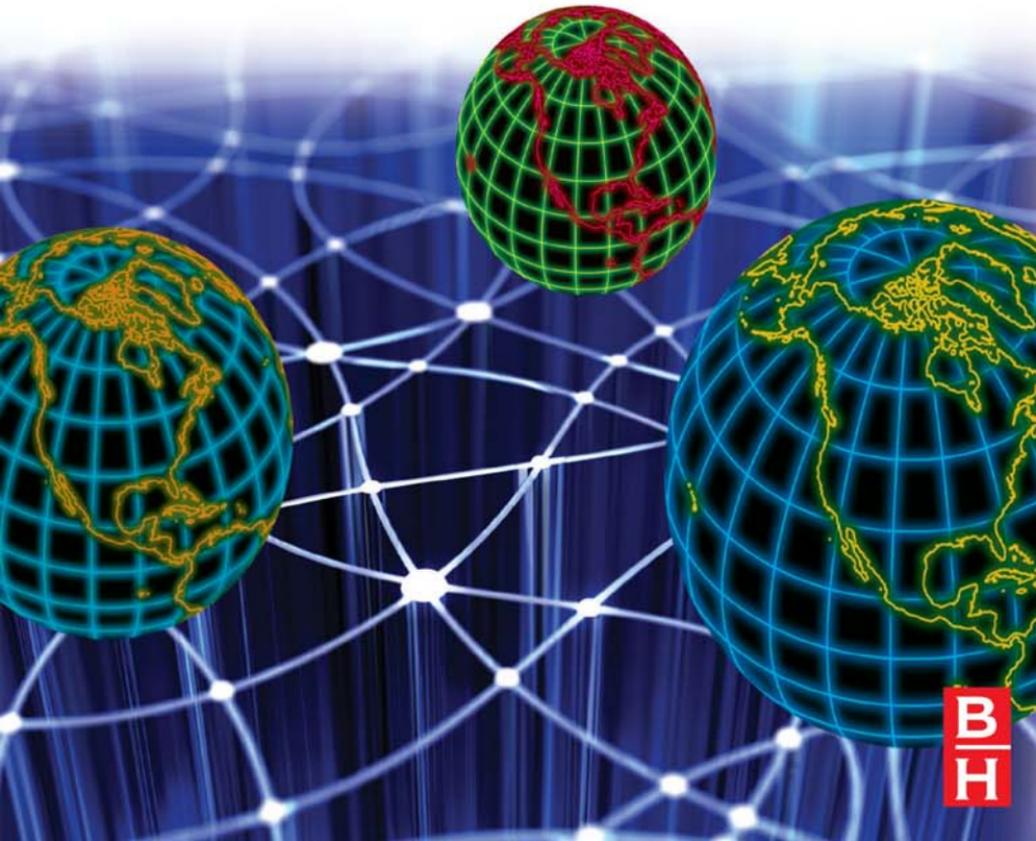


D. E. Leidner  
T. R. Kayworth

# Global Information Systems

The Implications of Culture for IS Management



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## **The Implications of Culture for IS Management**

**D. E. Leidner and T. R. Kayworth**



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<sup>1</sup>The first three articles take a national perspective of culture and the last one an organizational perspective.

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# Introduction: An Overview of Culture and IS

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Since the emergence of IS as an academic discipline, researchers have observed that the deployment of information technology (IT) in organizations seems to follow no predictable pattern. Rather, the dynamics of IT adoption and use, and the outcomes of such use in organizational settings, were seen to be largely dependent on a host of variables external to the technology itself. One such variable – culture – has been identified by some as a key management variable to be considered in the successful deployment and management of IT in organizations (Cash et al., 1994; Lucas and Baroudi, 1994).

Given the focus of this book on IT and culture, it is essential to first introduce the concept of culture and, in particular, to identify the myriad of ways this construct has been conceptualized.<sup>1</sup> Such an introduction will provide a lens for the reader, as they read the ensuing articles, that may interpret culture very differently in terms of how it is actually defined as well as the levels at which culture is actually studied (e.g. national, organizational, sub-culture, individual).

To begin this introduction, it is important to ask ourselves what culture actually is. The answer to this question is not an easy one since culture has been viewed in sundry ways, including as ideologies, beliefs, basic assumptions, core values, important understandings, the collective will, norms and practices, symbols, rituals, and myths (Sackman, 1992; DeLong and Fahey, 2000; Hofstede, 1998; Burchell et al., 1980; Pettigrew, 1979). So, our first point is that there is no single, universally accepted definition of culture.

Regardless of its definition, most agree that culture is a useful construct for explaining social group behaviors based upon their particular cultural interpretations of various events, objects, and stimuli. Theories of culture are critical to the IS field in that they present the view that IT artifacts and the information they generate are symbolic in nature (Robey and Markus, 1984)

<sup>1</sup>One early account lists 164 definitions of culture (Kroeber and Kluckhohn, 1952).

