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## Perceived Usefulness and Use of Information Technology: the Moderating Influences of the Dependence of a Subcontractor towards His Contractor

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*The perceived usefulness is a concept that has been used by several authors in different fields of study. The analysis of these studies shows, as suggested by Davis (1989), that when the individual perceives the information and communication technologies (ICT) to improve his performances, he uses them more frequently in his daily activities at work. However, one may think, as does this research, that the external factors can lead to relativize the significance of this hypothesis. Indeed, the mobilization of the research on the sociology of use and the organizational dispersion of the company allowed us to deduct that within the subcontractor enterprises, the use of ICT by the employees, who favourably perceive their usefulness, depends on the degree of the enterprises' dependency towards their contractors, in the sense that when this dependency grows, the reactive and standard use of these technologies is requested to the detriment of their creative use, and vice versa. The analysis of results, based on a positivist paradigm, a deductive reasoning and a quantitative empirical investigation, enabled us to empirically validate a conceptual model indicating, in fact, that in the subcontractor companies highly depending on their contractors, employees who are convinced that ICT improves their work performance made more reactive use in their administrative activities, while the creative use of these technologies in disseminating the information permanently and in real time has not been promoted within companies which are weakly dependent on their contractors.*

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**Keywords:** *Perceived Usefulness; Reactive usage of ICT; Creative use of ICT; Dependency on the contractors.*

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## Introduction

The globalization of markets and the increased competitiveness oblige large international firms to focus on their core business and to outsource, to the companies of the so-called emerging economies, any peripheral activity which is not specifically related to their know-how. This practice of outsourcing characterizes small and medium enterprises in emerging countries which, for the sake of a larger market and of seizing the opportunities offered by the contractor, as the acquisition of his skills and his expertise (Teng, Cheon and Grover, 1995), are increasingly called upon to perform outsourcing arrangements, mostly subcontracting agreements, that we can define as a formal contract which perceives the activities over which the signatory companies must cooperate (Lesca, 2006).

As part of this contract, the contractors, "in a power struggle that is often favorable for them, have strong requirements in terms of ... use of New Technologies of Information and Communication "(Lesca, 2006, p. 2). These technologies, by reducing the constraint of the geographical distance separate them from their subcontractors and facilitate for them, indeed, the communication, the coordination and the knowledge transfer (LeGoff and Lethiais, 2007).

Aware of these advantages, the use of ICT by geographically distant businesses is considered as "an utilitarian function of support "of their Information System (Prax, 1997), based primarily on meeting the needs of coordination. In this perspective, it seems that the companies around the least perceive more favorably the usefulness of ICT. Indeed, a lot of research on the determinants of the adoption of these technologies, including the work and the model of technology acceptance (TAM) of Davis (1986-1989) show that their perceived usefulness influences positively their acceptance and their use (Bukhari, 2008).

In subcontractor companies associated with a distant contractor, the favorable perception of the usefulness of ICT explains why they are used intensively (Kalika and Isaac, 2006), but does not tell us why their use varies

and is mainly divided into two ways: reactive use and creative use (Bellon, Ben Youssef and M'henni, 2007). The answer to this question lies in the relationship of dependency that relates the subcontractor to its contractor. Indeed, the diffusion of ICT in subcontracting firms in emerging countries is due to their state of dependency towards foreign contractor, which are demanding by imposing not only certain technologies and equipments, but also specific uses of them (St-Pierre, Mennoyer, Boutary, 2006).

This logic of subcontracting highly depending on the contractor "is not neutral in the dynamic of use. It contributed in promoting the uses of ICT in developing countries. However, since this kind of use is standardized by the contractors and the platform designers, the creative and innovative uses have not been solicited." (Bellon, Ben Youssef and M'henni, 2007, p. 18). This leads us to believe that the more the subcontractor is depending on the contractor, the more the reactive uses that it makes of ICT are solicited to the detriment of their creative uses.

The dependence of the subcontractor is a contingency factor which may, by moderating the impact of perceived usefulness of ICT on their use, relativises the scope of the TAM of Davis (1989) (Reix, 2002, Guilloux and Kalika, 2006), which represents in term of the prediction of the adoption and the use of ICT as the most empirically validated model (Legris, Ingham, Collar, 2003; Baile, 2005). The study of this specific moderation effect in the cases of subcontracting enterprises has not been dealt with by the literature. To fill this void, the question we will answer through this research is the following: What is the role of the subcontracting enterprises' dependency in the impact of the perceived usefulness of ICT on their use? The answer to this research question involves dealing with the following tool question:

- a) Does the perceived usefulness of ICT explain their uses?
- b) Is the impact of the perceived usefulness of ICT on their uses in subcontractor companies moderated by their dependency on their contractors?

The objective of this research is to verify whether the impact of the perceived usefulness of ICT on their use within the subcontractor enterprise is moderated by its dependency towards its contractor.

## Material and methods

The purpose of this section is to present the methodology adopted in order to conduct this research. We will first present our methodological choices. We will, then, proceed to the operationalization of the variables of the research and their validation.

### Methodological choices

In order to justify our methodological choices, we will respectively present our epistemological positioning, the type of our investigation, its data collection tool, and the sampling method adopted.

