

Chapter 8

Societal, Organizational and Individual Factors in the Adoption of Telework

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Introduction

Facilitated by computers and telecommunications technologies, telework is a work arrangement where employees of an organization work at a remote site (usually home) one or more days a week (Sell & Jacobs, 1994). With new communication technologies making it easier for remote employees to do their jobs effectively, telework is gaining popularity as a formal alternative work arrangement for the employees. However, self-employed workers and workers who do overtime at home are not considered teleworkers. In fact, many telework programs began when a valued employee negotiated an agreement to work at home (Upton, 1984). One important reason why managers support telework is that many companies, especially in information-based businesses, are struggling to recruit and to retain first-rate workers in an already tight information labor force. A study by Intelliquest, Inc. (1999), an information technology (IT) and marketing firm in the U.S, found that quality of life is going to be one factor, if not the key factor, in keeping valuable employees. In the traditional economy, what counted was being near resources and cheap labor. Now, in the digital age, it is being where workers want to be and what work arrangement they prefer. Therefore, telework, if in fact it helps them raise or maintain their life quality, may be one of the key factors in attracting and retaining already scarce knowledge-workers.

Recent figures indicate that the number of teleworkers in the United States increased from four million in 1990 to more than 19.6 million in 1999, and the percentage of employers offering telework arrangements climbed from 14% in 1997 to 27% in 1998 (The Internal Auditor, Feb. 2000). According to the Canadian Telework Association, the number of teleworkers in Canada has increased 40% over the past five years and has topped one million.

Many leading-edge Canadian companies such as Nortel and Cisco Systems Canada are establishing telework programs (Karstadt, 2000). However, telework in Hong Kong is still in its infancy.

Not all jobs are suitable for telework. Pruitt and Barrett (1991) suggested that jobs could be separated into those that required physical presence to deliver a service (e.g., construction and transportation) and those that are digital-based and can be delivered in cyberspace (e.g., accountants, computer programmers, news reporters, attorneys, and copy-editors). However, much of the work in the information society can be done by teleworkers who stay home and *commute* to work via the computer and telecommunications technologies. These technologies will become multi-purpose information appliances that integrate the functions of the telephone, television, and computer to deliver sound, images, text and data to both offices and homes. Through these information appliances, teleworkers can draw upon a wide array of electronic information and services to make their working life easier by *telecommuting*, and thus enrich their personal, social, and recreational activities.

In some countries such as the U.S., Singapore and Japan, employers can also rely on the use of an advanced telecommunications infrastructure for interconnectivity of information appliances in nearly every home, school, and workplace that transforms their nationwide information network into an intelligent nation. There is great strategic potential in developing an intelligent society via sophisticated telecommunications, computer and information technologies. Information technologies will enable countries to turn themselves into a global business hub, will boost their economic engine, enhance the potential of individual citizens, link their communities both locally and globally, and will improve the quality of life.

With the growth and widespread use of information technologies, such as PCs, e-mail, the Internet, mobile phones, fax machines, and teleconferencing technologies, Hong Kong is an important telecommunications hub and an intelligent city in Asia. With its excellent

telecommunications infrastructure, Hong Kong is perhaps an ideal place to promote telework. However, since little research has been done in this area, the purpose of this study is to examine the current state of telework in Hong Kong, identify factors that inhibit it, and explore important indicators that may influence the intention to adopt it.

Benefits of Telework

Past research has demonstrated the benefits of adopting telework as a motivator in different academic contexts, e.g., economics, sociology, political science, and ecology (Bailyn, 1989; DeSanztis, 1984; Eder, 1983; Luce & Hartman, 1984; Rothwell, 1987; Yap & Tng, 1990). Most research focused on the benefits that teleworkers accrue at the individual, organizational, and societal levels. At the *individual level*, telework saves on the cost of travel, clothing, food, day-care for children, and generates savings in terms of saved travel time (Ford & Butts, 1991; Kelly & Gordon, 1986). Flexible time in a teleworking schedule can also provide job satisfaction and reduce stress and exposure to pollution (Kinsman, 1987). For working mothers, telework allows them to fulfill the dual role of working mothers (Huws et al., 1990).

At the *organizational level*, research found that telework saved overhead costs because most telework programs under review paid teleworkers by the hour. Employers can also save on the costs of parking, office space and supplies. Telework improves managerial skills since managers have to rely on their skill in allocating tasks, planning, running mediated communication, and devising effective means to monitor his/her subordinates from a distance (Korte et al., 1988). Telework can be a sound solution for a female worker with family commitments, such as childcare after maternity. In this way, a company can retain valued employees and save the cost of recruiting and training (Krischenbaum, 1989).

At the *societal* level, telework can cut commuter traffic (Farmanfarmaian, 1989; Olszewki & Lam, 1993), and, in turn, save energy, create less air pollution, less crowding in cities, less wear on highways and transportation systems, and reduce environmental costs (Eckersman, 1991). However, there are always drawbacks to discourage any innovation.

