

The Impact of Information Behaviour Dimensions on Decision-Making Stages: Evidence for Kuwaiti Public Organisations

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Abstract

Aim: The purpose of this study is to investigate the impact of managers' information behaviour on the decision-making process.

Method: Simon's four decision-making stages (intelligence, design, choice and review) and three information behaviour dimensions (information sources, information types, and information characteristics) were included in this analysis.

Results: The initial findings of the data analysis indicated that there was a significant statistical evidence for the relationship between information behaviour and decision-making without looking at the inside dimensions of each variable. However, after extra three steps of data analysis, the final findings indicated that all information types dimension were found significant as a source of variation in decision-making four stages.

Conclusion: The general finding is that information behaviour does have an impact on decision-making stages; thus it plays a vital role in decision-making effectiveness and efficiency.

Keywords: Information behaviour; Decision-making; Public organisations; Data analysis

Introduction

Decision-making is the heart of administration

The study of decision-making is not new in the literature [1]. The root of interest goes back as far as Barnard and his book the Functions of the Executive [2]. However, the great momentum in decision-making emerged in Simon's writings. Simon [3] in his article in PAR's The Proverbs of Administrations argued that the essence of management activity is decision-making, and organisations should seek ways to improve managers' decision-making capabilities rather than trying to find the ideal organisational structure. Further, Simon [4] believed that decision-making by its nature plays a vital role in organisations; He argued '...any practical activity involves both "deciding" and "doing"'. Consequently, Simon took an unprecedented and important decision-making position when he called for a science of administration and positing decision-making as the unit of analysis in this science.

In preceding years, other writers have echoed Simon interest and such view of decision-making [5-11]. For example, Nooraie [9] argued that the world is witnessing large scale changes in all levels, which thus increases the complexity and rate of change in business environments. Therefore, there is frequently a need to make too many decisions too quickly on a range of unfamiliar problems. As a result, managers, who are already nervous in an unpredictable environment, are forced to make further decisions at an increasingly quicker pace. Similarly, Mark [7] argued that the most challenging managerial part in today's organisations is to take appropriate decisions. Pearce and Robinson [5], further, have argued that decision-making is inevitable because the activity of not making a decision is, by itself, making a decision. In other words, decision-making is an essential part of any managerial function in any type of organisation; therefore, a good manager is one who is a good decision maker [9]. Likewise, Johnson and Kruse [10] stated that 'decision-making lies at the heart of managerial behaviour in all organizations'. O'Sullivan [11] argued that "decision making is an important construct for all members of organizations to define themselves, their roles and their expectations of each other'. According

to this view, organisational members 'think and act in terms of decision making' [6].

Due to the high importance of decision-making, as illustrated by the previous literature, and the fact that decisions do not only affect the organisation but also the wider society, the decision-making process has been heavily studied, and researchers such as Barrett et al. [12] argued for 'a paradigm shift in decision-making', in terms of making better decisions in response to today's challenges.

A good decision, however, is not produced by chance; rather, it is the output of a highly intelligent process that includes, among others, good empirical research.

However, in the research field, Nooraie [9] noted that empirical studies that focused on factors influencing the decision-making process are either limited or have produced contradictory results. In the same vein, Papadakis et al. [8] argued that in spite of the crucial role of decision-making, research has not departed significantly from the stage it was based on.

Consequently, research on the decision-making process and factors affecting this process remains of great importance for both organisation theorists and management practitioners. Thus, much more empirical work is necessary before any solid conclusion can be reached.

It is the purpose of this study to advance our knowledge on how to make good decisions by investigating the impact of managers' information behaviour on the decision-making process.

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Literature Review

Organisational decision-making has been heavily studied in the literature due to the great importance of this issue, as stated in the introduction. Some researchers have focused on investigating the decision-making processes and have attempted to build decision-making models that assist in explaining how decisions are made [1,13,14].

A second group of researchers focused on the impact of decision-making processes on various organisational variables [15,16].

A third group of researchers investigated variables impacting decision-making [8,17-19].

These three bodies of literature could be viewed as an interrelated and interconnected chain where variables could be visualised or modelled as a serial of order impact. Figure 1 illustrates such a view.

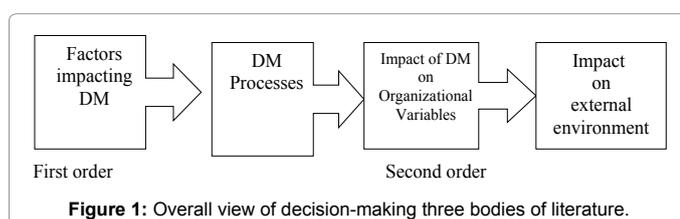
The focus of the current study is on contributing to the first order impact literature; its importance is illustrated in Figure 1. This body of literature consists of variables that are responsible for the variation, moderation, effectiveness and efficiency of the decision-making processes, which, in turn, determine the quality of the final decision.

