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2008

The Spinning Top Model, a New Path to Conceptualize Culture and Values: Applications to IS Research

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THE SPINNING TOP MODEL, A NEW PATH TO CONCEPTUALIZE CULTURE AND VALUES: APPLICATIONS TO IS RESEARCH

Le modèle de la toupie, une nouvelle approche pour appréhender la culture et les valeurs : applications à la recherche en SI

Type of Research: Completed Research

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Abstract

In this conceptual study we first categorize, from existing literature, different conceptions of culture rooted in Anthropology and Sociology. We argue that these conceptions build up the logical structure of specific theoretical and empirical tools which address human/IS interactions in a cultural-based perspective. We then propose a new model of the individual's global culture, the Spinning Top Model. We posit theoretical proposals based on this model and define a new analytical framework which can open new paths for IS research, the study of IT-related values , IT-attitudes and IT-behaviors.

Keywords: Culture, IT-Culture, Individual IT-Culture (IITC), Spinning Top Model, Values, IT-Values.

Résumé

Dans cet article, nous proposons une approche conceptuelle basée sur la notion de culture pour appréhender les interactions entre les individus et les outils SI. Nous commençons d'abord par positionner notre approche vis-à-vis de la littérature existante, puis nous explicitons un modèle théorique original conçu pour étudier ces interactions, le modèle de la toupie.

THE SPINNING TOP MODEL, A NEW PATH TO CONCEPTUALIZE CULTURE AND VALUES: APPLICATIONS TO IS RESEARCH

Introduction

Developing an integrated, pluri-dimensional perspective on the role of culture in human and technology-based Information Systems (IS) interactions is a critical issue. These systems support collaborative work in a global and cross-cultural environment and have greater *culture content*, by the virtue of being *social technologies* (Gallivan and Srite, 2005). In organizational theory, Smircich (1983) called for a "cultural paradigm" to analyze organizational phenomena. Similarly, we propose in this article a cultural mode of analysis to study issues related to IS "fit" and "misfit" within organizational settings. These issues have generated an extensive literature attempting to explain why technically viable IS do not meet the organizational requirements they were supposed to fulfill and why they are sometimes resisted by their users.

One research stream, which has addressed the human/IS interactions, is rooted in the positivist research tradition and presumes that technology should consist of structures designed to overcome human limitations (e.g. "Bounded rationality"), and should ultimately bring productivity, efficiency and satisfaction to individuals and organizations (DeSanctis & Poole, 1994). Some variants of this school are "Task-Technology-Fit" models (Goodhue & Thompson, 1993) which stress that technology is designed explicitly to match work tasks and the "socio-technical perspective" (Bostrom & Heinen, 1977) which addresses the issue of assessing how social and technological structures are jointly optimized. This first research stream is based upon the "Rational Choice Model" aimed at explaining human behavior as the resultant of a decision making process where (optimized) satisfaction and constraints are systematically assessed.

As explained by Boudon (1999), the rational decision-making model is a comfortable intellectual framework to describe and explain social actors' behaviors, because it produces analytical explanations in which there are no "black boxes", i.e. no "socialization processes" defined as inextricable psycho-sociological mechanisms evolving in a given context. These analytical explanations can however be quite poor with regards to the complexity of the situations in which social actors behave in their day-to-day lives. Boudon (1999) argues that an alternative intellectual framework is needed, led by what he calls "the value-based rationality" or "axiological rationality" according to which "action is guided by assumptions and not by the possible consequences or outcomes that it [the action] can produce" (p. 118).

In organizational theory, the predominant "machine" metaphor used to represent and describe the organization is directly linked to the rational model of organizational analysis. Some alternatives -such as the organization as a network of subjective meanings or a shared frame of reference for the organization's members- are extensively recognized as a more thorough analytical view of individual and organizational behavior and belong to the cultural perspective of organizational analysis, whether or not the term culture is used in these works (Smircich, 1983).

Similarly, in the IS field, a cultural analysis of Human/IS interactions draws attention to the questioning of taken-for-granted assumptions, norms and contextual effects and brings to the surface underlying values. Concepts like "subjective norms", "attitudes", "intentions", etc. arise and build up into widely adopted models like the TAM (Technology Accepted Model, Davis 1989 and its derivatives). These models depart from the rational choice view, even though the positivist research stance is still predominant in hypotheses which aim at measuring the "impacts" (sometimes in a deterministic approach) of technology manipulation on outcomes.

This paper first explains how the different research streams which address the human/IS interactions within the "value-based rationality" perspective belong to a cultural research tradition, whether or not the term "Culture" is explicitly used and/or the concept of culture called upon. We then focus on the concept of Individual Information Technology Culture (IITC). Does this concept already exist in the literature? Why do we need to define a "component" of culture especially dedicated to IT? Why settle on studying IT culture at the individual level and not at the group, the organizational or the societal levels?

We address these questionings through an original theoretical model which we present in this paper: the Spinning Top Model. We display the theoretical foundations of this model and explain how it attempts to fill a gap in the prevailing IS and culture literature. We then explicit why it is necessary to study users' value systems (and more specifically, users' IT value sub system) which we define using Rokeach's analyses of human values and value systems (1972-1973) as well as Schwartz's work (1992). We show how the methodology used by Rokeach and then by Schwartz to study human values and value systems could be applied to IT.

Finally, we identify the practical implications of our model and draw attention to how it could open up new paths for future research in the IS field.

Human/Information Systems Interactions and Culture: The Theoretical Foundations of the Spinning Top Model

The interest on Management Information Systems (MIS) success or failure has brought to light the role of what we call the "human factor" as opposed to the "technological factor" (Avison et al., 2001). Beliefs, values, attitudes and norms related to Information Technology (IT) are some of the human-related variables which have been proposed to explain IT/organization misfit. However these concepts are part of the broader concept of culture. In their extensive literature review on how culture has been apprehended in the Information Systems research, Leidner & Kayworth (2006) have identified 6 themes of interest : (1) culture and information systems development ; (2) culture, IT adoption and diffusion, (3) culture, IT use, and outcomes, (4) culture, IT management, and strategy, (5) IT's influence on culture, and (6) IT culture. These 6 themes provide the multiple facets of what we consider in this paper human/ IS interactions.

In many of these studies, scholars have expressed their concern about the absence of a consensus about the definition of the concept of culture. Kroeber & Kluckohn had already identified 164 definitions of culture in 1952. In this paper, we argue that the multiplicity of the conceptions of culture draws up the intellectual structure of the research tradition which apprehends human (non technical) antecedents of MIS failure and can serve as a framework to review research in the field.

We purposefully define culture from two complementary perspectives: the first one is rooted in Anthropology, the second in Sociology. Anthropology and sociology, though distinct, are linked through their common interest: understanding human beings and their communities. Both of them are recognized as legitimate in their approach to the concept of culture and have produced theoretical and empirical tools which have been extensively used in other disciplines, amongst them the IS discipline. These different conceptualizations of culture lay the foundations of very different works on human related IS research, because they induce specific tools for the measurement of culture which lead to specific determinants of the human/IS interactions and they accordingly shape specific streams of research in the IS field (see table 1).

Anthropological view of culture and IS applications

Within anthropology, culture has been conceptualized in multiple ways. Three of these approaches have been extensively used outside the anthropological domain, especially in organizational theory, and will be therefore presented here: cognitive anthropology, symbolic anthropology and structural & psychodynamic anthropology. We argue here that each of these perspectives builds up the logical structure of a specific stream of research in the IS field focusing on human/IS interactions summarized in the 6 themes defined by Leidner & Kayworth (2006) and listed above.

