DIRASSAT Journal Economic Issue (ISSN: 2676-2013)

Vol 3. N^{0} 2 - September 2012. PP: 207-224

Literature of Information Systems and Information Technology Evaluation in Management Information Systems' Field

أدبيات نظم المعلومات وتقييم تكنولوجيا المعلومات في مجال نظم المعلومات الإدارية

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Abstract

This paper investigates the famous streams in literature of information systems and information technology (IS/IT) evaluation. This theoretical review entails the user information satisfaction (UIS) models, the technology acceptance models (TAM) and Delone and McLean success model (D&M SM) (1992). The present paper represents a part from a study that has been undertaken to investigate the use of IS/IT in selected Algerian organizations and the perceived performance of both individuals and organizations

Key words: Information Systems and Information Technology (IS/IT), Technology Acceptance Models (TAM), User Satisfaction Approaches, D&M Success Model, Measurements of Variables' Categories

ملخص

يهدف هذا المقال إلى التعريف بأشهر التيارات المعروفة في أدبيات تقييم نظم وتكنولوجيا المعلومات IS/IT. تتضمن هذه المراجعة النظرية نماذج الرضا المعلوماتي للمستعمل UIS ونماذج قبول التكنولوجيا TAM وكذا النموذج المعروف بنموذج نجاح نظم المعلومات لـ Delone وMcLean (1992). تمثل هذه الورقة الجزء النظري من دراسة ميدانية أجريت على عينة مختارة من المنظمات الجزائرية في مختلف القطاعات والتي هدفت إلى قياس الأداء المدرك لدى المستعملين ولدى المنظمات

الكلمات المفتاحية: نظم وتكنولوجيا المعلومات IS/IT، نماذج قبول التكنولوجيا TAM، مقاربات رضا المستعمل، نموذج نجاح نظم المعلومات لـ Delone وMcLean، قياس متغيرات نموذج

Introduction:

Information systems and information technologies (henceforth IS/IT) have widely been and for a long time the purpose of deep research. The focus has been on the impacts that may be generated as result of IS/IT use, though the results were not from the same nature (Albadvi et al. 2007). The results were divided into two categories, the first category has shown positive impacts on the organizational performance, while the second one rejects partially or totally this effect (Mahmood et al. 2000). In IS/IT literature, this phenomenon is called "*the productivity paradox of IT*" (Brynjolfsson 1993, p. 67).

The focus is how organizations should benefit from this evaluation to achieve their organizational and effective objectives. The process of IS/IT assessment takes many aspects and each one has its benefits and pitfalls. The main objective of this study is to highlight the different processes of IS/IT assessment in management information systems (henceforth MIS) research.

To achieve this, this paper was divided into two major sections: the first one is devoted to literature review that includes two streams, user information satisfaction models and technology acceptance models. The second section is totally assigned to Delone and McLean Success Model (1992). This latter was selected from many studies because it agglomerates the majority of variables that may judge the success of an information system or an information technology into one model.

1. Literature Review:

Two famous streams have led research in IS/IT success: technology acceptance (TAM) approaches and user information satisfaction approaches. The first stream consists on the *use* as notion to construct the concept of technology acceptance, while the second one consists on the notion of *IS/IT characteristics* to construct the concept of user satisfaction (Wixom and Todd 2005, p. 85). In some studies user satisfaction was the aim of assessing the value of IS/IT (e.g: Ives et al. 1983, Baroudi and Orlikowski 1988, Melone 1990). Whereas, the concept of technology acceptance models was developed by (e.g: Davis 1989, Hartwick and Barki 1994, Venkatech 1999, Venkatech et al. 2003).

In this paper, we select only some distinctive researches in IS/IT evaluation, though the history of research is very long and rich. As abovementioned, the major dominant approaches in IS/IT assessment are user satisfaction approaches and technology acceptance models (TAM). Finally, the attempt to develop a construct which combine the two previous approaches (Wixom and Todd 2005).

1. 1. User Satisfaction:

User satisfaction approaches were the first to appear in many studies. Researchers have a major preoccupation that user satisfaction is used as a surrogate for IS/IT effectiveness and success (Ives et al. 1983, p. 786; Rai et al. 2002), or substituted variable for the measure of the improved performance (Kefi and Kalika 2004). Indeed, referent studies in IS/IT

evaluation have effectively contributed in the development of this tendency (Pearson 1977; Baily and Pearson 1983; Ives et al. 1983, 1986; Baroudi and Orlikowski 1988; Melone 1990).

