

# Telecommuting in Singapore: Current Status and a Comparison with Other Countries

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*Telecommuting is a possible solution to several problems faced by employees in large congested cities around the world. These problems include time wasted in commuting, environmental pollution caused by gas guzzling automobiles, rising costs of day care for children, and deterioration in the quality of family life. With excellent IT infrastructure in place and a high number of computer-literate workers, Singapore is well suited to the use of telecommuting technology. This empirical study documents several advantages (motivators) and drawbacks of telecommuting for computer professionals and their employers in the Singapore environment. The study goes on to rank these motivators and drawbacks in order of importance as perceived by these respondents. Finally, results of this study are compared with those of similar studies conducted in other countries.*

Telecommuting refers to a form of work arrangement involving the use of computer and telecommunication technologies that allows employees to substitute telecommunication for physical transportation, thereby permitting the job to be performed at a remote work site (Yap and Tng, 1990). Telecommuters can live in their preferred location and substitute electronic communication for physical travel (Stanworth and Stanworth, 1991). With advanced information technology available in Singapore, many jobs dealing with the ma-

nipulating of information can be done at home.

In addition to these benefits, a number of *socio-economic factors* are forcing business organizations to evaluate new technologies and consider using alternative ways of carrying out their business activities such as the implementation of telecommuting.

Firstly, the *globalization* of economic markets means that competition is intensified and businesses have to be even more productive in order to stay competitive. Telecommuting is widely perceived as a way to reduce organizational overhead and improve individual and organizational productivity.

Secondly, *evolving information technologies* have also brought about increased interest in telecommuting. The growth in telecommunication and computing technologies motivates telecommuting. As the cost of personal computers (PCs) continues to decline, they become enormously popular in the business setting. The PCs are connected to the company's main computer via telephone lines and they enable office and remote workers to send messages or transmit work back and forth and use file and database servers, printers and other peripheral devices. Evolving desktop teleconferencing and electronic mail systems, coupled with continually upgraded computer hardware and software, local area digital technology and mobile and wireless systems, are also contributing to the growth and development of the telecommuting

concept (Cross and Raizman, 1986). In addition, client/server architecture and software, such as Windows for workgroups, Windows NT and Lotus Notes, encourages cooperation among employees and information sharing.

Thirdly, changes in *management style* have also increased the attractiveness of telecommuting. Information-based organizations find that by decentralising managerial authority and responsibility, their staff can make faster and better decisions. Because of decentralisation, the flow of information from managers to operating personnel has become increasingly important to an organization (Cross and Raizman, 1986).

Finally, as part of the business process reengineering movement and with the trend of *networked organizations* and *autonomous teams*, team members may not be working at the corporate office, but at different locations, or even at home. Information technologies enhance the work of such dispersed teams, including telecommuters.

## Literature Review

Several studies have surveyed the status of telecommuting in Singapore.

Yap and Tng (1990) surveyed the attitudes of female computer professionals in Singapore toward telecommuting. Of the 459 respondents, 73% were in favour of telecommuting. Most would prefer to work at home one to 3 days a week and at the office on the other days, instead of working at home full-time. They would telecommute only in times of need, such as when they have young children. They were concerned with work and interaction-related problems that might arise from telecommuting. The findings suggest that telecommuting will be of particular interest to employees who are married, those with a high proportion of work that can be done at home, those who find their journey to work frustrating, and those with supervisors and coworkers who are supportive of telecommuting. Respondents who are single and have a study room at home are also likely to favor telecommuting.

A subsequent survey of data processing managers was done by Yap and Lim in 1990. Only twenty-one percent of the managers indicated that they were "likely" or "very likely" to adopt telecommuting as an alternative work arrangement for computer professionals under their supervision. The computer managers were particularly concerned about security issues, legal issues, unauthorized access to reference materials and files in the office, and unnecessary communication with users, colleagues and clients. Only 4% said that they intended to implement a pilot telecommuting programme within the next year.

Recently, Lam et. al (1995) surveyed 868 Singapore establishments employing 10 or more employees. Results show that 12% of the responding organizations practise some form of teleworking with some having more than one teleworking arrangement. Increased productivity and reduced office space are viewed as the main benefits of teleworking,

while main perceived problems include data security and provision of adequate supervision.