In the field of cognitive anthropology, "culture is a system of shared cognitions" or a system of knowledge and beliefs (Rossi & O'Higgins, 1980, quoted in Smircich, 1983, p.348). Measuring the cultural characteristics of individuals and groups, especially those characteristics which intervene in shaping and influencing human/IS interactions, follows a rule-based perspective and consists of identifying the "rules" or "scripts" that guide action and the structures of knowledge in operation within a specific context, e.g. the implementation of an IS. This concretely is applied in the cognitive style research based on psychiatrist Jung's (1921) "premise that the mental functions related to information gathering and decision-making are central, […] consequently, people are "typed" according to how they perceive and form judgements" (McElroy et al., 2007, p. 811). The Myers-Briggs Type Indicator or MBTI is probably one of the most emblematic cognitive style measurement tool, used and validated in IS research (Wheeler et al., 2004).

Conception rooted in	Anthropology			Sociology			
	Cognitive	*Symbolic*	*Structural*	*Biological*	*National*	*Organizational*	*Psycholocgial*
What is culture?	"Culture is a system of shared cognitions" or a system of knowledge and beliefs (Rossi & O'Higgins, 1980, quoted in Smircich, 1983, p.348). Culture is generated by human mind (Goodenough, 1971).	Culture is a system of shared symbols and meanings (Geertz, 1973).	Culture is the expression of unconscious psychological processes. The human mind has built-in constraints through which it structures psychic and physical content. "Unconscious infrastructure" (Rossi, 1974, p. 16) "The existence of a deep underlying structure built into the ordering capacities of the mind" (Turner, 1983, quoted in Smircich, 1983, p.353)	Culture is the resultant of communalities in beliefs, norms and behaviours of a group of human beings who share the same biological or demographic characteristics: gender, age, ethnicity…(Long, 1992)	Culture is "the collective programming of the mind which distinguishes one human group from another" (Hofstede, 1980, p.260). Culture is assumed to be equivalent to *national identity*. A nation is considered as a country or a nation-state	Culture is "the sum total of all the shared, taken for granted assumptions that a group has learned throughout his history" (Schein, 1986, p.29) "Culture is usually defined as social or normative glue that holds an organization together[…]It expresses the values or social ideals and the beliefs that organization members come to share" (Smircich, 1983, p. 344)	Culture is multi-layered and is the product of the individual's various identities resulting from his/her various group affiliations (e.g., gender, race, nationality, occupation, organization). Each layer plays a specific role in shaping beliefs, norms and behaviors of an individual in given circumstances.
How to measure culture?	A rule-based perspective How the members of a group see an describe their world What are the "rules" or "scripts" that guide action of individuals/organizations? What are the structures of knowledge in operation?	A meaning-based perspective How to "read", "interpret", or "decipher" "themes" of culture"? How to specify the links among values, beliefs and action in a setting?	A psycho-analytic perspective How to analyse the individual/organizational practices and actions considered as projections of unconscious processes? How to analyze the dynamic interplay between out-of-awareness processes and their conscious manifestation?	A socio-demographic perspective Do gender, age, ethnic origin…matter in shaping human beliefs, norms and behavior?	A cross-nation perspective Describing culture along a taxonomy of dimensions: power distance, uncertainty avoidance, individualism-collectivism, masculinity-femininity, long-term *versus* short-term orientation (Hofstede, 1980, 1983, 2001). Universalism-particularism, affective-neutral relationships, specificity-diffuseness, achievement-ascription, internal-external control (Trompenaars, 1996)	A value-based perspective Establishing organizational cultural taxonomies to enable the differentiation of organizations along dominant values guiding organizational behaviors Organizational culture is addressed trough the "levels of awareness" defined by Schein (1986) : • Visible symbols, artefacts, routines and practices • Values and beliefs • Patterns of underlying assumptions	How multiple layers of identity converge and interact within each individual (Gallivan & Srite, 2005)

Table 1: Human/IS interactions and Culture

Conception rooted in	Anthropology			Sociology			
	Cognitive	*Symbolic*	*Structural*	*Biological*	*National*	*Organizational*	*Psycholocgial*
Human IS interactions conceptions	*(1) culture and information systems development ; (2) culture, IT adoption and diffusion, (3) culture, IT use, and outcomes, (4) culture, IT management, and strategy, (5) IT' s influence on culture, and (6) IT culture*						
Determinants of Human / IS interactions	Cognitive style in IT use/adoption/diff usion, mental functioning How users perceive IT and form judgements about IT?	-Information Technology Acceptance and Usage Measures: intensity of usage, behavioral intentions, attitudes, perceived usefulness, perceived ease of use; -Innovation diffusion measures : beliefs related to relative advantage, compatibility, complexity, trialability, observability	A stable set of characteristics that determine peoples' commonalities and differences in thoughts, feelings and actions (Maddi, 1989) related to IT The role of Personality in IT use/adoption/diffusion	Exploring gender, race, occupational differences in beliefs, norms and behaviors about IT	Using the determinants of national culture (e.g. the Hofstede's taxonomy) to examine how perceptions about IT management, development and use differ across countries	Intersection between IT and Organisation trough the lens of values, beliefs and assumptions.	Individuals interactions with IT with regard to their subcultural (identity) layers
Conceptual and empirical models: some examples	"The Myers-Briggs Type Indicator" (MBTI) applied to IT studies (McElroy et al., 2007 ; Taylor, 2004)	TAM (Davis, 1989) ; TAM2 (Venkatesh &Davis, 2000) UTAUT (Venkatesh et al., 2003)	"Big Five" instrument used in IT studies (McElroy, et al., 2007)	Trice (1993) ; Gefen & Straub (1997) Adam (2000) ; Venkatesh and Morris (2000) Venkatesh et al.(2003) Guzman et al (2004) Guzman et al. (2008)	Cross-cultural studies related to IT (for a comprehensive literature review concerning this theme, see Leidner & Kayworth, 2006)	(See also Leidner & Kayworth, 2006, for a comprehensive literature review concerning this theme)	The Theory of Information Technology Culture Conflict (Leidner & Kayworth, 2006) The *virtual onion* (Straub et al., 2002) Gallivan & Srite (2005) Karahana et al. (2006) (see table 2)

Table 1: Human/IS interactions and Culture

Conception rooted in	Anthropology			Sociology			
	Cognitive	*Symbolic*	*Structural*	*Biological*	*National*	*Organizational*	*Psycholocgial*
Theoretical bases **(in and out side IS research)**	Jung (1921)	Theory of Reasoned Action (Fishbein & Ajzen, 1975) Theory of Interpersonal behaviour (Triandis, 1980) Theory of Planned Behavior (Ajzen, 1991)	Zmud (1979)	Cultural studies (Hall, 1980, 1992) Feminism theory (Beauvoir, 1949)	Cross cultural studies (Hofstede, 1980, 1983)	Sociotechnical theory (Bostrom & Heinen, 1977)	Social Identity theory (Tajfel, 1978 ; Tajfel et Turner, 1979)
				Kluckhohn (1951) Theory of Reasoned Action (Fishbein & Ajzen, 1975) Theory of Interpersonal behaviour (Triandis, 1980) Theory of Planned Behavior (Ajzen, 1991).			

a

The symbolic anthropology has provided the most popular conception of culture used in organizational and IS research and has explicitly related this concept of culture to meanings, beliefs and values. Culture is considered here as a "system of shared symbols and meanings" (Geertz, 1973). To measure culture according to this approach, the researcher may use several kinds of evidence to gather and interpret data related to symbol systems and their associated meanings and specify the links among values, beliefs and actions in a setting (Smircich, 1983). Transposed to the IS field, this view generated "perceptual" measures used as surrogates to evaluate information systems success (Delone & McLean, 1992) e.g. perceived usefulness and perceived ease of use. These measures have been successfully applied in models like the TAM (Technology Acceptance Model: Davis, 1989; Venkatesh et al., 2003), which have been built upon previous value-based theories like the Theory of Reasoned Action (TRA, Fishbein & Ajzen, 1975) or the Theory of Planned Behavior (Ajzen, 1991). The success of the theories and models based upon values and attitudes is partly due to the fact that this approach puts the focus on how individuals and groups interpret and understand their experience with IT and how these interpretations and understandings are related to their attitudes and actions (involvement, use, adoption, diffusion).