For exemple, Ives et al. (1983) provide a forty-item scale by which they measured user information satisfaction (UIS). They followed the line of multiple-item scales studies by which information system product is basically the aim of the measurement. This latter is also based on three major concepts: system acceptance, output quality and MIS appreciation. Then these concepts are operationalized through content of the IS/IT (e.g., accuracy, relevance); and the manner in which the information is presented (e.g., format, mode). Besides, the organizational support for developing and maintaining IS/IT is also an essential factor to judge the services provided by MIS function (p.786). Within scale, training, documentation, systems maintenance are the basics of this measurement. Later on, Baroudi and Orlikowski (1988) have examined the instrument's characteristics of Ives et al.; and they reinforced the findings of their precursors.

Melone (1990), in her review of user satisfaction construct in IS/IT research, recommends not to be satisfied by user satisfaction alone as a measurement of IS/IT effectiveness, and she reported: *"user satisfaction is not sufficient to adequately capture the full meaning of effectiveness"* (p. 88), for the reason of failing to consider the role of user behavior in transferring inputs to outputs. Consequently, she stresses on considering components of user attitude, the cognitive (arguments and information) and behavioral (actions and intentions), in addition to the observed behavior.

1. 2. Technology Acceptance Literature (TAM):

In IS/IT literature, several studies have oriented their efforts towards system usage. In the field of IS/IT evaluation, Davis' TAM (1989) was the pioneer to develop a valid instrument in which he measured the user acceptance of computers by using two famous variables in the approaches of TAM that are perceived usefulness (PU) and perceived ease of use (PEU).

According to Venkatech (1999), technology acceptance models (TAM) have theoretically found their roots in the social psychology theory of reasoned action (TRA) developed by Ajzen and Fishbein (1975, 1980). This theory suggests that individual's behavioral intention to use a technology is shaped or determined by two behavioral beliefs: perceived usefulness (PU) and perceived ease of use (PEU) (Venkatech, 1999). As stated by Davis (1989), PU is defined as *"the degree to which a person believes that using a particular*

system would enhance his or her job performance". PEU, in contrast, is referred to *"the degree to which a person believes that using a particular system would be free of effort"*. The former is followed from the word useful which means *"capable of being used advantageously"*. While the latter is followed from the word ease which means *"freedom from difficulty or great effort"* (p. 320).

The subsequent works have aimed to reinforce this orientation. Venkatech (1999) for e.g. has reported that: *"investment in emerging information technology applications can lead to productivity gains only if they are accepted and used"* (p. 239). They stressed on the technology acceptance as key issue in IS/IT use. However, the most remarkable research in TAM's stream is the one of Venkatech et al. (2003), this because it unified, as they said, the majority of views and measurements in TAM's research.

Venkatech et al.'s unified theory of acceptance and use of technology (UTAUT) was formulated with four core determinants as independent variables: performance expectancy, effort expectancy, social influence and facilitating conditions. These latter affect directly the dependent variable behavioral intention, and this latter affects use behavior as result to the use intention. The UTAUT model suggests that these relations occur but by moderating their effects by gender, age, experience and voluntariness of use as moderating variables.

Until now, research in IS/IT was dominated by two streams which have been treated widely as distinct. Then, the attempt to mix the two streams in one model has been realized by Wixom and Todd (2005). They demonstrate the potential to integrate concepts related to user satisfaction approaches and TAM approaches into a single model. This latter results in such model that strengthens the pitfalls of each stream by filling the gaps missed by the two approaches.

2. Delone and McLean Success Model (1992):

2. 1. Describing D&M Success Model:

As aforementioned, this study is backed up and has been inspired from the famous model of Delone and McLean which is developed to sum up approximately the major determinants of IS/IT's success. Our choice was built on the reputation of the model, though it faces many critics concerning its methodological structure (Seddon 1997). In a review of their D&M IS Success Model, Delone and McLean (2003) have reported that the model was a reference to nearly 300 articles in refereed journals, and made use of these IS success models from 1992 to 2003 (p. 10).