#### *The epistemological positioning*

The positivism dominates the research in management of information systems (Goles and Hirshheim, 2000). It is characterized by an ontology which states that the reality is objective; an epistemology, which is based primarily on the confirmation /invalidation of theories and the attempt to generalize them, and a methodology that requests the use of quantitative data collection tools to objectively test the theories (Fourati, 2006).

The following table (A1) outlines the criteria of a positivist paradigm and justifies our choice to adopt it in this research.

#### *The choice of investigation type*

Research of theoretical investigation focus on developing ideas and concepts of different theories, while research of empirical investigation are more interested in the observation of data to test the said theories (Hirschheim and Chen, 2004). Since our goal is to test a conceptual model developed from the formulation of theoretical hypotheses derived from the development of ideas and concepts belonging to a theoretical framework that we specified in the first part, our research corresponds to both theoretical and empirical investigation.

Our deductive approach also leads us to conduct an empirical and quantitative study (Trudel and Antonuis, 1991), using the questionnaire administered face-to- face, as an instrument of data collection. Indeed, the questionnaire survey shows several advantages such as the quantification of

research results, the estimation of latent variables, the easier comparison of results with other works, the consistent with the geographical dispersion of respondents, the consistent with the application of the methods of structural equations and the researcher's objectivity (Bukhari, 2008).

Our research questionnaire is divided into three parts: the introduction, the body and the Material Safety Data Sheet. The body of the questionnaire is composed of four sub-sections; each is devoted to a variable of the conceptual model. Each subpart has a contain number of items, rated on a Likert scale, ranging from 1 to 5 points. Having the advantage of clarity, these items, which represent closed (or structured) questions, facilitate the statistical processing since they do not leave the subject open in terms of choice, form and length of the response (Thiétart, 2007). The final version of this questionnaire includes only the items that have been validated in the confirmatory factor analysis (CFA).

### *The sampling mode*

The purpose of this section is to present our investigation field, the implemented sampling technique and the size of our sample. Our field of investigation is determined by the specificity of our conceptual model. Limiting our investigation to ICT users belonging to manufacturing subcontractor enterprises, operating in the Tunisian sub-sector of textile and clothing allows us to avoid the confusion between ICT infrastructure and ICT uses (Bellon, Ben Youssef and M'Henni, 2007).

Given the advantages of simplicity, speed, convenience, insurance and consistency with the specificity of research in management (Thiétart, 2007), we found that the convenience sampling method is the most appropriate one for the constitution of our sample. The rules proposed by Roscoe, Lang and Sheth (1975) recommend that this latter should be composed of at least thirty topics. However, using the structural equation method (SEM) in this research requires a sample of at least one hundred to one hundred fifty subjects (Roussel, Durrieu, Campoy and El Akremi, 2002). Our sample, therefore, includes 175 ICT users, belonging to 68 subcontracting enterprises and operating in the Tunisian sub-sector of textile and clothing.

## **The Operationalization of variables**

The objective of the operationalization, in this research, is to measure the so called 'Latent' variables providing observables elements (the items). The result of this operationalization is presented in (A5). We then prepared the first draft of the questionnaire to verify that the number and the quality of the questions do not pose problems for respondents (Evrard et al. 2003, Malhotra, 2004). This pre-test allowed us to explore the favorable conditions to the administration of the questionnaire and to make any changes deemed necessary, namely removing the concepts of total quality and of just in time because they were vague and imprecise, and replacing the term 'codify' by writing and the concept of economy of scale by "increasing the volume of production. "We have subsequently carried out a second version. The data collected from this one were used to validate the measurement scales of the research variables. This validation was to make an exploratory analysis on the collected data (SPSS 11) followed by a confirmatory analysis (LISREL 8.3).

## **Theoretical framework and conceptual model**

The literature that focuses on the adoption of ICT and their uses is abundant. We will focus in this part on the theoretical currents that deal with the relationship between the perceived usefulness of ICT and its use by the user. We will devote the first section to the delimitation of the concepts of the perceived usefulness and the use of technology. We will analyze, then, in the second section, the relationship between these two concepts. Finally, we will explain, in the third section, how the impact of the perceived usefulness of ICT on their uses in the subcontractor companies is conditioned by their dependency towards their contractor.

### **The perceived usefulness and the uses of ICT: Definition of concepts**

The literature on ICT adoption is based on research in social psychology. The sociology of use focuses on the analysis of the uses of these technologies.

## **The perceived usefulness of ICT: Theoretical basis and definition**

The concept of perceived usefulness is based on a theoretical framework that includes the theory of self-efficacy, the theory of behavioral decision, the theory of expectations, and the theory of 'the diffusion of innovations', the theory of reasoned action and the theory of planned behavior (Baile, 2005).

The theory of self-efficacy (Bandura, 1982) explains that individual behavior is influenced by the beliefs of expected result of this behavior. The concept of perceived usefulness is the equivalent here to this of the result's beliefs. The behavioral decision theory (Beach and Mitchell, 1978, Johnson and Payne, 1985) emphasizes the fact that the choice that an individual makes between several decision-making strategies is conditioned both by the effort required to implement a strategy and by the correctness of the perceived decision resulting from this process. This latter determines the choice of the individual and therefore joins the concept of the perceived usefulness. In the same attempts to explain the behavior of an individual, Triandis (1971) borrows from the theory of expectations of Vroom (1964) the concept of perceived consequences of behavior and suggests that they precede and determine the said behavior, as the perceived usefulness precedes and influences the use of ICT.