Through the structural and psychodynamic lens, culture is conceptualized as the expression of unconscious psychological processes. Structural anthropologists postulate the "existence of a deep underlying structure built into the ordering capacities of the mind" and consider that "the human mind has built-in constraints by which it structures psychic and physical content" (Turner, 1983, quoted in Smircich, 1983, p.353). Smircich (1983) has considered that this view has had limited applications within the organizational field, partly because it is too broad in scope, unless we try to link unconscious human mind with its visible manifestations. The attempt to apply this psycho-analytic perspective to define the determinants of human/IS interactions could be achieved by bringing to light a stable set of characteristics that determine peoples' commonalities and differences in thoughts, feelings and actions related to IT (Maddi, 1989). A stream of research that has attempted to achieve this task has focused on the role of Personality in IT use/adoption/diffusion. Studies grounded on the "Big Five" personality factors are representative of this stream of research (McElroy et al., 2007).

It is important to notice here that many studies which have recognized the role played by human related factors in predicting IT adoption and use focus on a mutable set of factors labelled personal factors, individual attitudes, personal perceptions or cognitive style. These factors could be jointly or exclusively used. Early work of Lucas (1973) stated that IT adoption can be affected by personal factors, decision style and users' attitudes. More recently, McElroy et al. (2007) proposed to compare the effects on Internet use, of personality on one side and those of cognitive style, on the other side. The three conceptions of culture rooted in anthropology presented above, lead to different ways of apprehending human/IS interactions. The value-based perspective rooted in symbolic anthropology is predominant in the literature and has produced a wide range of perceptual and attitudinal studies. The cognitive-based and the psycho-dynamic perspectives could provide complementary and useful views.

Sociological view of culture and IS applications

Historically, the anthropological approach of culture is prior to the sociological one. Sociologically oriented studies of culture are however more accurate in addressing specific issues at multiple levels of analysis. We argue that the anthropologist's perspective focuses on culture as an intrinsic content, whereas the sociologists study objects and phenomena in which a culture content is embedded, i.e. culture as a variable: dependent, independent, mediating, etc. The debate over culture and society has emerged at the beginning of the industrial era (XIX° century) when culture has been conceived as the glue of the national consciousness and consequently as a tool to "socialize" and integrate emergent social classes, e.g. proletarian classes (Williams, 1966). As explained by Fleury (2006), the shift from the anthropological to the sociological conception of culture has been engaged when variables like gender, generation, ethnicity, occupation, sexuality, education, etc. have been substituted to the global notions of "social classes interactions" in addressing issues related to the construction of collective identities. This fact has contributed to the emergence of the *Cultural Studies* stream of research (Hall, 1980, 1992).

More globally, the categories of variables mobilized to identify social groups and to define and compare their cultural characteristics, in terms of norms, values, behaviors, etc. build up specific branches of studies in the sociology of culture: (1) the socio-biological branch, related to demographic, ethnographic and racial variables characteristics ; (2) the national culture studies devoted to the country, or nation-state identification of the individual and of groups ; (3) the organizational culture studies centred on cultural issues within organizations (and/or organizational issues within culture) ; and (4) the psycho-sociological stream of research. Our purpose in the

following section is to explain how each of these branches has been applied within the IS field to study human/IS interactions. The focus will be particularly put of the latter perspective: the psycho-sociological oriented because it has been an attempt to integrate the other perspectives, more explicitly the national and organizational streams, and has opened the path to a new research direction devoted to the study of culture within the IS research.

The socio-biological view of culture settles the central question of whether gender, age, ethnicity or race matter in shaping human beliefs, norms and behaviors. Many studies have been conducted in this area and have extensively used positivist-oriented methodologies. Their most important findings are not archetypes of ethnic group subcultures but critical views of social practices at the societal level that aim at refuting inherited taken for granted assumptions that presume the "superiority" of one kind over another (Cultural studies, Hall, 1980, 1992 ; Feminism theory, Beauvoir, 1952). Transposed to the IS field, we can notice that socio-demographic and occupational variables have been used either exclusively, or are associated most frequently with perceptual and attitudinal models, as predictors of IT adoption, diffusion or use (Guzman et al., 2004 ; Trice, 1993 ; Venkatesh et al., 2003).

According to the national-oriented perspective, culture is assumed to be equivalent to national identity, i.e. the identity shared by a human group belonging to the same country (or nation-state). Researchers in this field adopt, explicitly or not, an anthropological conception of culture, like Hofstede who defines culture as: "the collective programming of the mind which distinguishes the members of one human group from another" (2002b: 9), i.e. using here a cognitive anthropological view. In the last three decades, national culture studies have been extensively developed within the fields of Management Science, Organization Theory and IS. This can be explained by the global geopolitical and economic evolution which the business environment has experienced in recent years. Globalization of the economy and blurring of the companies' physical boundaries have contributed to highlight the necessity to take into consideration national differences in organizational practices and processes. It is not surprising therefore that national culture studies have been massively conducted within multinational companies and have produced a coherent body of research referred to as cross-cultural studies. These have been aimed at describing culture along a taxonomy of dimensions: e.g. power distance, uncertainty avoidance, individualism-collectivism, masculinity-femininity, long-term versus short-term orientation (Hofstede, 1980, 1983, 2001); or Universalism-particularism, affective-neutral relationships, specificity-diffuseness, achievement-ascription, internal-external control (Trompenaars, 1996). Adler (1983) developed a methodological review in which she depicts six approaches through which national culture has been linked with management studies: parochial, ethnocentric, polycentric, comparative, geocentric and synergistic. IS research has also been interested in the relationship between national culture and human/IS Interactions. The investigated themes concern for example the transferability of western-based management theories to non-western cultures, or the influence of national culture on the development and use of IS (Straub, 1994; Walsham, 2002). "More recently, works by Myers and Tan (2002) and by Ford et al. (2003) provide critical examinations of cross-cultural IS research and offer suggestions for future IT research examining issues involving national culture and IT" (Leidner and Kayworth, 2006, p. 358).

Organizational culture, also referred to as corporate culture, is defined as "the sum total of all the shared, taken for granted assumptions that a group has learned throughout his history" (Schein, 1986, p.29). Defined by Smircich (1983), culture is a "social or normative glue that holds an organization together […] It expresses the values or social ideals and the beliefs that organization members come to share" (p. 344). Smircich stated that what we call a "cultural perspective" of organizations covers in fact a range of five research themes: comparative management, corporate culture, organizational cognition, organizational symbolism, and unconscious processes and organization. "In the first two, culture is either an independent or dependent, external or internal, organizational variable. In the final three, culture is not a variable at all, but is a root metaphor for conceptualizing organization" (p. 342). Smircich (1983) provides therefore a very useful theoretical framework allowing us to divide culture research in two areas: (1) the 'has' approach where culture is considered as a feature or a variable affecting and/or being affected by other variables within organizations. Culture is then considered as an adaptive or regulative mechanism contributing to the overall performance of the organization; and (2) the 'is' approach, which relies much more strongly on the anthropological tradition, supports the position that organization 'is' culture, or that culture is a "metaphor" to study organizations.

The socio-organizational conception of culture has brought an important contribution in deepening our understanding of this concept and has produced fundamental theoretical developments about how some components of culture are articulated and linked more specifically to values, assumptions, norms, beliefs and attitudes. Schein (1991) developed a three-level model of culture which includes: basic, underlying/assumptions, values, and behaviors expressed through artefacts. The three levels of culture underlined by Schein are referred to as "levels of

awareness", ranging from the deepest (basic/underlying assumptions), to the more peripheral and therefore more accessible levels (values, then practices). In empirical studies, basic/underlying assumptions seem to be the least investigated level of culture; however Schein (1991) asserted: "If I understand the pattern of shared basic assumptions of a group, I can decipher its espoused values and its behavioral rituals. But the reverse does not work" (p. 252). Therefore investigating only the most peripheral level of awareness ie practices appears certainly not sufficient.