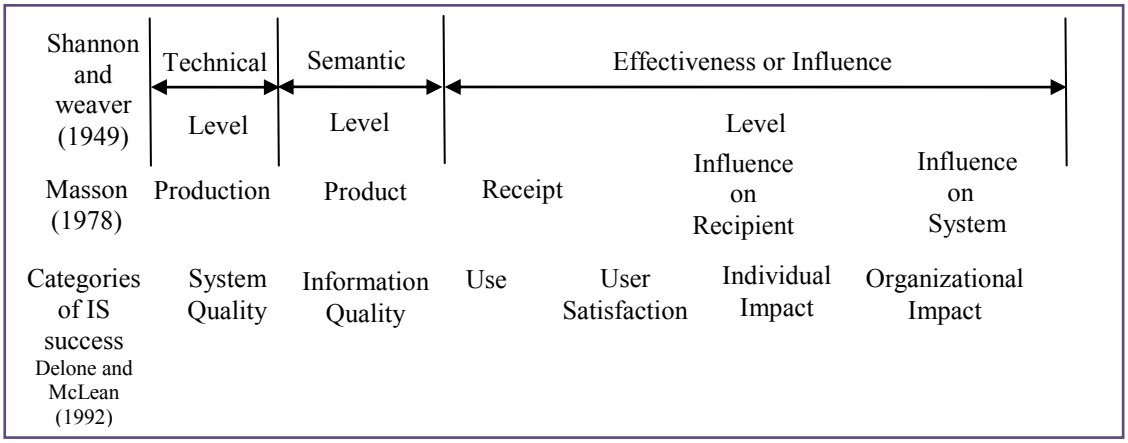
Many researchers have examined empirically the validity of this model. Seddon and Kiew (1996) and Hunton and Flowers (1997) found support for the relationships of Delone and Mclean model and they concluded that the majority of these relationships are significant (Rai et al. 2002). By applying a part of D&M Success Model, a similar work to investigate the impact of using intranet in communications conducted on an Algerian users' sample, Benaoune (2008) has also found significant relationship between the use of the intranet and the individual performance.

A very interesting research to be mentioned is that of Rai et al. (2002), because it evaluated the validity of two models: D&M Success Model (1992) and Seddon's model (1997). Rai and their colleagues stressed the model's strength and they gave it the merit to explaining IS success, as they said. Another merit to the model is offered by Garrity and Sanders (1998) when they built upon the model the majority of the chapters included in their book entitled IS success measurement published in 1998 (cited in Rai et al. 2002). This is about D&M Success Model's importance, now what about the construct itself?

First, Delone and McLean have returned back to the communication theory developed by Shannon and Weaver (1949) in which these pioneers have measured the process of generating information by information and communication systems. According to them, this process is divided into three levels: the technical level by which information is produced by systems' accuracy and efficiency, and the semantic level as the success of information in conveying the intended meaning, and the effectiveness level as the effect of the information on the receiver (Delone and McLean 1992).

Later on, Masson (1978) has adapted from this theory his model in which he changed the effectiveness by influence. Further, *"there is a series of influence events includes the receipt of the information, and evaluation of the information, and the application of the information, leading to a change in recipient behavior and a change in system performance"* as stated by Delone and McLean (1992, p. 61). We observe a projection of Shannon and Weaver's levels on Masson's sequence of events from the production of information stage to its impact stage.