## Motivators and Drawbacks of Telecommuting in Singapore

From the literature, the following factors were found to be the primary motivators and drawbacks of telecommuting.

### Motivators for Employees

Telecommuters can save on expenses associated with having to travel to work. *Cost reduction* for a telecommuter would be in the areas of travel (gasoline and vehicle depreciation), office clothing (fewer occasions to dress up formally), food (more economical to eat at home), day care for children and the opportunity cost of saved travel time (Kelly & Gordon, 1986, Ford & Butty, 1992).

In addition, the telecommuter no longer faces rush-hour traffic, crowded rail or road routes, or waste time travelling (Ford & Butty, 1992), hence *reducing his level of stress and exposure to pollution*.

Added time *flexibility* is yet another attractive feature of telecommuting. A telecommuter can do his office work whenever he wants (Kinsman, 1987) as long as the work is completed on time and to an acceptable standard (Stanworth and Stanworth, 1991). A telecommuter's ability to modify working schedules give rise to another benefit—balancing work and home life (Stanworth and Stanworth, 1991). This feature appeals particularly to working mothers (and fathers as well) as it enables them to organize their dual role as working mothers - bringing up a family and meeting work deadlines at the same time (Huws et. al, 1990). Social appointments such as dentists' appointments or shopping or time commitments like looking after sick children or school holidays can be arranged more easily.

A high level of *job satisfaction* can be derived from the time flexibility in telecommuting as well according to Huws et. al (1990). Compared to traditional work, the telecommuting environment was felt to be very much more relaxed (Kinsman, 1987) in spite of given deadlines.

Finally, female telecommuters can *avoid a career gap* after statutory maternity leave (Stanworth and Stanworth, 1991) and can keep up-to-date with skills already acquired. It gives them a chance to remain on the career ladder of the organisation— maintaining and then developing their careers at the speed that suits them (Kinsman, 1987). At the same time, it enables women to earn income while providing their own child care.

### Drawbacks for Employees

Day-to-day loneliness is a feature of telecommuting (Stanworth and Stanworth, 1991). Conversations during coffee breaks or at after-hours gatherings give people a chance to learn about what is going on within the organisation. The

lack of such interaction may lead to a feeling of alienation and a lack of identity with company goals and values. Electronic messages and bulletin boards help communication but are poor substitutes for face-to-face meetings (Cummings, 1992). Isolation has also led to a "problem-solving" barrier (Kinsman, 1987). Telecommuters cannot physically turn to someone else for casual advice and may be nervous about going to the lengths of ringing up to ask, for fear of appearing incompetent or even foolish. Telecommuters dislike the sense of feeling left out, or "not as professional" in the eyes of the employers.

Although telecommuting can resolve conflicts between home and work life, it can also exacerbate them (Stanworth and Stanworth, 1991). There is evidence that conflicts will be exacerbated if relationships at home are already poor or if one partner does not sympathize with the other working at home (Stanworth and Stanworth, 1991). The individual telecommuter (especially woman) must learn to *separate work and domestic responsibilities* (Stanworth and Stanworth, 1991). Telecommuting mothers with babies less than six months are often at the risk of failing to cope with the conflict of roles involved (Huws, 1984). The noise of a young family can be disruptive to concentration (Huws et al., 1990).

A woman's dual role of combining work with parenting has also caused another psychological problem — the feeling of guilt (Kinsman, 1987). The *feeling of guilt* is reported by both women and men. According to a study by Huws (1984), some of the telecommuters studied felt guilty when they were at home but not working, even during leisure hours.

When the telecommuter is not assigned the important key objectives of the job, or assigned work that is sometimes more mundane and less intellectually demanding than the skills of the telecommuter warrants, *it may limit his/her opportunities for promotion* (Stanworth and Stanworth, 1991). Unlike their counterparts in the office who have a better chance to be known to their supervisors and so they may be able to advance up the career ladder quicker, the telecommuter's opportunities are limited (Cummings, 1992). In addition, since the telecommuter has limited face-to-face contact with fellow employees, finding evidence of the interpersonal skills necessary for managerial positions becomes difficult. The employee's work as a telecommuter can serve as evidence that he would rather not be around other people (Kelly, 1988). This could also be a drawback when he wishes to search for a new position. In making recommendations, supervisors may feel they do not really know much about their telecommuters beyond productivity numbers and impersonal work records, and there is no visible check on punctuality and diligence.