More recently, a psycho-sociological conception of culture has been developing (Straub, Loch, Evaristo, Karahanna & Srite, 2002; Gallivan & Srite, 2005; Karahanna, Evaristo & Srite, 2005) to fill the gap mainly between the national and the organizational research streams which we have described. Numerous works grounded in psycho-sociology have been debating for a long time about the presence of multiple identities in a single individual (Burke, 1937; Feldman, 1979; Tajfel & Turner 1979; Markus & Nurius, 1986). To understand and manage those multiple identities within organizations can be considered an important managerial task. Social Identity Theory (SIT) has put forward a considerable contribution in this stance. SIT takes its sources in the research on inter group relationships (Tajfel & Turner, 1979). This theory explains why and how some individuals identify with some groups and how this can affect their behavior; three processes are brought into play as shown by Ashforth & Mael (1989): categorization, identification and comparison. The notion of identity implies asking the question "who am I?" and if the individual is part of a group "who are we?" The answer is not single but multiple as it corresponds to multiple identities (Pratt & Foreman, 2000). Within organizations, various collective identities linked to assumptions about IT do emerge (Kaarst-Brown & Robey, 1999) and can evolve over time. The manner in which identities evolve in a situation of organizational learning is also considered an important managerial concern (Brown and Starkey, 2000).

Through the lens of SIT as framework, Straub et al. (2002) developed the "virtual onion" metaphor describing the different layers of subcultures which make up the global culture of each individual. Each person is the unique product of various cultural identity layers: ethnic, national, organizational, etc. Globally, and a fortiori in an organizational context, individuals' behavior is then seen as the result of their different social identity layers; these layers not being static but evolving, intermingling, they are of varying importance depending on the situations met by the individuals. We must however notice here that the applications of this view still remain under developed, but "paradigm shifts in any science meet with strong initial resistance" (Hofstede, 2002a, p.1). Some works have started to be published in recent years which follow the path opened by the ground breaking conceptual study of Straub et al. in 2002 (see table 2 for a chronological classification of these works). However, the theoretical aspects of this stance are still evolving.

Table 2: Summary of the works grounded on the "holistic" cultural approach

Authors	Title	Theoretical / Empirical
Straub, Loch , Evaristo, Karahanna & Srite (2002)	Toward a Theory-Based Measurement of Culture	Theoretical: First theoretical groundings: the multilayered individual's culture.
Gallivan & Srite (2005)	Information technology and Culture: Identifying fragmentary and holistic perspectives of Culture	Theoretical: proposal of an alternative to the fragmentary view of culture for research.
Karahana, Evaristo & Srite (2005)	Levels of Culture and Individual Behavior: An Integrative perspective	Theoretical: values and practices proposed as surrogates to assess culture.
Karahana, Agarwal & Angst (2006)	Reconceptualizing Compatibility Beliefs in technology Acceptance Research.	Empirical: Model explicitly including the concept of values.

Gallivan and Srite (2005) argued that this "holistic" view is an appropriate lens to study culture and recommended using it to address the issue "labelled a lack of system/culture fit" (p. 296). They have developed an extended literature review on IS and culture and stated that the debate about the relationship between organizational culture and national culture goes beyond the question of whether the organizational culture is a subset of national culture (which is most frequently admitted) or whether the contrary is more plausible (which is so in the case of multinational companies). They concluded that despite the considerable amount of research in these areas, the two research traditions "have existed as stovepipes, operating in parallel but not communicating effectively with each other" (p. 295). The result is a fragmentary and non-cumulative research tradition.

Following Gallivan & Srite (2005), we argue that the virtual onion metaphor and SIT provide a solid framework to conceptualize and measure culture. In this study, we also posit that it is of a tremendous importance to build upon an integrative perspective of the concept of culture. Accordingly, from an etymological point of view, we adopt a polymorphous definition of the term culture grounded on anthropology which federates the cognitive, symbolic and psycho-dynamic views defined above. We argue that these views are not only complementary but that they also provide the basis to apply a value-based perspective to measure of culture at different levels of analysis. Culture is not exclusively beliefs *or* attitudes *or* cognitions *or* norms… but a contextualized mix of all these, emerging *in situ* at a certain point of time.

This theoretical choice is enhanced by the conception of culture given by Kluckhohn, renowned anthropologist and social theorist : "culture consists in patterned ways of thinking, feeling and reacting, acquired and transmitted mainly by symbols, constituting the distinctive achievements of human groups, including their embodiments in artefacts; the essential core of culture consists of traditional (i.e. historically derived and selected) ideas and especially their attached values" (Kluckhohn, 1951, p. 86).

To apply this theoretical choice, we start by positioning ourselves in the socio-psychological school of thought. While attempting to go further than the virtual onion metaphor, we propose a value-based and dynamic model of the individual cultural identity, the Spinning Top Model. This model encompasses a layer specifically dedicated to IT prehension, use, attitudes, etc. in other words to the IT culture of the individual.

This layer is a fundamental part of our theoretical model, through which we observe the dynamic interactions between the various cultural layers of the individual, given an innate (biological) set of human specificities. The research approaches developed in our literature review, while certainly not aimed to be exhaustive, contribute to build up the theoretical foundations of our model. From left to right, table 1 illustrates how our prehension of the concept of culture has evolved and got increasingly multidimensional and accurate with regard to our research theme.

Through our model, and using Schein's work on culture (1991), we show the necessity to study users' value systems (and more specifically, users' IT value sub systems) which we define using Rokeach's work on human values (1972-1973) as well as Schwartz's work (1992). We also explain how the Spinning Top model could help describe and predict users' behaviors within organizations with regards to IS.

The Spinning Top Model

Prior to describing our model and its implications, we first explicit the cultural identity layer we named Individual IT Culture (IITC).

IT-Culture: an identity layer amidst the others

In their literature review, Leidner and Kayworth (2006) had identified only two previous works which explicitly address the IT culture theme (Kaarst-Brown & Robey, 1999; Kaarst-Brown, 2004).

The term "IT culture" was used in recent works (Nord & Nord, 2007; Guzman, Joseph, Papamidal & Stanton, 2007) as meaning the culture pertaining to a group of individuals involved in IT implementation in organizations as opposed to the group of users' culture. In this study, we rather propose to extend Kaarst Brown and Robey's (1999) conception of an organizational IT cultural dimension and consider it at the individual's level to include it in Straub et al.'s model of the individual's culture. Rather than positing our level of analysis at the organizational level, we will target the individual level and therefore we will investigate what we name the *Individual Technological Culture* or *Individual IT-Culture (IITC).*

The study of IT culture at the individual level appears essential as the degree in which individuals espouse values dictated by their belonging to a single cultural group may vary widely (Straub et al, 2002); furthermore we first have to study and understand this concept at the individual level before envisaging the possibility of extending it to group or societal levels.

We can then complete the virtual onion model to include a layer of IITC. The individual's positioning with respect to IT, the use of IT by this individual, his norms, values, beliefs and behaviors linked to IT as well as his basic assumptions with respect to IT can then all be included in a separate and specific cultural layer amidst the others. Karahanna et al. (2005) propose to define each of the cultural layers in terms of values and practices. Grounding our

analysis on Schein's (1991) model of culture, we should add a third most significant dimension: the basic, underlying assumptions. Thus, each cultural layer, including the IITC layer, has three cultural sub levels.

We will then define an Individual's IT-Culture (IITC) as the set of:

1) The individual's IT-related visible, audible behaviors
2) The individual's IT-related values
3) The individual's IT-related underlying assumptions

We have assumed that the technological cultural layer does exist today in all individuals, whatever their nationality, religion, age, ethnic origin, etc. This layer belongs to the supra-national level of the cultural hierarchy described by Karahanna et al (2005) which includes "any cultural differences that cross national boundaries or can be seen to exist in more than one nation" (Karahanna et al, 2005 p.5).