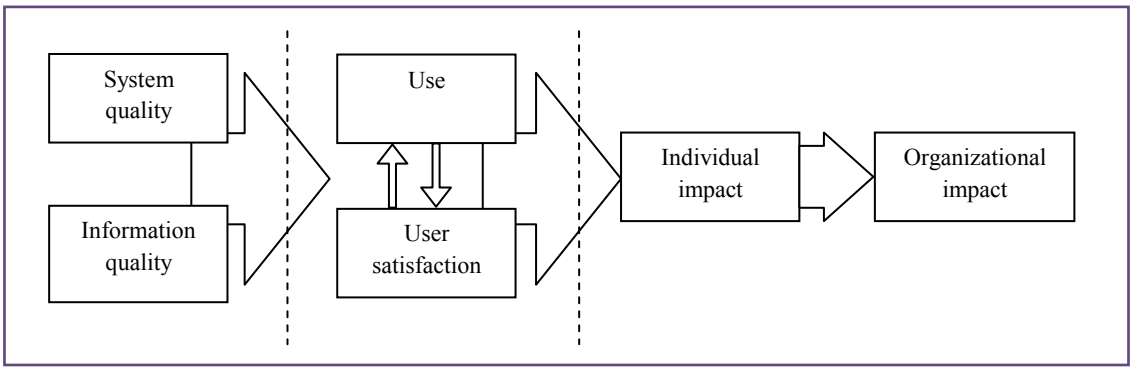
Figure 1. Categories of IS success



Source: Delone and McLean (1992, p. 62)

These previous studies yielded the fundamental components in IS/IT success as follows: System Quality, Information Quality, System Use, User Satisfaction, Individual Impact and Organizational Impact.

Figure 2. Delone and McLean success model (D&M SM**) (1992)**



Source: Delone and McLean (1992, p. 87)

The important contributions for the above components have been recapitulated by Delone and McLean in their paper; but we have just chosen some of the most significant to mention this theoretical background of D&M Model.

Table 1. Empirical Measures of D&M Success Model components

variables	Researchers	Description of study	Description of measures
1. System Quality	Bailey and Pearson (1983)*	Overall IS; 8 org., 32 managers	• Convenience of access • Flexibility of system • Integration of systems • Response time
	Franz and Robey (1986)	Specific IS; 34 org., 118 user managers	• Perceived usefulness of IS (12 items)
	Belardo, Karwan, and Wallace (1982)*	Emergency management DSS; 10 emergency dispatchers	• Reliability • Response time • Ease of use • Ease of learning
2. Information Quality	Bailey and Pearson (1983)	Overall IS; 8 org., 32 managers	• Accuracy • Precision • Currency • Timeliness • reliability • Completeness • Conciseness • Format • relevance
	Miller and Doyle (1987)*	Overall IS; 21 finc. firms, 276 user managers	• Completeness of information • Accuracy of information • Relevance of reports • Timeliness of reports
	Baroudi and Orlikowski (1988)	Using UIS, 2 org.; Finc. IS, EDP	• Recommending of using Baroudi et al.'s UIS (1983)
3. IS/IT Use	Hamilton and Chervany (1981b)	Comparing evaluator viewpoints (users, MIS, management, internal audit)	• Assessing system effectiveness
	De Vaujany (2007)	Analyzing usage to "caution value", "assimilation value" and "appropriation value"	• Cau. V: diffusion ratio • Ass. V: duration of use • App. V: stakeholders satisfaction
	Youngcheol kang et al. (2008)	139 proj., 74 org., computer aided operations, construction industry	• Using IT for project scheduling
4. User Satisfaction	Ives et al. (1983)*	Overall IS, 200 firms, 200 prod. managers	• UIS instrument of Bailey and Pearson
	Doll and Torkzadeh (1988)	618 users, 12-item instrument,	• Content • Accuracy • Format • Ease of use • timeliness
5. Individual Performance	Goodhue and Thompson (1995)	662 quest. available, 2 org., 25 technologies, study of task-technology fit	• Effectiveness • Productivity • performance
	Straub et al. (1995)	458 resp., Using voice-mail, using Davis' TAM, financial institutions	• Decision making enhancement • Job performance improvement
	Benbasat and Dexter (1986)*	Financial; 65 business students	• Time to take to complete a task
6. Organizational Performance	Albadvi et al. (2006)	200 org., studying the role of org. infrastructures. and bus. process reengineering.	• Customer results • Operational results • People results • Growth

Mashhour and Zaatreh (1995)	Jordan banks	• Cost-benefit analysis

The above works are cited as a sample from many studies describing D&M Success Model components. Those marked with asterisks are cited in the original article.

2. 2. D&M Success Model's Variables:

This section describes the different variables of Delone and McLean success model (1992). Here, we have to note that this description of variables is different from the Delone and McLean's one.