Drawbacks to Telework

Organizationally, control and supervision of remote workers is much harder than control and supervision on site. This is especially true in the Chinese culture, in which managers are accustomed to an over-the-shoulder mode of supervision and derive much of their status and pride from the size of the workforce (Korte et al., 1988). Telework is also difficult for some companies because certain jobs need a significant amount of coordination and group discussion, for which telework may not be suitable. In some cases, the manager's lack of trust in employees has led to the installation of expensive and elaborate monitoring systems for teleworkers (Huws et al., 1990). Thus, some managers may feel that little productivity gain and reduction in overhead cost can be observed. This may cause discontent and further mistrust between employers and teleworkers. Additionally, teleworkers may not have the skills to use the hardware or software of telework equipment, and need additional training. This could mean considerable cost for the company (Goodrich, 1990). Thus, some corporate officials remain skeptical about the cost-benefits of telework.

At the *individual* level, social isolation, alienation, and feeling left out are some of the main drawbacks to telework (Tung et al., 1996). Informal conversations at coffee break will be sorely missed and after-hours get-togethers to learn about what is going on in the organization may lead to less cordial contacts and friendship. Communications mediated by IT are poor substitutes for face-to-face interaction (Cummings, 1992). Telework may be difficult because noise at home can disrupt concentration, and limited space at home, in

particular, makes it impossible to work. Furthermore, some people may feel that telework is more demanding and stressful, because the work never seems to end and teleworkers are constantly in touch with the office. When they work away from the office, teleworkers may not be assigned the important tasks or their contribution may not be as visible. As a result, there is a fear that their supervisors may overlook them in making recommendations for promotion or salary adjustment (Stanworth and Stanworth, 1991).

Adoption of Telework

Aside from the benefits and drawbacks that motivate or deter companies from adopting telework, the early diffusion model has suggested other well-researched indicator variables (Rogers, 1995).

In studying the adoption dynamics of personal computers, Lin (1998) found a set of factors under four categories, namely resources, the need for innovativeness, complexity, and advantages. She concluded that, in addition to affordability, whether a person perceived the innovation as complex, useful and relatively advantageous or not might affect their readiness to adopt it. Rogers (1995) characterized these perceived attributes - namely relative advantage, compatibility, complexity, trialability and observability - as characteristics of innovations. Relative advantage, according to Rogers (1995), is the degree (in terms of economics, social-prestige, convenience and satisfaction) to which an innovation is perceived as better than the idea it supersedes. Compatibility describes the degree to which an innovation is perceived as being consistent with existing values, past experience, and beliefs. Complexity is the degree to which an innovation is perceived as difficult to understand and use. Trialability depicts the degree to which an innovation may be experimented with on a limited basis. Finally, observability stands for the degree to which the results or the benefits of an innovation are visible to others. Rogers (1995) concluded that innovations that are

perceived by late-adopters as having greater relative advantage, compatibility, trialability, observability, and less complexity will be adopted more readily than others.

In addition to characteristics of innovation, diffusion research also addresses the importance of the adopters' socio-economic background variables. Surveys of adoption studies suggest that early adopters tend to be of a higher socio-economic status than the rest of the population (Atkin & LaRose, 1994; Dutton, Rogers, & Jun, 1987; Krugman, 1985; Leung & Wei, 1998, 1999). For example, Garramone et al. (1986) found that the demographic profile of adopters of computer bulletin services were typically younger and better educated than non-adopters. Furthermore, Steinfield, Dutton, and Kovaric (1989) also demonstrated the usefulness of the diffusion framework to guide research in the study of computing in the home.

Rogers' "technology cluster" concept has also proved its usefulness in explaining adoption patterns. According to this perspective, "a technology cluster consists of one or more distinguishable elements of technology that are perceived as being closely interrelated" (Rogers, 1995, pp. 235-236). Applying this concept, research shows that adoption of one technology (e.g., VCR) is related to functionally similar media entertainment services (such as cable TV) that fulfill similar underlying needs (Perse & Courtright, 1993). Other scholars also noted that the adoption of a technology might be motivated by the wish to acquire a "trigger" innovation (Dozier et al., 1996). More specific to innovation adoption than general motivation is the concept of innovativeness. Rogers (1995) defined "innovativeness" as "the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas than the other members of a system." Innovators are active novelty-seekers and they have a high degree of mass media exposure and widespread interpersonal networks. As Lin (1998) pointed out, the trendy and novelty-seeking motives may result in a willingness to adopt an innovation. In a study of the uses and gratifications of pagers, Leung and Wei (1999)

also found this same result and called it “the fashion and status” motive. Thus, grounded in the diffusion framework and drawing from past work in this area, we expect:

- H₁: The more complex non-teleworkers perceive telework to be, the less they are likely to adopt it.
- H₂: The less advantages non-teleworkers perceive telework to offer, the less they are likely to adopt it.
- H₃: The less observable benefits non-teleworkers perceive in telework, the less they are likely to adopt it.
- H₄: The less the non-teleworkers perceive telework to be compatible with their existing values, the less they are likely to adopt it.
- H_{5a}: The more need non-teleworkers have for innovativeness, the more likely they are to adopt telework.
- H_{5b}: The more technology non-teleworkers own, the more likely they are to adopt telework.