To the extent that employers ask telecommuters to buy their own supplies, or at least contribute towards the cost (Cummings, 1992), or bear utility costs for the high power-consumption personal computers or equipment, *it increases the telecommuter's expenditure*.

### Motivators for Employers/Organizations

According to a telecommuting project undertaken by AT&T and the State of Arizona and another similar project conducted by Washington State Energy Office, *productivity increase* of managers and operational level employees was observed in the range from 30% to 100%.

*Overhead costs* can be reduced since most telecommuting schemes under study pay the people only for the hours that they work. This means that the head count is a variable cost rather than a fixed cost, leading to greater staffing flexibility. However, if the telecommuters are paid a salary, telecommuting will not constitute a motivator to the user organization (Strizich, 1992). In addition, employers can save on parking and office spaces as there will be fewer employees around. On top of that, office supplies can also be controlled better. With telecommuting, the employees will be more responsible for the usage because in many instances they will have to pay for the office supplies first and be reimbursed later.

Contrary to the perception of many employers, instead of reducing managers' effectiveness, telecommuting may *improve their managerial skills*. Since these managers operate without the benefit of face-to-face interactions, they will have to rely more on good planning (such as task allocation) and communication (such as listening skills). A manager also has to learn how to monitor his subordinates from a distance (Korte et. al, 1988). As one becomes more oriented toward management by objectives, rather than how the work is done, he is making a step forward in becoming an effective manager (Lozano, 1989).

Telecommuting gives employees autonomy and flexibility on how and where their work is performed. If a female employee is forced to quit her job due to family commitments such as having to take care of her child after maternity, she does not have to quit her job now since telecommuting can provide a solution. Similarly, for an employee who is temporarily disabled due to an accident, injury, or some disease and has been advised not to travel, telecommuting can be a boon to both the employer and the employee. This is an advantage to the company because it can *retain these employees* and does not have to waste resources recruiting new employees and training them from scratch (Kirschenbaum, 1989).

In addition, telecommuting has the potential to open up *new manpower sources*. The human resources of retirees, homemakers with younger dependents, students, and the handicapped still remained largely untapped.

Since telecommuting entails the acquisition, installation, use, and maintenance of computers and network devices, employees will be forced to *enhance their computer skills*. In the short term, this newly acquired computer literacy may not directly contribute to increased productivity, but in the long run it will. It is definitely to the benefit of the company in the long term to improve the IT skills and capabilities of its workforce.

### Drawbacks for Employers/Organizations

Telecommuting involves control and supervision from a

distance which is *much harder than control and supervision on site*. The managers are used to an over-the-shoulder mode of supervision and derive most of their status from the size of their visible workforce (Korte et al., 1988). When this “power” is taken away from them, they may be demotivated, and it may lead to dysfunctional behaviour. Certain jobs require a significant amount of coordination and group discussions. However, it is very hard to achieve that for telecommuters in a cost effective manner, even with advanced technology such as video conferencing. Traditionally, managers’ lack of trust in their staff (including highly qualified and experienced staff members) has led to elaborate and expensive monitoring system for telecommuters. It may result in resentment among telecommuters and very formal, impersonal communications (Huws et al., 1990).

Since the company does not have direct supervision of the telecommuting employees, they will have greater opportunities to negotiate with others on behalf of the company. Some of these negotiations may be detrimental to the company's interests. Consequently, the company *may face increased risks of legal liability* (Huws, 1984).

When the company recruits the employees, they may not have the skills necessary to use the telecommuting devices and computer software. The company will have to *incur additional costs to train these employees*. Another problem that may arise is the fact that providing on-the-job training for telecommuters may not be as effective as training on the company site. This can translate into substantial costs to the company (Goodrich, 1990).