System Quality

This variable was a determinant factor in information systems use. It helps users to built a strong trust which lets them relaying on the system to accomplish their tasks. Many studies have tried to describe the operationalization of the system quality. For instance, the majority of TAM approach adopters noted that perceived ease of use is a crucial issue in system quality (Davis 1989, Venkatech 1999, Venkatech et al. 2003) for them; it forms the basic criterion in system quality judgment. Wagner and Majchrzak (2006-2007) have stressed on the simplicity and the easy-to-use technology as important enablers of the users' engagement (cited in Trkman and Trkman 2009). In their study about the possibility to create an Intranet from the Wiki[1] in a company, The Trkmans have noticed that *Neopedia* (an upgraded application of *MediaWiki* with extensions and users' additions) can be judged as good if it is perceived as *easy to use* it, and this requires an organizing informal training to users. Another feature of system quality is the *convenience of access*; the user could access Neopedia from any computer in the internal network (p. 1094).

Further, other qualities were mentioned in many other studies, for instance, Franz and Robey (1986) have considered the *perceived usefulness of IS/IT* as an essential factor to measure the good quality of a system. *Reliability*, *system flexibility*, *response time* and *ease of use* were a set of criteria in Hamilton and Chervany's (1981) formative system quality evaluation. *Ease of learning* system use is another criterion in addition to others had formed the core study of DSS in Belardo et al.'s research (1982) (cited in Delone and McLean 1992).

In assessing the use of English newspapers internet websites, Nicholas et al. (1999) have considered *entrance* and *exit* as factors to evaluate the quality of the website. *Entrance*

[1] . ***Wiki*** is a system for building web pages, a tool of collaborative work and space of discussion. It can be executed from the server and permits to users to modify freely the content of web pages. With any navigator, ***Wiki*** can recognize the hyperlinks and dispose of simple textual interface to create new web pages. (The origin of ***Wiki*** is from Hawaiian language "wikiwiki" which means "quick"). (www.futura.techno.com accessed 06/10/2012)

measures the percentage of users who enter the site from the home page. While, *exit* indicates that a large number of users leave a site and this alerts to re-examine the probability of (links are down, too long time to load, content needs work).

Information Quality:

User satisfaction constructs in IS/IT research has usually adopted the notion of good information as the measure of IS/IT output. In four studies (Etezado and Farhoomand 1996, Seddon and Kiew 1996, Teo and Wong 1998, Wixom and Watson 2001), *accuracy*, *timeliness*, *completeness*, *relevance* and *consistency* were the measures of information quality which impacts individual performance in terms of *decision making, job effectiveness* and *quality of work* (Delone and McLean 2003).

Completeness, accuracy, volume, relevancy, reliability, currency (up to date), timeliness of information consist a part of the user satisfaction towards information systems' functionality and use (Ives et al. 1983).

Information quality was also measured in terms of security. Information is secure if users understand the relative value of information, the *vulnerability* of information system could affect the sensitivity of information to be not well secured (Spears and Barki 2010). In recent studies, privacy and social issues are raising to constitute a deep concern for individuals. Accordingly, the phenomenon of "*googlization of everything*"[2] is preoccupying individuals as well as institutions (Chen et al. 2009, p. 59).

System Use:

System use is a fundamental variable which determines the IS/IT success; and for Delone and McLean, use is the recipient consumption of the output of an information system. The IS/IT use is regarded as *"a behavior that a person enters into with the expectation of positive outcomes, and as a result, it is a consequence of IS success…"* as Seddon said (1997, p. 245). From this side, the IS/IT use or utilization in some MIS literatures, could affect the effectiveness of the individuals as well as the organizational performances.

Theoretically speaking, once the information systems are implemented, the managers expect that performance will be improved. However, in practice, the use of IS/IT is linked

[2] . *(…) Maurer's report (2007) for the Austrian government on the danger of large search engines describes a number of concerns including: copy-and-paste syndrome of extracting online text and transforming it to other forms; plagiarism; intellectual property violations; and the stultifying presumption that "if Google doesn't find it, it doesn't exist".* (Chen et al. 2009, p. 59)

essentially to the state of easy-to-use IS/IT feeling, and how well these tools help them to perform their work tasks. *The technical complication of IS/IT* contributes dramatically in slowing down the speed and the frequency of utilization (Jalonen et al. 1999). According to these researchers, breakdowns and shortcomings as aspects of technical problems related to hardware and software efficiency lead users to sometimes cope with or to tolerate them or to get around as well as possible (p. 136).

