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Information Quality and Decision-making Effectiveness: A Study of Banks in Palestine

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ABSTRACT

Studies carried out on large banking firms across the globe suggest that information quality affects decision making, and managers are likely to be blamed the most for making right or poor decisions. However, few of the previous studies focused on how information quality affects decision making among bank managers operating in Palestine, which revealed the important role of information quality in decision-making effectiveness. A sample of 146 bank managers in Palestinian banks was recruited. The data collected were analyzed by SPSS and partial least squares-structural equation modeling for descriptive and hypothesis testing. The findings indicated the relevance and importance of information quality dimensions to decision-making effectiveness in the banking sector of Palestine. The results can guide banks in Palestine to understand better and utilize the information facilities at their disposal towards the provision of sustainable banking services in Palestine.

Keywords: Banking Sector, Decision-making Effectiveness, Information Quality
JEL Classification: D7

1. INTRODUCTION

The banking sector is considered a major source of financing for most businesses and organizations in Palestine (Alkhatib and Harsheh, 2012). The common assumption is that a company's business success depends much on its financial performance because a good financial standing allows it to improve its functions and activities (Alkhatib and Harsheh, 2012). Because banks are the primary source of financing, it is imperative to understand how bank managers make effective decisions to meet the bank's objectives of providing financial assistance to business companies and other organizations.

According to Abdel-Karim and Shahin (2013), information quality is important to modern organizations. However, there is limited research on the role of information in managerial decisions (Bettis-Outland, 2004; Popovich, Coelho, & Jaklic, 2012, 2012). Even though past studies have highlighted positive relationships between quality of information and quality of decisions, very few empirically examined the relationship between information quality and decision effectiveness (Alkhatib and Harsheh, 2012; Slone, 2006).

In general, decision makers and planners in both private and public sectors in Palestine are facing the problem of poor information quality (Nusseir, 1995; Sa'ed et al., 2010). The Ministry of Information and Communication Technology of Palestine suggested that lack of Information Communication Technology usage among managers is a major weakness and causes poor information quality which may subsequently lead to low-quality decisions (Alkhatib and Harsheh, 2012; Tamir et al., 2015). Despite this problem, the few studies that examined the relationship between information quality and decision making were mainly conducted in the USA and Western countries, and very few in the developing countries such as in the Middle East (Ahmad and Zink, 1998; Beersma et al., 2016). Thus, this study was carried out to fill the existing gap in the literature.

2. LITERATURE REVIEW

2.1. Decision-making Effectiveness

In order to be effective in making decisions, managers have to consider, assess, and evaluate several choices or alternatives. Thus, decision-making is a systematic and incremental process that consists of recognizing, acting, and selecting alternatives by using utility functions (Ehsani et al., 2010). Making effective decision means making the correct choice among several options. But to do so, it depends on the quality of information available to the decision maker (Dean and Sharfman, 1996).

Previous research showed that managers are able to learn to manipulate successfully and manage complex causal systems (Hagmayer and Meder, 2013). This is because making a decision involves metacognitive processes that can allow individuals to exert cognitive control by enabling them to generate multiple, alternative decision frameworks that focus on interpreting, planning, and implementing goals (Haynie et al., 2009).

2.2. Information Quality

Information can be defined from the organization's perspective as data that need to be processed (Michnik and Lo, 2009). Without adequate processing of such data, organizations may not have the necessary information to operate effectively. Some scholars view information and data in a similar light (Gwartney et al., 2008). An appropriate alternative definition of information that can be used is provided by English (2000) who stated that information is not a by-product, nor documentation, but rather it is a direct product of process used to capture knowledge about persons, places, things, and events discovered while conducting business transactions. When managers have the necessary information, they can make good decisions as information can be tabulated into diagrams which managers can interpret.