If the company provides all the *necessary hardware, software and insurance* to each and every telecommuter, the resulting costs can be prohibitively high (Kelly, 1988). However, in most cases, the employees are expected to pay for their own computer equipment.

As the employees’ computers are linked to the company system through modems, the company will have to pay for the charges of renting a line from the *telecommunication* companies. The other alternative is to have the connections provided by the company. Both choices imply additional costs to the company. In this context, it is very important that the company to perform a cost-benefit analysis before implement-

ing telecommuting (Cross and Raizman, 1986).

After the telecommuting scheme is implemented, telecommuters will have access to the company’s systems from different parts of the country. The company’s data will be transmitted to and from the telecommuters’ homes. This greatly *increases the risk of the data being vulnerable* to unauthorized access, as compared to the case where all the employees are stationed in the company and connected by LANs. The impact of loss or leakage of data will be more severe if the telecommuter is in the higher management levels, because the information they deal with is of strategic importance to the company.

Table 1 below summarizes the motivators and drawbacks discussed above.

## Survey and Results

We conducted a survey to gather information from computer professionals and their organizations. Two hundred organizations were selected at random from the 1990 Asian Computer Directory. The sample included companies from sectors such as manufacturing/engineering, computer sales/service, transport and communication, education and training, banking and finance and government. In the survey, the respondents were asked to rate the motivators and drawbacks on a five-point Likert scale ranging from very low to very high in importance. A total of 62 responses from 62 organizations (representing 31% of the sample size) were received.

The profile of the respondents is presented in Table 2. Table 3 presents the characteristics of the organizations.

Results from the survey show that less than one quarter (21%) of the organizations allows their full-time staff to perform office duties at home during office hours. Of these organizations, the majority (77%) express a positive attitude towards adopting the above work arrangement officially. Thirty percent of these respondents express their likelihood of adopting telecommuting as “very likely” and “likely”. These respondents are uncertain if they will initiate a pilot telecommuting scheme. This shows that telecommuting has not really caught on in Singapore.

### Individual motivators

- Reducing costs
- Reduction in stress and exposure to pollution
- Time flexibility
- Job satisfaction
- Avoiding the career gap

### Organizational motivators

- Productivity gains
- Reductions in overhead costs
- Development of managerial skills for the Future
- Retention of Staff
- Tapping Additional Sources of Manpower
- Higher computer literacy

### Individual drawbacks

- Social isolation
- Potential conflicts between work and home life
- Feeling of “guilt”
- Impediments to career growth
- Increase in equipment and utilities costs

### Organizational drawbacks

- Loss of control and coordination of employees
- Legal Liabilities
- Additional Training Costs
- Equipment Acquisition Costs
- Costs of Communication
- Data and Equipment security

Table 1: Motivators and Drawbacks



Dimension	Categories	Percentage
Sex	Male	89%
	Female	11%
Marital status	Married	82%
	Single	18%
Age	25-35	17%
	36-45	55%
	46-55	28%
No. of years of experience	less than 7	10%
	7-8	17%
	more than 8	73%

**Table 2: Individual Respondent Profile (n=62)**

### Ranking of motivators and drawbacks

Table 4 presents the rankings of motivators and drawbacks. Organizational rankings are compiled from individuals representing the organizations' points of view.

### Individual Motivators

A detailed analysis of the responses to each of the individual motivating factors indicated that the factor *time flexibility* is the highest ranking individual motivator in table 4. Almost 80% of the respondents rated this factor as having "high" to "very high" importance. Flexibility in working times, the ability to combine childcare with work, to meet other family demands and to combine other activities with work have also been identified as the top few facilitating factors in the Empirica Telework Survey (US, 1990). In the same survey, over 90% of the respondents cited flexibility as an important or very important advantage of their current work

arrangement. However, most men also value these opportunities — Olson (US) found that 66% of the respondents working at home were male (Olson, 1987). Clearly, flexibility is or is perceived to be a significant advantage both in the U.S. and Singapore.

More than half of the respondents perceived the benefit "reduction in child care costs" to be of high importance (33%) or very high importance (32%). In some US cases, the choice of telecommuting by parents of young children is seen as necessary because of the unavailability or excessively high costs of daycare facilities (Huws et al., 1990).