Given the past success of similar work on socio-economic, technological attributes, as well as mass media exposure influences on the adoption of new media, this study also examines other psychological dynamics that might drive the adoption of technology. Since the adoption of telework in Hong Kong is still in its initial phase, a study of the psychological factors grounded in the actual uses and gratifications sought or obtained from telework may be premature.

As a result, this study proposes a wider framework that considers other motivating or inhibiting factors that influence the adoption of telework by integrating other perspectives, such as the quality of life attribute. According to Sell and Jacobs (1994), quality of life is defined as an evaluative term that summarizes a person’s reactions to the experiences in his or her life. These experiences include satisfaction with the physical environment, the

neighborhood, their work, family and personal life, feelings of economic security, and political involvement. Only a few attempts have been made to investigate the link between the adoption of technology and quality of life (Wei & Leung, 1999; White et al., 1999). It was found that a higher evaluation of life quality was significantly correlated with the number of new media technologies owned (Wei & Leung, 1999). Work in this area has also demonstrated that the Internet, including e-mail, has the potential to improve social support and psychological well being for many older adults (White et al., 1999). Work on long-term care residents also found that the use of interactive computer services is among the strongest indicators of enhanced quality of life (McConatha et al., 1994). Thus, one can predict:

H₆: The intention to adopt telework will be significantly related to quality of life.

The underlying theoretical framework for this study assumes that varying degrees of innovativeness may help predict the intention to adopt telework, which is, in turn, mediated by other antecedent variables, including demographic attributes, perceived characteristics of the innovation, innovativeness as indicated by ownership patterns of communication technology, job satisfaction and quality of life, and media use. Given the exploratory nature of this study regarding the important policy implications for organizations and Hong Kong society at large, factors influencing the individual intention to adopt telework will be examined under the following research question:

RQ: What are the relative influences of demographics, perceived attributes in favor of telework, innovativeness, satisfaction with current job and life quality, and media use on the intention to adopt telework?

Methods

Sample and sampling procedure

As employers and employees may have different reasons to resist telework, two independent samples of employers and employees were drawn. In the Spring of 2000, 243 employers and 380 employees were randomly selected from two information industry directories: *The Hong Kong IT Directory (1999)* published by the Hong Kong Productivity Council and *The Directory of Hong Kong Information Services Industries (1999-2000)* published by the Hong Kong Business Information Center. Of the 623 respondents, less than 3% were teleworkers. Only 4.9% of the employers and 1.3% of the employees telecommute. Respondents were information workers listed on the two databases with the former being a database of mostly foreign-owned information businesses and the latter a list of Hong Kong-owned information-based companies. Only information workers were included in the study, as telework is most suited to this group of workers. All calls were made from a central location and excluded ineligible respondents (e.g., younger than 18), numbers out of order, and numbers that did not answer after five attempts. The completion rate was 53%. The employer sample was 55.6% male, with a median monthly household income of US\$3,846-5,128, a mean age of 37.8 years, and included 42% college graduates. The employee sample was 52.6% male, with a median monthly household income of US\$2,564-3,846, a mean age of 30.5, and 28.9% college graduates.

Measures

Dependent Variables (adoption intention). Two questions were used to tap non-teleworkers' intention to adopt. For the employers, they were asked (1) how desirable their company was to adopt telework in the next five years, on a scale of 1 to 5, with "1" = "not ready" and "5" = "very ready" and (2) on the *likelihood* of adopting telework in the next five

years, using a similar scale of 1 to 5, with “1” = “very unlikely” and “5” = “very likely.” The employees were asked comparable questions on (1) how desirable they were to adopt telework and (2) the *likelihood* of adopting if the organization allowed them to do so, using similar scales as for the employers. The two questions were highly correlated with $r = .58$ and $\alpha = .73$. As a result, these items were added to yield two composite measures of adoption intention, one for the employers and the other for the employees.

Perceived attributes hinder telework. Separate questions regarding the perceived attributes towards telework, which inhibit employers and the employees in adoption telework, were used in the questionnaire. The decision to focus on inhibiting, instead of motivating, factors was because only a small percentage of teleworkers responded. Most of the items on telework adoption were drawn from the existing literature (Sell and Jacobs, 1994; Tung et al., 1996). A list of 30 statements representing ten wide ranging categories of perceived inhibiting factors in the adoption of telework at the individual, organizational, and societal levels were used. Inhibiting factors included loss of control and coordination of employees, legal liabilities, additional training costs, equipment acquisition costs, data and equipment security, difficulty in controlling performance, lack of loyalty to company, social isolation, potential conflict between work and home life, feeling of ‘guilt for working at home,’ impediments to career growth, lack of professionalism, and increase in equipment and utilities costs. Items that were found repetitive or ambiguous were deleted. In the survey, respondents were asked to indicate how similar each reason was to their own reasons for resisting telework, on a 5-point Likert scale, where “1” means “strongly disagree” and “5” means “strongly agree.” Fourteen items survived pretesting in the survey for the employer sample and 12 items for the employee sample.