Following is a discussion of this literature.

Context and decision-making

Theoretically, the previous body of literature is based on the general proposition that context has an impact on organisational variables/activities, including decision-making. For example, Johns [20] argued that it is very important to study context so that we can understand person-situations interactions. He argued 'context is likely responsible for one of the most vexing problems in the field: study-to-study variation in research findings'. Johns [20] believed that context has many effects, such as: restricts range, affects base rates, changes causal direction, reverses signs, prompts curvilinear, tips precarious relationships and threatens validity. Regarding the status of studying the context in the literature, the researcher noted that, 'the many examples of context effects provided here raise the question of why context has been underappreciated. The repeatedly lamented absence of a good taxonomy of situations is in part to blame, since we lack a refined, systematic language for expressing context'.

More specifically, several researchers have drawn attention to the impact of context on decision-making [18,19,21-23]. The theoretical root of the impact of contextual factors in decision-making springs from Simon's view of decision-making, and, specifically, the bounded rationality concept. In explaining Simon's contributions, Yang [24] argued that decision-making models could be categorised into two types: rational and practical. The rational models assume that the decision maker works under unconstrained conditions of time and capacity to make a clear definition of the problem and choose an optimal alternative. The practical models, on the other hand, assume that the decision maker works in a particular context, and rational step by step decision-making procedures do not exist.



Bounded rationality [4] has led the attack on the rational model. Based on the bounded rationality concept, a decision maker works within several types of constraints, such as information and time; thus, optimisation is out of reach and the only alternative is to satisfice. Faced with this situation, the decision maker creates a simplified model of the situation he/she is facing that includes the essential characteristics of the problem and eliminates any complexity that might be included. As a result, the solution that been reached is good enough.

Yang [24] stated that this approach, 'emphasizes that decisions are shaped by practical factors and that means and ends are mutually determined and inseparable'.

This approach thus recognised that the importance of contextual factors in constraining decision maker's abilities, including information behaviour factors.

Furthermore, Romanelli and Tushman [21] believed that the extent of the influence of managers and environment on organisational outcomes has a central debate in organisation theory, and stated the consequences of such influence:

'If environments predominantly influence organizational activities, then firms founded or entering a context under different conditions should evidence commensurately different patterns in early activities. Differences in later adaptational patterns should be largely predictable from contextual origins and characteristics of change in environmental conditions.'

Therefore, it can be concluded that if managers' information behaviour influences decision-making, then changes in decision-making can be largely predictable from the change in information behaviour. Thus, the importance of studying the impact of information behaviour on decision-making emerges herein, which is the goal of this study.

Bronner [18] argued that one of the causes for decision failure concerns variables related to the decision maker, which could include: individual characteristics, personal preferences. He stated, 'with regard to the individual as a problem solver, cognitive abilities and motivational factors influence the handling of a decision, from the perception and estimation of the present problem to the final resolution'. The same argument was also presented by Callanan et al. [19].

On the other hand, Rajagopalan et al. [23] argued that one of the priorities of future research in decision-making is to examine the extent of the variations in decision-making, which is due to variations in organisational, environmental, decision-specific and managerial factors. A similar argument was also presented by Johns [20].

In the empirical literature, several researchers have found a link between managers' characteristics and decision-making [18,19,25-37].

The sum of the preceding literature gives a strong argument that decision-making is influenced by context, which includes, among others, the decision maker's characteristics. Influences of these contextual factors could be summarised in that these variables are both the sources of variations in decisions and one of the causes for decision failure.

Thus, the study of decision context has vital importance in the effort to make high-quality decisions. The current study investigates the impact of managers' information behaviour as a contextual variable on decision-making.

However, the context-decision-making relationship still needs

further investigation in order to draw a clear picture of the interactions within this relationship.

In 1993, both Nahavandi and Malekzadeh, and Rajagopalan et al. noted that literature focusing on factors impacting decision-making and studies in this literature are both limited in number and have produced mixed results [38,39].

In 1998, Papadakis et al. also argued that 'in spite of the crucial role of strategic decisions the strategy process research has not departed significantly from a stage being based on' [8].

In 2008, Nooraie [9] echoed this view in stating that empirical studies that focused on the factors influencing the decision-making process are either limited or have produced contradictory results, and conclude that research on the decision-making process and factors affecting this process remain of great importance in organization theory and management, and much more empirical work is necessary before any solid conclusion could be reached.

More recently, Pavic argued that our knowledge of decision-making is still incomplete [40].

The current study attempts to contribute to clearing the issue of how contextual variables impact decision-making in the context of Kuwaiti ministries. Schwenk [22] argued that 'it may be that many of the conclusions about strategic decision making developed in the US context will have to be modified in order to be applicable across cultures'. Thus, a study in non-western culture would be a highly valuable contribution to the literature.