## 2 *Global Information Systems*

and hence subject to the various cultural interpretations. Such a view provides an alternative to the notion of technical determinism and suggests that technology is socially constructed based on particular social groups' assumptions, beliefs, or values. As social groups enact information technologies in different ways, these varied interpretations will lead to different behavior patterns in how such groups adopt and use IT, thereby leading to different outcomes of such use. Consequently, theories of culture may be helpful in explaining why IT use in firms often results in what seems to be contradictory consequences (Robey and Azevedo, 1994; Robey and Boudreau, 1999).

One definition we find useful is by Edgar Schein (1985a, 1985b) who defines culture in terms of 'basic assumptions, shared beliefs, or values'. Schein argues that culture exists at three levels: basic assumptions, values, and artifacts and creations. Basic assumptions exist at the core level of human existence and represent the belief systems that individuals have towards human behavior, relationships, reality, and truth. They represent interpretive schemes that are used to perceive situations and that form the basis for collective action. These assumptions are formed over time; they are passed along to new members, and they remain largely preconscious or invisible to the group's members.

At the next level lie values that represent espoused beliefs identifying what is important to a particular group. For organizations, corporate values form the foundation of corporate culture and provide a basis for appropriate behavior (Deal and Kennedy, 1982). According to Schein, values tend to be much more visible than assumptions with individuals being able to articulate their particular sets of values. Values are often characterized in terms of polar opposites such as 'task-orientation' vs. 'results-orientation' cultures.

At the third and most visible level of culture are artifacts and creations. Artifacts and creations may include such things as art, technology, and visible and audible behavioral patterns. While these manifestations of culture are quite explicit, they may also be among the more difficult to interpret. Consequently, one finds a dearth of mainstream research examining IS phenomenon based upon cultural artifacts and creations.

To summarize, culture may be very implicit in the form of basic assumptions (e.g. assumptions regarding information technology and the information it produces) while at the same time it may be very explicit in the form of visible artifacts and creations (e.g. technology artifacts). Additionally, culture can be reflected in individual values that represent knowable espoused beliefs (e.g. collaborative values). To date, IS culture research has been heavily slanted in favor of a 'values perspective' to the study of issues at the intersection of technology and culture. As such, much of the extant IS culture research focuses on the identification of particular sets of value orientations at the national, organizational, or sub-unit levels to examine how variations in such values affect particular IT outcomes. This trend is evident in the selection of this book's readings that focus heavily on a values perspective of IS culture

research. To a much lesser extent, IS culture research has examined the role of basic assumptions in shaping various IT outcomes. Two notable examples of this are Kaarst-Brown and Robey (1999) and Kaarst-Brown (2005).

Defining culture on the basis of values or basic assumptions, researchers have examined an abundance of IS-related phenomenon addressing such questions as: How does culture influence patterns of IT adoption and diffusion? How does culture influence the way IT is managed in organizations? How do cultural differences influence the systems development process? How can variations in patterns of IT use and subsequent organizational outcomes be explained through cultural values? The common thread among these and other IS culture studies is that researchers seek to explain variance in IT-related dependent variables based upon differences in culture as either an independent or moderating variable.

While there are differences in the definition of culture, we also see dissimilarity across studies regarding the level at which culture is studied. Essentially, IS culture research has evolved over two distinct streams that examine culture's influence at the national level<sup>2</sup> as well as at the organizational or sub-unit levels (Leidner and Kayworth, 2006). While these two streams have experienced little overlap, they both share a focus on defining the cultural values that distinguish one group from another and how differences in values influence certain IT-related outcomes. The great majority of IS cross-cultural studies to date have relied extensively on Hofstede's (1983) taxonomy characterizing national culture along the value dimensions of power distance, uncertainty avoidance, individualism–collectivism, and masculinity–femininity.<sup>3</sup>

Studies using these dimensions generally involve subjects from two or more countries with very distinctive value sets (e.g. China vs. USA) and examine how differences in one or more of these value orientations might explain variations in one or more IT-related outcomes. Such studies have been helpful in deciphering how differences in national culture may help to account for differences in IT use, adoption, and IT use outcomes. Other popular conceptualizations of national culture used in cross-cultural IS research have included: time orientation (Hofstede and Bond, 1988), monochronism vs. polychronism (Hall, 1983), context (Hall, 1976) and locus of control (Smith et al., 1995). While most cross-cultural IS studies rely on some existing conceptualization of national culture (e.g. Hofstede, 1983), other studies such as Hill et al. (1998) rely more on evidence from field research to develop qualitative assessments of culture.

<sup>2</sup>This is typically referred to 'cross-cultural' research.

<sup>3</sup>See Leidner and Kayworth (2006: 361) for a more complete taxonomy of national cultural value frameworks.