Presentation of the Spinning Top Model

It is important to underline that the model we present here is not an attempt to reify the concept represented by the word *culture* but rather an attempt to develop a model which, though not doing justice to the complexity of the concept, can be made operational as easily as possible in an organizational context of human/IS interactions. We propose to develop a conceptual model of the individual's multi-layered culture, seen as a set of embedded cylinders, rotating around their innate core cylindrical axis (see figure 1). This axis is made up of the characteristics the individual is, biologically, genetically, born with, before primary socialization occurred during his/her childhood. This innate core, which is by essence not made of culture, represents the individual's innate specificities, and will affect the development of his/her cultural layers through his/her varied socializations. The subsequent cylinders, added on the core/innate cylinder, represent the acquired/added on after birth, idiosyncrasies of the individual, hence his/her global culture, and are the results of his/her socializations, leading to his/her pertaining to specific groups of people.
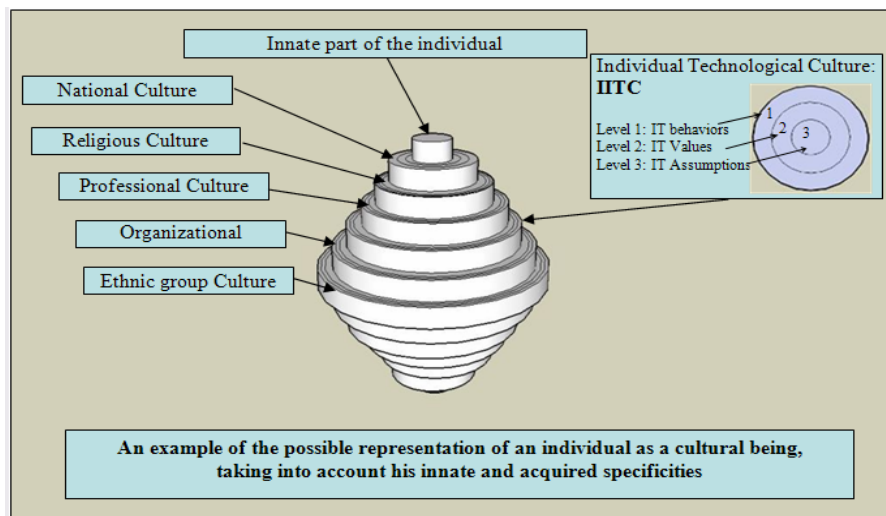

Figure 1 : The Spinning Top Model (adapted from Walsh & Kefi, 2008a)

The cylinders closest to the core cylinder, are the most stable, their possible varying dimensions signalling their relative importance in the individual's global culture. As in the virtual onion model (Straub et al, 2002), the layers are permeable and dynamic; their volume as well as their positioning with respect to the central innate core will vary, depending on possible changes of the external circumstances. However in the virtual onion model as illustrated by Gallivan & Srite (2005), the individual positioned at the core of the virtual onion, is the result of his/her cultural layers whereas in the Spinning Top Model, culture is part of the individual. We propose to consider culture as a "root metaphor" (Smircich, 1983) which allows us to study the individual, hence the IT user.

All layers of the Spinning Top Model being mobile and porous, the particular layer of innate specificities (central axis) has to be taken into consideration as culture, resulting from acquired specificities, feeds from it and grows

upon it. We consider this an important element particularly when, in a managerial perspective, and in the context of a new IT implementation, one should consider specific training facilities depending on users' technological cultural profiles (which also depend on the individuals' innate specificities) and not only tailored on their academic level, their professional attributes or their hierarchical position in the organization.

Each layer of culture, national, organizational, etc, and also technological, has three sub- levels as illustrated by the 3 lines on each cultural layer in figures 1 and 2. In the IT cultural layer those three sub levels are IT-related visible, audible behaviors, IT-related values and IT-related underlying assumptions as illustrated in the IITC cross section diagram in Figure 1. When in presence of other individuals, and in a given context, e.g. an IT implementation project, the whole set of rotating cylinders speeds up and takes the shape of a spinning top, allowing all layers to intermingle into 3 fundamental levels (all underlying assumptions – all values – total visible, audible behaviors). Through socialization, the speeding up of the *Spinning Top* also allows all salient features to be "projected outwardly" and to intervene in the socialization processes between individuals.
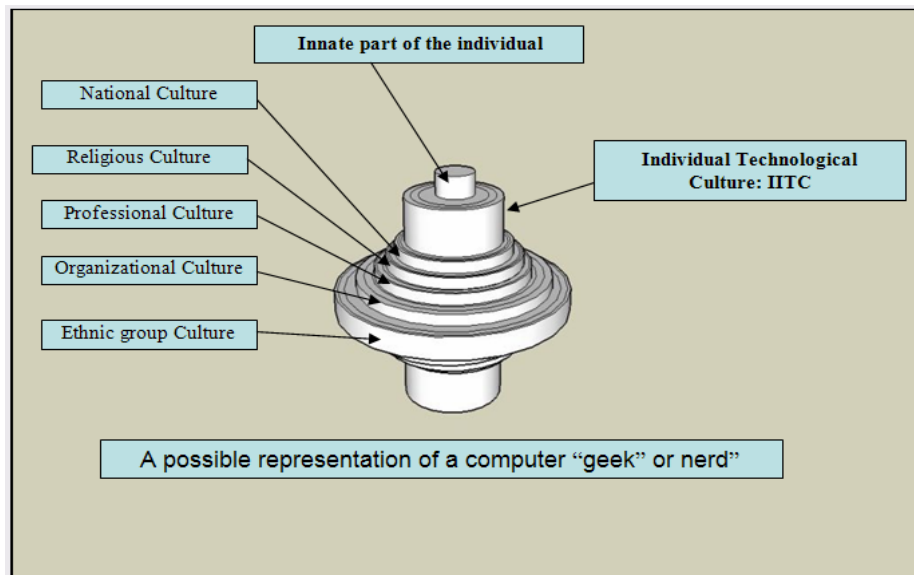

Figure 2: Illustration of a technological cultural salience (Walsh & Kefi, 2008a)

If we wish to investigate a specific behavior within an organizational context, the relative significance of each layer will vary and depend on the investigated behavior itself.
The closer the layers are to the cylindrical innate core, the greater their volume, and the more significant they are in the global cultural context of the individual. Thus, figure1 illustrates the possible representation of a human being seen as a cultural being with no particular cultural salience, except concerning the specific hierarchy of his cultural layers, with the national culture being closest to the core of the spinning top, therefore being closest to his innate characteristics and most stable in his global culture. Figure 2 illustrates the possible representation of the American computer "Geek"/"nerd" or the Japanese "Otaku", impregnated with IT, and who cannot stay away from his/her computer. The technological layer is then very thick and closest to the central innate component of the individual and is salient in the global culture of the individual. In the IITC layer of this individual, one can envisage the most unconscious, implicit sub-level which includes the basic assumptions of the individual related to IT, as being also salient. As Agarwal & Karahanna (2000) remind us past research works did study this type of cultural salience. Some of them highlight the negative aspects of what can be considered an addiction to some IT (Dern 1996, Nash, 1997, Sinha, 1999); however other works (Csikszentmihalayi, 1990; Ghani & Deshpande, 1994) also suggest that positive attitudes and exploratory use of IT could result from this type of profile.

Thus, the Spinning Top Model allows us to answer one of the questions brought forward by Straub & al (2002); that is we have determined the level of culture one should consider depending on the issue under investigation. In IS research, we should certainly first concentrate on and investigate the IITC layer before considering the global culture of individuals.

Values, beliefs, attitudes, and behaviors.

To study more specifically users' IITC and in order to devise means of empirically validating the proposed Spinning Top Model , there is a need to clarify and redefine the three cultural sub levels described by Schein (1991) which make up each of the Spinning Top layers; we have to find out how these three sub-levels interact with and are embedded into one another; then we should apply this to the layer of IITC which we have identified (see illustration top right hand corner of figure 1).

