

December 1995

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## Recommended Citation

Schmidt, Roy, "Cultural Values and IT Use Among Senior Executives in Hong Kong" (1995). *PACIS 1995 Proceedings*. 41.  
<http://aisel.aisnet.org/pacis1995/41>

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# CULTURAL VALUES AND INFORMATION TECHNOLOGY USE AMONG SENIOR EXECUTIVES IN HONG KONG<sup>1</sup>

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*National culture has become a popular subject for examination in the information systems literature in recent years. Researchers have explored the effects of national culture on a variety of issues. In previous I/S research concerning culture, studies were conducted by comparing samples across various countries. No studies have examined the effects of ethnic culture on I/S use controlling for external effects due to locale. In the present study, we focus on ethnic culture as a factor in I/S use by managers within the same territory. The subjects for the study are managers in two companies located in Hong Kong. The two companies differ in that the management (and ownership) of one company is British, while the management (and ownership) of the second company is Hong Kong Chinese. We found that despite cultural differences that affected some aspects of the leadership of the companies, their I/S usage was very similar. However, we did find that resistance to I/T innovations was more difficult to counter in the Chinese-led company.*

## 1 Introduction

National culture has become a popular subject for examination in the information systems (I/S) literature in recent years. Researchers have explored the effects of national culture on a variety of issues. Some examples are I/S development practices (Kumar and Bjorn-Anderson 1990), IT diffusion (Straub 1994), motivation of I/S personnel (a series of studies by Cougar and associates starting with Cougar 1986), microcomputer usage (a series of studies by Igbaria and associates; see, e.g., Igbaria and Zviran 1991), and GSS use (Watson, Ho, and Raman 1994), among others. All of this research has been guided by the pioneering work of Hofstede (1980, 1984, 1985, 1991), who established a link between the operation of organizations and national culture.

In previous I/S research concerning culture, studies were conducted by comparing samples across various countries. Although this approach does provide us with a rich set of data concerning differences among national cultures, there remains the question of whether the differences are entirely due to culture or partly due to governmental influence, geographic distances, or economic conditions. No studies have examined the effects of ethnic

culture on I/S use controlling for external effects due to locale.

In the present study, we focus on ethnic culture as a factor in I/S use by managers within the same territory. The subjects for the study are managers in two companies located in Hong Kong. The two companies differ in that the management (and ownership) of one company is British, while the management (and ownership) of the second company is Hong Kong Chinese.

We will begin in the next section with a brief review of the theory base concerning cultural differences. Then we will describe the method used in the study and the demographics of the two companies in detail in section 3. In section 4, we present our observations of the use of I/S by managers in the two companies, comparing and contrasting their practices. Finally, in section 5, we draw hypotheses from our findings and discuss the potential for further research.

## 2 Cultural Differences

Hofstede's four dimensions of national culture (uncertainty avoidance, individualism, power distance, and masculinity) are derived from his examination of a single multinational company (IBM) across its operations in 40 countries (1980, 1984). Uncertainty avoidance is a measure of the tolerance of uncertainty and ambiguity. Individualism is shorthand for a scale ranging from collectivism to individualism in cultural identity. Power distance measures the degree to which there is a perceived distance between supervisor and worker. Masculinity is an expression of the degree to which gender affects the effectiveness of management as well as job opportunities and promotions.

Hofstede maintained that Great Britain differs from Hong Kong on all four cultural dimensions (Hofstede 1980, 1984, 1985). Hong Kong registered at the extreme of high tolerance of uncertainty, while Great Britain was classified as having moderate levels of uncertainty avoidance. In Hong Kong, collectivism is high, while in Great Britain individualism is high. Power distance and masculinity are also high in Hong Kong but moderate in Great Britain. But how do these national differences translate to differences in ethnic culture within the same borders?

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<sup>1</sup> The author was assisted in the preliminary data collection phase by Mr. Hean-Tat Keh, MBA '93. This research was partly funded by a Direct Allocation Grant from the Research Grants Committee of Hong Kong, DRG#92/93.BM04. The author also thanks the anonymous reviewers for their suggested improvements to the paper.