Delone and McLean (1992) have referred to many indicators in order to operationalize the variable of system use. *The number of Computer inquiries*, *the amount of user connect time*, *the number of computer functions utilized*, *frequency of use*, still other subjective or perceived measures; the list of the quoted measures is not exhaustive.

Equally important, the IS/IT use is considered the measure adopted by most web site managers and auditors when they come to assessing the popularity and success of their sites (Nicholas et al. 2009, p. 146). Operationally, the use of web sites is measured according to the number of *visits* and to the *number of page impressions*.

Other issues have been studied related to system use or the utilization, among these are *nature of use*, *gender*, *age* and *experience*. For instance, nature of use is voluntary vs mandatory use. The former one expresses *"the degree to which use of the innovation is perceived as being voluntary or of free will"* (Moore and Benbasat 1991, p. 195) (cited in Venkatesh et al. 2003); and it also expresses an intrinsic motivation of users to use IS/IT by their own which reflects a high level of systems acceptance. Whereas, the mandatory use reflects a managerial orientation of extrinsic motivation to impose new technologies and systems at work to enhance employees' efficiency regardless of their will.

Gender, age and experience were moderating variables in the Venkatesh et al.'s (2003) unified TAM theory. These variables determine in some way the degree of IS/IT use. For example, in Davis et al.'s TAM model, perceived usefulness (PU) is more significant for men while perceived ease of use (PEU) is more significant for women. In addition, research on job-related attitudes suggests that gender differences can be misleading if do not intersect with age and worker's life stages. To illustrate, according to Barnett and Marshall (1991) the IS/IT use could be changed between the time in which working women enter the labor force and the time they rich childrearing years (cited in Venkatesh et al. 2003, p. 450).

Experience has also its moderating effect on IS/IT use. This factor goes with the factor *facilitating conditions* such as the existence of permanent assistance, guidance, and specialized instruction. The second factor is *compatibility*; it reflects the degree to which

IS/IT is perceived as being consistent with values, needs and experience. Both *facilitating conditions* and *compatibility* contribute in increasing the use at the experienced workers better than the inexperienced ones. Thus, the use of information systems goes up better with increasing experience. Accordingly, it is one of the findings of Venkatesh et al.'s unified TAM theory (2003, p.468).

User* Satisfaction *:

As aforementioned, in the stream of user information satisfaction, the variable user satisfaction was considered as surrogate for the variable effectiveness; it's also considered as the response to the use of the output of an information system (Delone and McLean 1992, p. 68). Besides many important studies in this stream such as Bailey and Pearson (1983), Ives et al. (1983), Baroudi and Orlikowski (1988) etc. Garrity and Sanders (1998) have carried out a research of holistic view about satisfaction at work by using information systems. The framework of this study includes four dimensions about satisfaction: task support satisfaction, decision-making satisfaction, interface satisfaction and quality of work-life satisfaction (Sherman, Sanders and Garrity 2001, p. 196).

Task support satisfaction represents a part of the work world. According to Garrity and Sanders, it is the measurement of the amount of a support provided by an IS/IT to help individuals improving their performances of work tasks. In other words, *"this construct is designed to measure a user's way of working and the ability of the user to easily and smoothly derive information from a system while solving problems"* (p. 200). This way includes several factors such as the relevant information needed to accomplish tasks, the design of information systems from both its hardware and software sides (interface for example). Furthermore, Goodhue and Thompson (1995) have also proposed an overall construct by which they measured the task-technology fit. These factors are used to measure how well the IS/IT provide work support. In their adaptive model, Sherman, Sanders and Garrity have operationally measured task support and fit satisfaction in terms of three items: "*system provides information needed to do job"*, *"overall come to rely on system for job*", and *"system is useful in my job*". In addition, decision making satisfaction represents a very important part of task support and fit satisfaction.

The second component of user satisfaction according to this model is quality of work life satisfaction (QWLS); and it represents a part of the life world. Originally, this component is derived from the constructs of Bailey and Pearson (1983) and Baroudi and Orlikowski

(1988). Two parts constitute QWLS which are: (1) task control and empowerment of the user to complete his job related tasks; (2) health concerns that are related to the degree to which the IS/IT environment bears the health and safety concerns of the user.

