The relationship between information quality and national cultural in Jordan: conceptual framework

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Abstract

There is a lack of agreement on the theoretical and empirical relationships between quality project and culture, and their relative power as predictors of quality of project.

This study combination TAM model and culture dimensions as suggested model to predictable acceptance of information quality. A possible contribution is to understanding the role of acceptance technology theory in information quality, to explore national culture affected information quality. And to explores perceptions of information quality held by information technology professionals and held by data consumers.

A researcher attempts to validate Hofstede's national culture dimensions, TAM model for the case of information quality and researcher extended technology acceptance model (TAM) as theoretical framework to test and predict quality of information and to explore whether national culture influences users' perception where the People do things because they believe it is right thing to do.

Key words: information quality, national culture, Technology Acceptance Model (TAM).

Introduction

Information is becoming a signification resource in a societies and organizations. Information quality is becoming recognized as a critical and competitive strength in business.

Information quality is not an entirely new concept, but it has gained increasing attention during the last few years, also in business communities. Much like information, the concept of quality is defined in different ways by different people.

The quality perception is that the customer must believe that the product or service is the right one, satisfies his or her needs, meets his or her expectations, and is delivered with integrity, courtesy, and respect. Further, quality is also described by a number of dimensions, durability, performance, competitiveness, process capability, freedom from errors, and reliability being just some of them. Further, these dimensions vary in their importance as a commonly accepted dimension of quality.

Wang and Strong (1996) show that users view some quality dimensions as impartial - i.e., the perception of quality along these dimensions is based on the data itself, regardless of how that data is used. Other dimensions are viewed as being contextual and the perception of quality along these depends on the decision context in which the data is used.

Quality information will improve consumers' provider choices only if it considers the features of care that consumers perceive as relevant to their provider choices. A large number of recent studies describe consumer perceptions of health care quality. These studies typically employ focus group and survey methods to elicit consumer perspectives on important factors considered in choosing a health care provider. These studies find that consumers conceptualize and value quality of care as distinct from other features of care, such as cost, access and convenience (Robinson, 1997).

The reason of why discussion of cultural effects on IT adoption is lacking is that most empirical studies have been conducted in North American culture, mostly in U.S firms. Culture does have an impact on an individual's decision-making to adopt and use a specific system. The examination of cross-cultural working and IS is dominated by Hofstede-type studies (Myers and Tan 2002).

The problem of poor data and information quality is widespread and plays a critical role for all organizations whose activity is based on communication and information. Insufficient quality of information and data often leads to numerous negative effects; it can disrupt business processes and interfere with decisions or can compromise communication and understanding among people.

There is a lack of agreement on the theoretical and empirical relationships between quality project and culture, and their relative power as predictors of quality of project. This study sought to examine the association between self-report measures of quality project and culture.

A researcher will attempt to validate Hofstede's national culture dimensions, TAM model for the case of information quality by extended technology acceptance model (TAM) as theoretical framework to test and predict quality of information and to explore whether national culture influences users' perception and affected information quality. And to explores perceptions of information quality held by information technology professionals and held by data consumers. Where the People do things because they believe it is right thing to do.

Information Quality

Information is money and time. Recent studies show that data quality problems are costing businesses billions of dollars every year, with poor data linked to waste and inefficiency,

damaged credibility among customers and suppliers, and an organizational inability to make sound decisions.

Strong and Wang (2002) defined Information quality is the characteristic of information to meet or exceed customer expectations.

Wand and Wang (1996) define data quality as the quality of mapping between a real world state and an information system state. In a more recent work, Eppler in2003 adopts both definitions of quality - meeting the customer expectations and meeting the activity requirements - acknowledging the important duality of quality: subjective (meeting the expectations) vs. objective (meeting the requirements) (Besiki et.al.2008).

Wang and Strong (1996: 6) define 'data quality' briefly as "data that are fit for use by data consumers". Wang and Strong (1996) show that users view some quality dimensions as impartial - i.e., the perception of quality along these dimensions is based on the data itself, regardless of how that data is used. Other dimensions are viewed as being contextual and the perception of quality along these depends on the decision context in which the data is used.

Lane Keller and Staelin (1987) defined information quality as the information's inherent usefulness to consumers in assessing the utility of an alternative. In studying the effects of quality and quantity of information on decision effectiveness, they operationalized information quality as the cumulative score of an individual's importance weights for certain attributes provided. In that case, the attributes were associated with job preferences. A major conclusion that consumer's perceptions of the usefulness of an informational environment are strongly associated with their measure of information quality.