Following is a discussion of the information behaviour - decision-making literature.

Decision-making and information behaviour

Theoretical contributions: The basic component of managers' information behaviour, clearly, is information which plays a vital role at all organisational levels [41]. The link between information and decision-making has been argued for by many researchers [17,18,24,42-49].

Higgins [17], for example, investigated the impact of the credibility of information sources on information usage and in turn decision. The study found that there are influences. The importance of managers' information behaviour was highlighted by Higgins [17] when he discussed the role of information credibility on information usage and in turn decision. The researchers stated, Decision makers may be faced with choosing from several possible avenues of action, with the final choice being based upon the decision maker's judgment of the value of the information pertinent to each of the various options. In simple decision models, the information is often assumed to be unproblematic; the decision maker only has to process all the usually succinct and perfectly expressed information. Beyond the simple models, however, it is clear that information can be anything but unproblematic: information itself has attributes which need to be judged. It can be timely (or otherwise) reliable (or otherwise), accurate, vague, controversial and contradictory (or otherwise). Realistically, a decision maker has to process not only the information itself but also meta-information, this is, the information about the information'.

According to Higgins [17], when a decision maker perceives an information source to be highly credible, he will give it weight, which in turn will lead to favouring this source in making the decision. Herein emerges the importance of studying managers' information behaviour. In other words, the decision makers use simplified models due to the

bound rationality concept; such models include judgment and source credibility. Hattrup and Ford [50] stated 'cognitive structures interact with informational characteristics to affect attentional processes during social judgment'.

Also, in explaining the information-decision-making relationship, Frisharmmar [45] argued that one of the foundations underlining organisational decision-making is the acquisition and use of information, and managers' assumptions of the environment play a role in choosing soft or hard information; when managers perceive the environment to be unanalyzable, then soft information is used and vice versa. Therefore, according to the researcher, uncertainty could be the function of the decision maker's experience or information behaviour, and information is used to reduce or remove uncertainty, which is defined as the difference between information proceeded and information needed. The study of managers' information behaviour would reduce the magnitude of the gap between information proceed and information needed through pinpointing the type of information needed for decision-making. This is very important nowadays due to the high degree of complexity and overload/overwhelming of produced information.

Bronner [18] argued that one of the causes of decision-making failure is having the basic conditions to deal with a situation. This includes the information given and communication. Information given within the decision process plays a major role in both defining a problem (this is called framing) and theoretically justifying a solution option or the final solution. Regarding communication, the researcher argued that different communication methods reduce or strengthen information exchange and the way to handle a subject within the decision-making process. Information pathologies is the concept used by Bronner [18] to denote such a reason he defined as the insufficient demand for information, which leads to wrong decisions that take place due to difficulties in information processing and evaluation.

In the same vein, Newell and Broder [51] argued that, Intelligent organism operates in a perception-action cycle: the senses take in information from the environment, the mid/brain performs computations on that information and the outputs of those computations are used to guide subsequent goal directed action. When individuals encounter a decision situation, salient and associated information is activated in memory and a mental representation is formed that combines given and memory-stored information'.

Consequently, and based on Simon's concept of bounded rationality, decision makers create and use strategies which enable the reduction of information processing and a number of cognitive operations. All of this, of course, is connected to the nature of the mental model and personal characteristics (such as age, education, national culture) that are attached to that decision maker. The study of managers' information behaviour and its impact on decision-making, therefore, has a highly valuable contribution in shading more light inside the black box of decision-making mechanisms and how to improve such mechanisms. This paper connects information behaviour and decision-making.

Empirical contributions: In addition to the theoretical fragment of the information-decision-making relationship, which could be found in the previous study's arguments, empirical evidence also shows a link between managers' information behaviour and decision-making [30,45,48,52,53].

For example, Frisharmmar [45] examined the impact of information behaviour on decision-making. The study address the

following questions: what kind of information is used in strategic decision-making? Why is information used in strategic decision-making? How do decision makers obtain the information used? Where do decision makers obtain the information used? The finding of this study indicated that information is used to reduce or remove uncertainty, that a combination of soft and hard information varies over time and that intuition and cognitive structures become important in making decisions.

In addition, Paprika et al. [30] investigated the relationships of three aspects of managerial decision-making, information supporting decision-making and a number of organisations' approaches to managing relationships with their stakeholders in private organisations in Hungary. Regarding the importance of the decision-making informational aspect, the researcher argued, 'the existences of these skills are the basic supporting factors of managerial decision-making. These are very personal aspects of decision-making they are attached strongly to the decision maker'. Furthermore, Paprika et al. [30] found empirical support for the relationship between the quality of the decision-making processes and several personal factors related to the decision maker, including the informational aspect.