A recent investigation of employee opinions concerning management behavior in Hong Kong (Selmer, 1994) establishes that expatriate managers retain their cultural differences while working in Hong Kong. This is particularly evident in individualism, power distance, and masculinity. As a result, we can expect that such differences persist in Hong Kong and will have an effect on managerial actions, including the use of I/S and information technology (I/T) in support of the managerial functions. As a result, this study is designed to isolate differences in I/S use among managers that might be attributable to ethnic culture, but not environment, by conducting the study entirely within Hong Kong.

### 3 Description of the Study

For this study, we used Eisenhardt's (1989) approach to theory building, wherein data is collected and analyzed, then compared to previous studies to generate theories. Central to Eisenhardt's approach is making explicit the means of data collection (including selecting cases and defining collection methods) and the method of data analysis, including the generating of hypotheses.

#### 3.1 Data Analysis

We begin with a description of data analysis, because the method of data analysis drives the kind of data to be collected. In this study, our analysis is a qualitative comparison/contrast of behaviors and phenomena. Following the dimensions of cultural differences set out by Hofstede (and other differences as noted in the study) we attempt to explain and understand how I/S use might differ between ethnic cultures in the same country environment. We intend to control for as many non-cultural factors as possible, so that the cultural differences can be more easily seen and understood.

Since no previous studies exist in this area, this study is completely exploratory. Lacking corroborating or conflicting evidence, we must be satisfied at this point with the induction of hypotheses from the data, leaving theory-building to a later time when additional studies can add to our body of knowledge.

Analysis was performed in 5 steps: classification, deduplication/matching, reduction, relation building, and induction. Below we briefly describe each of these steps.

First, after each interview, we reviewed all data collected. Each item that pertained to one or more of the four cultural dimensions was filed under the dimension(s). Items concerning the use of I/T were filed under the particular technology to which they referred (e.g., electronic mail). Information about organizational leadership was filed according to the 17 facets of strategic leadership defined by Shrivastava and Nachman (1989) and tested by Schmidt and Wynne (1993). Other items related

to culture (such as Confucian ethics) were also filed accordingly.

Once all interviews were completed, each file was reviewed, seeking multiple mentions of items or similar items within a file. These items were grouped together as representing the same fact. Facts corroborated by multiple informants were considered more reliable than those mentioned only once. Then we made another pass through the files seeking conflicting evidence. Where contradictions were found within data from a single informant, we attempted to resolve the contradiction through reference to other informants, or alternatively by seeking clarification from the informant by telephone. A similar effort was made to resolve contradictions between informants.

In the third step, we reduced the data to yield classifications along each of the dimensions of culture, I/T usage patterns (Schmidt and Wynne 1993), leadership patterns, and other factors, such as organizational demographics. In some cases, such as Confucian ethics, no classifications were made, but the data were tabled to ease cross-reference.

Next, we began the process of relation building. We sought qualitative correlations between files. For example, the presence of a strong Confucian influence on the relationship between generations was associated with difficulty in dealing with resistance to the adoption of new I/T. The relations produced in this step are described in section 4.

The final step was induction of hypotheses from the relations discovered in the previous step. The hypotheses are presented in section 5.

#### 3.2 Data Collection

Data were collected through in-depth interviews with managers and workers and the administration of an I/S usage questionnaire for managers. The questionnaire was previously developed and validated through a large-scale mail survey (Schmidt and Wynne 1994). The main interviews were conducted on-site over a period of three months in early 1994. Preliminary interviews were conducted with senior management representatives in 1993, and follow-up interviews were conducted after receipt of the I/S usage questionnaires. We used a set of questions drawn from the cultural dimensions, leadership patterns, and I/T usage patterns instruments to guide our interviews, but the interviews were not strictly structured. Some questions led to collection of data on new facets of the cases not anticipated when the questions were drawn up. Data in the form of organization charts and sales literature were also collected during the interviews.

Considering the data analysis method of comparison and contrast, we needed to carefully select cases that would aid us in detecting cultural differences and eliminate as many confounding factors as possible. Beginning with a

sample of 15 companies, we conducted preliminary interviews and administered the I/S usage questionnaire. Two of these 15 companies were selected for this study based on both their similarities and differences. Our intention was to emphasize cultural differences while minimizing the effects of environmental and other factors. So these two companies were considered "matched" on many dimensions, while retaining an element of cultural difference. The two companies are identified in the study by fictitious names to retain the confidentiality of our investigation.