Sixty-six percent of the respondents consider the third highest ranking factor, "Savings in time/cost of commuting" as highly important or very highly important in influencing their decision to telecommute. In the literature review, reduced commuting time and costs are frequently cited advantages of working at home (Huws et al., 1990; Kinsman, 1987; Stanworth and Stanworth, 1991).

Results also revealed that about 34% of respondents rated the factor "increase in job satisfaction" as high to very high in importance. This factor is only ranked fourth in importance in this study probably due to the fact that the Singapore computer professionals have not actually tried telecommuting and thus feel uncertain about their job satisfaction.

Finally, only 21% of the respondents feel that "savings of clothing expenditure" (ranked last) is a highly or very highly important factor.

### Individual Drawbacks

The individual drawback, "impediment to career growth," is seen as the most significant individual drawback in this study. Eighty-one percent of the respondents consider

Size of Organization	Under 50 employees	8.1%
	Between 50 and 99 employees	22.6%
	Between 100 and 499 employees	58.1%
	Equal to or Over 500 employees	11.3%
Industry Type	Manufacturing/Engineering	9.7%
	Computer Sales/Service	40.3%
	Transport & Communication	4.8%
	Banking & Finance	27.4%
	Wholesale/Retail	16.1%
	Education & Training	1.6%
Ownership	Foreign company	9.7%
	Sole proprietorship	37.1%
	Local company	53.2%
Telecommuting Policy	Telecommuting allowed	21%
	Telecommuting not Allowed	79%
Likelihood of adopting Telecommuting (of those organizations where telecommuting is allowed)	Very Likely	11.3%
	Likely	17.7%
	Uncertain	45.2%
	Unlikely	16.1%
	Very Unlikely	9.7%

**Table 3: Organizational Profile**

Motivators	Score	Rank	Drawbacks	Score	Rank
<b>Individual</b>			<b>Individual</b>		
• Time Flexibility	4.09	1	• Impediment to Career Growth	4.12	1
• Reduction in Child Care Costs	3.88	2	• Social Isolation	3.38	2
• Savings in time/cost of commuting	3.88	2	• Conflicts between Work & Home	3.03	3
• Increase in Job Satisfaction	3.41	4	• Increase in Equipment Cost	2.84	4
• Savings of Clothing Expenditure	2.98	5	• Lack of Professionalism	2.78	5
<b>Organizational</b>			<b>Organizational</b>		
• Ease of Recruitment	4.22	1	• Coordination of Employees	4.11	1
• Reduction in Overheads	3.99	2	• Data Security	4.00	2
• Productivity Gains	3.75	3	• Difficult to Control Performance	3.87	3
• Training of Managerial Skills	2.68	4	• Equipment Security	3.68	4
• Higher Computer Literacy	2.43	5	• Lack of Loyalty to Company	2.97	5
			• Cost of Acquiring Equipment	2.95	6
			• Legal Liability	2.45	7

Table 4: Ranking of motivators and drawbacks

it of high or very high importance as a disincentive to telecommute. It seems that Singapore respondents feel threatened if they telecommute. This may be due to the attitudes of the employees who perceive their career advancement as determined by the employer, and therefore place a high value on being in close proximity to the supervisors and other management groups in their company. Furthermore, in Singapore there has been little formal telecommuting in place, so employees feel uncertain about their career growth if they work from home.

The results for the second most important drawback, social isolation, indicated that 44% of the respondents feels that social isolation is an important or very important factor in influencing their decision not to telecommute. The Diebold survey (Diebold Group, 1987) found that 56% of telecommuters surveyed mentioned social isolation as a disadvantage, which rose to 70% among the women in the survey (Huws et al., 1990). The conclusion drawn by Olson was that the need for social interaction may in part be a function of personality type, with wide variations between individuals (Olson, 1987). Heilmann agrees with this view, pointing out that computer professionals tend to be of a personality type with low communication needs, and therefore particularly well suited to telecommute (Heilmann, 1988). The high percentage of male respondents and professionals in this survey may have accounted for lower perceived importance compared to these studies.