Phusavat et al. [48] examined the information requirements for managerial decisions in manufacturing companies in Thailand to ensure high-quality decision-making; and more specifically, electing a supplier to provide a transportation service for a manufacturer. The study's findings indicated there are specific information needs for each of the eight alignments that reflect the positive interrelationships between manufacturing and supplier-selection strategies. For example, when a management represents a strategic criterion for supplier section, and quality reflects the management strategy, the following information requirements are raised: information on quality, customer relation and quality of work life. In general, the study found a link between information requirements and strategies; in other words, the quality of managerial decisions depends on the quality of information given to the decision maker and the experience of the decision makers.

Case [53] investigated how coin collectors decided to include an item in their collection. The study's findings indicated that there are several different paths and strategies which could be taken to reach a buying decision, and that the information behaviour of the buyer plays an important role in all of these paths and strategies.

Furthermore, Canfield-Davis et al. [52] examined the factors influencing legislative decision-making in the United States of America. The researchers found that there are many personal and contextual factors impacting legislative decision-making. Among these factors are: sources of information, sources of voting advice, civil servants and legislative staff. The researchers noted that legislative decision-making is complex, diverse and a dynamic, changing process; thus, it is very difficult to make generalisations because some factors may be important at one stage and later may not. Furthermore, Canfield-Davis et al. [52] argued that 'if practitioners are familiar with the why politicians vote for or against proposed bills, then they may have a greater influence on the policies enacted, and the content therein'.

Here, the same argument could be stretched to justify the study of the impact of managers' information behaviour on decision-making in stating that if managers are familiar with how their information behaviour impacts their decision-making, these managers will have greater influence on their decision-making quality and its impact on their organisations.

In sum, while ample research has been carried out reflecting upon

the contextual factors and their impacts on decision-making, our knowledge is still inadequate in understanding the full picture of the factors impacting decision-making. The better we understand and pinpoint factors impacting these decisions, the better our abilities to make good decisions.

It is the purpose of this paper to contribute to this understanding by investigating the impact of managers' information behaviour on the decision-making process.

In the era of information reevaluation, there is a need to understand the impact of information behaviour on decision-making. And, there is a need to improve decision-making. Several researchers have recognised this need, such as Davenport [54], who called for making better organisation and decision-making through using more analytic tools. According to Davenport, we generate a lot of data and tools, so people make better decisions; however, we never make sure that they do so and added that there are so many great tools that are relatively still under-explored and under-exploited. This may be a result of lack of coherence between decision styles and these tools. One step of creating such a coherent practice is to understand managers' information behaviour in order to create/choose the tools that match this behaviour.

Consequently, the present study's research question is: Does a manager's information behaviour have an influence on the decision-making processes?

Research Methodology

Population and sampling

The population of this study comprises managers who work in Kuwaiti ministries. There are 18 ministries in Kuwait. Due to time and cost constraints, a sample was taken from these ministries and from all managerial levels using a simple random method (lottery). Using this method, eight ministries (Education, Foreign Affairs, Interior, Communication, Health, Energy, Welfare and Defense) and 350 managers were selected.

A questionnaire instrument was the main method used to obtain the data for this study. In total 350 questionnaires were distributed. Two hundred eighty-one questionnaires were returned. This makes the response rate 80%. Of the returned questionnaires, 54 were eliminated because the participants either provided two answers for the same question or left most of the questions unanswered. Thus, there were 227 usable questionnaires.

Measurement

The information behaviour variable: In order to measure this variable and at the same time create measurement consistency, a review of empirical studies was conducted that dealt with information behaviour dimensions [55-59]. In doing so, one would clearly notice the fragmentation of the information behaviour dimensions on a long a wide group of studies. The current study attempts to collect most pieces (dimensions) of this fragmentation in one study.

Thus, information behaviour, in this study, was first grouped using three general categories: information characteristics, information types, information sources. These categories have been individually used by other researchers O'Reilly and Helen [55,57]. This action, the grouping of information behaviour dimensions, is consistent with the practice of other researchers [60-62].

Following is a detail discussion of each category.

The information characteristics dimension: Measured using 10 information characteristics (subjectivity, timeliness, specificity, clarity, comparable, trusted, non-biased, useful, flexibility, truthfulness). Responses ranged from 1 (not important) to 5 (very high importance). These characteristics have been adopted from other studies in the literature [56,59].

The information types dimension: Measured using four general information types: general information about the organisation (Org-I), information about the employees (EMP), information about the customers (CUST), and information about organisational plans and procedures (Org-P). A five-point Likert-type scale, ranging from 1 (very high disagreement) to 5 (very high agreement) was used. All information types used in the present study have been previously used by other researchers [55,58].

The information source dimension: Measured using 28 information sources. These information sources were divided into three groups: traditional, electronic and personal. A five-point Likert-type scale, ranging from 1 (very high disagreement) to 5 (very high agreement). Researchers have used these information sources [55,57,58].

