internet and makes all sorts of transactions that can be performed on PCs. Mobile devices, specifically mobile phones, are necessarily small in size, and their computational capability is low to deal with huge computational operations. These properties have greatly affected the delivery of certain types of information which may create problems for the user [1]. Therefore, information through mobile devices has to be identified, structured, organized, labeled, specific and straightforward [2]. Conventionally "quality" is regarded as a degree of excellence, which relies on metrics or benchmarks. It is critical that for any aspect of government transactions, information should be presented with a high degree of excellence. However, there are some limitations to the amount and type of information that might be accessed through mGovernment, in addition to the need for presentation of relevant information in real time [3]. It is difficult to understand complicated information on

small screen mobile devices [4]. Mobile sites are like normal sites but are optimized for mobile phones, meaning that their content has fewer features. Information is an important asset to any organization.Received information quality reflects the quality of information a system produces [5]. Data and information quality is commonly thought of as a multi-dimensional concept with attributes varying   according to an author's philosophical viewpoint. It is the objective of this paper to investigate the information quality of mGovernment through a quantitative user study.

2   mGovernment Information Quality

The adoption and implementation of mGovernment is still at an early stage [6]. Implementation involves the utilization of wireless and mobile technologies, services, applications and devices for improving the benefits of the parties involved [7]. Hypothetically, the benefit of implementing mGoverment will be enormous if the information quality on this platform is high; therefore the state of information quality should be investigated with reasonable measures. As a result, this research measures the quality of information on the mGovernment platform using key criteria used in previous research.

2.1   Variables

This research adopted four main key variables (Accuracy of data, Relevance of data, Accessibility of data, Representation) synthesized from previous research [8] on measuring information quality. These four variables represent an independent or antecedent variable. Independent variables are variables that are presumed to cause change in another variable [9]. In this research, the variables are conceptualized with each one of them comprising some numbers of scale items. Information quality in this study represents the dependent variable, which is the outcome or consequence that the researcher seeks to understand or explain [10]. Information quality in the present study is conceptualized as a multi-dimensional construct with multiple indicators. In this way it is possible to incorporate as many measures as possible.

Accuracy of Information
Several studies have used accuracy as a key, as either the only or one of several key dimensions for measuring information quality. This dimension is used in [8] to measure "the extent to which data are correct, reliable, and certified free of error". In this study accuracy will measure the degree of information on mGovernment that is perceived as actual facts on the ground. Thus the following hypothesis is formulated:

H1: *Information quality is associated with Accuracy of Information*

Relevance of Information
This dimension, according Wang and Strong [8], measures "the extent to which data are applicable and helpful for the task at hand". Therefore this research measures the information on the mGovernment platform that is applicable and helpful for the task at hand.   The following hypothesis is formulated:

H2: *Information quality is associated with Relevance of Information*

Accessibility of Information
This is another key information quality dimension, which measures the degree to which information is available on demand. Wang and Strong [8] describe it as "the extent to which data are available or easily and quickly retrievable". Thus for this study Accessibility of Information measures the extent to which mGovernment make information available on demand. Consequently the following hypothesis is formulated:

H3: *Information quality is associated with Accessibility of Information*

Representation of Information
This dimension dwells on aspects of the format of presentation of information at the right place and at the right time. Wang and Strong [8] measure representation consistency as "the extent to which data are always presented in the same format and are compatible with previous data". Thus this research measures the quality of presentation of information in the mGovernment platform, and the following hypothesis is formulated:

H4: *Information quality is associated with Representation of Information*

Conceptualization and Pilot Test
The research process involves conceptualization of research constructs. Conceptualization is the process of taking a construct and refining it by giving it a conceptual or theoretical definition [11]. A construct is thus a conceptual term used to describe a phenomenon of theoretical interest [12] or "an element of scientific discourse that serves as verbal surrogates for phenomenon of interest" [13]. The present research contains four main independent constructs and one dependent variable; these will be conceptualized so that aggregation of the four independent constructs reflects the dependent instance. Thus a conceptual frame work (see figure 1) is proposed, establishing the relationships among the constructs. Prior to the data collection, a pilot test of the scale items from the main constructs was carried out in order to improve the final version. As a result several scale items were deleted, based on the reliability and validity of the results.   The following scale items were deemed fit for data collection:

Accuracy

- The information provided is accurate
- The information provided is reliable
- The information provided is presented in a consistent format