Employer’s inhibiting factors in telework. First, exploratory principal components factor analysis with varimax rotation was used to extract the perceived inhibiting factors in telework

adoption for the *employers*. The analysis identified four inhibiting factors with eigenvalues greater than 1.0, explaining 63% of total variance (see Table 8.1).

Table 8.1 About Here

- Factor 1, *Complexity* (eigenvalue = 4.94, variance = 35.27%, after rotation) contained a total of six items. This factor revealed the employer's perception that telework would be frustrating for the organization because it does not allow the benefit of face-to-face interaction, is difficult, as certain jobs might need a significant amount of coordination and group discussion and is troublesome, as it relies more on good planning and task allocation. Some also feel that it would be difficult for managers to monitor subordinates from a distance. Factor 1 had the highest item mean score of 3.66 (SD = 4.79, Cronbach's alpha = .82).
- Factor 2, *Incompatibility with Existing Values* (eigenvalue = 1.65, variance = 11.8%) contained three items reflecting that telework was perceived as incompatible with the existing local Chinese culture and required greater staffing flexibility. These societal and organizational factors greatly inhibit non-teleworkers from considering telework. In contrast to the concept of compatibility in the adoption theory (Rogers, 1995), it was labeled "incompatibility with existing values." Factor 2 had the third highest item mean score of 2.97 (SD = 2.81, Cronbach's alpha = .71).
- Factor 3, *Perceived Relative Disadvantages* (eigenvalue = 1.12, variance = 8.0%) contained three items. It showed the belief that telework yields very few advantages for the organization, as little productivity increase on the part of employees can be observed. Employers found that monitoring teleworkers, from a lack of trust, would be expensive; and telework is intimidating as it usually requires a higher level of computer literacy.

Unlike the concept of relative advantages in the adoption theory (Rogers, 1995), this factor was labeled “relative disadvantages.” Factor 3 had the second highest item mean score of 3.11, SD= 2.58, Cronbach’s alpha = .60).

- Factor 4, *Absence of Observable Benefits* (eigenvalue = 1.04, variance = 7.44%) contained two items revealing the perception that telework was not useful for the organization and offered few visible benefits, since it does not save on overhead costs and does not reduce traffic congestion. Factor 4 had the lowest item mean score of 2.96 (SD = 2.05, Cronbach’s alpha = .49, largely due to the fact that this factor had only two items).

Employee’s inhibiting factors in telework. Similarly, a second exploratory principal components factor analysis with varimax rotation was also used to extract the perceived inhibiting factors in telework for the *employees*. The analysis identified four inhibiting factors with eigenvalues greater than 1.0, explaining 62% of total variance (see Table 8.2).

 Table 8.2 About Here

- Factor 1, *Perceived Relative Disadvantages* (eigenvalue = 3.68, variance = 30.66%, after rotation) contained a total of five items. This factor revealed the perception that telework would make *employees* miss the conversation in the office and feel alienated, left out and isolated. It may even lead to the loss of control and coordination of employees. These individual perceptual factors greatly inhibit non-teleworkers’ intention to adopt. In contrast to the concept of relative advantage proposed by Rogers (1995), this factor was labeled “perceived relative disadvantages.” Factor 1 had the highest item mean score of 3.42 (SD = 2.04, Cronbach’s alpha = .69).

- Factor 2, *Complexity* (eigenvalue = 1.40, variance = 11.63%) comprised of three items suggesting that telework would be difficult and frustrating for some teleworkers because noise at home can disrupt concentration and limited space makes it impossible to work. In addition, it would be unattractive if one partner does not sympathize with the other working at home. Following Rogers' term (1995), it was named "complexity." Factor 2 had the second highest item mean score of 3.19 (SD = 2.62, Cronbach's alpha = .65).
- Factor 3, *Absence of Observable Benefits* (eigenvalue = 1.24, variance = 10.33%) contained two items, which revealed the perception that telework can be very demanding, as employees may have to do a 24-hour job and the work may seem never-ending. In contrast to the concept of "observable benefits" proposed by Rogers (1995), the third factor was called "absence of observable benefits." Factor 3 had the third highest item mean score of 3.17 (SD = 2.35, Cronbach's alpha = .73).
- Factor 4, *Incompatibility with Existing Values* (eigenvalue = 1.03, explaining 8.58% of variance) contained two items: "telework will not work in the local culture" and "telework is not for the Chinese culture" -- reflecting the incompatibility of telework with employees' existing values. In contrast to the concept of compatibility in the adoption theory (Rogers, 1995), this factor was named "incompatibility with existing values." Factor 4 had the lowest item mean score of 3.14 (SD = 3.08 and a Cronbach's alpha of .62).