The Decision-making stages

Simon [4] proposed that decision-making passes through four stages: intelligence (DM1), design (DM2), choice (DM3) and review (DM4). These four stages are used in this study to present the decision-making stages.

In the intelligence stage, the decision maker looks for an opportunity to make the decision, which can be a problem that either needs to be solved or an opportunity needs to be taken.

In the design stage, the methods to deal with the situation are identified. If the situation was previously encountered, then the methods to deal with this situation are already saved in the organisational or/ and manager memory, and we need only to retrieve these methods; however, if the situation is new, then the decision maker needs to design a new method to deal with the new situation.

In the choice stage, a method to deal with the situation is chosen from the available course of actions that have been determined in the design stage. Simon [4] argued that the chosen method is not the best option to deal with the situation, but merely the best of the available options. This is due, according to Simon, to the bounded rationality effect on the decision maker.

In the review stage, the decision is implemented and evaluated in term of achieving the desired goals.

To measure the impact of information behaviour on stages of decision-making (intelligence (DM1), design (DM2), choice (DM3) and review (DM4)), Schmidt's [63] measure is used. This measure consists of 12 questions. All items were based on a seven-point Likert scale, which ranged from "no impact" to "very high impact".

All measures were subjected to a multi-step process to check for validity and reliability. First, the questionnaire was submitted to a panel of four professors at Kuwait University to check whether the items

in the questionnaire measured what they should be measuring, and whether they suit the Kuwaiti business environment. No major changes were suggested by the panel. All suggestions were related to the format of the questionnaire, and all these suggestions were incorporated into the final version of the questionnaire.

Second, a pilot study was conducted to check whether items in the questionnaire were understandable and clear. The study covered 50 employees from three Kuwaiti ministries. The findings of the pilot study indicated that all questions and concepts were clear and understandable.

Cronbach's alpha (an internal consistency technique) was used to assess the reliability of each measure that is scaled in nature. A cutoff of 0.70 is considered the minimum acceptable level of reliability [64]. This cutoff is adopted in this study. Cronbach's alpha coefficients for the variables used in this were as follows: information characteristics (0.84), information types (0.88), and information sources (0.90), intelligence (DM1, 0.92), design (DM2, 0.94), choice (DM3, 0.95), and review (DM4, 0.95). Thus, all measures exceeded the cutoff accepted in this study.

Data Analysis and Results

Data analysis was conducted using simple regression, multivariate analysis of variance (MANCOVA), and analysis of variance (ANOVA). The data analysis plan was divided into four steps.

In step one, the impact of information behaviour on decision-making was assessed without looking at the inside dimensions of each variable.

In step two, the impact of information behaviour on each decision-making stage was assessed without looking at the inside dimensions of the information behaviour.

In the third step, the impact of information behaviour three dimensions on decision-making without looking at the four decision-making stages.

In the fourth step, the information behaviour dimensions found significant in step three will be assessed in detail of their impact of on the four decision-making stages.

Therefore, various statistical methods were used. The outputs of these statistical methods should accomplish the goal of the data analysis plan in term of providing a more general picture of the information behaviour-decision-making relationship (MANCOVA) to more specific picture (ANOVA). Thus, this data analysis plan provides a complete picture of the relationships between the study's variables.

Step one: Regression analysis

The goal of this step is to assess the impact of information behaviour on decision-making without looking at the inside dimensions of each variable. Table 1 shows the results of the regression.

As indicated in Table 1, there was a statistically significant relationship between information behaviour and decision-making at the 95% confidence level. The R-squared statistic indicated that the fitted model explained 88.9% of the variability in decision-making. The

Independent Variable	R	R Square	Adjusted R Square	Std. Error of the Estimate	F Value	Significant
Information Behaviour	0.943*	0.889	0.889	0.31297	1806.077	0.000***

*Sig. at ≤0.05

**Sig. at ≤0.01

***Sig. at ≤0.00

Table 1: Regression analysis for the variable predicting Decision-making.

standard error of the estimate showed the standard deviation of the residuals to be 0.312. Thus, there was significant statistical evidence for the relationship between information behaviour and decision-making without looking at the inside dimensions of each variable.

Consequently, we can progress to investigating the information behaviour- decision-making relationship in more detail, which is conducted in the following second step of the data analysis plan.

Step two: MANCOVA

The goal of this step is to assess the impact of information behaviour on each decision-making stage without looking at the inside dimensions of the information behaviour. Table 2 presents the result of this analysis.

As shown in Table 2, there are differences in decision-making that are due to the behaviour information being statistically significant. Consequently, this variable was subjected to further analysis in terms of assessing its impact on each of the four decision-making stages. Table 3 shows the results of this analysis.

Information behaviour was found to be statistically significant with all four decision-making stages. As indicated by the size of the partial eta size, the impact of information behaviour was greatest in the third stage, while the smallest impact was in the fourth stage.