According to English (2000), there is an indication to support the perception that good information can help lead an organization towards effective decision making. However, it is difficult to make correct decisions without processed data or information in each activity and phase of the decision-making. This is because of the increasing numbers of alternatives, time constraints, decision complications, the cost of making wrong decisions, and the need to access appropriate information (Buhalis and Law, 2008). In other words, information has value if it contributes to decision-making effectiveness for the organization. That is, the value of information should be measured to determine if that information is useful to a particular organization (William et al., 2007).

Findings from past studies indicated that useful information improves decision making, enhances efficiency, and provides a competitive edge to the organization. As pointed out by Petter et al. (2013), quality of the information circulated by several sources is a major problem encountered by information users. This is because most information sources are not well-structured and, hence, they cannot be relied upon to get information with high-quality attributes (Baars and Kemper, 2008). The quality of information received can be measured against its attributes or dimensions, such as accuracy, accessibility, relevancy, timeliness, completeness, and interpretability.

Accuracy is not the only important factor in determining the quality of information. Accuracy depends on how the data is collected and is usually judged by comparing several measurements, calculations, or specifications from the same or different sources to the correct value or a standard (Widom, 2004). Accurate information enables a decision maker to make effective decisions. On the contrary, if the information is inaccurate or incorrect, it leads to lack of precision in the decisions made.

Accessibility can be defined as the availability of data and ability to obtain or retrieve when needed by managers (Delone and McLean, 1992). Accessibility of information quality is connected with the problems of the medium of communication rather than the data itself. Poor or unavailable communication channels may lead to problems of accessibility.

Relevancy means that the data should have relevance to the task at hand (Wang and Strong, 1996). DeLone and McLean (1992) considered relevancy as one of the important dimensions of information quality. It is argued that when data is relevant to the task at hand, this means that it is adequate for managers to make decisions (Miller, 2005; Wang and Strong, 1996).

According to Schaffer (2008), timeliness of information means the sooner the information is available to decision makers; the faster it is for them to make decisions. Completeness of information can be defined as the extent to which data are of sufficient breadth, depth, and scope to the task at hand (Wang and Strong, 1996). This definition is task-centered and is derived from the intended use of the information for managers. According to the data-centered view, completeness is defined as all values for a certain variable that are recorded (Ballou and Pazer, 1985).

Interpretability implies ease of understanding. In information quality perspective, interpretability is concerned with the interpretational semantic aspect. According to Kahn et al. (2002), interpretability refers to the extent to which information is in appropriate languages, symbols, and units; the definitions are clear and adhere to technical aspects, for instance, whether the information is represented using appropriate notation.

Based on the above arguments on the role of information quality, we developed the following hypotheses:

H_{1a}: Accuracy of information has a significant relationship with decision-making effectiveness.

H_{1b}: Accessibility of information has a significant relationship with decision-making effectiveness.

H_{1c}: Relevancy of information has a significant relationship with decision-making effectiveness.

H_{1d}: Timeliness of information has a significant relationship with decision-making effectiveness.

H_{1e}: Completeness of information has a significant relationship with decision-making effectiveness.

H_{1f}: Interpretability of information has a significant relationship with decision-making effectiveness.

3. METHODS

3.1. Data Collection Procedure

An online survey form was created for the data collection purpose. Data were collected from 146 bank managers working in either conventional or Islamic banks across Palestine after approval from the respective bank management was secured.

3.2. Measures

3.2.1. Decision-making effectiveness

Three dimensions of decision-making effectiveness were considered. They were quality, commitment, and satisfaction. Quality refers to the extent to which the decision maker is confident in his/her decision, and whether the decision is comprehensive, reliable, and understood by subordinates. Four items were used to measure this dimension. The items were taken from various sources (Fisher et al., 2003; Ives et al., 1983).

Commitment refers to the extent to which a subordinate is committed to accepting the decision in order that it may be successfully implemented. Four items were used to measure this dimension. The items were taken from various published research (DeShon and Landis, 1997; Hollenbeck et al., 1989; Ivancevich and Matteson, 2008).

