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ADOPTION OF IS DEVELOPMENT METHODS ACROSS CULTURAL BOUNDARIES

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Abstract

In IS practice as well as in the literature, IS development methods are prominently espoused. IS development methods are used around the world and globalization of business stimulates their harmonization. To our knowledge, no empirical research has been reported regarding the effect of national cultures on the actual (non-)adoption of IS development methods, which is the focus of this research project. The study is based on Hofstede's well-known research (conducted within IBM), which has provided a conceptual foundation for cross-national research over the past two decades. Data encompassing approximately 40 countries were collected within one global consulting firm. The outcomes of this study are expected to have implications for how global organizations can introduce new development methods more effectively.

Keywords: Empirical research, cultural differences, social science, globalization, organizational procedures, managerial control.

Global organizations first must be able to transport their know-how into a broader range of cultural and political settings; and second, that they must be able to accommodate within the corporate family people drawn from a wide range of national cultures.

Herbert Simon

1. RESEARCH OBJECTIVE AND QUESTION

Many professional service organizations (e.g., law, accounting, consulting) have global operations. Their customers expect the same products, quality, and service around the world. Globalization of business, although almost a cliché, is a powerful force that deserves attention from management researchers. Globalization of business stimulates harmonization of professional practices used around the world, for example, system development methods. IS in particular is a global phenomenon. In IS practice as well as (the mostly *normative*) research literature, standard IS methods¹ are prominently espoused. (See, for example, Brinkkemper, Lyytinen and Welke 1996; Avison and Fitzgerald 1995).

For any global organization, the issue of how to promulgate standardized (“best practice”) approaches across national and cultural boundaries is, therefore, an important one. If research into such problems had an effect of only a few percentage points on

¹We define “method” as a systematic way of doing something, which, in the context of this paper, is developing and/or implementing information systems.

profits, the global impact would be a hundreds of millions of dollars. Clearly, the adoption of IS development methods across different cultural boundaries is, as Simon describes, not without problems. Interestingly, however, no research has been done, to our knowledge, on the actual (non-) adoption of IS methods across different national cultures.

The research question at the heart of the research-in-progress described in this paper is: *What is the effect of different national cultures on the adoption of IS development methods?* Answers to that question should provide insight into a corollary question of importance to the leaders of organizations: How should the introduction of a new approach be adjusted, dependent on national cultures, in order to improve or speed up adoption?

2. THEORETICAL FOUNDATIONS OF THE STUDY

2.1 Methods Adoption in Different Cultures

To our knowledge, no research has been conducted into adoption of IS development methods *across* different national cultures. There have a number of studies that have researched methods adoption *in* different national cultures, but they did not focus on differences *across* different cultures. For example, Fitzgerald (1997), Hardy, Thompson and Edwards (1995), and Chatzoglou (1997) all studied actual use of methods in the UK. Rahim, Seyal and Rahman (1998) studied the use of software systems development methods in Brunei. Krogstie (1995) studied the use of methodologies and CASE tools in Norway. Sauer and Lau (1997) studied the adoption of SSADM in a government agency in Australia.

2.2 Other Aspects of IS Across Different Cultures

Differences *across* national cultures have been reported for aspects of IS other than adoption of methods. For example, across firms in the U.S., France, and Korea, Grover, Segars and Durand (1994) researched differences in the perception of IT's competitive role, the level of integration in IS and strategic planning, as well as differences in deployment policy, telecommunications organization, and risk taking. Couger (1986) researched differences in motivation of analysts and programmers in Singapore and the U.S. Abdul-Gader and Kozar (1995) researched the effect of alienation, i.e., attitudes and beliefs, of decision makers on IT investment decisions across the U.S. and Saudi Arabia.

2.3 Cultural Differences

When faced with the same situation, people from different national cultures behave potentially very differently. There are, of course, many dimensions on which many national cultures differ. In his well-known studies (conducted within IBM), Hofstede (1984, 1991) has provided a conceptual foundation for much of the cross-national research over the past two decades. It is, indeed, also the conceptual foundation for the research described in this paper.

Hofstede's studies resulted in five dimensions with which national cultures and their differences can be described: "*power distance*" (the extent to which the less powerful members of society accept that power is distributed equally), "*individualism versus collectivism*" (the extent to which people look after themselves or look after in-groups—families, clans or organizations—in exchange for loyalty), "*masculinity vs. femininity*" (the extent to which gender roles are clearly distinct or overlap, respectively), "*uncertainty avoidance*" (the extent to which people feel threatened by uncertainty and ambiguity and try to avoid it in situations), and "*long-term orientation*," previously called Confucian Dynamism (the extent to which a society exhibits a pragmatic or future-oriented perspective rather than a conventional historic "absolute truth").

3. ADOPTION OF IS DEVELOPMENT METHODS IN DIFFERENT NATIONAL CULTURES

3.1 Hypotheses and Expected Results

The goal of this research project is to test the hypotheses described in this section. Four of Hofstede's dimensions are, in our view, relevant to the adoption of IS methods: uncertainty avoidance, power distance, long-term orientation, and individualism.