Relevance

- The information provided is relevant to my needs
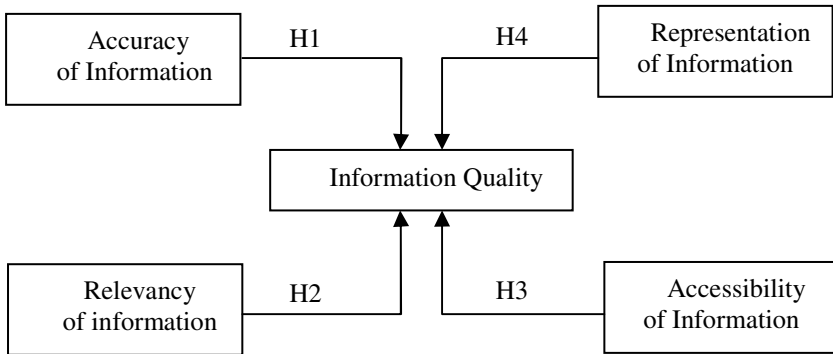- Overall, I find the information provided is useful

Fig. 1. Conceptual framework

Accessibility

- The information provided is quickly accessible
- The information provided is obtainable
- The information provided is easy to retrieve

Representation

- The information provided is easy to understand
- The information provided is easy to read
- The information provided is easy to find
- The information provided is well organized

A total of 300 questionnaires were distributed in MOHE, MOH and MOMRA in Saudia Arabia. The highest usable response rate was from MOHE (33.9% of 86), followed by MOH and MOMRA (33.1% of 84 respectively). 56.1% respondents were male and 48.4% respondents female. 95% of the respondents were under 40 years of age, and 85% had Bachelors level of education. 42% and 48% had been using a smartphone for 1 to 3 and more than 3 years respectively. Finally, 69% and 26% of the respondents respectively used mobile sites always or regularly.

2.2   Treatment of Data Integrity

The data analysis was undertaken with SPSS version 18.0, in two stages. Inferential statistics were used to determine the influence of correlation, Multiple Regression Analysis on the data in order to test for the relationship between the variables and to determine the difference between the independent and the composite dependent variable. Prior to the reliability and validity tests, treatment of normality was undertaken with the aid of the Explore procedure in SPSS. Normality variables were assessed by either statistical or graphical methods [14]: Kolmogorov-Smirnova and Shapiro-Wilk tests were conducted and the results indicate that the entire variables met the normality assumption.

2.3   Reliability Test

A reliability test was conducted on the items using a measure called Cronbach's alpha, which shows the proportion of the variability in the responses to the items, that is the result of differences in the respondents' answers. The alpha minimum value for reliable items varies according to the researcher's views, although 0.5 to 0.6 is the generally agreed limit [14]. Thus Cronbach's (α) values on the items are Accuracy (α= .663), Relevance (α= .644), Accessibility (α= .756) and Representation (α= .782).

3   Results

The results of the correlation analysis indicate that the values of Pearson's (r) correlation coefficient range from r = 0.530 to r = 0.806. The highest correlation coefficient (r) was obtained from the relationship between the accuracy and relevance of information (r = 0.806). This indicates a very strong and significant relationship between them. Pearson's correlation coefficient (r) between accessibility and relevance of information (r = 0.530) was the lowest, although still significant. In general, the entire Pearson's correlation coefficient (r) was positive and significant. This suggests that the entire construct changes directly affect each other in a positive way, as an increase in one results in an increase in the rest. The finding of multiple regressions based on coefficient results indicate that all variables make a statistically significant contribution. Representation of information (Beta = .36, p = .00 at .05 alpha level) makes the strongest contribution to nformation quality. The next is Accessibility (Beta = .30, p = .00 at .05 alpha level), followed by Accuracy and Relevance of information (Beta = .26, p = .00 at .05 alpha level), (Beta = 18, p =.00 at alpha level). Therefore the regression analysis results suggest that information quality can be highly influenced by all the independent variables. Thus the results of correlation and regression analysis (see Table 1) support the entire four hypothesized relationships posed for this research. As a result, the hypothesized model is fit and satisfied a measure for determining the information quality on mGoverment.

Table 1. Multiple Regression Analysis result

Model 1	Beta	T	Sig	Hypothesis
Relevancy	.184	4.561	.000	Accepted
Representation	.365	7.538	.000	Accepted
Accessibility	.305	8.836	.000	Accepted
Accuracy	.267	6.451	.000	Accepted

4   Conclusion

This study focuses on the information quality of mGovernment. It is a responsibility of any government to serve the wellbeing of its citizens and ensure efficient transactions within the state and with other governments. The study investigated the information quality on mGovernment through a quantitative research approach. It utilized a hypothesis testing approach in order to generalize the outcome. A total of 254 respondents

participated in the survey. Their responses were analyzed using statistical analysis tools. The result indicates that the representation format of mGovernment information is a major influence on information quality. Accessibility, accuracy and relevance of information are also key variables supporting the information quality of mGovernment.

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