The last component of this model is interface satisfaction; this factor was among a set of factors carried out by Doll and Torkzadeh (1988), and Goodhue (1990). According to these researches IS/IT offer a beautiful interface (in the meaning of a direct and an interactive hardware and software), and compatible information in adaptive format directly used in accomplishing work tasks (Kefi and Kalika 2004, p. 170).

As we noted above, the user satisfaction stream is very rich, and it was always a deep concern to academicians and practitioners for many reasons that we have already discussed. But we think there are other recent issues need to be investigated like the electronic communications which have substituted for face-to-face communications (Kalika et al. 2005), and the concern of securing information and data from piracy and vulnerability (Spears and Barki 2010).

Individual Impacts:

In Delone and McLean model, individual impacts beside the organizational impacts (net benefits) form the main quest for IS/IT success. They consider performance or effectiveness as the aspect which reflects the better IS/IT success. Simultaneously, the difficulty of this variable could not be overcome either in terms of its definition or measurement. We note here that the majority of the reviewed works in Delone and McLean paper were axed round the decision making improvement and problem solving by using IS/IT. The second important issue in individual impacts is the efficiency in terms of productivity (time spent in accomplishing tasks). For instance, decision making improvement was treated from many aspects such the quality of decision analysis, time to arrive at a decision, number of alternatives, confidence in decision, accuracy of decision. While, problem solving was investigated from these sides: problem identification, user understanding of inventory problem, ability to identify solutions, generation of alternatives, time to solve problem, accuracy of problem solution (pp. 76-78).

In addition, effectiveness of IS/IT user has also taken a considerable importance. Practically, studies measured this variable in terms of time taken to complete a task, ability to forecast firm performance, accuracy of information interpretation, time savings, personal

effectiveness, productivity improvement, immediate recall of information, recognition and use of modern software practices etc. (pp. 76-78).

Other research in the same development has also considered the reliance of individual in performing his or her work on IS/IT as a key factor that affects performance. For example user depends heavily upon databases to process some queries about business operations. According to Goodhue and Thompson (1995), at any given level of utilization, a system with higher task-technology fit will lead to better performance since it more closely meets the task needs of the individual (p. 218). Operationally, they measured the individual performance by using three questions but only two valid were used in their instrument: (1) *the company computer environment has a large, positive impact on my effectiveness and productivity in my job*, (2) *IS computer systems and services are an important and valuable aid to me in the performance of my job* (p. 236). In such study, Researchers did not use relevant indicators or measures to better clarify the notion of performance; rather, they preferred subjectively and holistically querying this variable.

Based on Schultz-Slevin questionnaire, King and Rodriguez (1978) have also measured interpersonal factors (relations, communications, and increased interaction and consultation with others). These factors form a part of a set of many factors oriented to measure attitudinal factors in the instrument.

In D'Ambra and Rice's instrument (2001) of evaluating the internet use and its impacts on users; many measures have been utilized such as (in terms of items): positive impact on my ability to get things done, intensive communications, quality of my work has improved, better decisions because of information from web, accomplish things more quickly, increased knowledge about topics of interests, better informed. The aforementioned measures are all significant according to the researchers.

Organizational *Impacts:*

This variable is also considered as a key issue in assessing IS/IT success since it represents the aim of any organizational effectiveness. IS/IT field has known distinctive and difficult issues in assessing organizational impacts, for the reason of the difficulty of isolating IS/IT effect on performance from other effects which influence organizational performance (Delone and McLean 1992, p. 74).

The distinctiveness of measuring IS/IT's impacts is very attractive due to the volume of research in this level. Beyond the discussion about information productivity and IS/IT

productivity (Brynjolfsson 1993, 1994, Greenan and L'Horty 2002); Desq et al. (2007) have reviewed 1018 articles which had been published during 25 years (from 1977 to 2001) in the most leading Anglophone and francophone publications over the world. They remarked a focus of analyzing IS/IT phenomena on organizational level (84%) of the most works in contrary to the beginnings of research in this field which the individual was the level of analysis in the majority of studies.