**General Supply Company.** General Supply Company was established in Hong Kong by a British family two generations ago. It is privately held by the family. The first generation has retired, and the second generation now holds the senior management position (Managing Director). The third generation (son and daughter) have just begun to take an active part in management of the company. All generations received a traditional British education through secondary school, and the younger (son) of the third generation just completed an MBA in the United Kingdom about one year before the study was conducted.

The primary business of General Supply Company is the manufacture and sale of equipment to an industrial market. The principal market for their products has traditionally been Hong Kong businesses, but in recent years they have begun selling in Australia, the United Kingdom, and China, and look to further expand their sales in the Asia-Pacific region. Their products are sold on the basis of high quality. Manufacturing is conducted in Hong Kong and in other Asian countries under close supervision to ensure the highest level of quality in their merchandise. Supply Company has earned a reputation for quality and is proud of it. Employees at the time of the investigation totaled 95. The company enjoys average annual sales of around HK\$50 million.

Besides the managing director, the two other senior management posts, general manager and technical manager, are held by family members as well. Middle management positions are mixed among expatriates (non-family) and local Hong Kong Chinese.

Expertise is highly valued in the company, and is the key to gaining influence over the operation of the company. There is an active effort to get ideas from the "grassroots" of the company. The managing director expresses his management philosophy as "non-confrontational". He seeks decisions that keep the company "peaceful". Still, being a small, family-owned business, authority is on a personal, rather than positional, basis. Input from any and all employees is considered before making a decision, but the managing director always makes the final decision. "Say, it's my company!" he said.

**Technical Supply Company.** Technical Supply Company has also been operating in Hong Kong for three generations. It is closely held by a Hong Kong Chinese family. The first generation has retired, turning control of the company over to the males of the second generation,

one of whom holds the position of Managing Director. The three sons of the managing director hold upper middle management positions. The second and third generations completed their educations through a B.Sc. in Engineering at local schools. Two of the three sons of the third generation have completed an MBA degree at a Canadian university, which is a typical educational pattern for Hong Kongers.

Technical Supply Company manufactures and sells a narrow range of vital supplies to an industrial market. Their customers are almost exclusively Hong Kong businesses, but in recent years they have begun to supply materials to Chinese operations as well. Their emphasis is on high quality, as their materials are used to support critical operations in customer companies. Product failure could cost both lives and money. Manufacture of the most critical items is done in Hong Kong, but some materials that require less exacting specifications are now made in China. With 110 employees in the company at the time of the investigation, Technical Supply had total sales of about HK\$80 million per year.

Besides the managing director, the general manager and production manager are also members of the second generation of the owner family. The three third-generation managers (all sons of the managing director) hold upper middle-management positions, one of which is the job of I/S manager.

Although expertise plays a part in influencing the operation of the company, there is a sense among all employees that it is a family business. The family members hold absolute sway over management actions. Authority in the company is on a personal, rather than positional, basis. For major decisions, the family members might confer, but the managing director always makes the final decision. There is a definite deferment to the older generation in all matters. In fact, since many of the line managers are contemporaries of the second generation, they treat the third generation as children, and are not likely to consider their decisions as final.

**Summary.** From the above descriptions, the reader can see that the two companies are very similar in many respects. They are both engaged in the manufacture and sale of industrial supplies, with an emphasis on quality. They have traditionally sold to Hong Kong customers, but recently began marketing their products abroad. Both have factories outside Hong Kong. They are nearly the same size in number of personnel, and their total sales are under HK\$100 million, placing them in the same class of small business. Both are family-owned and managed. They are about the same age chronologically, and the same generations (second and third) of the families currently control the companies. The I/S managers are from the same generation and have the same educational qualifications. And of course, both companies are based in Hong Kong.

Furthermore, General Supply and Technical Supply were classified as having what Shrivastava and Nachman

(1989) term an "entrepreneurial leadership pattern". That is, a single person makes all important decisions and has total control of the company. Both companies were also found to have a "central feeder" I/T usage pattern (Schmidt and Wynne 1994), whereby information is channeled one-way to the single decision maker. Schmidt and Wynne found this usage pattern was strongly associated with the entrepreneurial leadership pattern.

On the other hand, there is a pronounced difference in the ethnicity of the senior management. This ethnic difference provides the key ingredient in our study of cultural influence on the organizations.