Level 1, audible, visible behaviors expressed through artefacts are the day to day vectors through which values and underlying assumptions express themselves. Level 3, underlying assumptions can be considered as values which have sedimented i.e. they are values which have become tacitly accepted and are unquestioned by the individual. They are mostly unconscious and buried deeply in the individual, thus difficult to reach and impact on directly.

Underlying assumptions (level 3) as well as behaviors expressed through artefacts (level 1) are then directly related to values (level 2). Thus, and grounding our reflection in Rokeach's research on human values (1972-1973), and applying it to the IITC, we have to explore the notion of values (and thus IT-values), that is more specifically the second of the three levels of each of the various layers of the *Spinning Top Model*. Leidner & Kayworth (2006) underlined that "research on IT values is still at a nascent stage and much remains to be done in isolating and understanding IT-related values and the impact of these values on IT projects" (Leidner & Kayworth, 2006 p.371)

However "beliefs, attitudes, and values are all organized together to form a functionally integrated cognitive system, so that a change in any part of the system will affect other parts, and will culminate in behavioral change" (Rokeach, 1972 p.ix). Therefore in order to study values we first have to "disentangle" these various concepts, as we need to find our way through what Campbell (1963) named a "terminological forest".

The term *value(s)* is used in social sciences with different but related meanings (Hofstede, 2002b). It is a key concept used in sociology, anthropology, ethnology, social psychology, educational science and political science (Wach & Hammer, 2003). In this study, we will limit ourselves to Rokeach's approach of values and value systems (1972-1973) completed and extended by Schwartz (1992). Rokeach gives different definitions of the word "value". His most commonly retained definition of a value is: "an enduring belief that a specific mode of conduct [instrumental value] or end-state of existence [terminal value] is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence" (Rokeach, 1973 p.5). However he also stresses not to confound beliefs and values: "Values are abstract ideals, positive or negative, not tied to any specific attitude object or situation" (Rokeach, 1972 p.124), whereas beliefs are "simple proposition(s), conscious or unconscious, inferred by what a person says or does, capable of being preceded by the phrase 'I believe that….'. The content of a belief may describe the object of belief as true or false, correct or incorrect; evaluate it as good or bad" (Rokeach, 1972 p.113).
Extending Rokeach's work to IT, an IT value could concern IT in the general sense of the word whereas an IT belief could concern a specific IT e.g. a specific ERP, CRM, etc. An example of IT- value could then be expressed by the statement: "*For me, IT is not only a commodity, it is an important part of my life*", whereas an example of IT- belief could be expressed by the statement: "*The new CRM will help me do my job better*".
However, Rokeach stresses that what differentiates individuals is not the set of values they possess but the way these values are organized and ranked, thus their value system which Rokeach defines as "an enduring organization of beliefs concerning preferable modes of conduct or end-states of existence along a continuum of relative importance" (Rokeach, 1973 p.5).
Rokeach (1973) identified 36 values which all human beings possess; Schwartz (1992) extended Rokeach's work and identified 57 such values. As all human beings possess these identified values, we named them *transcendental values.* Both Rokeach and Schwartz approach human values in a deliberately decontextualized manner. Schwartz (2006) demonstrates the universality of the human values he identified, but not of their hierarchy, nor their scaling, positive or negative; this allows conciliating similarities between social groups (structure) and specificities (relative importance of each value). Schwartz's model of human values which extends Rokeach's was tested on 200 samples in 70 countries belonging to 5 continents. It could be opposed to Schwartz that he mostly tested his model on populations of students and teachers but Wach & Hammer (2003) tested it on representative samples of the populations in 6 European countries. As of today, his list of values and his model still stand valid.

Figure 3: The process of value systems organization in Level 2 of the Spinning Top.
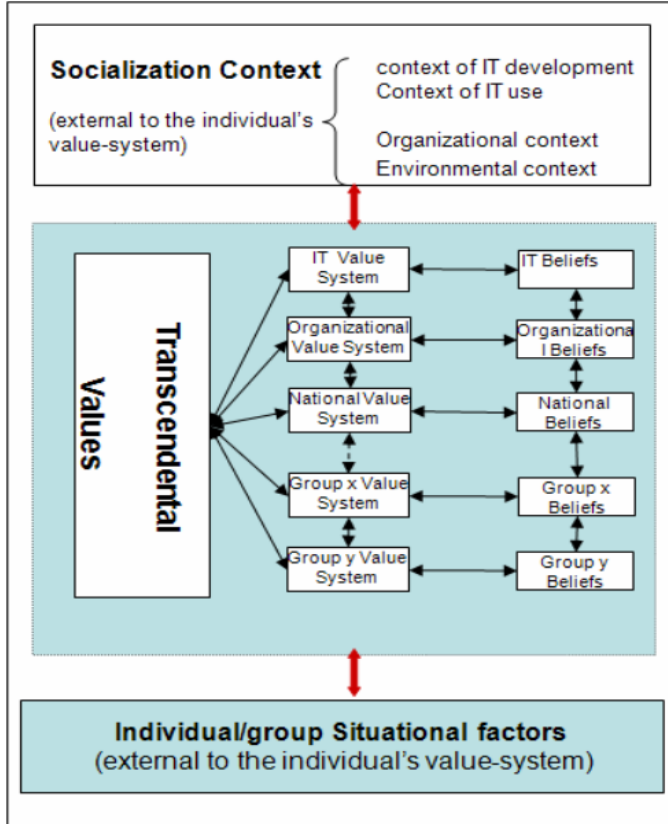
Before we go any further, we have to go back to the Spinning Top Model and put forward the implications of what precedes. Even though, as soon as a human being breathes and lives, he does so in a context and the spinning top starts rotating, we will for a minute stop it to understand it properly and investigate more specifically the set of the individual's beliefs and values (see figure 3). In a static position, the set of transcendental values identified by Rokeach (1973), and extended by Schwartz (1992; 2006), as universal and shared by all human beings, are found in the central axis. The existence of these values is independent of any context. However their activation, ranking and organizing will depend heavily on the context as soon as the individual 'lives' and socializes and the Spinning Top starts rotating. When this happens, some transcendental values are activated, ranked, organized and the outwards layers of the Spinning Top build up, thus adding group cultural layers on top of the central innate axis. Through socialization, context and group norms, new beliefs are born, which when sedimenting progressively become values (i.e. "enduring beliefs": Rokeach 1973) and then underlying assumptions when finally completely sedimented. We have summarized these elements in figure 3.

Therefore if we are to study users' IITC, we should not study users' behaviours, attitudes, beliefs or even values but the users' general value system or/and the IT values sub system and the way in which these systems are organized.
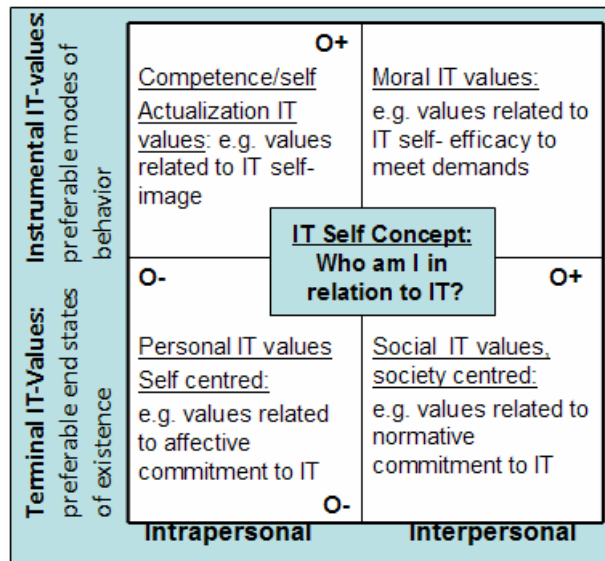

Figure 4: The Individual's IT value System or IITS

Wach & Hammer (2003) underline that, in 1913, Spranger had already stressed that one should not study values independently from the whole which they constitute. Value systems could then be addressed as important predictive variables in IT behavioral models (Wach & Hammer, 2003).