Effect	Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	0.056	3.291	4	222	.012*	0.056
Information behaviour	0.89	449.815	4	222	.000***	0.89

*Sig. at ≤0.05 ** Sig. at ≤0.01 ***Sig. at ≤0.00

Table 2: Multivariate Tests (Pillai's Trace).

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Information behaviour	DM1	170.679	1	170.679	765.616	.000***	0.773
	DM2	179.992	1	179.992	822.124	.000***	0.785
	DM3	174.984	1	174.984	928.837	.000***	0.805
	DM4	184.099	1	182.099	635.016	.000***	0.738

***Sig. at ≤0.00

Table 3: Tests of Between-Subjects effects.

Effect	Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	0.716	138.915	4	220	0.000***	0.716
Information characteristics	0.03	1.681	4	220	0.155	0.03
Information sources	0.054	3.12	4	220	0.016*	0.054
Information types	0.879	399.933	4	220	0.000***	0.879

*Sig. at ≤0.05 ***Sig. at ≤0.00

Table 4: Multivariate Tests (Pillai's Trace).

	Effect	Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Dimension	Intercept	0.761	172.375	4	216	.0000***	0.761
	Information sources	Traditional	0.015	0.849	4	216	0.495
Information sources	Electronic	0.042	2.364	4	216	.054*	0.042
	Personal	0.033	1.841	4	216	0.122	0.033
	Information types	G-I Org	0.725	142.196	4	216	.000***
Information types	EMP	0.727	143.735	4	216	.000***	0.727
	CUST	0.744	157.053	4	216	.000***	0.744
	Org-P	0.687	118.309	4	216	.000***	0.687

*Sig. at ≤0.05 ***Sig. at ≤0.00

Table 5: Multivariate Tests (Pillai's Trace).

In general, the positive results in step two of the analysis allow us to progress to the third step of the data analysis plan.

Step three: MANCOVA

The goal of this step is to assess the impact of the three dimensions of information behaviour on decision-making without looking at the four decision-making stages. Table 4 presents the result of this analysis.

Two of three information behaviour dimensions were found to be statistically significant. The information characteristics dimension was not found to be a statistically significant source of the variation in the decision-making stages. Thus, it was eliminated from any further analysis. The rest of the two information behaviour dimensions were subjected to a detailed analysis of their impact on the four decision-making stages.

Step four: MANCOVA

The goal of this step is to assess, in detail, the impact of the information sources and information types dimensions on the four decision-making stages. The information sources dimension consists of three sources (traditional, electronic and personal), while the information types dimension consists of four types: general information about the organisation (Org-I), information about the employees (EMP), information about the customers (CUST), and information about organisational plans and procedures (Org-P). All these information sources and types will be assessed for their impact on the four decision-making stages. Table 5 presents the result of this analysis.

Statistics in Table 5 indicate that electronics are the only information sources to be found statistically significant while all information types were found to be a statistically significant source of the variation in

decision-making stages and also the big size of the partial eta indict that the information types dimension has a large effect on the decision-making stages.

Furthermore, Table 6 presents a detailed picture of the impact of the previous variables. The information types dimension was significant in all four decision-making stages, while the impact of the electronic information source did not show up in this detailed analysis step.

Discussion

The purpose of this study is to advance our knowledge on how to make a good decision by investigating the impact of managers' information behaviour on the decision-making process; therefore, the study's research question was: Does a manager's information behaviour have an influence on the decision-making processes?

Figure 2 presents the variables found to be statistically significant as sources of the variations in decision-making stages. A general finding of this study could be summarised, in that decision-making is influenced by other variables. Although of the simplicity of this finding, it is the base/root of current decision-making paradigm; which started with Simon's concept of bounded rationality that signalled the departure from the rational model paradigm.

Therefore, the study's findings could be viewed as another confirmation, in the context of Kuwaiti public sector, of this proposition, along with other previous studies which argued for the role of context [18,19,21-23], managers' characteristics [18,29,30,32,35,37] and more specifically, information behaviour in impacting decision-making [30,45,48,52].

Based on the preceding discussion, therein, the study of decision-making should take more of a holistic view instead of the micro view that is common in the current analysis of this issue. Based on the literature review and study's findings, Figure 3 is presented to illustrate this holistic view.

Based on Figure 3, decision-making is incubated in several

areas of influences that are located in what could be called: external environment and internal environment. Each type of environment has its own unique factors that influence decision-making. Furthermore, the close connectedness between the two types of environments implies that some of these factors may be masking other factors not readily apparent. In other words, these factors are multilayered with some influencing or controlling others. Herein emerges the need to create a comprehensive model for factors impacting decision-making and modelling, as well as the interrelationships between these factors.