Satisfaction is defined as the extent to which the sum of one's feelings or attitudes towards the decision. Four items were used to measure this dimension, which were adopted from various sources (Cai, 2007; Fisher et al., 2003; Lilien et al., 2004; Speier and Morris, 2003).

3.2.2. Information quality

Six dimensions of information quality were examined, which are accuracy, accessibility, completeness, relevancy, timeliness, and interpretability.

The accuracy dimension was measured by three items, accessibility by four items, completeness by four items, relevancy by four items, timeliness by four items, and interpretability by five items. All items were taken from various sources of previous research (Bovee et al., 2003; Grafe and Werner, 2004; Kahn et al., 2002; Lee et al., 2002; Miller, 2005; Najjar, 2002; Slone, 2006; Wang and Strong, 1996). All items for decision-making effectiveness and information quality were measured on a five-point Likert scale, ranging from "1" ("strongly disagree") to "5" ("strongly agree").

3.2.3. Demographic information

Personal information about the bank managers under study was also sought. It includes gender, age, level of education, and work experience.

3.3. Data Analysis

Data were analyzed by using partial least squares (PLS), which is a structural equation modeling (SEM) technique that is based on path analysis and regression analysis. PLS is good for both theory confirmation and exploratory research (Chin, 1998). PLS involves two types of assessment, namely the measurement model and the structural model.

The measurement model specifies the relationship between the indicators and the latent construct they are intended to measure. Assessment of the measurement model requires examining two types of validities, namely convergent validity and discriminant validity (Chin, 1998). Convergent validity indicates the degree to which theoretically similar constructs are highly correlated with each other. Alternatively, discriminant validity indicates the degree to which a given construct is different from other constructs. Collectively, these two validities provide some evidence regarding the goodness of fit of the measurement model.

On the other hand, the structural model's characteristic is measured by studying the R^2 determination coefficients and regression estimates and statistical significance. The R^2 value exemplifies an amount of prognostic power and shows the extent of divergence, justified by its antecedent variables in the model. The model's R^2 values should be high enough to reach a minimum level of explanatory power (Urbach and Ahlemann, 2010). Chin (1998) considers R^2 values of 0.67, 0.33, and 0.19 as significant, reasonable, and poor, respectively. The path coefficient value measures how strong the link between two variables is. To indicate a certain influence, the path coefficients should exceed 0.1 within the model, and be substantive at the 0.05 level of significance at least.

4. RESULTS

4.1. Profile of Participants

Table 1 shows the profile of the participants. The majority of the bank managers who participated in the study were male (90.4%). Close to half of them were <45 years old (43.8%). In terms of education, the majority held a bachelor's degree (84.2%), and most of them had been working in the bank for a long period of time, between 10 and 20 years (99.0%), indicating that the sample had fairly good experience in making decisions.

4.2. Assessment of the Measurement Model

The purpose of the measurement model analysis is to ensure the measures used are valid and that they adequately reflect the

Table 1: Respondent characteristics.

Characteristic	Category	Frequency	Percentage
Gender	Male	132	90.4
	Female	14	9.6
Age	45 years old and lower	64	43.8
	Above 45 to 50 years old	50	34.2
	Above 50 years old	32	22
Education Level	Diploma	6	4.1
	B.Sc.	123	84.2
	Master	13	8.9
	PhD	4	2.7
Experience	> 10 Years	5	3.4
	10-15 Years	66	45.2
	15-20 Years	64	43.8
	> 20 Years	11	7.5
	Total	146	