Amongst the 36 values identified by Rokeach as being common to all individuals, 18 are defined as instrumental values which include competence/self actualization values and moral values and 18 are defined as terminal values which include personal and social values.

We propose to extend this approach to IT values without presuming of the number of IT values which could be found as common to all individuals and which still remain to be identified.

Concerning the "ought" character of values, Rokeach suggests that "'oughtness' is more an attribute of instrumental rather than terminal values and more an attribute of instrumental values that concern morality

than of those concerning competence" (Rokeach, 1973 p. 9). This is indicated in Figure 4, along the 2 axes by the indications O+ and O-, O meaning "Oughtness". The moral IT values, which possess the highest "ought" character,

should then be a privileged zone of managerial concern and Figure 4 is then a possible illustration of the Individual's IT value System (IITS).

In order to validate the Spinning Top Model with its IITC layer, we must therefore try and inform the IITS; to do so, we have to find the rest of our way through the aforementioned terminological forest ie clarify the meanings of the remaining two concepts (norms and attitudes) and investigate how they are related to the main concept of values.
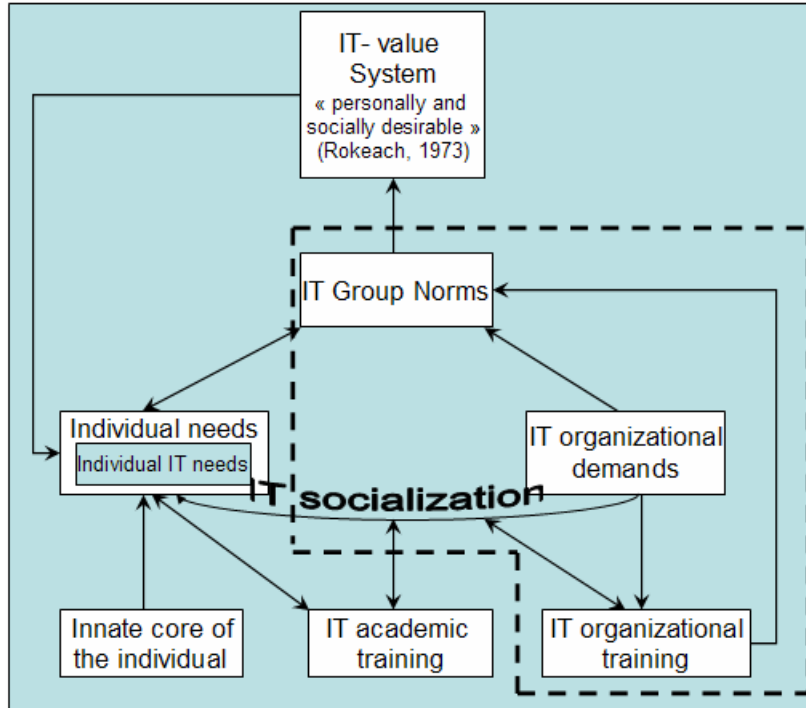
Rokeach clearly distinguishes norms and values: "a value is more personal and internal, whereas a norm is consensual and external to the person" (Rokeach, 1973 p.19).

He does not explicitly position group norms, however he indicates that "once (such) demands and needs become cognitively transformed into values, they are capable of being defended, justified, advocated, and exhorted as personally and socially desirable" (Rokeach, 1973 p.20)

which implies that the societal and institutional demands as well as the individual's needs have to be processed through group norms in order to be cognitively transformed into values (see figure 5).

Following the tradition initiated by Kluckhohn (1951) and Rokeach (1973), Schwartz and Bilsky (1987) have focused on the content of values

Figure 5: The possible zones of managerial influence

which is by essence related to human requirements. They particularly remind us the theoretical assumption about the nature and sources of values: "values are cognitive representations of three types of universal requirements: biologically based needs of the organism, social interactional requirements for interpersonal coordination, and social institutional demands for group welfare and survival" (Schwartz & Bilsky, 1987, p. 551). These requirements are then cognitively transformed into goals to aim at or into values. This reasoning is very important to understand the shift from human requirements (biological versus social), to human interests (individualistic versus collectivist) and finally to the portfolio of motivational domains of values: the Enjoyment Domain, the Security Domain, the Achievement Domain, the Self-Direction Domain, the Restrictive-Conformity Domain, the Prosocial Domain, the Social Power Domain and the Maturity Domain (Schwartz & Bilsky, 1987).

Applying this to IT (figure 5), it shows precisely the level at which managerial implication, through organizational socialization centred on IT, could be important. In figure 5, the proposed zones of possible managerial influence are indicated by the dotted line to render the reading of the diagram easier. Within organizations, through voluntarily nurtured and carefully managed socialization, centred on IT, individual IT needs could be made to evolve and be satisfied through organizational IT training. In consequence, those evolved IT-needs being processed through group norms into new ranking of values, could help reorganize some of the users' IT value system, if deemed necessary for adequate adoption and use of new IT. Empirical validation of this point could be done through in depth longitudinal case studies of varied organizations

The motivational domains guide, more or less consciously, the individual's disposition for or against a specific action or behaviour, for example to use or not to use an IT tool in a given organisational setting, at a certain point of time. Moreover, these motivational domains do not play the same role in a given context; they are ranked and are translated into the individual's value system. This ranking is influenced by the interests served, e.g. individualistic versus collectivist, and shape "the set of interrelated predispositions to action organized around an object or situation" (Rokeach 1973 p.18), i.e. what Rokeach defines as an *attitude*, several attitudes leading to a specific

behavior. Attitudes, which are in fact sub systems of some ranked beliefs and values, are antecedents to behaviors (see figure 6).
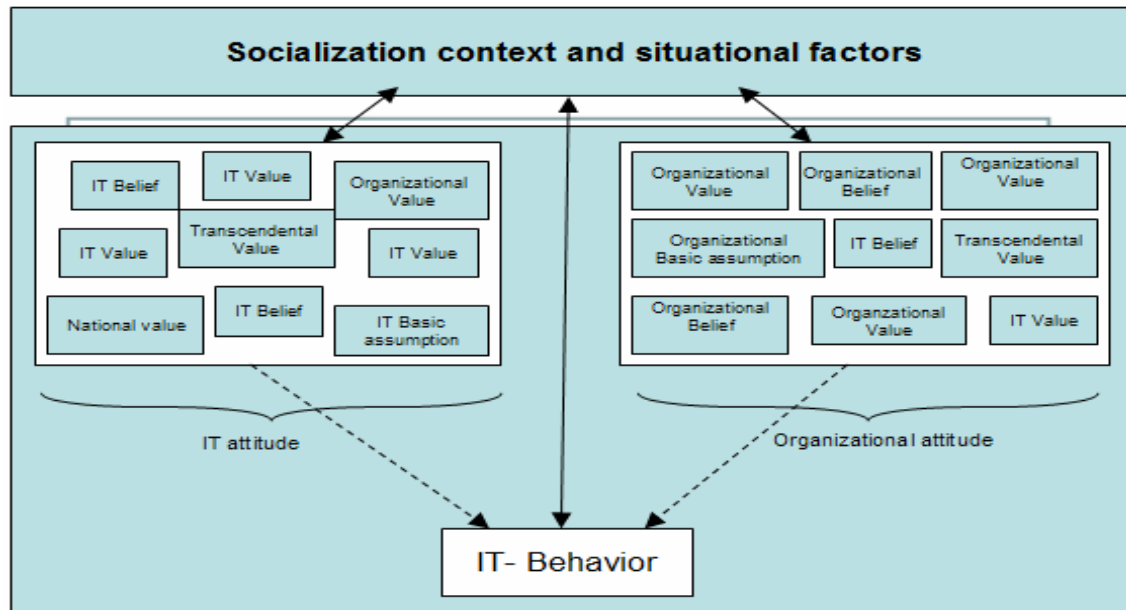

Figure 6: Illustration of an example of two attitudes leading to an IT-behavior.