Ten years later, by focusing on the relationship between the characteristics of innovation and its adoption, the theory of 'diffusion of innovations' (Torknatzky and Klein, 1982) considers that the adoption of an innovation depends on the relative advantage acquired through the latter, a concept that is also related to the concept of the perceived usefulness of a technology, if we consider it as an innovation.

In the same perspective, marketing research conducted by Hausser and Simmie (1981) show, by demonstrating that the perceived effectiveness of ICT determines the choice of accepting or declining their use, a similarity between the concepts of perceived effectiveness and that of perceived usefulness.

Finally, the concept of perceived usefulness as defined in the technology acceptance model of Davis (1989) seems to have as their primary origin the theory of reasoned action (Ajzen and Fishbein, 1980) and the theory of planned behavior (Ajzen, 1991) where the attitude toward the behavior corresponds, according to Baile (2005), to the perceived usefulness.

This model presents, in fact, the concept of perceived usefulness as the gain in performance that an individual believes he can win when using a technology. The usefulness of the latter is related to the perception of the person who uses it in performing his tasks. It is in this sense that Davis (1986) defined it as "the degree of performance improvement expected from using the system" and assessed through six indicators that actually represent the expected benefits of using the technology, namely:

- a) The speed in performing tasks
- b) The increase in work performance
- c) The increase in productivity
- d) The increase in efficiency at work
- e) The facilitation of work
- f) The usefulness of technologies in the workplace.

Consequently, we define the perceived usefulness of ICT as the degree of personal conviction that the use of this latter will improve the individual performance at work.

#### *The uses of ICT: the reactive uses versus the creative uses*

The productivity of a technology depends not only on its intrinsic characteristics, but also on users' uses (Millerand, Proulx and Giroux, 2001). Marketing studies on post-purchase behavior of consumers describe these uses along two main lines: their frequency and their variety where we can distinguish between several types of uses (Ram and Jung, 1989). A mode, in the French language, is "la manière générale dont un phénomène se présente" (the general manner in which a phenomenon occurs) (Larousse, 1990, p.407). The mode of use of ICT can be considered as the general manner in which the frequent and habitual use of these technologies is presented. However, the early researches on the use of an object relate the 'use and gratification' of Katz and Lazarsfeld (1955), which focuses on the media and specifically on the influence of television spots on the individual. The development of these media and of modern communication tools has been the origin of the sociology of use, a mode of thinking that focuses mainly on the manner in which the individuals make use of a technical object (Toy, 2000).

The sociology of use distinguishes often between "usage" and "utilization". It suggests that the "utilization" is synonymous to "usage" when

it becomes an intense, stable and 'routinized' handling of the technology (Kouloumdjian and Chartier, 1991). Consequently, a user is a person who uses technology very often. By contrast, a user of a technology is an individual who does not make common, every day and stable uses.

However, defining the "usage" as stable, is not qualifying it as uniform. Several authors refer to various forms of usage (Toy, 1993), of 'diverting', of 'handiwork' and of the adaptation of a technology to the user's need (De Certeau, 1990).

Continuing his researches, Rogers (2003), in his theory of innovations diffusion, sees technology as a neutral object designed independently from its potential user. This gives him the character of a passive individual and the image of a simple receiver. However, the theory of mediation does not exclude the possibility that this individual can negotiate with the developer of the technology in order to reach a compromise on its characteristics, which will determine its future use, assigning to this user the status of an actor rather active (Akrich, Callon and Latour, 1988). The development of research around this idea of social use of technology is the main purpose of the translation theory and the structuration theory. In contrast to technological determinism, the theory of translation highlights the interaction between the technical and the social within the organization. It considers the technology as an innovation of social dimension, built and rebuilt continually by an iterative game of perception and meaning between individuals (Akrich, 1987). This iterative game between individuals and around a technology often leads to the transformation of its use, or even the creation of new uses not provided when it was designed. This suggests the existence of various forms of ICT uses.

The structuration theory, in its turn, completes the translation theory and considers, according to Giddens (1984), the organization as a social system where the 'routinized' interactions between individuals and around the technology produce uses of it. These uses consist of the fact that these individuals make the technology suitable to the act', 'activate' it 'or 'enact' it within the meaning of Weick (Orlikowski, 1996). Thus, the three forms of use of the technology are manifested in the fact that the individuals use it either habitually (inertia), or to modify their competences (Application) or to change their practices (change). This leads us to believe that the uses of technology are constantly transformed, constructed and reconstructed, diverted, and therefore varied (Giddens, 1984; Akrich, 1998;

Orlikowski 1996). Within this variety, we can distinguish between two types of use: reactive uses (standard or operating) and creative uses (innovative or operating): "two types of uses (which) are found today in the enterprises of rapidly developing countries, which are the most exposed to global competition." (Bellon, Ben Youssef, M'henni, 2007, p. 9).

