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# Enhancing Decision Making through Key Information Value

Research Article

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**Abstract.** Organizations have embarked upon various strategies that exploit the use of data and information for competitive advantage. We see numerous strategies proposed for organizations namely in areas of business intelligence applications, such as Data Mining. However, these applications do not inform managers the Value of Information (VoI) that they generate. Management often does not see the value of such information and how they can relate the information to some measure, such as monetary value or critical business decisions. This produces a gap where managers are unable to identify key information that is important to their business roles with the ability of the technology provided to identify these valuable data. This paper provides an insight to the Value of Information (VoI) in management and proposes a conceptual model to identify and classify key information value for managers and administrators at all levels of management. The study begins by analyzing revenue-related business processes to identify key information that directly influence the business performance. Qualitative data collection is conducted to solicit information relating to the execution of the business processes to capture other relevant information. A framework is developed to identify and classify the key data and information based on an identified set of criteria for each level of management. This research produces Key Information Value Identification and Classification Framework, which is very useful for companies to enhance their decision-making process at every level or management

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## 1. Introduction

How managers find and use key information in the course of their daily work has been a topic of great interest to information science scholars [1, 2]. Inside organisation, the volume of information available for decision-making is upending longstanding theories of managerial cognition and action. The challenge is no longer to make decisions under conditions of information scarcity; increasingly, it is to make decisions under conditions of information overload [3].

Many managers have to deal with an overwhelming amount of information from many sources as part of their job [4]. Thus, it is important to understand how managers seek and use the right information to overcome information overload. Managers need to seek key information relevant to their work roles and satisfy the raised information needs. In addition, managers must understand the value of key information that is crucial and important for them to analyze, make informed decisions and avoid information overload.

Putting value on information (i.e. a meaningful message) is therefore becoming more crucial to judge what to retain and what to discard [2]. As the quantity of available information increases, its value becomes an ever more important factor for the effectiveness of the organisations and managers. Value of Information (VoI) can be defined as “the amount a decision maker who would be willing to pay for information prior to making a decision” [5]. If one were to ask the General Managers of business organisation on the value of key information that are crucial and important for them to know and monitor, one would be surprised that only a few would be able to identify those information. The reason for such inability is that key information value identification and classification has never been a strategic issue for many organisation.

This study proposes a conceptual framework to identify and classify key information value for managers at all levels of management in organisations. Managers in this study refer to the heads/deputies of business departments such as training, safety or finance. The levels are senior management, middle management and operational management. If the key information could be classified in terms of its value, then business managers should be more objective in managing their operations rather than minding less important or unrelated information. The value of information enables managers to improve the business decision-making processes at the departments. Hence, this conceptual framework is considered as an effort towards improving business decision-making and increases its efficiency through improved business processes, reduced costs and provide quality of service.

The rest of the paper is organized as follows: Section 2 reviews the concept of Key Information and Value of Information. In Section 3 we propose the methodology of the study which describes data collection instruments and procedures. Section 4 discusses the proposed Key Information Value Conceptual Model in identifying and classifying key information and Section 5 concludes the paper.

## 2. Related Works

The literature reveals countless works that have been researched in information value [6–12]. Some of these papers claim to apply the value of information for decision-making in oil and gas

industry [11], ecology and resource management [12] and risk aversion and assessment [8, 10]. Shimp considered the value of information as part and parcel of the greater information management economy [7]. He suggested that the information revolution is underway, with a change in emphasis from information processing to information management that will have a significant effect on the economy and society.

Wikipedia offers a comprehensive definition of Value of Information (VoI) as “the amount a decision maker would be willing to pay for information prior to making a decision”. For example, before planning for a vacation, one would usually like to know what the weather would be like at the vacation location. Two cases are apparent [6]:

- (i) The value of perfect information on the weather represents the value of knowing the weather condition even before deciding for the vacation. It is the highest price the vacation planner is willing to pay for knowing the weather condition before deciding to go for the vacation.
- (ii) The value of imperfect information on the weather, however, represents the value of knowing the outcome of another related uncertainty, e.g., the Weather Forecast, instead of the actual weather condition itself before deciding for the vacation. It is the highest price the vacation planner is willing to pay for knowing the Weather Forecast before deciding to go for the vacation.