The factor "conflict between work and home" is ranked third in importance as an individual drawback, with 36% of the respondents considering it of high or very high importance. Little research has been carried out on the effects of telecommuting on personal relationships within home. However, according to Huws et al. (1990), working at home brings the public world of work and private domestic sphere into close proximity and confuses their boundaries. As a result, role conflict problems may arise. Bailyn (1989) feels that it may be easier for men to avoid distractions and give work the necessary priority while working at home. Women working at home are simultaneously responsible for keeping an eye on

young children and general running of the household which is therefore unlikely to result in a relaxing environment. The fact that the Singapore results do not show conflicts between work and home as an even stronger drawback may be attributed to the fact that the respondents are mostly male.

Only 28% of the respondents consider the factor "increase in equipment cost" to be of high or very high importance (ranked fourth). Employers overseas have demonstrated a reluctance in supplying some necessary equipment (such as fax machines and photocopiers) for telecommuters because the expense of providing these relatively costly machines (that cannot be shared with others in the office and hence are used less frequently) is difficult to justify (Huws et al., 1990). As a result, telecommuters will have to supply their own equipment or at least contribute towards the costs. However, this factor shown is not identified as a constraint factor for the Singapore survey, perhaps due to the lack of telecommuting activities in Singapore.

Finally, 43% percent of the respondents consider the factor "lack of professionalism" as low or very low in importance. Stanworth and Stanworth (1991) feels that employers tend to push the responsibility for routine tasks on telecommuters. Another study in US by Huws (1984) shows that women are more likely to be carrying out routine work. Lack of professionalism is not perceived as a strong drawback in the survey results of this study as the respondents mostly belong to the top management cadre (63%). Furthermore, they are professionals and hence may not think they will be assigned routine jobs.

### Organizational Motivators

Ease of recruitment is ranked as the most important motivator for organizations to adopt telecommuting, with 79% of the respondents considering it of high or very high importance. In Singapore, the labour market is rather tight. Telecommuting helps to tap additional sources of labour. Results of our survey support this point.

Our survey results show that "reductions in overhead"

ranks high in importance (40%-high, 36%-very high). In *The Telecommuters* by Kinsman (1987), the international managers (UK) surveyed felt that the advantage lies in the fact that a self-employed workforce involves fewer fixed overheads, and this factor applies to a company in United Kingdom (CPS). Huws et al. (1990) also point out that savings in overhead cost can be realized.

The factor “productivity gains” is an important motivator for organizations to initiate telecommuting, with 72% of the respondents considering it high or very high in importance. According to a telecommuting project undertaken by AT&T and the State of Arizona, 80% of the participating supervisors indicated that telecommuting increased employee productivity and 67% indicated that it increased the overall efficiency of their departments. In a similar project conducted by Washington State Energy Office, 72% of the telecommuters felt that their overall performance improved. Stanworth and Stanworth (1991) claim that productivity gains of telework can range from 30% to as high as 100%. Hence, the results of our survey are in line with the situation overseas and what is written in the literature on telecommuting.

The factor, training of managerial skills, is ranked fourth in importance by the respondents (7% high, 6% very high). If the turnover of managers in the industry is high, then the benefit derived by training a person will not accrue to the company. An alternative view is that telecommuting will not provide good training because of the lack of direct communication (Kirschenbaum, 1989).

The factor “higher computer literacy” is ranked the lowest (10%-very low, 44%-low). One of the respondents commented that employers are faced with the task of developing computing skills of their employees even without telecommuting. Otherwise, the company will lose out to other competitors in terms of efficiency. Hence, this is not viewed as an important motivator for adopting telecommuting.

### Organizational Drawbacks

The factor “coordination of employees” ranks the highest amongst the drawbacks of telecommuting. In the Huws’ survey (1984), “difficulty of organizing telework” is one of the reasons that stand out as the most common explanation for the lack of interest in telecommuting. With decentralized work situations, the work to be carried out has to be carefully planned and greater efforts have to be made to coordinate the telecommuters. This may prove to be too much of a hassle. The consistency in results is easily explained by the fact that “coordination of employees” is an inherent problem in implementing telecommuting.