Lists of information quality dimensions have been produced by Wang and Strong (1996).they report the results of a study that identified the attributes of data quality that were important to data consumers. Wang and Strong took an empirical approach to studying data quality. They followed the methods developed in marketing research for determining the quality characteristics of products. They first collected data quality attributes from data consumers, then collected importance ratings for these attributes and structured them into a hierarchical representation of data consumers' data quality needs. From initial 179 data quality attributes Wang and Strong (1996) developed a hierarchical framework with four data quality categories and fifteen dimensions:

DQ Category	DQ Dimensions
Intrinsic DQ	Accuracy, Objectivity, Believability, Reputation
Accessibility DQ	Accessibility, Access security
Contextual DQ	Relevancy, Value-Added, Timeliness, Completeness, Amount of Data
Representational DQ	Interpretability, Ease of understanding, Concise representation, Consistent representation

Table 1- DQ Categories and Dimensions (Wang and Strong 1996)

The quality attributes were collected from data consumers instead of being defined theoretically or based on researchers' experience. Wang and Strong justify their framework by the fact that a data quality framework had not existed before – and one was needed to enable measurement, analysis and improvement of data quality in a valid way. Their framework provides a basis for deciding which aspects of data quality to use in any research study. The definitions for all the dimensions are listed in appendix1.

Wang and Strong's framework has more dimensions than works of some other researchers. Earlier, most studies were based on a small set of quality attributes that were commonly selected (for instance, accuracy only). The framework has been utilized and advocated later by Wang et al. (1998), Wang (1998),Kahn, Strong and Wang (2002) and Lee, Strong, Kahn and Wang (2002). Although the exact number of dimensions considered and the arrangement of the dimensions varies somewhat from researcher to researcher, the essence of this model now has broad support among the information quality research community.

Helfert and Herrmann (2005) described a case at a large financial services company that adopted the product metaphor for improving the quality of data in a data warehouse. The data warehouse included metadata regarding the transfer process, but none about data quality. At the start of the project, users had very low confidence in the data and complained frequently, not only about the poor quality, but also about the inconsistent quality and the inability to distinguish good data from bad. They reported that "overall, the initiation of data-quality management can be characterized as a success" (p. 145). Although no quantitative analysis was performed, they observed a significant reduction in complaints and an increase in user acceptance of the data warehouse. The processes were well accepted, a fact "attributed to the continuous involvement of business users and technical staff in the data-quality project" (p. 145).

Wang et al. (1998) reported on several cases in which information quality problems were identified, but not resolved. Despite the lack of reportable success, these cases are instructive.

The authors of this study proposed treating information as a resource in order to solve a quality problem with information provided by government agencies to the Florida citrus industry. The authors noted that even in this narrowly defined industry in one state, official data come from

more than 50 publications of 13 different governmental agencies, creating inconsistencies and confusion for users.

DeLone and McLean (1992, 2003) published articles in which they explored the notion of information system (IS) success. In seeking an explanation for IS success as a dependent variable, they developed taxonomy of IS success consisting of six dimensions: system quality, information quality, service quality, use, user satisfaction, net benefits. This taxonomy As DeLone and McLean described it; the arrangement of these dimensions is intended "to suggest an interdependent success construct while maintaining the serial, temporal dimension of information flow and impact" (p. 83). They reviewed were several articles that evaluated the role of information quality, which was shown "to be strongly associated with system use and net benefits" (p. 21). There were also several studies focusing on system quality. system quality was measured" in terms of ease-of-use, functionality, reliability, flexibility, data quality, portability, integration, and importance" DeLone and McLean (2003, p. 13).

Managing data quality is critical to the success of information systems (IS). Quality influences IS adoption and end-user satisfaction at the individual level, thus affecting the positive contribution of information systems to organizational performance (DeLone & McLean, 1992).

ISO 9001 (2000) defined Quality as "the degree to which a set of inherent characteristics fulfills the requirements." The software product quality model provided in ISO/IEC 9126-1 (ISO9126, 2001) defines six quality characteristics:

Portability: adaptability, installability, conformance, replaceability.

Maintainability: changeability, Stability, Testability.

Usability: understandability, learnability, operability, attractiveness.