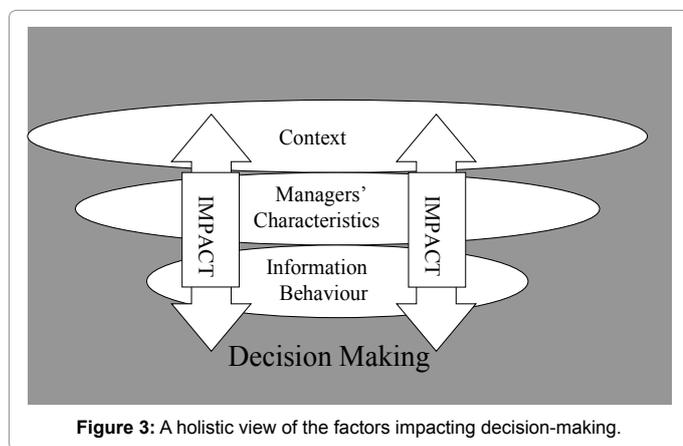
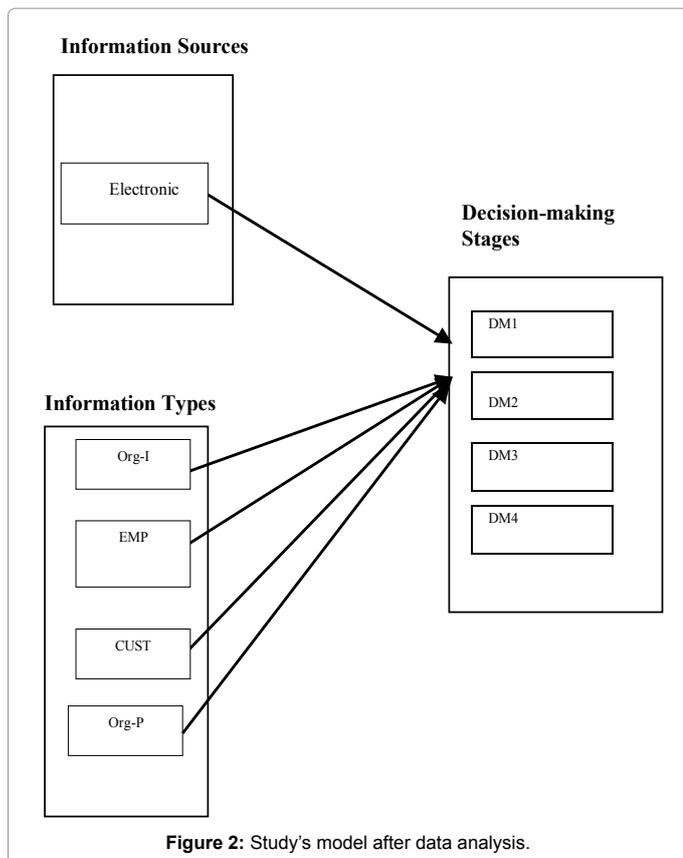
The specific findings of this study, on the other hand, pinpointed two variables that influence decision-making. Firstly, the information types dimension was found to be significant as a source of variation in decision-making over the four stages. Further, all of the information types were found significant with all four decision-making stages. This finding is logical because information is present across all decision-making stages. This is apparent in the description of the inside decision-making mechanisms that have been proposed by all decision-making models [4,13,14]. For example, in the decision-making model by Mintzberge et al. information exists in all three main decision-making phases: identification (recognition and diagnosis routines), development (search for ready-made solutions and passive search routines) and selection (screen, evaluation-choice, authorisation routines). Other researchers have also found a close relationship between information and decision-making [24,46-49].

In the context of the Kuwaiti public sector, the use of several types of information in all four decision-making stages indicates that the decision-making processes are less rely on pure personal judgment; rather, this judgment is based on four types of information: general information about the organisation (Org-I), information about the employees (EMP), information about the customers (CUST), and information about organisational plans and procedures (Org-P). Thus, scientific judgment is what could be called the type used in this decision-making processes by Kuwaiti managers. The large size of the Partial Eta Squared for all information types supports this conclusion.

Variable	Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Information Sources	Electronic	ds1	0.201	1	0.201	1.313	0.253	0.006
		ds2	0.361	1	0.361	2.475	0.117	0.011
		ds3	0.01	1	0.01	0.088	0.767	0
		ds4	0.337	1	0.337	1.726	0.19	0.008
Information Types	G-I Org	ds1	9.748	1	9.748	63.593	.000***	0.225
		ds2	11.644	1	11.644	79.868	.000***	0.267
		ds3	12.961	1	12.961	117.27	.000***	0.349
		ds4	14.208	1	14.208	72.781	.000***	0.249
	EMP	ds1	10.533	1	10.533	68.714	.000***	0.239
		ds2	8.671	1	8.671	59.478	.000***	0.214
		ds3	13.483	1	13.483	121.989	.000***	0.358
		ds4	16.194	1	16.194	82.955	.000***	0.275
	CUST	ds1	9.402	1	9.402	61.334	.000***	0.219
		ds2	9.512	1	9.512	65.249	.000***	0.23
		ds3	16.037	1	16.037	145.106	.000***	0.399
		ds4	19.192	1	19.192	98.315	.000***	0.31
	Org-P	ds1	14.021	1	14.021	91.467	.000***	0.295
		ds2	13.948	1	13.948	95.673	.000***	0.304
		ds3	6.192	1	6.192	56.027	.000***	0.204
		ds4	7.114	1	7.114	36.443	.000***	0.143