Innovativeness. Two indicators were used to assess innovativeness. In exploring personal computer adoption dynamics, Lin (1998) used 'need for innovativeness' as an indicator to assess an individual's potential psychological need to be computer literate. In keeping with Lin, the need for innovativeness was also used in this study to assess the psychological traits of non-teleworkers. Using a five-point Likert scale, with "1" meaning "strongly disagree" and "5" meaning "strongly agree," respondents were asked to answer five items: "I am willing to

learn new ideas,” “I am willing to take risks,” “I consider myself a modern person who is usually up-to-date with new technologies,” “I like to keep up with new technologies,” and “I am willing to explore new technologies.” These five items were condensed into a single factor labeled “need for innovativeness” and its Cronbach’s alpha was .74. Another indicator for innovativeness was the adoption of newer media technologies, measured by totaling the number of mobile phones, pagers, personal computers, Internet services, and fax machines the respondent owned or subscribed to. These technologies were chosen, as we believe that they are most helpful for teleworkers to do their job at home.

Satisfaction. Satisfaction was assessed in two aspects. One was with their current job and the other was with their quality of life (QOL). *Satisfaction with current job* was measured with a simple question to respondents to report how satisfied they were with the current work arrangement on a 5-point scale, with “1” = “very dissatisfied” and “5” = “very satisfied.” Two *quality of life* indicators were used to provide a direct measure of QOL. The subjective indicators included the extent of leisure activities; and the objective indicators measured satisfaction with family and social life. Although there is a wide range of indicators measuring the concept of QOL, such as external social and environmental situations (Atkinson, 1982; Campbell, 1981; Diener & Suh, 1997), these two are most relevant and essential for studying new media technology and its relationship to QOL.

There was a total of eight items used to measure the extent of leisure activities. They included self-improvement (e.g., studying, reading and participating in sports and games), entertainment (e.g., partying and playing video games), and artistic appreciation (e.g., going to a concert, listening to music or visiting an art gallery). The Cronbach’s alpha of these items was .62. To measure the subjective appraisal of one’s well being in general, respondents were asked to indicate how satisfied they were with their family lives and with their relationships with friends on a 1-5 point scale, with ‘1’ meaning “very dissatisfied” and “5” meaning “very

satisfied.” The reliability was acceptable with Cronbach’s alpha equal to .72 and Pearson’s correlation between the two scales r equals .57 ($p < .001$).

The resulting two dimensions of QOL were combined to yield a composite index (QOLI). To do this, all items were first transformed into a standard z score before merging. The combined index was then used as an independent variable for subsequent regression analysis.

Use of Mass Media. Four mass media variables were included in the analyses: newspapers, magazines, TV and TV news. Reading newspapers and magazines was measured in days per week, while watching TV and TV news was measured in minutes per day.

Demographics. Demographic information was assessed in terms of age, gender, monthly household income, education, and household size.

Findings

Correlation and regression analyses were used to test the hypotheses and to answer the research question.

Hypothesis 1 predicts that the more complex non-teleworkers perceive telework to be, the less likely they are to adopt it. As shown in Table 8.3, results of correlation analyses indicate a significant but negative relationship between complexity and the adoption intention dependent variable ($r = -.45$, $p < .001$) for the employer sample. Similar result was found for the employee sample ($r = -.34$, $p < .001$ as shown in Table 8.4). This particular finding suggests that when non-teleworkers perceived telework as complex, the less likelihood there was that they would adopt it as an alternative work arrangement. Thus H_1 was supported.

Table 8.3 About Here

Hypothesis 2 proposes that the less advantageous non-teleworkers perceive telework to be, the less likely they are to adopt it. Again, correlation analyses in Tables 8.3 and 8.4 show significant and negative relationships between relative disadvantages and adoption intention ($r = -.21, p < .01$) for the employer sample, and between relative disadvantages and intention to adopt ($r = -.33, p < .001$) for the employee sample. These findings largely support H_2 .

Hypothesis 3 predicts that the less observable benefits non-teleworkers perceive in telework, the less likely they are to adopt it. Correlation results in Table 8.3 and Table 8.4 show that absence of observable benefits was significantly and negatively related, in both the employer and the employee samples, to adoption intention ($r = -.22, p < .01$ and $r = -.32, p < .001$ respectively). As a result, H_3 was fully supported.

 Table 8.4 About Here

Hypothesis 4 proposes that the less non-teleworkers perceive telework to be compatible with their existing values, the less likely they are to adopt it. Results of correlation analyses in both Table 8.3 and Table 8.4 also reveal that incompatibility with existing values was significantly and negatively related, in both the employer and the employee samples, to intention to adopt ($r = -.36, p < .001$ and $r = -.18, p < .01$ respectively). Consequently, H_4 was also supported.

Hypothesis 5a infers that the less need non-teleworkers have for innovativeness, the less likely they are to adopt telework. Results in both Table 8.3 and Table 8.4 show that innovativeness was significantly and positively related, in both the employer and the

employee samples, to adoption intention ($r = .22, p < .01$ and $r = .13, p < .05$ respectively). Thus, H_{5a} was also supported.