Reliability: maturity, fault tolerance, recoverability.

Efficiency: time behavior, resource behavior, analyzability.

Functionality: suitability, accuracy, interoperability, security.

The six quality characteristics have defined sub characteristics, and the standard also allows for user-defined components. The intention is that the defined quality characteristics cover all quality aspects of interest for most software products and, as such, can be used as a checklist for ensuring complete coverage of quality early in the specifications phase.

We should be interested in the cultural aspects of quality is that any change an organization wants to make, for example, moving up on the Capability Maturity Model integration SM (CMMiSM) (SEI, 2002) maturity scale, cannot simply be ordered; the organization has to cope with the current culture when making a change in maturity, especially when such a change implies a profound change in that culture. An organization cannot just “buy and deploy” off-the-shelf processes that contain quality.

Ahn et.al, (2007) investigated the effect of playfulness on user acceptance of online retailing and tested the relationship between Web quality factors and user acceptance behavior. A survey of 942 users of Web-based online retailing was conducted to test a model. The results showed that playfulness plays an important role in enhancing user attitude and behavioral intention to use a site. they also found that Web quality, categorized into system, information, and service quality, had a significant impact on the perceived ease of use, playfulness, and usefulness, and consequently, that it encouraged website use in the context of online retailing.

Information system resources create value only when used and integrated into business processes (Davern & Kaufmann, 2000). We hence suggest that the quality attributed to data and associated economic benefits are influenced by the business context in which that data is used.

Contextual factors such as personal characteristics, decision task, and organizational settings have been shown to strongly influence perceptions of data quality (Shankaranarayanan & Watts, 2003), and significantly affect decision outcomes (Lee et al., 2002; Lee et al., 2003).

Definition of Culture and the Levels of National Cultural

The term culture can refer to professional culture, organizational culture, and national culture. According to Hofstede national culture is defined as "the collective programming of the mind which distinguishes the members of one human group from another" Hofstede (2000).

Hofstede argued that they couldn't assume that organizational cultures exist independently of national cultures because organization's culture is nested within a national culture. This mental programming shapes values, beliefs, assumptions, expectations, perceptions and behavior. Therefore, national culture influences human resource practices and organizational behavior. Hofstede in 1993 developed a definition of culture based on knowledge: "Culture is the means by which people communicate, perpetuate, and develop their knowledge about and attitudes toward life" .So a Culture is a set of unique values and beliefs that guides the behavior of people belonging to that culture.

Hofstede proposes four cultural dimensions Hofstede (2000): Individualism-collectivism, masculinity-femininity, power distance, and uncertainty Avoidance. The major assertion of Hofstede's framework is that there are shared values, Beliefs and norms that are culture specific and these factors can predict a wide range of Human behavior and practices.

In cognitive terms, Hofstede in 1980 noted national culture is viewed as a set of shared meanings transmitted by a set of mental programs that control responses in a given context. The basic thesis of a cognitive approach to culture is that processing frameworks acquired in one culture persist and influence behavior even though contextual circumstances change (Hofstede, 2000). Power Distance (PD): The extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally (p. 98). Uncertainty Avoidance (UA): The extent to which the members of a culture feel threatened by uncertain or unknown situation (p. 161) Individualism (IND) it stands for a society in which the ties between individuals are loose (p. 225) and known as individualism/collectivism: versus societies in which the interests of the group prevail over the interest of the individual. Masculinity/femininity: masculinity stands for a society in which social gender roles are clearly distinct while femininity is a society having gender roles overlap (Hofstede, 2001).

This research employs Hofstede's model, because it has been shown as a reliable and useful tool to identify and explain the cultural differences in numerous studies across many disciplines.

Information systems and Cultural Relationships

Traditionally, sociologists have referred to the study of how groups of people share meaning and resolve their common problems as the study of culture (e.g., Hofstede, 1991).

Straub, Keil, & Brenner, (1997) they conducted a three-country study to test the TAM across cultures— Japan, Switzerland and the United States. The study administered the same TAM construct instruments to employees in three different airlines companies, all of them had access to the same IS, i.e. email. The results demonstrated that TAM holds for both the U.S. and

Switzerland, but not for Japan. This implies that TAM may not predict technology use across all cultures in the world. This implies that TAM may not predict technology use across all cultures in the world. They did not attempt to relate TAM to any cultural instrument. In fact, the authors, and others, point out that caution should be exercised when interpreting these findings since social and cultural norms could predict IT use. TAM is widely regarded as a relatively robust theoretical model for explaining IT use. From a practitioner perspective, TAM is useful for predicting whether users will adopt new information technologies.