In a theoretical perspective, Howard presented the theory of information value that arises from considering the joint probabilistic and economic factors that affect decisions [13]. Numerical values were discovered and can be assigned to the elimination of any uncertainty. The joint elimination of the uncertainty about a number of even independent factors in a problem can have a value that differs from the sum of the values of eliminating the uncertainty in each factor separately.

Oestreich claimed that it is difficult to assess the real value of information. In explaining the concept of VoI analysis, Bratvold et al. proposed that engineers and scientists acquire information with the aim of improving decision-making [12]. However, the fundamental question is whether the subsequent improvement in the decision is worth the cost of collecting the information. This represents one of the many issues a VoI framework should address.

Nadiminti et al. developed a framework to examine the relationship between the value of information and risk aversion [5]. The study revealed that the method of payment for information must be considered in determining this relationship. The Arrow-Pratt measure of risk aversion was used to derive explicit conditions under which the value of information increases or decreases with risk aversion. The analysis of this study was found to be applicable to the ex-post evaluation of transaction processing systems and a subset of decision and expert support systems.

Sajko et al. described the evaluation of business information values and the criteria for determining the importance of information. The study resulted in the dimensions of information values and the ways to present the importance of information contents. The study also proposed qualitative and quantitative approaches in evaluation and combine these approaches to determine the forms of information content. A three-dimensional model criterion was developed

which combines the existing experiences (possible solutions for information value assessment) with the study's identified criteria via literature [14].

Williams et al. discussed "the value of information in a context of adaptive management, in which actions are taken sequentially over a timeframe and both future resource conditions and residual uncertainties about resource responses are taken into account". The study derived value of reducing or eliminating uncertainty in adaptive decision-making and described several measures of the value of information based on management objectives of adaptive management. The study also claimed that relying on the value of information informs decisions about whether and how much to monitor resource conditions through time [15].

### 3. Methodology

This research focuses on identifying and classifying key information for each level of management, analyze the Value of Key Information (VoKI) for each level of management, and evaluate the classes of key information value to some tangible measure for enhanced decision-making. Hence the usage of an interpretive research is deemed suitable as interpretive research aims to produce an understanding of the "context of the information management, and the process whereby the information is influenced by the context" [16]. Apart from that, a case study is also chosen as a research method as it allows researchers to obtain the "insider view" to the selected organization, thus enables a better understanding of the current organizational status directly from informants within the organization. Hence this would also lead to a more in-depth and holistic picture of the studied phenomenon [17].

A preliminary study is made to verify the reliability of the above hypotheses on a chosen case business unit. The study includes understanding the business and the various dimensions of issues that are important to know in sustaining the business. We then analyze the revenue-related business processes of the business unit. This research adopts a qualitative research approach using exploratory and case study strategy. The qualitative research approach has been identified as the most suitable method of inquiry for this research as it seeks to perform an in-depth study of the current practices in quantifying information.

As a basic framework, the study begins by conducting an assessment to identify:

- the business goals and activities of the case company,
- the related information resources currently used and gaps in the information provisions,
- current IT infrastructure and resources.

Data and information on the roles of the management levels are solicited. For this activity, we employ three information gathering techniques. Firstly, it involves information gathering from respondents through interviews, which provide the main input to this study (in-depth interviews using open-ended interview questions). Secondly, data is also collected through document analysis (written documents). Finally, data gathering through observations method is also used to gain further insights into the operation of the company (direct observation).

We then develop a framework to identify and classify key information for each level of management. Data and information gathered earlier is used to identify relevant and pertinent

parameters for the development of the framework. A set of criteria is established to identify and classify the key information of each management level.

Based on identified valuation and formulation procedures, a ranked and tangible measure of the key information is established. The framework is validated by a questionnaire survey on experts in this area by employing the Delphi method.

### 4. The Conceptual Framework

This study proposes a conceptual framework in business operation by identifying and classifying key information value for managers and administrators at all levels of management. The idea is to offer new insights in daily management and operational tasks and decision-making by minding only those information that are key to their roles. If the key information could be classified in terms of its value, then business managers should be more objective in managing their operations rather than minding less important or unrelated information. The value of information enables managers to improve the business decision-making processes at the departments. Hence, this conceptual framework is considered as an effort towards improving business decision-making and increases its efficiency through improved business processes, reduced costs and provide quality of service. An overview of the key information value paradigm is shown in Figure 1.