Hypothesis 5b predicts that the more technologies non-teleworkers own, the more likely they are to adopt telework. No significant relations were found. Thus, H_{5b} was rejected.

As for H_6 , which predicts that the intention to adopt telework will be significantly related to quality of life. No significant relationship was found between adoption intention and quality of life in both the employer and the employee samples. As a result, H_6 was also rejected.

Furthermore, hierarchical regressions were run to answer the research question that examined the relative influence of demographics, perceived attributes of telework, innovativeness, satisfaction with current job and with life quality, as well as media use in predicting the intention to adopt telework. Demographic variables (gender, age, education, household income, and household size) were entered first, followed by perceived attributes of telework (complexity, relative disadvantages, absence of observable benefits, and compatibility with existing values), innovativeness (need for innovativeness and technology owned), satisfaction (with current job and with quality of life) and mass media use (television, television news, newspapers and magazines).

Employers' intention to adopt. As shown in Table 8.3, the hierarchical multiple regression reveals that complexity (negative; $\beta = -.29, p < .001$) and incompatibility (negative; $\beta = -.17, p < .01$) were found significant predictors of intention to adopt telework. The results indicate that the less complex and the more compatible employers perceived telework to be with existing values, the higher the intention they are to adopt telework. The perceived attributes of telework block explained the largest amount of variance at 18%. Need for innovativeness was also found to be a significant predictor of telework adoption intention for the employers ($\beta = .20, p < .01$). This finding affirms previous research that adopters of

innovation are willing to learn new ideas, take risks, and explore new technologies (Lin, 1998). Satisfaction with the current job was also found to be a significant predictor (beta = -.18, $p < .05$) contributing three additional percent to the variance. This result indicates that the less satisfied the employers are with the current job, the higher the intention they would have to adopt telework. In sum, complexity was the most influential predictor, followed by need for innovativeness, satisfaction with current work, and compatibility with existing values in predicting the telework adoption intention for the employers. In total, the equation explained 24% of the variance.

Employees' intention to adopt. When assessing the relative influence of the independent variables predicting the intention to adopt telework for employees, no demographic variables were significant predictors. Unlike the employers, relative disadvantages (negative; beta = -.19, $p < .001$) was a significant predictor, followed by complexity (beta = -.17, $p < .001$), and absence of observable benefits (beta = -.16, $p < .01$). The perceived attributes of telework block alone explained a total of 16% of the variance. Similar to the employer sample, the need for innovativeness (beta = .12, $p < .05$) and satisfaction with the current job (beta = -.09, $p < .05$) were also found to be significant predictors of intention to adopt telework for the employees. This result indicates that the less satisfied the employees are with the current job, the more ready they would be to adopt telework. Overall, employees with a higher need for innovativeness and with less job satisfaction expressed more intention to adopt telework. The innovativeness and satisfaction blocks contributed two additional percent of variance. The regression equation explained 20% of the variance in the total.

Discussion

In this study, inhibiting factors that discourage telework and other factors that contribute to the decision to telework are identified. In general, this study echoes past work on

the adoption of new media technology, which reveals a significant relationship between perceived attributes of new media and adoption behavior (Lin, 1998; Rogers, 1995). The fact that the perceived attributes of telework are our most explanatory block is in line with past work (Busselle et al., 1999; Leung & Wei, 1999). The large degree of variance attributable to the perceived attributes of telework measures implies that attitudinal variables are important to supplement demographics. This suggests a diminishing role for demographic and media use variables as differences among the level of technology adopters over time, due to access to technology, is becoming more affordable and accessible (LaRose & Atkin, 1988, 1992; Reagan, 1991; Sparkes & Kang, 1986). In fact, the poor showing of socio-demographics in the regression analyses for both employers and employees underscores the need to move beyond the traditional conception of the early adoption model and focus on underlying psychological needs that may be served by the innovation (Lin, 1998; Perse & Dunn, 1998).

It is also interesting to note that only two of the perceived attributes in favor of telework were significant predictors, namely complexity and incompatibility with existing values, for employers' adoption intention. This particular finding suggests that, for employers, relative advantages and observable benefits were not important motivations for the decision to adopt telework. At the organizational level, employers are less concerned about reducing traffic congestion, since the environment was less of a major issue for managers, and they felt that saving on overhead costs was negligible. Moreover, employers felt that the disadvantages and absence of observable benefits, such as little gain in productivity, an expensive monitoring system for teleworkers, and the computer literacy requirement, were not significant deterrents to adoption when compared to the complexity of telework as an idea and whether such an idea is compatible with existing values and current experience of managerial staff.

In sum, employers felt those disadvantages and the absence of observable benefits were trivial factors, given the importance of complexity and compatibility with existing values. For example, working from home might be a dream job for many employees, but for employers, telework could present complex administrative decisions for workers' compensation in the event of an injury at home. Experts, who have looked into the question, affirm that the main compensation-claim issue for employers with telecommuting workers is the same as for other types of workers, i.e., the actual determination of whether an injury is work-related. Unfortunately, the experts continue, this determination can be more difficult when employees are working from home, where they are surrounded by non-work-related distractions and responsibilities.