The reactive use of ICT results from a passive vision that considers their users as a simple receiver who must be able to use them frequently and in accordance with what their designer 'dictates'. It consists therefore of a use "shaped by supply" of a technology "ready to employ" (Bellon, Ben Youssef, M'henni, 2007, p. 9). The company is looking, through this type of use, for the accelerating effect of ICT on its capacity of operating. In fact, this use oriented to human-technology interaction, is based on the routine use of the latter in the electronic management of documents and of production. It consists, according to Bellon, Ben Youssef, and M'henni (2007), in the daily use of ICT in the automation of administrative and productive functions, in the flexibility of production processes (inventory management, Just in Time), in monitoring the total quality and in the management of customer-supplier files. It follows, hence, an operational process and relies mostly on memorized solutions stored in electronic documents and sometimes transformed in forms of rules and procedures registered in hard copies.

The creative use of ICT relies rather on the transformation of their intended use. This transformation results from the interaction between the user of ICT and their designer. This use is also qualified as a 'non-anticipatory' or 'strategic' use (Bellon, Ben Youssef, M'henni, 2007, p. 8) in the sense that it leads to basic innovations of value's creation for the company. This method of use therefore follows an operational process in which the supply cannot formulate the frequent use of ICT and in which the logic of social construction of these latter takes precedence over technological determinism. It helps to improve the coordination, the facilitation of decision making, and the collective problem-solving, the sharing of experiences and the creation of new collective procedures.

### **The Perceived Usefulness: A Determinant of ICT Uses**

In the management of information systems, several studies are integrated into the issues of the ICT adoption. These researches attempted to identify

the explaining factors of their adoption and their use (since the adoption is the first time of use (Rogers, 2003)). Among these factors, we find a reference in each theory, the most often implicit in the concept of perceived usefulness.

The theory of the richness of the means of communication, in its descriptive approach, shows that the individuals choose the means of communication, for the sake of personal efficiency (Baile, 2005, p. 5). This efficiency, in the extent that it represents the desired result through the use of ICT, is in this respect a determinant of this use. This is the thing that makes it synonymous with the concept of perceived usefulness as defined by Davis (1986). In the theory of reasoned action (Ajzen and Fishbein, 1980) and the theory of planned behavior (Ajzen, 1991), the attitude toward the behavior, which reflects the interest of an individual to adopt or to not adopt a technology, is based on his belief that his adoption leads him to a given result that he assesses. This allows us to consider that the attitude toward the behavior (or personal interest) corresponds to the concept of perceived usefulness. The theory of interpersonal behavior, which is originally based on Triandis' model (1971), explains the behavior of technology's adoption across several factors, including the 'Perceived consequences of behavior', a concept borrowed from the theory of expectations of Vroom (1964) according to which the individual tends to appreciate the potential consequences of his behavior in relation to the value that he attaches to the said consequences before adopting this behavior. Consequently, the concept of "perceived consequences" is very close to that of perceived usefulness (Baile, 2005). Thus, several studies have shown that the adoption of personal computers (Thompson, Higgins and Howell, 1991), the use of the electronic mail (Limayem and Loukil, 1997), the purchase on the Internet (Limayem Frini, 2000) and the adoption of Web work (Chang and Cheung, 2001) depend on their perceived consequences by users before they adopt them.

According to the theory of diffusion of innovations (Rogers, 2003), the diffusion process of ICT within a population depends on five factors, including the relative advantage which means that the individual perceives the new technology as better than the one that it replaced.

The relative advantage of the technology joins that of perceived usefulness as defined by Davis (1986).

Finally, "Specially designed to explain the attitudes towards computers, including those of users vis-à-vis information technologies within various populations and in different contexts. »(Davis, 1989, p. 985), the TAM's aim is to explain the acceptance and the use of ICT, incorporating two factors: the ease of use and the perceived usefulness, and by stating that only the latter acts directly on the use of technology. Indeed, the acceptance of ICT is influenced by the beliefs of their potential users. The more they are convinced that their use is improving their individual results, the more they use them in their daily tasks. This hypothesis of the positive impact of perceived usefulness of ICT on their future use has been verified in many studies (Bukhari, 2008) confirming that perceived usefulness is a determinant of the future use of technologies (Subramaninan, 1994), that it is a more important factor than this of the ease of use in determining the system's use (Straub et al, 1997), that the pre-adoption attitude is based only on the perceptions of the utility (Straub et al., 2000) and that 60% of the explanatory power of TAM is due to the perceived usefulness (Venkatesh and Morris, 2000). More recently, Halawi et al, (2007) and King and Marks (2008), confirm that the use of knowledge management systems is possible only if their users perceive them as useful.

Based on this analysis, it is clear that perceived usefulness has a positive effect on a given adoption behavior. This allows us to conclude that there is a positive impact of perceived usefulness of ICT on their use. As these uses can be both reactive and creative, we deduce that perceived usefulness has positive effects both on the first and on the second one. However, the critics of TAM suggests that other factors, such as the characteristics of the organization, are integrated as moderators of the impact of the perceived usefulness of ICT on their uses (Reix, 2002; Baile, 2005; Guilloux and Kalika, 2006). In the next section, we will see how is the dependency of the S towards its O likely to moderate this impact, by orienting it either towards the reactive uses of ICT, or towards their creative uses.

### **The Moderating Role of the Dependency of the subcontractor towards the contractor**

By showing that the use of ICT is more important in companies belonging to a group (Galliano, Lethier and Soulie, 2005; Le Goff and Pronost Lethier,

2007), particularly in the subcontracting enterprises dependent on their contractors (Rejeb and Ghorbel, 2004), several researches confirmed the positive influence of the organizational dispersion of the enterprise on the use's frequency of ICT. Other studies have even shown that the perception of the strategic role of these technologies is significantly related to this dispersion and have found that "the importance attached to ICT in strategic thinking is directly related to discriminating factors of context such as the organizational dispersion of the enterprise"(Kalika and al., 2006, p. 9).