When investigating the aspect of culture, IT researchers have primarily relied upon the national cultural dimensions by Hofstede (1980), which reflects a "national character" portrait of a society.

Straub (1994) used Hofstede's dimensions to study the diffusion of e-mail and fax in the United States and Japan. He found that the uncertainty avoidance characteristic of the Japanese caused them to be less likely to accept e-mail. He also concluded that culture played an important role in the adoption and use of electronic communications media.

Robichaux and Cooper (1998) developed a research model in order to identify the interaction of culture and group support systems (GSS). Their research made use of Hofstede's cultural dimensions and the TAM and focused on North American countries. Although, the authors did not empirically test their model, they did develop several propositions.

Other studies on the influence of cultural on GSS use include Watson, Ho, & Raman (1994) study of Singaporean groups' use of GSS. However, in both of the studies, the technology was already accepted and in use. The research measured this use and the effect of culture on how the groups used the system.

More recently, Srite and Karahanna (2006) used the extended TAM with Hofstede's cultural dimensions as moderators to study the role of national cultural values on the acceptance of information technology. However, their data was collected from graduate and undergraduate students who attended the same university. They did not draw their sample directly from specific countries.

The obvious reason of why discussion of cultural effects on IT adoption is lacking is that most empirical studies have been conducted in North American culture, mostly in U.S firms. Culture does have an impact on an individual's decision-making to adopt and use a specific system. The examination of cross-cultural working and IS is dominated by Hofstede-type studies (Myers and Tan 2002).

The study Khalifa and Cheng (2002): which were conducted in Hong Kong, did not arrive at a similar conclusion? But one result might be enough to question whether the TAM cannot equally predict user behaviour across culture. It calls our attention to considering the cultural dimensions of the TAM when studying user behaviour in other cultures than just North America.

Hofstede (2000) the paper investigates the specific attributes of countries that influence IT adoption speed. Findings show that cultural variables (individualism and uncertainty avoidance) can be used to predict the ease and speed of changes. Cultures of high uncertainty avoidance are slow of adopting new technologies.

MacGregor et.al. (2005) discussed some concern that agile methods are inherently western in orientation and do not translate well to other cultures. He mentioned that high power distance cultures will not gain the same benefit from some agile practices. For example, in a

culture where an employee rarely, if ever, contradicts and/or speaks freely in front of a manager, the benefit of a daily scrum would be minimized if not completely lost. The issue of 'face' in conjunction with the "customer on site" practice may interfere with a team's ability to engage in out-in-the-open risk assessment activities.

Veiga, Floyd & Dechant (2001) this study discussed the effects of national culture on the acceptance of IT, using the Technology Acceptance Model (TAM). The authors compared acceptance in Japan and the United States and the findings suggest that Hofstede's dimensions of cultural differences play distinct roles in influencing the acceptance.

Technology Acceptance Model (TAM)

A key purpose of TAM is to provide a basis for tracking the impact of external factors on internal beliefs, attitudes, and intentions. TAM was formulated in an attempt to achieve these goals by identifying a small number of fundamental variables that deal with the cognitive and affective determinants of computer acceptance (Davis et al., 1989).

Davis adapted Ajzen and Fishbein's (1980) Theory of Reasoned Action (TRA) to model (figure 1) intentions to accept information technology. Davis' (1989) technology acceptance model was extensively tested and is widely accepted among researchers in the field of IT as a theoretically based model with good predictive validity. TAM explains the causal links between beliefs and users' attitudes, intentions, and actual usage of the system.

Previous researchers identified two determinants that are (Davis, 1989): The first variable is referred to as the perceived usefulness of IT technology; even if potential users believe that a given application is useful, they may, at the same time believe that the systems is too hard to use and that the performance benefits of usage are outweighed by the effort of using the application.

Davis et al. (1989) defined perceived usefulness as “the degree to which a person believes that using a particular system would enhance his or her job performance” (p. 320). Within the organizational context, people are generally reinforced for good performance by raises, promotions, bonuses, and other rewards. A system high in perceived usefulness, in turn, is one that a user believes will lead to a positive use performance relationship.