Table 2: Summary of results of measurement model

Component	Item	Main loading	AVE	Composite reliability
Accuracy	Acc1	0.870	0.736	0.917
	Acc2	0.880		
	Acc3	0.898		
	Acc4	0.778		
Accessibility	Abl1	0.897	0.793	0.939
	Abl2	0.885		
	Abl3	0.899		
	Abl4	0.881		
Completeness	Com1	0.882	0.795	0.939
	Com2	0.885		
	Com3	0.904		
	Com4	0.895		
Relevancy	Rel1	0.887	0.777	0.933
	Rel2	0.853		
	Rel3	0.875		
	Rel4	0.911		
Timeliness	Tim1	0.877	0.686	0.897
	Tim2	0.793		
	Tim3	0.764		
	Tim4	0.874		
Interpretability	Int1	0.881	0.736	0.918
	Int2	0.793		
	Int3	0.866		
	Int4	0.888		
	Int5	0.780		
Satisfaction (lower order construct)	SAT1	0.836	0.731	0.915
	SAT2	0.825		
	SAT3	0.925		
	SAT4	0.829		
Quality (lower order construct)	QUA1	0.717	0.606	0.860
	QUA2	0.835		
	QUA3	0.714		
	QUA4	0.839		
Commitment (lower order construct)	CMT1	0.720	0.603	0.858
	CMT2	0.836		
	CMT3	0.730		
	CMT4	0.813		
Decision making (higher order construct)	Satisfaction	0.982	0.953	0.984
	Quality	0.974		
	Commitment	0.972		

AVE: Average variance extracted

underlying theoretical components. The test of the measurement model includes the estimation of internal consistency (reliability) and component validity of the instrument items.

4.2.1. Reliability test

Cronbach's alpha determines the internal consistency or average correlation of items in a survey instrument to gauge its reliability (Santos, 1999). Alpha coefficient ranges in value from 0 to 1. The higher the score, the more reliable the generated scale is. All constructs were found to have an acceptable reliability and scored well above 0.7, and ranged from 0.847 to 0.948.

4.2.2. Convergent validity test

Following Hair et al. (2010), this study used factor loadings, composite reliability (CR), and average variance extracted (AVE) to assess convergent validity. Fornell and Larcker (1981) recommended the following: All factor loadings for all items should be >0.5 as the recommended level is 0.7. An item with loading <0.7 should be scrutinized to determine whether the item should be deleted or not to enhance the level of AVE (Hair et al., 2013). In general, items with loadings of <0.5 should be dropped (Hulland, 1999). Secondly, the CR values of the components should exceed 0.70. Finally, the AVE values should be <0.5. Table 2 shows that all items met the validity requirements.

4.2.3. Discriminant validity test

There are two approaches to assess discriminant validity, which are cross-loading and Fornell-Larcker's approaches (Hair et al., 2013). Both approaches were performed for this study. The cross-loading approach was run by examining the cross-loadings of the indicators. Specifically, an indicator's outer loading on the associated construct should be greater than all of its loadings on the other constructs. It should be greater by at least 0.1 more than other cross-loadings. Our result showed that the item loadings were higher for their corresponding components (main loading) than for others (cross-loading). The difference between main loading and cross-loading values were greater than 0.1 in all cases. Thus, the first criterion was fulfilled.

Based on the standards recommended by Fornell and Larcker (1981), discriminant validity of the scales is satisfied when the square root of the AVE values from the component is greater than the variance any of the inter-component correlations. We found that the AVE values on the diagonal were greater than the correlation coefficient of that component with all the other components in the model. This shows that the discriminant validity was fulfilled for all components, and the inner model was ready for hypothesis testing.

4.3. Assessment of the Structural Model

To examine the hypotheses, t-statistics were assessed for the standardized path coefficients by running bootstrap with 5000 re-samples. Four of the six relationships were significant. Accuracy, relevance, timeliness, and interpretability were found to be positively linked with decision-making effectiveness. Accessibility and completeness did not show any significant relationship, but all dimensions of information quality were found to explain 83.7% of the variance in decision-making effectiveness. Figure 1 shows the result of the structural model assessment.