### *The dependency of the subcontractor and the patterns of use of ICT*

There is an organizational dispersion of a company when it belongs to a group. One form of membership in a group is subcontracting. Contrary to an independent enterprise, the subcontracting enterprise, which shares the characteristics of its contractors, especially their geographical distance, has a greater need for communication and collaboration (Isaac and Kalika, 2006), which leads it to use ICT intensively.

This subcontracting relationship implies a certain dependency of the subcontractors towards its contractors; a dependency characterizing the subcontractors in developing countries and involved in an outsourcing policy in order to gain a position in the global economy. Although it promotes the technology transfer and the diffusion of ICT in emerging countries, this policy limits the innovative and creative uses of the latter, because the dominant position of the contractor is reflected by influences and requirements as strong as the subcontractors can only consider the ICT in reactive, standard and 'normalized' uses (Bellon, Ben Youssef and M'henni, 2007). Given the fact that the diffusion of ICT in the subcontracting enterprises in emerging countries results from their dependency towards an contractor who seems demanding by imposing, among other things, certain technologies and equipments (St-Pierre, Mennoyer, Boutary, 2006), the dependency on the S can be considered as a discriminating factor between creative uses and reactive uses. This leads us to think, as shown in the figure below, that the more the subcontractor is dependent on the contractor, the more its reactive uses of ICT are addressed to the detriment of their creative uses (A<sub>2</sub>).

Hence, the hypothesis that the impact of perceived usefulness of ICT on their uses within the subcontracting enterprises has a moderating influence of their dependency towards their contractors, in the sense that:

H1: the greater the subcontracting enterprise is dependent on its contractor, the more the positive impact of perceived usefulness of ICT on their reactive uses is important.

H2: the less the subcontracting enterprise is dependent on its contractor, the more the positive impact of perceived usefulness of ICT on their creative uses is important.

This leads us to construct the following conceptual model:

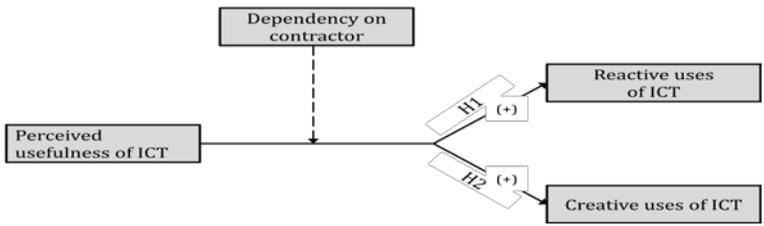


Figure 1: The conceptual model research

In order to complete our analysis, we will discuss the characteristics of the dependency of the subcontractor on the contractor, in the following paragraph.

*The characteristics of the dependency on the contractor*

Nowadays, the contractor prefers to work with a subcontractor who would be the sole executor of their peripheral activities (Laigle, 1996). This situation makes the downstream market of S an oligopsony or monopsony market. Consequently, an increased commercial dependency of the S in relation to the contractor triggers. Thus, the dependency of the subcontractor can be appreciated in accordance with the shares that his most important contractor gets in its total turnover. In fact, Ghorbel and Rejeb (2004, p. 26), evaluated this dependency by asking the following question to the subcontractor "Please indicate, on average, the rate of your sales with each of your most important customer."

The second aspect of this dependency corresponds to the influence that the contractor could exercise on its subcontractors. The accountability of these latter implies the fact that they should be more autonomous in their choice of manufacturing means and methods (Bourgault, 1998) and that their contractors be more involved in training programs for their employees, in the exchange of personnel, in funding their business (Krause, 1999) and even in the intervention in the internal organization of their enterprises (Soussi, 2002). Consequently, the influence of the contractor can be defined as the ability of the latter to guide the selection of the subcontractor, not only in terms of the methods of manufacturing, but also with respect to its adoption of technological innovations, its choice of manufacturing personnel and its training and the funding of its activities (Ghorbel and Rejeb, 2004).

Finally, the last feature of the dependency on the contractor represents the level of its requirements which, in a global economy, increases progressively as the competition intensifies. Indeed, large firms, often in the position of contractor, must deal with constraints that result, in their relationship with their subcontractor, through requirements in terms of deadlines, quality, visibility and flexibility (Oral and Martel, 1995). Therefore, the S depends more on their contractor when "the degree of difficulty of predicting their new requirements, «the degree of variability of their requirements» the importance of the changes caused by their demands "and "the needed time to be adapted" are higher (Ghorbel and Rejeb, 2004, p. 26).

## **Results**

### **Data and measurement**

The results of operationalization show, as summarized in the table below, that the scales chosen to measure our four theoretical constructs are reliable, valid and represent the observations in a very satisfactory manner.