Recently, some criticism has been leveled at Hofstede's dimensions of culture (Myers and Tan, 2002; Ford et al., 2003) with some arguing that it is overly simplistic and outdated. One criticism is over the underlying assumption of homogeneity of national culture that is implicit to Hofstede's work. In reality, specific countries may consist of various regional sub-cultures. Secondly, Hofstede's data on cultural values was collected close to thirty years ago. Over this period of time, it is likely that values have changed, particularly as the world has undergone globalization. In spite of these criticisms, research based on Hofstede's cultural values remains popular given the intuitive appeal of these dimensions as well as the body of prior research that has been built upon this tradition.

The second major stream of IS culture research examines the intersection of IT and culture from the standpoint of organizational culture.<sup>3</sup> Similar to the cross-cultural tradition, this line of inquiry has, to a great extent, taken a values-based approach to studying how organizational values (e.g. espoused beliefs) influence how social groups adopt and use IT, as well as subsequent organizational outcomes of such use. However, unlike the body of cross-cultural IS research, organizational IS culture research does not always assume homogeneity of culture at the organizational level. This is evidenced by a growing body of IS research investigating how distinctive sub-unit cultures within given organizations may influence IT-related outcomes. From the organizational literature, Martinson and Myers (1987) do an excellent job of describing these two views of organizational culture in terms of the *integration* and *differentiation* perspectives. Further discussion on each of these perspectives is provided below.

The *integration* perspective regards organizational culture as a homogeneous set of values that act as 'an integrating mechanism or social or normative glue that holds together a potentially diverse group of organizational members (Martinson and Myers 1987: 624).' One of the drawbacks to this perspective of organizational culture is that it cannot explain the presence of conflict in firms with homogeneous sets of values. Furthermore, this portrayal of organizational culture does not tolerate ambiguity in values. Thus, organizational values are valid only to the extent that they are widely shared across the enterprise. A good example of IS culture research from the integrationist perspective is a study by Ruppel and Harrington (2001) who use Quinn and Rohrbaugh's (1981) competing values framework to explain how different types of organizational values account for different patterns of intranet adoption across companies.

In contrast to the integrationist perspective, the *differentiation* perspective embraces the notion that most organizations are composed of different sub-cultures, each with their own views of the world based upon distinctive sets of values embraced by each group. Regarding this view, Rose (1988) comments: 'while it is empirically possible for an organization to exhibit a

homogenous organization culture, this appears to be the exception rather than the rule'. Thus, a more realistic view may be one that considers organizations as mini societies – multi-cultural in nature; each with distinctive, competing, and potentially overlapping sub-cultures.

This differentiation perspective is useful for explaining how different sub-cultures within the same firm (e.g. engineers vs. sales people) may adopt and use IT differently based upon their respective sub-culture values. Furthermore, the differentiation perspective holds promise for explaining the conflict that often occurs among different sub-cultures (e.g. users and developers) within the same firm as well as across firms. One good example of such IS culture research from this differentiation perspective is found in Huang et al. (2003). While there have been a number of such studies from the differentiation perspective, most studies at the intersection of organizational culture and IS do so from the integrationist perspective.

While IS culture research has focused almost exclusively on culture's influence on IS, there has been a more recent trend in research examining how the adoption and use of IT may actually influence culture (Leidner and Kayworth, 2006). In one recent example, Doherty and Perry (2001) showed how the implementation of advanced data warehousing technology actually transformed an organization's culture in terms of values related to customer service, flexibility, and empowerment. This stream of research has practical significance through examining how technology might be deployed as an intervention to shape a firm's values consistent with management's wishes. Such research examining technology's influence on culture appears relatively unexplored, particularly at the national level.

Research on IS and culture is not without its challenges. First is the fact that studies at the intersection of IS and culture must address a construct that may exist at one or more levels (e.g. sub-unit, firm, national) simultaneously. In addition to determining the level of culture one is studying, researchers must also agree upon how culture should be best conceptualized; whether it be in terms of basic assumptions, values, tangible artifacts or one of the many other ways that culture has been defined. Given these conceptual challenges, a final challenge has to do with how culture is actually measured. In spite of these challenges, we believe the potential rewards to be gained from IS culture research are well worth the effort of grappling with these types of challenges.

In *Global Information Systems*, we provide readers with a cross-section of articles that we believe capture the complexities of IS culture research we've discussed. These readings provide some excellent examples of studies examining the IS phenomenon at different levels of culture (organizational, sub-unit, national culture) using various conceptualizations (e.g. basic assumptions, values) and different means to measure the culture construct. Many different national cultures are featured in the readings, including China,

Egypt, Hong Kong, Hungary, India, Jamaica, Korea, Mexico, Peru, Saudi Arabia, Sweden, Singapore, Turkey, the United Arab Emirates, the United Kingdom, and the United States. It is our hope that upon completion of this book, readers will have a much better grasp of the role played by culture in the development, adoption, use and management of IS. Enjoy the book!