The majority of the respondents feel that “data security” is high in importance (37%-high, 33%-very high). With telecommuting, there will be more people accessing the company's system and some of these people may not be authorized. Since organizations value their data resources, heavy emphasis has been placed on controlling access to them.

Respondents feel that the factor “difficulty in controlling

performance” (ranked third) plays an important role in impeding their organizations from adopting telecommuting. Seventy-one percent of the respondents indicated that it is high or very high in importance.

“Equipment security” is ranked as fourth in importance among organizational drawbacks. Fifty-seven percent of the respondents rated it high or very high in importance. In most cases, the cost of the equipment will be borne by the individual employee making him/her responsible for the proper care of the equipment. Besides, if the organization provides the employee with the necessary equipment, there will be a penalty system associated with damages to equipment requiring the concerned employee to pay for the repairs.

The factor “costs in acquiring equipment” is not seen to be high in importance by most of the respondents (16%). In Singapore, computers and telephones are prevalent in many homes. With the infrastructure in place, the cost of acquiring additional equipment will not be prohibitive.

Most respondents (10% very low, 44% low) do not feel that fear of legal liability is an important factor impeding their organizations from adopting telecommuting. This factor is not featured in any other telecommuting studies reviewed by the authors. In reality, the employer organization runs the risk of employees contracting on behalf of the company without authorization.

### Comparisons with UK and Germany

In an attempt to compare the local findings with those conducted elsewhere, the authors scanned available literature in search of similar studies conducted elsewhere. One such study conducted by Huws et. al (1990) described a survey carried out by Empirica in 1987. The study was conducted on 14 companies in Germany and UK to understand, among other objectives, the relative importance of teleworking factors. This Empirica study is used in this paper in an attempt to compare the Singapore findings.

The Huws et al. (1990) study cited some factors that were roughly similar (but not exactly the same) to this study. To make a comparison, we analyzed the results of the comparable motivators and drawbacks in Huws et al. (1990) and displayed their ranks according to that study. Table 5 presents the results of that study in comparison with this study. Factors that do not match with this study are left out. This explains why the estimated ranks in Table 5 are not consecutive.

A comparison of the individual motivators to teleworking show that there is some similarity over the two studies. Singaporeans and their European counterparts recognized that the important motivators of teleworking were time flexibility and reduction in child care costs. Both these categories were ranked as the top 2. Both these studies also rated the importance of an increase in job satisfaction rather low. However, there is a huge discrepancy in terms of savings in time/cost of commuting, with the Singapore respondents ranking this factor as much more important (ranked second) than their counterparts in UK and Germany (ranked sixth).

Motivators	Score	Rank	Estimated UK & Germany Rank*	Drawbacks	Score	Rank	Estimated UK & Germany Rank*
<b>Individual</b>				<b>Individual</b>			
• Time Flexibility	4.09	1	1	• Impediment to Career Growth	4.12	1	7
• Reduction in Child Care Costs	3.88	2	2	• Social Isolation	3.38	2	6
• Savings in time/cost of Commuting	3.88	2	6	• Conflicts between Work & Home	3.03	3	3
• Increase in Job Satisfaction	3.41	4	5	• Increase in Equipment Cost	2.84	4	-
• Savings of Clothing Expenditure	2.98	5	-	• Lack of Professionalism	2.78	5	-
<b>Organizational</b>				<b>Organizational</b>			
• Ease of Recruitment	4.22	1	1	• Coordination of Employees	4.11	1	2
• Reduction in Overheads	3.99	2	3	• Data Security	4.00	2	-
• Productivity Gains	3.75	3	2	• Difficult to Control Performance	3.87	3	1
• Training of Managerial Skills	2.68	4	4	• Equipment Security	3.68	4	-
• Higher Computer Literacy	2.43	5	-	• Lack of Loyalty to Company	2.97	5	-
				• Cost of Acquiring Equipment	2.95	6	4
				• Legal Liability	2.45	7	-

\*Huws, et al. (1990); p 96. The ranks of the UK and Germany study are rough estimates only as many of the factors bear similarities but they are not exactly the same factors.