For example, an IT-attitude could be a user's voluntary involvement in a new IT-project, which when coupled with an organizational attitude of interpersonal collaboration could lead to an IT-behavior seen as emulating for other users.

Many competing models have been developed in IT acceptance research. These models have been integrated in the Unified Theory of Acceptance and Use of Technology (UTAUT: Venkatesh, Morris, Davis & Davis, 2003).
Having defined what we name attitude and IT-attitude, UTAUT can help us start and inform the model of IITS proposed in Figure 4
The seven constructs described in UTAUT as being direct or indirect determinants of user acceptance and usage behavior are: performance expectancy, effort expectancy, attitude towards using technology, social influence, facilitating conditions, self-efficacy, anxiety, and behavioral intention to use the system.
To illustrate our argument and if we interpret these constructs using Rokeach's work as summarized above, they could be viewed as follows:
- Effort expectancy is the attitude which includes the enduring belief (i.e. the value) that using computers is (or is not) easy; that is an instrumental self actualization IT value
- Performance expectancy is the attitude which includes the enduring belief that using computers enables one to accomplish tasks more quickly (or not); that is a moral IT value.
-Social influence is the attitude which includes the enduring belief that people who influence one's behavior think one should use computers; that is a terminal social IT –value, etc.

In order to inform the model of IITS proposed, we could then use past IS research to identify IT values common to all individuals; the different ranking of these values could then in turn inform us on the users' various IITC profiles.
Thus the Spinning Top Model could lead us to propose a value based meta-framework of analysis which could allow us to compile and integrate previous frameworks developed in IS research. We could then envisage proposing new adoption models including users' value systems as primary variables and test these against established models like the TAM.

Limitations, future directions and implications for practice

The main limitation of this study is probably the fact that it is based on the interpretation of concepts and previous researches, hence it could be biased by the researchers' own cultures, which in turn could be influenced by the conducted research. Smircich (1983) underlined this particular drawback: "Because we are of our own culture, it is difficult for us, researchers and managers alike, to both live in our cultural context and to question it. It is difficult to engage in contextual, reflexive management and research, with the requirement of examination and critique of one's own assumptions and values (page 355).As IS scholars impregnated with IT we have considered the IITC as a fundamental layer of the individual's culture through which we have proposed to observe the dynamic interactions between the various cultural layers of the individual, given an innate (biological) set of human specificities. This point illustrates how it is almost unavoidable for a research study focused on culture to do away with the researchers' own cultures, hence their basic assumptions.

A possible limitation is that we assumed that all human beings have an IITC layer; this of course is subject to caution and valid only for those individuals who have been exposed to "technological culturation" (Straub, Loch & Hill, 2000).

Historically, research on IT users' personal factors has focused on what can be seen as subsets of IT-values: personal perceptions and individual attitudes (Mac Elroy, 2007). The present study points at the fact that we should rather go back to studying either the users' complete value system or the subsystem of their IT-values, as well as any factor possibly acting upon these, for example group norms, context, etc. Building upon this view, possible further researches should be:

- Through an exploratory study, using qualitative methods and an ethnomethodological stance, to attempt the identification of individual IT cultural archetypes and develop a typology of users based on these archetypes; this is already in the process of being done (Walsh & Kefi, 2008b) by the authors of the present article.
- To study and rank the users' set of IT-values and test whether various users' IITS are correlated with positive or negative users' IT-attitudes and/or behaviors.
- To develop a dimensions model in which IITCs could be empirically sorted out into similarly scored clusters, on the basis of their dimension scores (Hofstede, 2001).
- To adapt to the IS field the works of Schwartz & Bilsky (1987), Schwartz (1999), Schwartz & Boehnke (2004), Schwartz (2006), based on Rokeach's work on values and study, in varied organizational settings, users' global value systems and check if possible patterns are emerging in the organization of the users' values and if one can identify the transcendental values predominantly at play in technology acceptance or if specific arrangement of values can be identified depending on various IITC users' profiles which would have been previously defined. If the user's value system is considered as an antecedent variable, a correlation between users' value systems and IT-attitudes and behaviors could then be investigated.

It is only after such researches are successfully conducted that the proposed model could be deemed empirically validated and in order for these researches to be valid, they should be conducted across several countries, religions, organizations, and mixing key moderators i.e. ages, academic trainings, etc. This, in itself, would prove a vast endeavour.

Using the developed framework, past IS research studying human /IS interactions could be reviewed/ used to develop new models solely relying on values, and not on "mixed" concepts using various interdependent elements of the now clarified "terminological forest". It could also explain some of the mixed results obtained by some models.

In any given organizational context of IT implementation, it could appear important to study the prospective users' IITC and their specific IT related values as they could influence users' behaviors and their adoption/appropriation of IT. Thus, to give a concrete example, a user whose basic assumptions include the absolute necessity of IT use in his/her everyday life might need quite different training sessions on a new IT work tool to the one needed by another user whose basic assumptions include a fundamentally and globally negative judgment concerning all technological tools or a deeply ingrained fear of these tools. Taking into consideration the possible interactions between an individual with a salient IITC, rooted deeply and close to the innate core cylinder of the *Spinning Top Model*, and another individual with a minimal and/or superficial IITC could prove valuable in a managerial perspective. Culture not being static, the managerial nurturing of socialization centred on technology and possible emulation between groups of users with different IITC could be a facilitating influence before or during the implementation of new IT tools in an organization.

Through questionnaires, one could envisage to devise a human resource tool which could be used as possible team management support, through a simple computerized visual representation of the individual as a spinning top. Though this vision would be approximate, not static and deemed simplistic by some critics, its very simplicity could be precious in managerial terms if used with adequate/careful judgment.

Conclusion

We have argued in this study that different streams of research which address the human/IS interactions are built upon a cultural research paradigm even though they do not always explicitly call upon the concept of culture. Compiling the cultural approaches rooted in Anthropology and Sociology we have proposed an analytical framework which integrates previous cultural and value-based views used in organizational research as well as IS research. This framework is compatible with the various conceptions of culture which are rooted in anthropology and sociology, which we have described and it builds upon them.

We defined and described the IT culture concept which has only started to appear very scarcely in IS literature in recent years and we have shown the need to define this specific component at the individual's level. Grounding our reflection on SIT and the conceptual integrative work of Straub et al (2002), and in order to develop and operationalize our new theoretical approach, we have proposed an original model: the Spinning Top Model. This model allows us to identify and study the users' Individual IT culture within the global culture of the individuals. This should be our concern in an organizational setting of IT implementation and in a managerial context which has become globally cross cultural. Such a framework could lead to original approaches to studying IT users' acceptance, adoption, appropriation and users' IT related behaviors.

Our model could contribute to filling the gap in the prevailing fragmentary IS and intercultural literatures. Using Rokeach's (1972-1973) work on human values, we have shown that in IS research we should study more specifically the individuals' full value system and/or their IT-value sub-system, and take these into consideration in constructing descriptive, normative or prescriptive IT behavioral models. Furthermore the Spinning Top Model approach federates and encompasses previous research works done in various fields. It provides a new analytical framework which allows us to reinterpret past research and opens possible new paths for further research in MIS but also in intercultural Management.

Humanity has migrated throughout its existence from an oral culture to an oral and written culture, and more recently to an oral, written and numerical culture. For the last couple of decades, it appears that we have not been living through an information revolution or a knowledge revolution; Humanity has been living through a true cultural revolution.

Users all over the world have to be helped through a "cultural migration" which appears close to mandatory; training should be adapted to the various users' technological cultural profiles in corporate settings and also more generally in the population at large. To do so we truly needed to understand the concepts of Culture and IT Culture, Values and IT-Values. The present conceptual study is an attempt to achieve this task.

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