The findings concerning the need for innovativeness influencing the intention to adopt telework present a concrete picture. In that regard, the result confirms past work that documented a variety of personality traits, in which an individual's interest and involvement in learning new ideas, willingness to take risks, and always wanting to stay up-to-date with new technologies, can in fact influence the intention to adopt telework, as shown in the bivariate analyses. This finding seems to be most consistent among studies trying to link the need for innovativeness and technology adoption (Lin, 1998).

By contrast, quality of life failed to associate significantly with intention to adopt telework for both employers and employees in our bivariate analyses. These findings imply that employers' and employee's intention to adopt telework was not driven by quality of life. In fact, the failure of quality of life to predict the intention to adopt telework may be explained by the fact that telework could bring more responsibilities and work, as well as drawbacks as indicated earlier in this study, instead of improving life quality. Employees are perhaps concerned that with their mobile phones, laptops, e-mails, and Internet at home, their work will appear to be a 24-hour job intruding into every other aspect of their lives. In the

past, it used to take a day or two for a memo to reach the employee – now we have instant e-mail, which demands an instant response. In fact, the long hours' culture is seriously undermining the quality of family life; telework to these people may mean excessive workloads which might lead to exhausted employees, low morale, unhappy families, high levels of stress and poor productivity.

The major weakness of this study was that data could only be collected from non-teleworkers. Thus, relative disadvantage and lack of observable benefits could be especially difficult to establish as respondents were asked to self-report their “perceived“ experiences. Secondly, the size of the samples was rather small due to difficulty getting respondents to participate in the telephone survey during business hours.

Conclusion

In short, on an aggregate level, these findings establish the importance of augmenting conventional variables, such as social locators, attributes of innovation, technology owned, and mass media use, with a wide range of subjective measures, including need for innovativeness and quality of life. Taken together, these findings provide a portrait of a technology in its early stages of diffusion especially in a city when its main economic activity is slowly diverging from real estate and finance to information-based. Information appliances, at work and at home, have initiated an economic and social revolution, which will deeply affect our lives in the future. High-performance, broadband, and wireless intelligent networks are basic elements of the intelligent society of tomorrow. One of the main challenges is to provide a variety of information services to the users, which are tailored to individual needs. More intelligent and individual services are therefore required to master the glut of information and to provide a high quality environment for teleworkers in any intelligent society of the future to do their work at home.

One important implication from the results of this study is that, as the telecommunication hub of Asia, the Hong Kong government should take the lead to begin vigorous feasibility studies and cross-benefit analysis of implementing telework at some levels of the government. The spread of information technologies will continue to expand into our daily lives, it will be valuable to understand the user profiles for potential “civil-servant” teleworkers. Further work is needed to determine multiple indicators, beyond the limited number of demographics, attitudinal, and media use variables used in this study. For example, opinion leadership in a social system as proposed by Rogers (1995) would be one important enabling factor, which might greatly enhance the total variance explained by a linear model.

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Table 8.1. Factor Loadings of Employers' Perceived Attitudes toward Telework (N=243)

Employers' attitudes toward telework	Mean	S.D.	Factors			
			1	2	3	4
<u>Complexity</u>						
Telework is frustrating because it operates without the benefit of face-to-face interactions	3.75	1.04	.77	.22	.03	.19
Telework is difficult because certain jobs need significant amount of coordination and group discussions	3.79	1.04	.72	.06	.14	-.06
Telework is troublesome because it relies more on good planning and communication on task allocation	3.61	1.16	.71	.06	.19	.19
Telework is more difficult for managers to monitor subordinates from a distance	3.62	1.09	.67	-.06	.47	.12
Telework is not for this corporate culture	3.64	1.25	.61	.37	-.02	.10
Telework implemented in the Hong Kong culture will lead to the loss of control and coordination of employees	3.49	1.08	.61	.32	.39	.03
<u>Incompatibility with existing values and culture</u>						
Telework will not work in the local culture	3.07	1.14	.10	.81	.07	.12
Telework is not for the Chinese culture	2.89	1.22	.24	.64	.12	.35
Telework does not give greater staffing flexibility	3.00	1.20	.25	.54	.35	.34
<u>Perceived relative disadvantage</u>						
Very little productivity increase from employees can be observed in telework	3.08	1.08	.12	.33	.77	-.08
Expensive monitoring system for telecommuters may be needed if there is a lack of trust in their staff	3.22	1.25	.18	-.26	.68	.44
Telework is intimidating because it requires higher computer literacy	3.06	1.14	.37	.28	.53	-.28
<u>Absence of observable benefits</u>						
Telework does not save on overhead cost	2.98	1.23	.07	.15	-.00	.81
Telework does not reduce traffic congestion	2.92	1.28	.13	.30	-.01	.63
Eigenvalue			4.94	1.65	1.12	1.04
Variance explained (%)			35.27	11.80	8.00	7.44
Alpha						