Table 4: Ranking of motivators and drawbacks

This may be due to the fact that fewer workers in Singapore own cars due to higher car prices. As a result, they rely on public transportation which is less convenient and takes a longer route compared to those who are driving. Singapore respondents may consider avoiding the high cost of owning a car and/or the inconvenience and time taken of traveling to be more important than their counterparts in Europe. Finally, it appears that saving in clothing expenditure was highlighted in the Singapore study but is absent in the Empirica study.

However, there is very little similarity in the perception of respondents of the two studies over drawbacks in telecommuting. While Singapore respondents perceived telecommuting an impediment to career growth and leading to social isolation, European respondents perceived these to be the least of their problems. They indicated that the lack of office services support and the reduction of benefits and perks as the top 2 major drawbacks respectively. In both studies, conflicts between work and home were ranked third.

Organizations in both research groups perceived the drawbacks and motivators in a similar light. Organizations in both countries saw that telecommuting would result in easing their recruitment problems, reducing their overheads and leading to productivity gains. These organizations were also seeing eye to eye on the constraints of telecommuting with the top three issues being coordination of employees, data security and the difficulty in controlling performance.

Interestingly, many of the categories surfaced as highly important in this study have not been presented elsewhere. Perceived organizational drawbacks such as data and equipment security and legal liability have not been found important in other studies. Further, issues such as the need for higher computer literacy, equipment cost and the lack of professionalism have not been studied extensively either. Hence, there is an opportunity for future research into the motivators and constraints on teleworking over time.

## Conclusion

Singapore has a tight labour market. Ease of recruitment via inducting telecommuters will help ease the situation as well as increase productivity and reduce overheads at the same time. There are also advantages for the individuals as well, allowing them to have more flexibility in the allocation of their time, and decreasing traveling cost and time. Yet, telecommuting has not taken off on a large scale basis here as compared to the study above in UK and Germany.

Despite the Singapore Government's efforts in promoting telecommuting (for instance, the IT2000 plan has incorporated telecommuting as a feature to improve the quality of life in Singapore) and despite efforts made by The National Computer Board, National University of Singapore and Nanyang Technological University in promoting its awareness, the results of this and other surveys in Singapore show that people still do not see telecommuting as a viable way to work yet.

One reason for the lack of enthusiasm in the adoption of telecommuting (see table 3 - likelihood of adopting telecommuting) besides the drawbacks as mentioned in this study may be that Singaporeans do not have an in-depth understanding of this new work-arrangement. They are skeptical of whether the perceived benefits will actually be reaped, and whether telecommuting will have a great impact on the organization and its employees. As employees are naturally resistant to change, it will take some time before they adapt and become receptive towards telecommuting.

One way to overcome the skepticism is for organizations to adopt a telecommuting scheme on a pilot basis to resolve the practical problems of telecommuting before they adopt it fully. In this way, resistance can be reduced and problems can be ironed out before the full scheme is adopted.

Since one of the major individual drawbacks is the fear of career growth impediment, organization must be sensitive



to the need for assurance that being on such a scheme need not harm their career. One way to ensure this is to set up a continuous process of communication between the organization and the teleworker, which includes regular supervisor-employee meetings, regular general meetings, invitations to social events, allocation of mentors, newsletters and building informal networks. Telecommuters must feel that their career growth is intact while they are on the scheme.

In addition, not every business area is suitable for telecommuting. Businesses with measurable deliverables or outputs are more suitable than those in the customer service industry for instance. This must be taken into consideration in targeting people for telecommuting. This will also ease telecommuters' fear of impediment to career growth as their results will be measured by deliverables (*The Straits Times* 13/9/96).

In addition, bosses must overcome their mindset on controlling and coordinating their employees directly, and trust their workers to be able to discipline themselves, or else the system would never work. This barrier may be a difficult one to overcome because of the fact that businesses are still conducted fairly formally in this region. However, these cultural barriers will be overcome gradually in the next few years (*The Straits Times* 24/9/96).

Telecommuting in Singapore may still be in its infancy, but those who have started the scheme have indeed benefited from adopting the concept (*The Strait Times* 13/9/96). This study has highlighted the motivations as well as problems that have to be overcome in order for others to reap similar benefits.

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