Two examples of cultural influence are already evident in the background information presented thus far. First, none of the management positions in Technical Supply are held by women, let alone women from the owner family. On the other hand, General Supply has women in several key positions, including that of general manager. Second, the leadership styles of the two companies are quite different, despite the fact that in both companies major decisions are made exclusively by the managing director. General Supply is much more open in formulating decision options, and conciliatory in making decisions.

These two differences support the expected placement of the two companies on two dimensions of Hofstede's cultural scale: masculinity and power distance. The Chinese management at Technical Supply display a high degree of masculinity and power distance, whereas these factors are moderate at General Supply.

The second difference also reflects a degree of Confucian influence on the management of Technical Supply. We also see this Confucian influence reflected in the role of the eldest of the second generation (managing director), as well as the preferential placement of his sons in the company.

With this background of similarities and differences, we are equipped to begin our exploration of the I/S usage in both companies.

## 4 I/S Usage

Both companies had a similar background of computer use: microcomputer-based applications, primarily aimed at office automation (such as word processing). In both cases, the more-highly educated third generation managers (MBA holders) had returned to the company with ideas about using existing or new computing resources to enhance company operations. Both companies also had set up private databases for the exclusive use of the senior managers (containing confidential information on production levels, sales, and earnings). These databases were used often.

## 4.1 Technical Supply

Technical Supply had also set up a central database for collection of data from all levels of the company. The data were periodically used to produce aggregate reports (for senior management information) on employee performance, absenteeism, inventory management, and other issues of interest to them. This arrangement had become very popular in the company.

Also based on knowledge gleaned from MBA studies, the third generation had subscribed to an on-line stock reporting and news retrieval service to help the company better manage its outside investments. They reported very low levels of usage for this service, as most of the information seemed readily available in the daily press in a more comprehensible form (Chinese language). The printed information was sufficiently timely for their purposes.

The third generation had also advocated the use of some simple spreadsheet-based decision support tools. However, senior management turned down this proposal. Since senior management was the older generation, there was little the third generation could do but accept the decision.

## 4.2 General Supply

General Supply had, at the time of the investigation, just installed a new computing environment based on open systems technology. The MBA holder had concentrated his studies in information systems, and was convinced that open systems held great promise for the future. He had already recouped the investment in the system by purchasing and using a computer-assisted design (CAD) package. The product design team had accelerated design of a new product by using the CAD package. Production had also been smoothed because the resulting design contained fewer errors than was usual.

At about the same time that the CAD package was purchased, a decision support system (DSS) based on an internal production model was developed. However, the managing director did not make use of the DSS. In his questionnaire, he did not even acknowledge the availability of the DSS, but in a follow-up interview he admitted that he knew about the DSS. He said that he did not use it because "there's no substitute for keeping your finger on the pulse of the company. I believe what I see, not what might be."

As a consequence of installing a client-server system, General Supply also had the opportunity to implement an electronic mail system. Although the mail system had been in place for some two months during the time of observation, not one message (other than preliminary test messages) had been sent on the system. As one engineer explained, "There's really no need for it. We are a small company and most everyone is here all day. We can just walk over and talk to each other." None of the managers had encouraged the use of electronic mail, and all admitted

that they had never checked to see if they had received any mail.

General Supply was in the process of implementing a centralized database to gather company data into one easily-accessible resource. The managing director was eager for this project to be completed. He was very pleased with sample aggregate reports his son had shown him, and felt the database would aid him in keeping up with the company and charting future directions.

### 4.3 Summary

Both companies reflect very simple usage of I/T in support of management functions. The usage pattern observed in the two companies is called "central feeder" by Schmidt and Wynne (1994) because managers use the I/S to channel information into a one-way flow to the top level, where all decisions are made. Hallmarks of the central feeder pattern are heavy use of centralized or private databases and aggregate reports. Electronic mail is either not used at all or only used to pass information one-way to top management. Schmidt and Wynne found this type of usage pattern to be associated with highly centralized organizations, so finding it in these two cases is not surprising.

There is little contrast between the two organizations as far as actual usage of I/T is concerned. Although the form of the system is more advanced in General Supply (client-server versus clone-PCs) the actual use of the systems for management purposes is essentially the same. This generally follows the usage patterns we had anticipated, with the exception of the disused DSS at General Supply. We would have expected that the moderate level of uncertainty avoidance usually associated with British managers would have influenced them to use the DSS to reduce uncertainty.