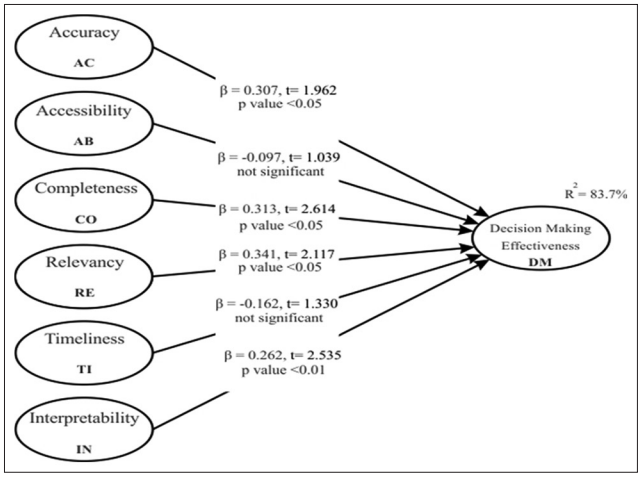
4.3.1. Predictive relevance (Q^2)

The blindfolding procedure yielded positive Q^2 values for all the endogenous constructs (i.e., a variable has at least one arrow pointing to it). As suggested by Hair et al. (2013), Q^2 values above zero imply predictive relevance. Therefore, the current path model had predictive relevance for the selected endogenous constructs with Q^2 values above zero.

4.3.2. Effect size (f^2)

The final assessments address the f^2 and q^2 effect sizes. Effect size is a measure of the strength of a phenomenon, by estimating the relationship between each two endogenous variables in a statistical population (Kelley and Preacher, 2012). The f^2 and q^2

Figure 1: Result of bootstrapping (t-values)



values of 0.02, 0.15, and 0.35 indicate an exogenous construct small, medium, or large effect, respectively, on an endogenous construct (Hair et al., 2013). The results showed that exogenous constructs (i.e., no arrows pointing to the variable; only arrows pointing out) had small effect size on the endogenous constructs.

5. DISCUSSION AND CONCLUSION

The present study was carried out to examine the role of information quality characteristics (accuracy, accessibility, relevancy, timeliness, completeness, and interpretability) in decision-making effectiveness. Generally speaking, all these features were able to explain 83.7% variance in decision-making effectiveness. The collective influence of information quality characteristics found in this study corroborates the argument and past studies that information quality is key in making decisions towards achieving the organizational effectiveness (Huner et al., 2009; Johnson, 2009; Jonas et al., 2008; Ni and Khazanchi, 2009).

However, upon a closer examination, of the six features, only four of them had significant individual effect on decision-making effectiveness. They were accuracy, relevancy, completeness, and interpretability. Such finding suggested that bank managers in Palestine require information that is accurate, relevant, complete, and interpretable when making decisions, implying that information quality features may be culture or context specific. Culture plays a critical role in decision-making (Rees and Althakhri, 2008; Vitell et al., 1993). As Arab culture is characterized by "high power distance" (Hofstede et al., 1991), it is reasonable to speculate why accessibility and timeliness do not play a major role in managerial decision-making. While such speculation may be valid, future research needs to be carried out to corroborate the cultural claim.

The findings offer practical insight to the management of banks in Palestine with regard to how they should manage the information and what type of information they should seek for before making decisions. In particular, decision makers should obtain accurate, relevant, complete, and interpretable information. Only when the information has all these characteristics that decisions made can help achieve organizational goals.

While the present study has offered valuable insight into the role of information quality on decision-making effectiveness, some caveats have to be considered. One of them is that this study was cross-sectional in nature; hence, drawing causal inferences may be problematic although it is likely that a good decision requires quality information. Secondly, the findings may have limited generalizability to other cultural contexts or research settings, which necessitate that future studies replicate the present research.

Information quality is inevitably an important pre-requisite for managerial decision-making, especially when the decisions made can have far-reaching consequences for the organization. Hence, scrutinizing the information obtained and demanding that the information meets certain features are paramount to achieving sustainable organizational performance.

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