Note: The scale used was 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

Table 8.2. Factor Loadings of Employees' Perceived Attitudes toward Telework (N=380)

Employees' attitudes toward telework	Mean	SD	Factors			
			1	2	3	4
<u>Relative disadvantages</u>						
Telework makes you feel alienated	3.65	1.03	.72	-.06	.22	.07
You dislike the feeling of being left-out if you telecommute	2.99	1.12	.70	.18	.11	.04
Telework makes you feel isolated	3.22	1.14	.66	.37	.10	.02
Telework makes you miss the conversations at the office	3.65	1.12	.58	.19	-.20	.10
Telework implemented in the Hong Kong culture will lead to the loss of control and coordination of employees	3.59	1.04	.57	-.03	.21	.35
<u>Complexity</u>						
Telework is difficult because noise at home can be disruptive to concentration	3.18	1.10	.10	.81	.15	.07
Telework is unattractive because if one partner does not sympathize with the other working at home	3.12	1.13	.12	.76	.21	.11
Telework is frustrating because limited space at home makes it impossible to work	3.27	1.19	.16	.57	.05	.20
<u>Absence of observable benefits</u>						
Telework is more demanding because works seem never end	3.23	1.17	.17	.11	.87	.08
Telework increases stress because it seems a 24-hour job	3.11	1.13	.09	.35	.81	.04
<u>Incompatibility with existing values</u>						
Telework will not work in the local culture	3.22	1.05	.11	.10	.14	.82
Telework is not for the Chinese culture	3.06	1.05	.11	.25	-.05	.79
Eigenvalue			3.68	1.40	1.24	1.03
Variance explained (%)			30.66	11.63	10.33	8.58
Alpha						

Note: The scale used was 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

Table 8.3. Hierarchical Regression of Demographics, Attitudes toward Telework, Innovativeness, Satisfaction, and Media Use on intention to Adopt Telework for Employers

Predictor Variables	Intention to adopt	
	Simple r	Beta
<u>Block 1: Socioeconomics</u>		
Gender (men)	.07	.01
Age	-.08	.05
Education	-.10	-.11
Household monthly income	-.15*	-.12
Household size	-.05	-.09
Incremental Adjusted R ²		.00
<u>Block 2: Perceived attributes for telework</u>		
Complexity	-.45***	-.29***
Relative disadvantages	-.21**	.01
Absence of observable benefits	-.22**	-.08
Incompatibility with exiting values	-.36***	-.17**
Incremental Adjusted R ²		.18
Change in Adjusted R ²		.18
<u>Block 3: Innovativeness</u>		
Need for Innovativeness	.22**	.20**
Technology owned	.04	.06
Incremental Adjusted R ²		.21
Change in Adjusted R ²		.03
<u>Block 4: Satisfaction</u>		
With current work	-.21**	-.18**
Quality of life	.13	.07
Incremental Adjusted R ²		.24
Change in Adjusted R ²		.03
<u>Block 5: Mass media use</u>		
TV watching	.02	-.00
TV news watching	-.06	-.02
Newspaper reading	.04	.04
Magazine reading	.07	.04
Incremental Adjusted R ²		.24
Change in Adjusted R ²		.00

Notes: Beta weights from final regression equation with all blocks of variables included for the entire sample. (N ranges from 226 to 243)

*** p < .001; ** p < .01; * p < .05; # p < .1

Table 8.4. Hierarchical Regression of Demographics, Attitudes toward Telework, Innovativeness, Satisfaction, and Media Use on Intention to Adopt Telework for Employees

Predictor Variables	Intention to adopt	
	Simple r	Beta
<u>Block 1: Socioeconomics</u>		
Gender (men)	.09	-.01
Age	-.11*	-.08#
Education	.10#	.02
Household monthly income	-.02	.01
Household size	-.11*	-.08#
Incremental Adjusted R ²		.02
<u>Block 2: Perceived attributes for telework</u>		
Complexity	-.34***	-.17***
Relative disadvantages	-.33***	-.19***
Absence of observable benefits	-.32***	-.16**
Incompatibility with exiting values	-.18**	-.01
Incremental Adjusted R ²		.18
Change in Adjusted R ²		.16
<u>Block 3: Innovativeness</u>		
Need for Innovativeness	.13*	.12*
Technology owned	.08	-.01
Incremental Adjusted R ²		.19
Change in Adjusted R ²		.01
<u>Block 4: Satisfaction</u>		
With current work	-.16**	-.09*
Quality of life	-.04	-.02
Incremental Adjusted R ²		.20
Change in Adjusted R ²		.01
<u>Block 5: Mass media use</u>		
TV watching	-.04	-.04
TV news watching	-.05	-.06
Newspaper reading	-.04	-.01
Magazine reading	-.04	-.08
Incremental Adjusted R ²		.20
Change in Adjusted R ²		.00

Notes: Beta weights from final regression equation with all blocks of variables included for the entire sample. (N ranges from 316 to 380)

*** p < .001; ** p < .01; * p < .05; # p < .1