***Sig. at ≤ 0.00 ds=decision stage

Table 6: Tests of Between-Subjects Effects.



The electronic information source was found to be significant to the overall decision-making process; however, it was found to be not significant in the detailed analysis (Tests of Between-Subjects Effects). The possible explanation for this contradiction between these types of analysis may be due to the very small impact for this dimension on each decision-making stage. Thus, this impact appears in the aggregation of the four decision-making stages and disappears in each stage. What supports this explanation is the small size (.042) of the partial eta squared in the overall analysis. In general, the impact of the electronic information source on the overall decision-making process could be explained in that the momentum for the use electronic information is very high nowadays. This is due to many reasons such as the new development in information systems and the emergence of new organisational forms that are related to the information technology

revolution, such as electronic governments. Thus, the high credibility of this type of information source in the mind of the decision maker led to using this source. Several researchers have shown the link between credibility and information usage [17]. The small impact of the electronic information source, as indicated by the small partial eta squared, however, this may indicate that electronic momentum among Kuwaiti decision-making is merely a fad. This is could be concluded from the lack of impact of this source in the tests of between-subjects effects, which indicated that the use of an electronic source had only a surface influence without going deep enough to influence the inside mechanisms of the decision-making stages, such as the influence of the information types dimension. Further investigation is needed on this issue.

This study did not support the link between the decision-making stages, on one side, and information characteristics and two types of information sources, namely traditional and personal. This is inconsistent with the findings of other studies [30,45,52].

A possible explanation for this finding could be found in March and Simon argument regarding the link between response and type of stimulus [65].

March and Simon [65] argued that when the stimulus is new, the decision maker does an extensive problem solving activities to define the problem and develop performance programs which are highly complex and organise a set of responses. The decision maker will use these activities, once learned, when he encounters the same/familiar problem in the future. In other words, when the stimulus has been encountered in the past, the problem solving activities will not be as extensive as when the stimulus is novel. Here, the decision-making has a clear definition of the problem along with an appropriate program to respond to the stimulus.

In this study, the research sample was drawn from Kuwaiti ministries, which are characterised by a very stable environment in which problems, to a large degree, lack novelty and are characterised by repetition and routine. Therefore, already-made-programs to deal with these problems should have been already created by the decision maker. In the Kuwaiti ministries context, information characteristics, traditional information sources and personal information sources may be not a component of these already-made-programs, which could be the explanation for the failure, in this study, to link them to the four decision-making stages. Further investigations are needed on this issue.

Implication for Research and Practice

This study has several implications for research and practice. We will start with implications for research. First, there is a need to create a comprehensive model for managers' information behaviour and decision-making relationships, which illustrates not only the factors impacting decision-making but also the interconnectedness between these factors.

Furthermore, second, in creating this comprehensive model, researchers should model variables impacting decision-making in the form of layers based on their location to decision-making such as external environment, internal environment, personal factor, etc.

Third, researchers are strongly advised to include in their analyses the direct/indirect impact not only on decision-making, but also other variables impacting decision-making. Herein, the correct weight/importance for each variable will be determined.

Fourth, inconsistent with other studies in the literature, the present

study's findings did not statistically significant impact variables such as information characteristics, traditional information sources and personal information sources. Future researchers need to further investigate the impact of these variables on decision-making to clearly pinpoint their impact.

Fifth, to enhance the external validity of the study's findings, future researchers are called to replicate the study's model in other countries and other types of organisations. Rich insights will be gained from such studies.

The study's findings also have several implications for practitioners. First, managers interested in improving decision-making in their organisations are advised to improve information collection, storage and distribution in these organisations. New information technology tools are excellent methods to use to accomplish such tasks. However, managers need to provide training on information technology tools in order for organisational members to fully utilise these tools in their decision-making process.

Second, managers need to build up an organisational memory (either digital, paper or both) that includes all data/information regarding all organisational aspects (employees, customers, plans, etc.). Organisational members should be aware of the existence of such memory and how to access it in order to use it in their decision-making process.

Third, transparency is a highly recommend managerial value that should guide managers in any informational activities they do in order to improve and enhance knowledge among organisational members, thus using it in their decision-making process.

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