**Table 1:** Reliability, convergent validity and fit indices of research variables

	Perceived usefulness of ICT (6 items)	Reactive uses		Creative uses of ICT		Dependency on contractor (5 items)
		RUAA (2items)	RUTA (3items)	PDI (3items)	PDC (2items)	
<b>Reliability</b>						
( $\alpha$ ) de Cronbach	0,9156	0,687	0,767	0,855	0,879	0,898
Rh $\hat{o}$ de Jöreskog	0,935	0,723	0,81	0,765	0,928	0,93
<b>Convergent validity</b>	0,713	0,58	0,60	0,55	0,866	0,729
<b><math>\chi^2</math></b>	2,44	2,43		2,29		2,44
<b>RMSEA</b>	0,091	0,092		0,092		0,091
<b>GFI</b>	0,97	1		0,98		0,98
<b>AGFI</b>	0,9	0,99		0,90		0,99
<b>NFI</b>	0,99	0,99		0,99		0,99
<b>CFI</b>	0,99	1		0,99		0,99

These results show that the scales of the variables of our research are both one-dimensional and two-dimensional:

- a) The scale of measurement adopted to measure the perceived usefulness of ICT is one-dimensional and contains 6 items. These results are compliant to those of Davis (1986) and are very close to those of many authors who have taken this scale and have evaluated it from different contexts (Bukhari, 2008).
- b) The scale of measurement adopted to measure the reactive use of ICT is two-dimensional: The first dimension includes two items that refer to a reactive use of ICT in administrative activities. This led us

to name it 'Reactive Use in Administrative Activities' and to encode it RUAA; the second dimension involves 3 items informing about reactive use of ICT in transactional activities. This allowed us to name it 'Reactive Use in Transactional Activities' and to encode it RUTA.

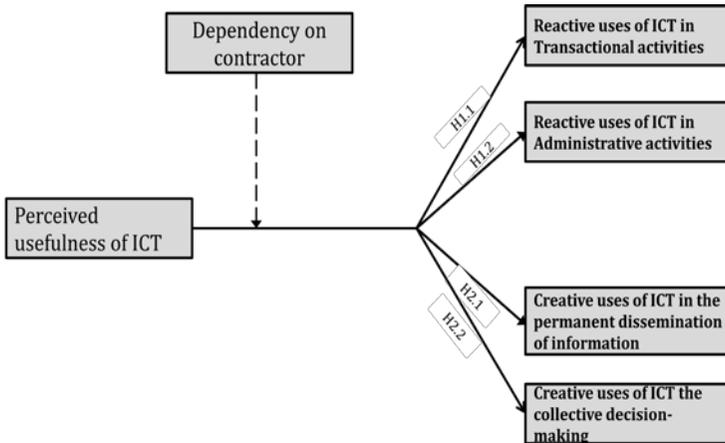
- c) The scale of measurement adopted to measure the creative use of ICT is also two-dimensional: The first dimension includes 3 items that provide information on the use of ICT in the activities of sharing and of the permanent and in real-time dissemination of the information. This dimension is called 'Permanent Dissemination of Information' and coded 'PDI'; the second dimension contains two items that review the use of ICT to facilitate the decision-making, to solve problems collectively and to create new working procedures. This led us to name it 'Collective Decision Making' and to encode it CDM'.
- d) The scale of measurement adopted to measure the dependency on the contractor is, finally, one-dimensional and involves 5 items.
- e) The final step in validating our measurement scales is to examine their discriminated validity. As shown in the following table, the result of the comparison between the constrained model and the free model (Roussel et al, 2002) indicates that the latter has a Chi-2 below that of the first and that this difference in Chi-2 (36.385) is statistically significant ( $df = 8; p < 0.001$ ). This allows us to judge the discriminated validity of our variables as satisfactory.

**Table 2:** Test of the discriminated validity of research variables

	Constrained Model(CM)	Free Model (FM)	Comparison of the models(CM-FM)
$\chi^2$	125,836	89,451	36,385
Ddl	37	29	8

The accuracy of the reliability, the validity and the dimensionality of the measurement scales of our variables led us to retain an operating model that includes, as shown in the figure below, a one-dimensional explanatory variable (perceived usefulness of ICT), a one-dimensional moderator

variable (dependency on contractor) and two-dimensional variables to explain (the reactive use of ICT and their creative use).



**Figure 2:** The operating model of research

The two-dimensionality of the variables Reactive Use of ICT and Creative Use of ICT led us to decline the two hypotheses of our research into sub-hypotheses as follows:

H1: The more the subcontractor enterprise is dependent on its contractors, the more the positive impact of perceived usefulness of ICT on their reactive use is important.

H1.1: The more the subcontractor enterprise is dependent on its contractor, the more the positive impact of perceived usefulness of ICT on their reactive use in transactional activities is important.

H1.2: The more the subcontractor enterprise is dependent on its contractor, the more the positive impact of perceived usefulness of ICT on their reactive use in administrative activities is important.

H2: The less the subcontractor is dependent on its contractor, the more the positive impact of the perceived usefulness of ICT on their creative uses is important.

H2.1: The less the subcontractor is dependent on its contractor, the more the positive impact of perceived usefulness of ICT on their creative uses in the permanent dissemination of information is important.

H2.2: The less the subcontractor is dependent on its contractor, the more the positive impact of perceived usefulness of ICT on their creative uses in the collective decision-making is important.

After presenting the operating model and the sub-hypotheses of the research, we will mobilize, in the next section, the method of the multiple regressions in order to test and to discuss them.

