



A study on the relationship between task, information, and individual performance



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ABSTRACT

The goal of this study was to find an abstract model that would address the relationship between information and task and thus lead to better business performance. The relationships among information, task, and performance are analyzed in the natural environment against job-related beliefs and technology. The final instrument was applied to professionals mainly from the Finance and Information and Communication Technology (ICT) sectors. Statistical analyses were used to quantify the relationships. The goal of the study was also to develop a model of task information fit (TIF). Results indicate that the tool has been successful and models the underlying structure between system characteristics, task characteristics, information characteristics, and their impact on perceived business success to some degree. A reduced TIF model was targeted to discover the relation between task characteristics, information characteristics, and their effect on business performance on a per-item basis. The correlations between the items supported the proposed relations.

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1. Introduction

21st century is characterized by its digital nature. Therefore exploring relationships that helps us to comprehend how technology impacts business and commerce are critical for technology and society studies.

In the world of information technologies, the question of finding the best solution for particular business needs has been an ongoing debate for decades, a debate that evolves with the development of technology. The effects of this spiral extend to the social-organizational attitudes of people, raising new questions and requirements.

Those thoughts led to the following questions.

- Is it possible to develop a model that favors Information System (IS) development and is independent from technology?
- What are the main factors in IS development? Information, system ... What else?
- How about interoperability between different ISS? Why do we need interoperability?

Those questions started a chain reaction of other questions that led to the creation of the Task Information Fit model. Therefore the main goal of this study was to find an abstract model that would address the relationship between information and task, thus leading to better business performance. The goal of the model is to eliminate the effect of time and technology.

The characteristics of information, task, and system are covered in the literature review. The relationship between task and information is explored. The concepts of integration and interoperability are studied. Finally, the effect of user acceptance on the use information technologies is discussed.

In the framework proposed; general system properties, task characteristics, information characteristics, beliefs of self and work, and their effect to perceived business success were examined.

The paper is composed of four additional sections. Section 2 introduces the literature review on information characteristics, task characteristics, technology acceptance, and information systems characteristics. Section 3 introduces the research methodologies and different phases of this research. In section 4, research frameworks of Task Information Fit are presented. The findings of the study are discussed in section 5.

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2. Literature survey

2.1. Work environment basic characteristics

Work in general can be defined as a mental or physical activity or set of activities introduced to produce or accomplish something. In the work environment, it can be defined as those activities necessary to accomplish a given set of job objective(s). These activities can be mental or physical; they can be performed by human or by machines and/or computers.

2.2. Job and job design

Jobs can be defined as the aggregation of activities across time for a particular individual. Proper job design for the organization is highly important as it has an effect on the structures of other jobs, it stimulates interactions between peers, and it divides responsibilities among workers. It dictates the hiring policy of the human resources department as well as the training and education schemes. Most interesting for us is that it is also used to indicate how an information system should be designed. In general, division of work can be done using different criteria such as functional decoupling, load sharing, worker competency, or allocation for problem solving. Whichever design is used, it is important to develop a coordinated and coherent structure in itself in pursuit of job requirements.

The objective of job design is to generate deliberate specification of the job holders' responsibilities. The process of job design has been defined as "... specification of the contents, methods, and relationships, of jobs in order to satisfy technological and organizational requirements as well as the social and personal requirements of the job holder" [2].

From the business perspective job design is expected to design the whole organizational structure to address the transformation processes from inputs to outputs and generation of revenue. Job design deals with work organization such as adding tasks, job structuring as giving control over work, and job scheduling and location.

Some of the significant job characteristics from the workers' perspective include variety, career development implications, autonomy, social significance, intrinsic motivation, collaboration opportunities, recognition, feedback, and responsibility [2,6,7,17–19,22]. The aforementioned characteristics are important for motivating people. These are the points to be accounted for in good job design for higher job satisfaction leading to better achievement of business objectives.

A good job design at the individual level should consider the following criteria:

- Optimal variety based on job requirements and people skills
- Being and feeling part of a whole
- A work cycle optimized for workers' needs
- Control over results and feedback
- Utilization of workers' skills, knowledge, and effort
- Perceivable contribution to the end product and recognition

Garg and Rastogi [15] built a model on Hackman and Oldham's proposal [17] on motivational factors of skill variety, task identity, task significance, autonomy, and feedback. The study added factors such as human resource management, ergonomics, organizational culture, leadership style, human performance improvement, and workplace spirituality. All the factors emphasize the workplace's role in employee motivation. The model proposed for job design takes into account external and internal organizational factors, individual values, group-level and social-level factors. All of these

combined result in employee motivation and a high-performance environment. The overall system facilitates higher productivity for the organization.

The primary rationale of survival for productive corporations is continuous creation of value. Creating value relies on information processing, which is in the hands of knowledge workers. Creating a motivating job design for knowledge workers is targeting processes to foster innovation for the company. An innovation motivation antecedents model is an effort to cover that aspect [1]. The model relies on five motivating drivers: sociological, psychological, generational, work, and cultural. Management is expected to analyze the right drivers for the motivation of their knowledge workers, and then apply those drivers as antecedents in creating the target environment. Findings indicate that the job done is the primary source of motivation, followed by intrinsic and extrinsic job outcomes [1]. The last point of motivation is the organizational system, considering corporate culture, rules, procedures, work environment, etc. The concepts of autonomy, intrinsic motivation, task identity, task significance, feedback were used in the design of the task-based and self-motivation-based constructs for the present study.

2.3. Task characteristics

As mentioned above, one basic construct we explored in this study was task. In general, *task* can be defined as an activity or set of activities complete within itself or forming a part of a process. There may be or may not be roles related to a task. Usually, the task takes some input resources and produces some output products or semi-products. For an information or knowledge worker, the input is usually information provided from a system and the output is a decision given or knowledge processed to be deployed.

In a usual controlled decision, the involved information processes include activation, observation, identification, interpretation, evaluation, definition of task(s), formulation of procedure(s), and finally execution of that procedure [27]. Though the steps should be sequential, the pieces of generated information after each process can use information from previous steps. In an earlier study [27], the role of designer, operator, and computer are questioned. The designer faces most of the difficulties by designing identification, interpretation, evaluation, task definition, and formulation of procedure. The operator is asked whether to execute the formulated procedure. This is the case of a well-defined problem. The context and interaction between actors can be completely different in a case where the problem is not so well defined. In those cases, the designed system should refer much more often to the operator to ask for decisions and directions.

Another study concentrated on derivation of taxonomy for cognitive work analysis [26]. The authors described *socio-technical systems* as self-organizing and adaptive to the current dynamic environment. In a complex work context such as the interactions between large information systems and their users (i.e., agents), there exist multiple layers of representation for relating the cognitive and emotional characteristics of a user to his other work environment: user's resources, criteria, and values; possible user strategies, tasks in decision terms, tasks in situation domains, the means-ends structure of the work domain, the work system environment, and the information system itself. The study [26] covered subjects from multiple disciplines: domain expertise, work psychology, decision theory, work sociology, psychology, organization and management, information science.

Task can also be defined as the smallest controllable work unit performed by an employee or group of employees from different departments [31]. Job design requires functional decomposition of the job into tasks. For higher quality achievements, the

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