One of the indicators of *uncertainty avoidance* is "the need for rules and laws" in case of high uncertainty avoidance and that "there should be few rules" with low uncertainty avoidance. For example, Japan and France have high uncertainty avoidance, but the U.S. has low uncertainty avoidance. *IS methods relate to this dimension, because they are often perceived like rules and laws*; i.e., they describe how things should be done (and, implicitly, how things should not be done). IS development methods reduce uncertainty and ambiguity as to how certain tasks are to be accomplished. The resulting hypothesis is:

H1: IS development methods are adopted more in cultures with high uncertainty avoidance.

The extent to which rules are followed (or "bent" or even broken) depends in part on a second dimension: *power distance*. France, for example, scores high on power distance, of which one indicator is that "power-holders have privileges" (e.g., overruling rules). France likes its rules in the form of broad "principles" that should be followed, but "within" which power-holders can make specific decisions based on specific circumstances. In contrast, the U.S. (a culture with low power distance) like its rules in exact form; the rules should be followed as closely as possible and cannot be overruled or "interpreted" by power-holders; and power-holders' rights are equal to the rest of the population. Of course, IS organizations have top executives or senior partners. With high power distance, they may exercise power as to how work is to be done (e.g., possibly contrary to any IS development methods, or modify them in given situations). Conversely, with low power distance, less powerful employees may feel empowered by the development methods, because they are less likely to be overruled. Consequently:

H2: IS development methods are adopted more in cultures with low Power Distance.

A third dimension that is relevant for our research is *long-term orientation*. Countries like the U.S. score low on this dimension; they expect an "absolute truth," which is reflected in the rules. In contrast, Japan is quite comfortable with "many truths" as dependent on time or context ("high" long-term orientation). A *common criticism* (at least in some circles) of IS development methods has been that they prescribe "*one way to do things*" and that they force on IS professionals some "absolute truth" as opposed to other truths or interpretations. As a result:

H3: IS development methods are adopted more in cultures with low long-term orientation.

Collectivism is relevant in our study as a potential indicator of yielding to the perceived demand characteristics of the survey questions. Also, the subjects' self-reported observations may contain an element of "social desirability," e.g., applying and reading methods is viewed as "good" in the subjects' firm. Such "social desirability" is not "bad" for our study, because, as an aspect of the firm's strong (sub)culture, it influences all subjects. However, the influence of such "social desirability" may differ across national cultures: The higher the score on collectivism, i.e., the lower the score of individualism, the more people want to reach a collective decision, for instance, as part of a development team. A method represents best practices in systems development, i.e., a strong suggestion by a respected collection of others (peers, professionals, the organization), which a development team may well want to consider, if not adopt. Conversely, high individualism is indicated by, for example, individual initiative and autonomy (as opposed to prespecified "rules"). Thus:

H4: IS development methods are adopted more in cultures with low individualism.

The remaining dimension (*masculinity vs. femininity*) is not expected to have a systematic independent effect on the adoption of IS development methods. Examples of indicators of masculinity (Hofstede, 1991, p. 186) that are relevant to our study are the need for achievement, being up-to-date, decisiveness. Similarly, example indicators of femininity are striving for consensus

or a friendly (work) atmosphere. For our study, the relevant indicators of masculinity are covered by the individualism and power distance dimensions, and the indicators of femininity are covered by individualism (being low). Other indicators of masculinity/femininity, for example, need for achievement, earnings, or training, have no relation to the propensity to adopt methods. So, there appears to be no independent effect of masculinity/femininity on the adoption of methods.

3.2 Data

The data were collected in Andersen Consulting's global practice as part of two earlier (survey) research projects: (Hidding, 1997) and another, still unreported, project conducted during the fall of 1997. Both projects gathered extensive data about adoption of IS development methods. The two data sets encompass approximately 40 countries/cultures. Hofstede also collected data in only one large global firm, namely IBM. Consequently, the same advantages (and criticisms) of Hofstede's methodology apply to this research project (see Hofstede 1991, pp. 251-253). In particular, in-depth analysis of extensive data from only one organization reduces generalizability, but increases correspondence to reality.

The question that was asked (for both data sets) to determine the subject's culture is: "*In which country/national culture were you raised? (If more than one, write the one you consider dominant.)*" The *independent variables* that in turn reflect those national cultures are Hofstede's scores on the culture dimensions, which were treated, dependent on the statistical analysis, as ordinal or ratio-scaled variables.

The *dependent variables* measure how often in a given period of time subjects read any methods ("frequency of reading"), how many pages they read per session or in total in a given period of time, and how much they applied the methods they read. The first two are ratio-scaled variables, the latter is ordinally scaled. Hofstede (1984) argues that "ecological" correlations (i.e., between means of variables for each culture) should be used in cross-cultural studies. In this study, we used the mean values of the various dependent variables in the various statistical tests.

Various *statistical analysis techniques* will be used: The (non-parametric) Spearman rank correlations, Pearson (product moment) correlations, analysis of variance, and regression. SPSS will be used for all statistical analyses.

4. CONCLUSION

The outcomes of this study are expected to have implications for how global organizations can introduce new approaches more effectively. In order for standardized practices to be adopted effectively and quickly, they may have to be introduced in different ways in different cultures.

5. CURRENT STATUS OF THE RESEARCH

As of the time of this writing, the statistical analysis is in progress. Preliminary results indicate statistically significant relations between various culture dimensions and several dependent variables. However, several of the relations have a sign opposite of what was expected. The full statistical analysis is expected to be largely complete at the time of the Conference, so the analysis results, their implications and overall conclusions will be presented.

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