**The moderating effect of the subcontractor dependency towards its contractor: Results and discussion and of the empirical analysis**

The test result of the four underlying sub-hypotheses on the moderation effect of the dependency of S towards its O is summarized in the following table.

**Table 3:** Test result of the four sub-hypotheses of the research

HYPOTHESES	RESULTS
H1.1: The more the subcontractor enterprise is dependent on its contractor, the more the positive impact of the perceived usefulness of ICT on their reactive use in transactional	<b>Invalidated</b>
H1.2: The more the enterprise is dependent on its contractor, the more the positive impact of the perceived usefulness of ICT on their reactive use in administrative activities is important.	<b>Confirmed</b>
H2.1: The less the enterprise is dependent on its contractor, the more the positive impact of the perceived usefulness of ICT on their use in the permanent dissemination of information is important.	<b>Confirmed</b>
H2.2: The less the enterprise is dependent on its contractor, the more the positive impact of the perceived usefulness of ICT on their use in the collective decision-making is important.	<b>Invalidated</b>

*The moderating effect and the reactive uses of ICT*

The results of the multiple regression conducted to test the hypothesis H1.1 show the absence of a significant impact of perceived usefulness of ICT ( $t = 0.398, p = 0.691$ ), of the dependency on the contractor ( $t = 0.436, p = 0.664$ ) and of the interaction of the last two notions ( $t = 0.467; p = 0.698$ ) on the reactive uses of these technologies in the transactional activities of the

subcontractor with a significance level set at 5%. Therefore, the dependency of the contractor does not moderate the impact of the perceived usefulness of ICT on reactive uses in the transactional activities of the S; and the H1.1 hypothesis is invalidated.

The results of the multiple regressions conducted to test the hypothesis H1.2 are summarized in the table 4 (A3). These results indicate that, despite the absence of a significant impact of the dependency of the contractor on the reactive uses of ICT in administrative activities ( $t = 0.772$ ,  $p = 0.441$ ), the positive impact of the perceived usefulness of these technologies ( $t = 11.991$ ,  $p = 0.000$ ) and of the interaction of this usefulness with the dependency on the contractor ( $t = 4.715$ ,  $p = 0.000$ ) on these uses are statistically significant at a risk threshold set at 5%. This allows us to conclude that the dependency on the contractor has a pure moderating effect of the impact of perceived usefulness of ICT on their uses in the administrative activities of the subcontractor. Therefore, the hypothesis H1.2 is confirmed.

This result means that the positive effect of perceived usefulness of ICT on their reactive uses in administrative activities (RUAA) increases gradually as the dependency of the subcontractor in respect to its contractor increases. Thus, the employees who perceive ICT as useful tend to use them more frequently in reactive and administrative activities when the subcontractor enterprise, to which they belong, is more dependent on its contractor. Indeed, the equipment of the subcontractor enterprises in the countries emerging in ICT is often consecutive to their dependency on a demanding contractor influencing, not only its technological choice, but also the uses that should be made of these technologies (ST-Pierre, Monnoyer, Boutary, 2006). These uses, imposed by the contractor, are reactive uses that are often limited to the electronic document management, to the management of customer/supplier files and to the treatment of coordination and communication needs, resulting from the geographic distance separating them from their subcontractor. For this reason, the user of ICT in these enterprises is a simple receiver that makes use of the technology that is equipped in accordance with the requirements of the contractor, the thing that limits the innovative uses (Bellon et al, 2007).

*The moderating effect and the creative uses of ICT*

The H2.1 hypothesis asserts that the less the S enterprise is dependent on the contractor, the greater the positive impact of perceived usefulness of ICT in their creative uses in the permanent dissemination of information is important. The results of the multiple regressions conducted to test this hypothesis are summarized in the table 5(A4).

These results indicate the presence of a positive impact of perceived usefulness of ICT in their creative uses in the permanent dissemination of information ( $t = 3.967$ ,  $p = 0.000$ ), but they also show that the impact of the dependency of the contractor ( $t = -2.995$ ,  $p = 0.003$ ) and its interaction with the perceived usefulness of these technologies ( $t = -2.745$ ,  $p = 0.007$ ) are negative at a significance level set at 5%. This allows us to conclude that the positive impact of perceived usefulness of ICT on their creative uses in disseminating information permanently increases progressively as the dependency of the subcontractor enterprise decreases. Consequently, the dependency of the contractor has a quasi-moderator effect on the impact of perceived usefulness of ICT on their creative uses in the permanent dissemination of information and the hypothesis H2.1 is confirmed.

This result means that the positive effect of perceived usefulness of ICT on their creative uses in the permanent dissemination of information increases (decreases) gradually as the dependency of the subcontractor enterprise towards its contractor decreases (increases). This means that the employees, who positively perceive the usefulness of ICT available to them, tend to use them more frequently in the permanent dissemination of information when the subcontractor enterprise to which they belong is less dependent on its contractor. In fact, the less demanding contractor has a less influence on the choice of technology and on the uses made by their subcontractor enterprises (and Rejeb Ghorbel, 2004). The use of ICT within these enterprises is not entirely dictated by their contractor and is based on the interaction and the permanent and in real time sharing of information between users in order to improve the coordination, facilitate the decision making, solve problems collectively and possibly create new operating procedures (Bellon et al., 2007) .. This promotes the creation of new forms of social use of ICT through the formation of a contact network and an interactional learning. In this sense, the sociology of use describes the ICT as a social object, rather than a purely technical object (Toy 2000).