On the other hand, there is a more liberal attitude toward new ideas in General Supply. The suggestions made by the third-generation MBA-holder have been accepted and implemented. The PC-based support for secretarial staff remains in place, but the remainder of the staff have migrated to the client-server system running under UNIX. Also, even though senior management initially opposed and has not used the DSS or electronic mail features installed on the system, these ideas were not blocked at the outset as were similar suggestions made at Technical Supply. In this regard, the cultural differences between the two companies are quite evident.

## 5 Discussion and Conclusion

We found the rejection of the DSS by both companies interesting. DSS as a concept and in practice has its origin in the United States, where uncertainty avoidance is high. As a result of low tolerance of ambiguity, American managers sought tools to reduce uncertainty about

outcomes. DSS offer the opportunity to model business contingencies and observe outcomes, thus reducing uncertainty about those outcomes given certain management actions. One would expect that Hong Kongers, with very low uncertainty avoidance, would see little need for such a tool. Indeed, the management at Technical Supply saw no use for a DSS, and would not even agree to experimental development of such a tool.

But it is surprising that the British managing director also had no interest in the DSS. It might be that the moderate level of uncertainty avoidance found in the United Kingdom by Hofstede (1980, 1984) may not represent a level high enough to pique interest in DSS. Alternatively, the long exposure to the Hong Kong business environment may have affected the managing director of General Supply, increasing his tolerance of uncertainty.

Both alternative explanations deserve investigation, but we will limit ourselves here to the current environment, and formulate two hypotheses that might be tested through further investigation in Hong Kong:

*H<sub>1</sub>: After long exposure to a business environment where there is high tolerance of uncertainty and ambiguity, managers from other cultures experience a reduction in their uncertainty avoidance behavior.*

*H<sub>2</sub>: In cultures with a low level of uncertainty avoidance (such as Hong Kong and Singapore) DSS adoption and implementation are adversely affected.*

In this study, we also saw that the Confucian principles concerning conduct between generations is strictly followed despite modern education and exposure to western ideas through a Canadian MBA program. Thus power distance is a major factor in running small businesses in Hong Kong. We can expect conservative reactions from the older generation to prevail without challenge in Hong Kong Chinese-run companies, while in expatriate-managed companies the younger generation can challenge old ideas and push vigorously for change. High power distance and the traditional reverence with which the older generation is treated combine to reinforce resistance to change. Herewith our third hypothesis:

*H<sub>3</sub>: In Confucian cultures, innovation in I/T use can be hampered by resistance to new ideas by the conservative, older generation.*

In their large-scale study of top management teams, Schmidt and Wynne (1994) found a strong relationship between two I/T usage patterns they detected and two leadership styles. They further hypothesized that certain patterns of use of I/T among managers would be found for the other leadership patterns known to exist in business organizations. In the current study, we found a usage

pattern (central feeder) and leadership pattern (entrepreneurial) in both companies that agree with the findings of Schmidt and Wynne. In both companies, the centralized leadership affected the choice of I/S applications in use, and thereby influenced the I/T usage patterns in these cases. The more open style of the managing director in General Supply evidently was overridden by his exclusive exercise of authority. In this sense, both organizations were similarly led, with the managing director making all decisions. This leads us to hypothesize that in organizations with similar leadership patterns, the I/T usage pattern might not be influenced by cultural differences among the managers.

*H<sub>c</sub>: The relationship between I/T usage patterns and leadership in organizations is not affected by cultural differences.*

Although the two cases examined in this study are larger than the "average" company in Hong Kong (95% of Hong Kong companies have fewer than 100 employees), they are small enough, and centrally controlled enough, to reflect the nature of the vast majority of businesses in the territory. Larger businesses are generally publicly-held with a strong multinational, multicultural flavor. It would be interesting to investigate those larger organizations to see whether decisions concerning I/T use are influenced by cultural differences.

Further research is also needed to see whether the hypotheses formulated above hold in other matched studies, both in Hong Kong and in other business environments. Of particular interest would be the nature of the relationships in companies closely held and run by second- or third-generation Chinese families in the United Kingdom, the United States, or Australia.

There is considerable potential for further research along the lines of the above four hypotheses in a variety of business settings, industries, and leadership styles. Only through increased data collection and analysis can we begin to induce theories that might better explain why these effects were observed (and other effects not observed). We intend to continue investigating these issues in the coming few years, and invite participation and partnerships with researchers in other countries who are interested in these same problems.

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