Perceived ease of use, in contrast, refers to “the degree to which a person believes that using a particular system would be free of effort” (p. 320).

Since Davis’ (1989) explanation of these constructs, numerous researchers discovered that technology acceptance theory yields consistently high explained variance for why users choose to utilize systems.

Depicted in Figure 1 is Davis’ (1989) model which is included a major three variables are Perceived usefulness (U) and perceived ease of use (EOU) are independent variables. The dependent variable is the system usage. Other mediating variables of TAM include attitude toward use and behavioral intention to use.

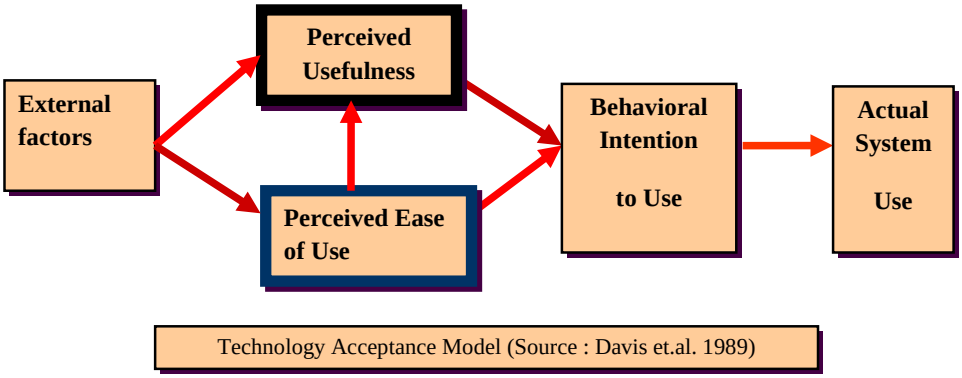

Figure 1: Technology acceptance model (TAM) (Davis, 1989)

TRA is based on the assumption that human beings make rational decisions based on the information available to them. Stated otherwise, TRA indicates that behavior (e.g., toward an information system or system usage) is best predicted by intentions, and that "intentions are jointly determined by the person's attitude and subjective norm concerning the behavior" (Fishbein & Ajzen, 1975). Attitude describes an individual's positive or negative feelings (evaluative affect) about performing the target behavior (e.g., Fishbein & Ajzen).

Davis et al. (1989) found that behavioral intention to use the system is significantly correlated with usage, and that behavioral intention is a major determinant of user behavior, while other factors influence user behavior indirectly through behavioral intentions.

According to TAM model perceived usefulness and perceived ease of use are major beliefs that influence attitude toward system use and eventually lead to actual system use. When IT professionals foster users' beliefs in ease of use and usefulness of the focal IT, adoption and usage are likely to occur.

Conceptual Research model and hypothesizes

Based on previous studies it focus on the factors that affect information quality and shown the willingness of individuals is the mainly motivation to accept quality. Researcher belief the significant factor is culture that value, belief, attitude toward things, benefits and cost and so on is affected quality of information in organization and society in general and how identify professional and user's expectations quality. To develop an integrative view of the forces influencing information quality especially national culture, acceptance technology, researcher adopted TAM model as an initial theoretical frame.

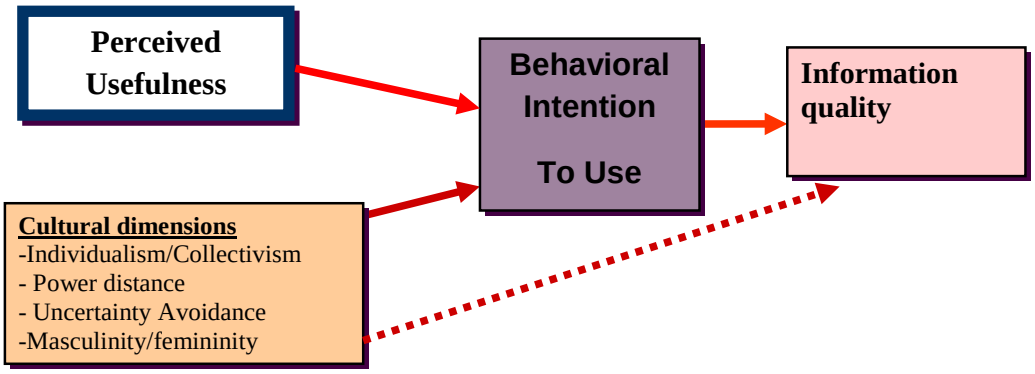

Figure 2 : A Proposed Conceptual research model

Researchers have developed the following suggested hypothesizes to test the proposed conceptual model, which are:

H1: There is a positive relationship between national culture and Behavioral intention to use.