Finally, the results of testing the hypothesis H2.2 show that the impact of perceived usefulness of ICT ( $t = 0.398$ ,  $p = 0.691$ ), of the dependency on the contractor ( $t = 0.436$ ,  $p = 0.664$ ) and of the interaction of these two last notions ( $t = 0.467$ ,  $p = 0.698$ ) on the uses of these technologies in collective decision making are not significant. This allows us to refute the hypothesis H2.2.

The testing of all the underlying hypotheses of the research shows that the moderating effect of the dependency on the contractor is significantly present only at the level of the test results of the two hypotheses H1.2 and H2.1. This effect of moderation is likely to modulate the sense of the impact of perceived usefulness of ICT on their uses according to the level of the moderator variable "contractor dependency." To better reflect the role of the latter, we tried, by making a Factorial Correspondence Analysis, to clarify the sense of this moderation.

*The sense of the moderation effect of the dependency of the contractor*

The objective of the FCA, at this level of analysis, is to determine whether the most dependent subcontractors towards their contractors are characterized by the highest reactive uses (RUAA) and the lowest creative uses (PDI) or not, and vice versa. The results of this analysis (A6) are statistically significant and indicate that the most dependent subcontractor are distinguished by high reactive uses of ICT in administrative activities (83% of the more dependent subcontractor), while the less dependent subcontractor make of them a high creative uses oriented to the dissemination of information on a permanent basis (69% of the lowest dependent subcontractor). This supports the confirmation of the sub-hypotheses H1.2 and H2.1 and allows us to empirically validate the following conceptual model:

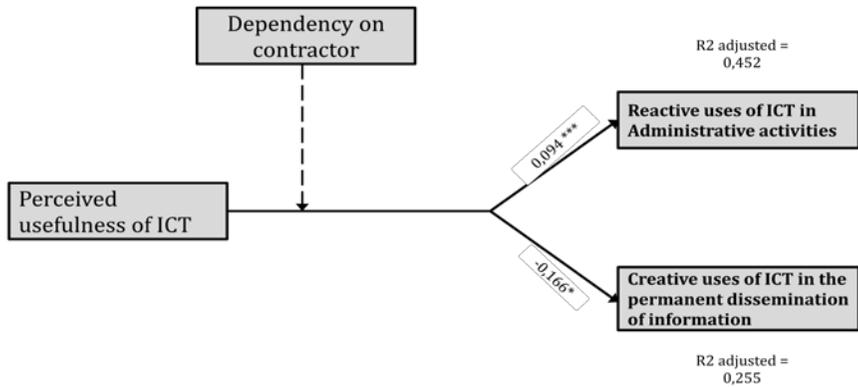


Figure 3: The validated research model

## Conclusions

The use of ICT is strongly determined by the perception of their usefulness in carrying daily tasks. The objective of this research is to demonstrate that these uses vary according to the level of dependence of subcontractor enterprises with regards to their contractors.

The manner in which the authors of the sociology of use address the uses of these technologies has allowed us to separate these latter in the two corresponding modes: the reactive uses and the creative uses. Although these uses depend on the perceived usefulness of the technologies through which they are conveyed, the analysis of the literature on the organizational dispersion of the company led us to conclude that the dependency of the subcontracting enterprise, to which the employees who perceive this usefulness belong, determines its uses; in the sense that these latter will be more reactive than creative when this dependency is high.

The data collected through a questionnaire survey administered to 175 ICT users, belonging to 68 subcontractors and operating in the Tunisian sub-sector of the textile and clothing, permitted to make the necessary statistical tests to verify this hypothesis.

The results of these tests allowed us to empirically validate a conceptual model confirming that the impact of the perceived usefulness of ICT on the specific uses of the latter is moderated by the dependency of the

subcontractors with respect to their contractors. In fact, in the subcontracting enterprises which are highly dependent on their contractors, the users who are convinced that the ICT improve their work performance make more use of reactive uses in their administrative activities. Conversely, although the users of ICT in these companies highly dependent on their contractors perceive positively their usefulness, they make of it very few creative uses in disseminating information permanently and in real time. This is consistent with the previous work that demonstrated that it is insufficient for the employees to be convinced that the ICT improve their job performance so that they could make of them creative uses oriented to the sharing and the dissemination of information.

Thus, through the development of a conceptual model that integrates several variables borrowed from a multidisciplinary theoretical framework combining the fields of the social psychology, the information systems management and the sociology of use, we contributed, on the theoretical level, to the enrichment of the researches dealing with the perceived usefulness of ICT and their use. On the managerial level, our contribution lies in specifying that the success of implementation of ICT in the sub-contracting enterprises requires the consideration of employees' perceptions, the level of dependency on contractors and the variety of uses that the potential users will make of these technologies.

Despite these contributions, this research shows the limits of hiding qualitative methods and considering the ICT as a whole, while it is not obvious that these findings can be applied to each of these technologies. Moreover, in order to improve the explanatory power of our conceptual model, it would be interesting to test it against each of the ICT, by adopting a qualitative methodology. It would equally be interesting to retest our hypotheses on companies belonging to other sectors of activities and to other contexts to see if our results could be generalized.

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