Task Characteristics that Fit Use of Business Intelligence

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Task characteristics that fit use of Business Intelligence

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Abstract. We present a literature review that identifies a gap in business intelligence knowledge regarding the fit between technology and the tasks solved using the technology. We propose a model that frames the fit between task characteristics and the use of business intelligence. The model represents task, system, and information quality as independent constructs with task compatibility as the dependent construct. A future quantitative study will test the model by looking at business intelligence users and how they use technology to perform tasks for solving problems.

Keywords: Task difficulty, task variability, Business Intelligence, Digital transformation

1 Introduction

In many organisations, the IT manager's top priority is to handle the increasing volume of data produced internally and externally in structured and unstructured formats. The data must be available to analysts and decision makers throughout all levels of the organisation because it is the foundation for future digital transformation [1]. Some of the 25 highest-ranked transformation factors include work, coordination and digital uses[1]. In the future, we should not regard hierarchy and horizontality as opposites, but instead, as different and complementary ways to coordinate. The next generation's behaviour is also reflected in new digital use as it is a generation raised with IT. It regards the relationship between employee and company as "something-for-something," tied in with memories of past managerial practices experienced [2]. According to Teague [1], high-quality IT systems are essential because when the users are satisfied, then they will do their job effectively independent of their characteristics. Therefore, in the context of the digital transformation, it is highly relevant to research how business intelligence (BI) quality fits certain tasks characteristics.

BI supports decision making at all levels in an organisation [3]. The top management often uses BI to follow up on the realisation of the established objectives. On the tactical level, BI provides a basis for decision-making about optimisation and modifying organisational, financial, and technical aspects of the organisation. At the operational level, BI is used for ad hoc analysis and reports related to daily operations [4].

Task structure is one of the most interesting variables in information systems (IS) research. First, task structure has been used to define the tasks that must be supported by IS. Second, task structure has been used to explain IS successes [5]. Achieving the net benefit of implementing BI, technology must be utilised and have a good fit with the supported tasks [6]. In the field of IS, several work activity determinants supported by IS have been identified [7]. In BI research publications, we have identified four papers focusing on task compatibility [4, 8–10] related to IS success. Unlike general IS research, BI research only focused on the fit between technology and jobs and not on the dimension of examining tasks characteristics' fit with the technology. In this paper, we provide a research model for how task characteristics and quality of a BI system is related to task compatibility.

2 Literature review

We conducted a systematic literature review to reveal state-of-the-art to identify the critical success factors (CSF) for BI [11].We focused on peer-reviewed papers in the period from 2006-2015. We used Papaioannou et. al.'s [12] search strategy covering databases, reference lists, and citations. The queries applied consisted of two components: one containing synonyms for the CSF and one for BI. Papers were selected first by abstract reading. In the remaining part we read the full paper content. Out of 336 papers and 1184 references, 29 papers were relevant to the scope of the review. We used the Petter, DeLone & McLean [7] framework of IS success to identify the CSFs and to analyse and map how researchers identify success in BI systems. CSFs were considered distinct if they occurred in more than 20% of the reviewed papers.

The findings motivating our model introduced below include: (i) the research in CSFs has a small focus on the task compatibility as an independent factor to BI success, which will be elaborated further in Section 3.1; (ii) as users often have access to the source system *and* BI, no previous research investigated the characteristics of the tasks supported by BI; and (iii) the most dominant factor describing BI success is the quality dimension, either in the understanding of system quality or information quality.

3 A Model for BI Tasks

3.1 Task

Tasks are the activities that support an organisation. A job consists of several tasks [13]. Thus, the purpose of the use of IS is to complete tasks [14]. Also, the purpose of implementing IS is either to automate tasks or to obtain information for the task [15]. Since there is a relation between tasks and IS, there are various antecedents of IS success related to the task structure and characteristics [16]. In the contingency theory literature, there is a close relation between task/fit and performance [17]. An example

of misfit is when the user wants to use information from the BI to follow-up on Key Performance Indicators (KPI), and the data is not available [18].

In the review, we found that BI literature has not thoroughly investigated tasks as a CSF [11]. Many researchers have investigated task characteristics and their impact on use, and there have been various suggestions for how the concept can be operationalized [6]. Petter, et al. [7] identified six determinants of the category *task* determining IS success: task compatibility, task difficulty, task interdependence, task significance, task variability, and task specificity. In the literature review, task compatibility was not considered a distinct CSF, having only been investigated in four papers[2]. Task compatibility differs from the other determinants in that the variable examines the fit between technology and task, whereas the remainder of the determinants describes the task itself independently of the technology. No examples of papers investigating the remaining five determinants as BI CSF's were found in the review.

The task characteristics construct is divided into several variables. Task interdependence is specifying the extent to which the task supported by BI depends on other tasks to be completed. Task difficulty is to what extent the task underwritten by BI is challenging for users of the system. Task significance is the task supported by BI and is necessary for the user's job or other employees in the organisation. Task variability is the degree of coherence between tasks that a person performs in interaction with that work process. Task specificity is the level of detail of the task [7].