H1-1: There is a positive relationship between Individualism and Behavioral intention to use.

H1-2: There is a positive relationship between uncertainty avoidance and Behavioral intention to use.

H1-3: There is a positive relationship between power distance and Behavioral intention to use.

H1-4: H1-3: There is a positive relationship between masculinity and Behavioral intention to use.
H2: There is a positive relationship between perceived usefulness and behavioral intention to use.
H3: There is a positive relationship between behavioral intention to use and information quality.
H4: There is a positive relationship between national culture and information quality.

Research Methodology

To test the proposed research model, researchers adopted the survey method for data collection, and used PLS graph. PLS is a powerful approach for analyzing models and theory building because of the minimal demands on measurement scales, sample size, and residual distributions (Chin, 1998 in Yong et.al.). In addition, the component-based PLS avoids two serious problems: inadmissible solutions and factor indeterminacy (Fornell and Larker 1981 in Yong et.al.). Unit of analysis will be the individual. The researchers developed the items in the questionnaire either by adapting measures that had been validated by other researchers or by converting the definitions of constructs into a questionnaire format .

We employed the measurement items for TAM constructs from previous studies (Davis, 1989; Davis et al., 1989; Venkatesh and Davis, 2000). Scales of perceived usefulness were modified from those developed and rigorously validated by Davis (1989).

where items national culture adapted from Hofstede‘s dimensions national culture. The sample will be composed of people whom work related to study fields in Jordan. Data collection will be conducted through questionnaires. Most of the questions in the survey are based on previous well-validated instruments.

The data obtained will be tested for reliability and validity using confirmatory factor analysis (CFA) and Cronbach’s. A confirmatory factor analysis used to test the construct validity of the multi-dimensional construct cognitive absorption.

Conclusion

This paper's objective is to explore the national culture affected information quality based on TAM model which is extended by suggesting a more coherent conceptual framework. To understanding the role of acceptance technology theory in quality of information, and to explored national culture affected information quality and to explores perceptions of information quality held by information technology professionals and held by data consumers.

The researcher supports their suggested model by reviewing a number of related studies which investigated the information quality and were influence by national culture as intention and attitude behavior. Then, the researchers aimed at the next coming step are to validate the proposed model through empirical investigation and testing.

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appendex1

Definitions of information quality dimensions (Source: Wang and Strong, 1996.)

- **Believability:** The extent to which information is accepted or regarded as true, real and credible.
- **Value-added:** The extent to which information is beneficial and provides advantages from its use.
- **Relevancy:** The extent to which information is applicable and helpful for the task at hand.
- **Accuracy:** The extent to which information is correct, reliable and certified free of error.
- **Interpretability:** The extent to which information is in appropriate language and units and the information definitions are clear.
- **Ease of understanding:** The extent to which information is clear without ambiguity and easily comprehended.
- **Accessibility:** The extent to which information is available or easily and quickly retrievable.
- **Objectivity:** The extent to which information is unbiased (unprejudiced) and impartial.
- **Timeliness:** The extent to which the age of the information is appropriate for the task at hand.
- **Completeness:** The extent to which information is of sufficient breadth, depth and scope for the task at hand.
- **Traceability:** The extent to which information is well documented, verifiable and easily attributed to a source.
- **Reputation:** The extent to which information is trusted or highly regarded in terms of its source or content.
- **Consistent representation:** The extent to which information is always presented in the same format and is compatible with previous information.
- **Cost-effectiveness:** The extent to which the cost of collecting appropriate information is reasonable.
- **Ease of operation:** The extent to which information is easily managed and manipulated (i.e., updated, moved, aggregated, reproduced, customized).
- **Variety of information and information sources:** The extent to which information is available from several differing information sources.
- **Concise representation:** The extent to which information is compactly represented without being overwhelming (i.e., brief in presentation, yet complete and to the point).
- **Access security:** The extent to which access to information can be restricted and hence kept secure.
- **Appropriate amount of information:** The extent to which the quantity or volume of available information is appropriate.
- **Flexibility:** The extent to which information is expandable, adaptable and easily applied to other needs