To illustrate, Kanungo, Duda and Srinivas (1999) have investigated improving speed of operations, facilitating information retrieval, improving control over system, and minimizing errors/mistakes in functional areas on top and IS managers. From quality-oriented performance point of view, Pitt, Watson and Bruce Cavan (1995) have measured the information systems effectiveness by investigating the service quality provided by MIS function. For this purpose, they brought "SERVQUAL" to IS field, an instrument used in marketing discipline. The dimensions of the IS service quality can be measured through *tangibles, reliability*, *responsiveness*, *assurance* and *empathy*. As Deming stated, quality and service are key measures of white-collar productivity, and quality is super ordinate goal (p. 174).

In the construction industry, Kang et al. (2008) have evaluated the use of IT and its impact on company performance which have been measured in terms of *schedule performance* and *cost performance*. The conducted analysis was taken from two groups of stakeholders' point of view: owners and contractors. As a result, the findings of this study showed a positive correlation between the increased use of IT and performance in general; but it is strongly correlated in favor of schedule performance.

In cars' manufacturing industry, and in order to define performance, Albadvi et al. (2007) had recourse to some subjective-based measurements such as *customer results*, *people results, operational results* and *growth*. The first and the second measurements were based on EFQM (European foundation for quality management) norms (1999), while the two last ones were based on many previous studies. In *customer results* measurement, the authors used product quality and better customer relationship as indicators to measure this dimension. Whereas, they used worker satisfaction and performance (productivity) as indicators to measure *people results*. Further, *operational results* were measured in terms of rate of flexibility, delivery, quality, cost, defectives and time of cycle. The last dimension *growth* was measured in terms of growth rate in sales and return of investment (ROI).

Using a model of performance excellence for organizational transformation based on the Baldrige criteria; recently, Mithas, Ramasubbu and Sambamurthy (2011) have investigated the contribution of *information technology capabilities* in firm performance. They argue that there are three capabilities known as organizational capabilities mediate the aforesaid relationship which are: *(1) customer management capability*, *(2) process management capability* and *(3) performance management capability*.

Mithas and his colleagues define Information Technology Capabilities as "*the ability to provide data and information to users with the appropriate levels of accuracy, timeliness, reliability, security, confidentiality, connectivity, and access and the ability to tailor these in response to changing business needs and directions*". While, they define *customer management capability* as "*the ability to develop significant customer relationships and nurture customers both as consumers and as innovation partners in new product development*". Further, they consider *process management capability* as "*the ability to develop processes with appropriate reach and richness for guiding manufacturing, supply chain, software development, financial, and other important activities*". And lastly, they describe the *performance management capability* as "*the ability to develop appropriate monitoring, evaluation, and control systems to observe business performance and guide managerial actions*" (p. 238).

This study underpins the important role played by information management capability in developing other firm capabilities for customer management, process management, and performance management. In turn, these capabilities favorably influence customer, financial, human resources, and organizational effectiveness measures of firm performance.

Conclusion :

Theoretical literature of IS/IT evaluation is very rich and we cannot arrogate to ourselves the right of summing up all research over many decades in this very short paper. However, our aim is to highlight the path for backing up our field study which will follow this attempt. Notwithstanding, we draw the following conclusions:

1. Evaluation of information systems and information technology is very rich due to the subjects and levels under investigation. For example Desq et al. (2007) have listed seven areas that researchers have been dealing with.
2. Investigating organizational performance is probably the variable which forms the majority of research preoccupations.

3. Methods and research methodologies used in IS/IT evaluation are multiple which gives the strength and rigor required to management information systems to merit the scientific status that they actually own.
4. Delone and McLean success model (1992) and updated Delone and McLean model (2003) offer to the researchers two strong and flexible scientific models for investigating IS/IT assessment's field. Regardless their double methodological foundations which were the main critic (Seddon, 1997), Delone and McLean models occupy a very respectable position in MIS evaluation field.
5. We suggest to strengthen the field of IS/IT assessment by orienting research towards new areas and subjects of awareness like systems security, assessing new social networks, benefiting from new technologies to concretize modern management styles and practices in developing countries such as e-commerce, e-recruitment, e-training, inter-organizational electronic interchanges and contractions. All these areas are fertile and require doubled progress and care in research.

This paper is the first part which is devoted to a theoretical treatment of this study. The next paper will tackle the methodology used in research using our framework. It will be followed by a deep analysis and discussion about the main findings. We will also suggest some future research orientations for Algerian organizations concerning IS/IT use that better fitting their strategic orientations and managerial environment.

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