3.2 BI Quality

In the literature, system quality was found to be an important parameter for BI success [11]. According to Lee, Strong, Kahn and Wang [19], quality can be divided into four different dimensions: intrinsic IQ, contextual IQ, representational IQ, and accessibility IQ. Intrinsic IQ is equal to DeLone and McLeans [20] dimensions information quality. Contextual IQ is equal to Goodhue's [6] concept of task/fit. The last two dimensions are equal to DeLone and McLean's system quality. Lee, Strong, Kahn and Wang [19] do not include service quality as a quality dimension as DeLone and McLean[21] in their Updated IS Success Model, as it is equal to the finding the literature review.

The quality of information the system produces is referred to as information quality [22]. It is considered an important factor when the system is being evaluated because the process involves the production of information to be used in decision-making processes [23]. In the review, 16 papers investigated information quality as a factor in BI success (Gaardboe & Svarre, 2017). Thus, it can be considered a distinct element in the BI literature. System quality is concerned with issues such as user interface system errors, ease of use, and quality and maintenance of program code [23]. Twenty-eight out of 29 papers in the review included system quality as a CSF (Gaardboe & Svarre, 2017). Thus, the review finds system quality as the most well investigated of all BI system success determinants of Petter, DeLone & McLean's [7] framework.

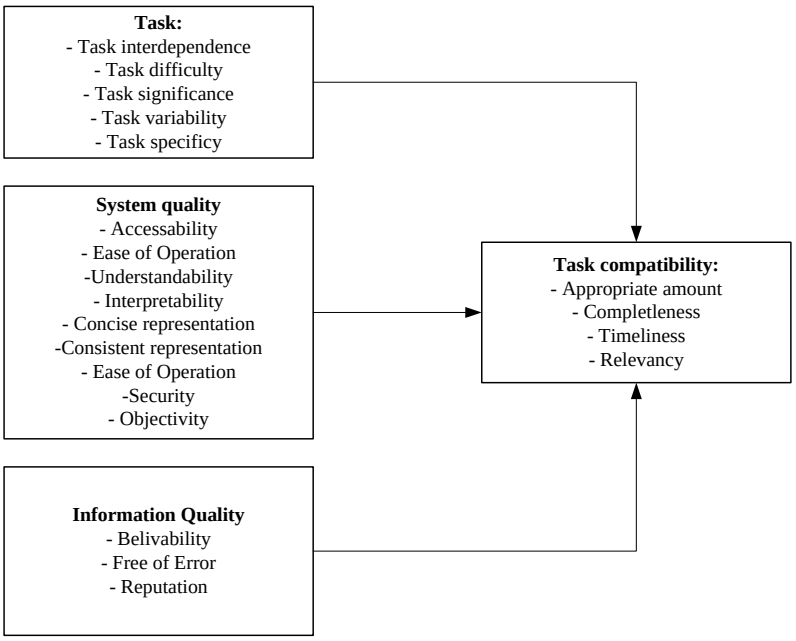
3.3 Task Compatibility

Task compatibility highlights the requirement that the information quality must be evaluated in the context of the task. BI must have the qualities needed to complete the user's task [6]. When these requirements are met, the system and task would add value. The information must be relevant, timely, complete, and of an appropriate amount [19]. This all leads to obtaining task compatibility. When BI has the proper amount of information, then this amount of information fit the user's needs. The completeness is different from a suitable amount because it measures the information including all the necessary values. The timeliness variable focusing on the information is up-to-date for the user's requirement. The last variable is the relevancy, which is the information relevant to the user's need to fulfil the task as is supported by BI [19].

3.4 Task/BI Compatibility Model

The model presented here consists of four constructs. We divided BI quality into system quality and information quality because system quality is an evaluation of the BI system itself, and information quality is an evaluation of the information from BI. The third construct is task. All construct affect task compatibility.

Fig. 1. Task/BI Compatibility Model.



4 Conclusion and Outlook

It is essential for many companies to effectively handle and utilise large amounts of data to survive in the global competitive environment. Based on a literature review, we developed a Task/BI compatibility model consisting of three independent constructs: task, system quality, and information quality with a dependent construct of task compatibility. The assumption in the model is that if tasks and technology fit together, users will (or are more likely to) use the technology. However, at present, we do not know how tasks fit BI.

To test the model, we will use the guidelines by Dillman [24] to construct a survey. The purpose will be to create a questionnaire where serval variables measure each construct. Based on existing research, we will find studies where the questions have been used, tested and validated. The questions must be quality-assured by other researchers before conducting a pilot study. The questionnaire must be prepared and distributed to respondents in a web survey. We will find organisations with very different characteristics and a major use of BI within each organisation. We will then test the model using the PLS-SEM, which is useful for the development of theory.

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