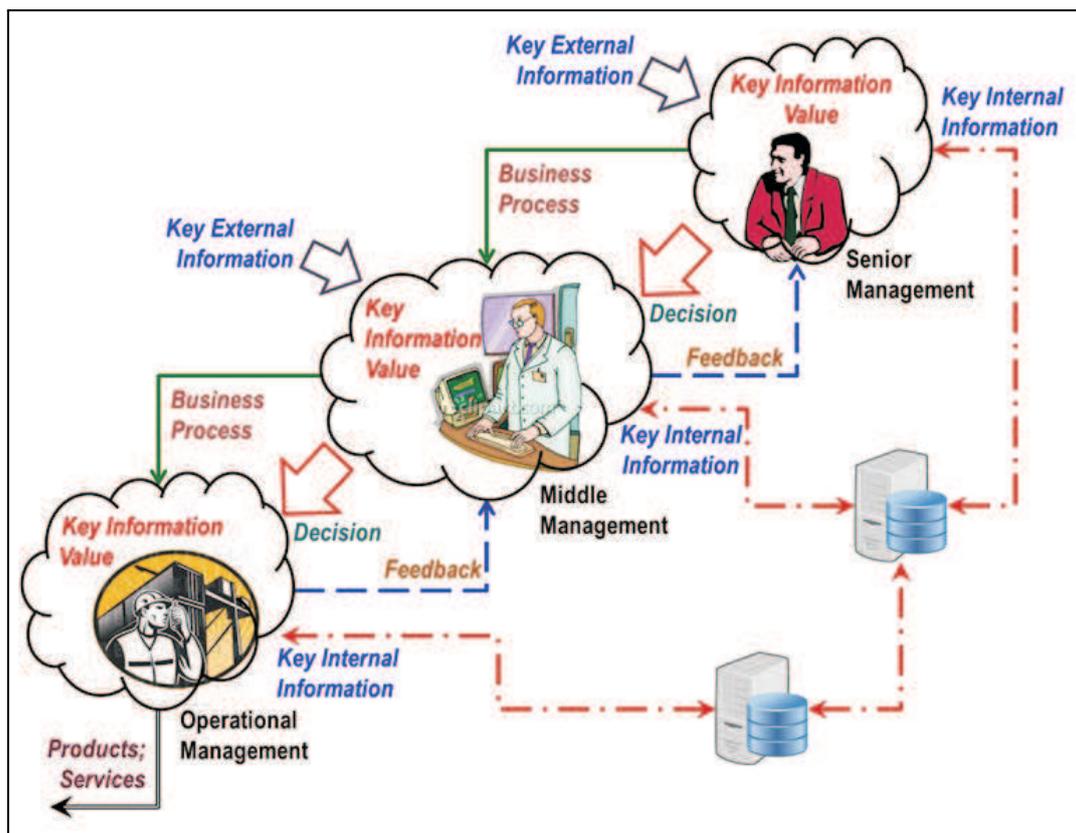


Figure 1. An Overview of the Value of Key Information Paradigm

This study attempts to resolve this issue by introducing the key information value concept, in which managers are aware of the key (internal and external) information values related to their roles. The values of the key internal and external information form the objectives and targets of their management and operational work processes, thus providing greater clarity and efficiency in decision-making. The key information values are shared among the constituents of the business process and form a link between the three levels of management, thus cascading the overall efficiency of the business process.

## 5. Conclusion and Further Works

This study provides an insight to the management by information value in many different applications. Yet such efforts are not readily found in many organizations. While many have sophisticated IT infrastructure to support their business strategies, a significant chunk of business managers' time is spent on unrelated informational issues, thus degrading the efficiency and quality of decision-making.

The proposed key information value conceptual model attempts to resolve this issue by identifying and classifying key information value for business managers at all levels to highlight only pertinent information that is key to their roles. This is necessary and important so that their time is spent on focusing issues related to the key information thus assisting their daily critical business decision-making activities. In our further work, we shall proceed with the case organization from which we shall acquire information pertaining to the requirements of the framework.

### Competing Interests

The authors declare that they have no competing interests.

### Authors' Contributions

All the authors contributed significantly in writing this article. The authors read and approved the final manuscript.

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