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## Part One

# The Role of Culture in IS Development

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This first part of the book focuses on the role played by culture in the development of IS. Research on IS development considers the challenges of IS design and development, the different development approaches used as well as the outcomes of the methods, the motivations and incentives of IS developers, and issues concerning IS developer productivity. Considerable work has focused on the cultural differences observed across different software development teams and approaches. A common finding across studies is that cultural variation explains different approaches towards software development and that an approach that works well in one cultural context may not work so well in another.

For example, Dagwell et al. (1983) found that systems designers' approach towards end users varied across four nationalities (USA, UK, Australia, and Sweden): Australian and Swedish designers favored a more people-oriented approach to IS development whereas US and UK designers favored a more process and efficiency orientation. Likewise Kumar et al. (1990) found that the Danish designers emphasized people-related issues in ISD projects more than their Canadian counterparts, who emphasized technical issues.

This part comprises four papers on the role of culture in IS development. The first three of these examine culture from a national perspective whereas the final paper examines culture from an organizational perspective. Of the articles looking at national culture, the following nations are included: China, Hungary, India, Jamaica, Singapore, and the United States.

The first article, by Perlow, Gittell, and Katz, describes the approaches to software development employed by software development teams in India, China, and Hungary. Having spent time observing the different teams onsite, the authors were able to get detailed information on how much time the team members spent interacting with one another, and for what purpose, as well as how much time, and for what purpose, they spent interacting with the leader. The article demonstrates the dramatic difference in how the project leader interacts with the team members in the different cultural environments as well as the differences in how the team members interact with one another. Moreover, the reward structures and work hours are shown to be quite different.

The Walsham (2002) article – the second in this part – considers the consequences of cross-cultural software development teams. In Walsham's paper, the interactions of Indian and Jamaican software developers are described, as the team members try in vain to complete an urgently needed software application. The differences in leadership style, in work habits, and in the very meanings associated with timetables and deadlines are shown to be stark across the two cultures. As a result, the developers from both cultures are challenged to adapt to the other.

In the third article in this part, Tan, Smith, Keil, and Montealgre (2003) address the question of information gathering and dissemination during software projects. Specifically, they are curious as to whether national culture influences the degree to which unfavorable project information (such

as being behind schedule and or over budget) is shared upwards in the hierarchy. Such information has important implications for whether doomed software projects are continued, or recognized as troubled and stopped or adjusted. The cultures they consider are Singapore, and the United States where the United States is an 'individualistic' culture and Singapore is considered to be 'collectivist'.

The final paper in this section examines organizational culture and its influence on CMM. The capability maturity model (CMM) has been part of a trend towards software development improvements over the past decade and is used by companies around the globe. Yet software development projects continue to fail at an alarming rate.

Ngwenyama and Nielsen (2003) uncover the core assumptions about organizational culture that are embedded into CMM and explain why CMM might not be successful in all organizations.

With the increasing use of offshore development practices (Carmel and Agarwal, 2002; Kaiser and Hawk, 2004) as well as cross-cultural software development teams, it is essential to understand how value differences in culturally diverse software development teams may influence the systems development process and outcomes. Moreover, as software process improvements, such as CMM, become common, it is likewise important to understand how these are accepted, or rejected by, an organization's culture. The four articles in this part help expand our understanding of these points.

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# 1 Contextualizing Patterns of Work Group Interaction: Toward a Nested Theory of Structuration

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**Abstract:** The focus of this article is the patterns of interaction that arise within work groups, and how organizational and institutional factors play a role in shaping these patterns. Based on an ethnographic study of groups across three national contexts, we describe the variation in patterns of interaction that we observed. We further suggest how different patterns of interaction form mutually reinforcing systems with aspects of the organizational context. In addition, we suggest how these mutually reinforcing systems are perpetuated by aspects of the broader institutional context. Our findings point toward a nested theory of structuration, expanding structuration theory to multiple levels simultaneously. In turn our findings have theoretical and practical implications for better understanding and managing interaction patterns among group members.

## Introduction

How does work get done in groups? Why does similar work get done differently in different places?

To address these questions, we must explore what people actually do at work. As Stephen Barley and Gideon Kunda (2001, p. 90) aptly describe: “The dearth of data on what people *actually* do – the skills, knowledge, and practices that comprise their routine work – leave us with increasingly anachronistic theories and outdated images of work and how it is organized”. Moreover, if we want to understand how work gets done, we cannot strip away the context. Rather, we must contextualize our findings to better understand the phenomenon we observe (e.g., Johns 2001, Rousseau and Fried 2001). Also, we must consider how factors at multiple levels of analysis shape and constrain the phenomenon we study (Kozlowski and Klein 2000, Hackman 2003).