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# A Study of Telecommuting in Singapore: Current Status and Future Prospects

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## ABSTRACT

*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 real and perceived 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 the professionals and their employing organizations.*

## 1 Introduction

Telecommuting refers to a form of work arrangement involving the use of computer and telecommunication technologies which allows employees to substitute telecommunication for physical transportation thereby permitting the job to be performed at a remote work site (Yap C.S., 1992). Telecommuters can live in their preferred location and substitute electronic communication for physical travel (Stanworth, 1991). With advanced information technology available in Singapore, many jobs dealing with the manipulating of information can be done at home.

In addition to these benefits, a number of *economic, social, logistic, environmental and technological factors* are also forcing business organisations to evaluate newer technologies, job design, organizational structures, business processes and procedures in the workplace, and many organizations view telecommuting as a way to achieve some of these goals.

Firstly, the increased competitive pressures from the globalization or world markets have led to an increasing customization of products and services and to not only sustain but improve employee productivity. Telecommuting is a possible solution for improving the productivity of employees as well as extending the traditional bounds of the workplace. Secondly, on the social front, the arrival of more and more women in the work-force means a change in the basic family and social fabric of our society. To allow women to contribute to national and global economy and yet preserve the family as the building block of the human society, telecommuting may be an attractive alternative. The third factor

contributing to the increasing attractiveness of telecommuting is the traffic congestion in big metropolitan areas during office hours—both in the mornings and evenings. Several US studies have produced estimates of the reduction in the demand for travel which would result from a widespread adoption of telecommuting. The fourth factor is the monumental problem of environmental pollution accompanying traffic congestion. Adding to that problem is the rapid depletion of earth resources caused by commuting in large numbers by individual automobiles. If telecommuting becomes popular in Singapore, it may result in a reduction in car traffic (P. Olszewki, Lam S.H., 1993). Finally, the declining cost of computer and telecommunication technologies relative to the inflationary costs of running an organisation further motivates telecommuting (Cross T.B., 1986).

## 2 Literature Review

*Duxbury, Hoggins and Irvings* (1984) carried out a survey involving 78 managers and 63 employees (on-managers) in Canada. Significant differences in views of these two groups were found for three variables: productivity, stress and quality of work-life. Managers took the view that telecommuting decreases productivity, while employees perceived that job-related stress will decrease and quality of work-life will improve. However, both groups did not feel that telecommuting would improve an organization's morale. Both groups felt strongly that personal interaction and "being visible" was important to their careers and that telecommuting would impede professional development and thereafter career opportunity. Both groups indicated that their organizations were not supportive of the idea of telecommuting.

*Vitalari, Hamilton and Ramsower* (1986) studied the attitudinal and normative beliefs behind the desires and intentions of 60 programmers and analysts in the United States to work from home. Their findings showed that while there was generally a strong desire to work from home for a few days each week, there was little intention to do so. The programmer analysts generally felt that their supervisors, organizations and co-workers would react unfavourably to telecommuting.

*De Sautis* (1992) examined the attitudes of 51 managers and 129 programmers in the United States. Her findings suggested that attitudes towards telecommuting is primarily related to a person's work position and job characteristics. Programmers tended to be more interested than project managers. Both groups perceived telecommuting as promoting better morale and

productivity (contrary to the findings of Duxbury et al). Her findings indicated that preference for telecommuting was significantly related to supervisory responsibility. The more frequently the respondents had to interact with others to perform their jobs, the less likely they prefer telecommuting

A Singapore study conducted on the attitude of female computer professionals towards telecommuting reported that almost three quarters (73%) of the respondents were in favour of telecommuting (Yap C.S., and Tng H., 1989). This survey also revealed that married respondents were more receptive towards telecommuting than single respondents.

A subsequent survey of data processing managers was done by Yap C.S., and Lim G.K. in 1990. 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. Just over half (55%) said they were "unlikely" or "very unlikely" to adopt telecommuting. 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. About 4% said that they intended to implement a pilot telecommuting programme within the next year, 24% within the next three years and 17% within the next five years.

### **3 Motivators and Drawbacks of Telecommuting in Singapore**

Based on a comprehensive review of the literature, the following are the primary motivators and drawbacks of Telecommuting.

#### **3.1 Motivators for Employees**

##### **3.1.1 Reducing costs**

The cost reduction would be in the areas of travel, office clothing, food, day care children for children and the opportunity cost of saved travel time. Besides saving gasoline costs and vehicle depreciation costs, costs of office clothing can also be saved for employees working from home. A telecommuter does not have to dress up formally except when he/she has to go to office. Furthermore, expenditure will be saved on food as eating at home will be much more economical than eating at a restaurant or cafeteria (Kelly & Gordon, 1986). Finally, there will be savings from the high cost of daycare facilities (Ford & Butts, 1992). Being home-based, a parent can simultaneously care for his/her children and do his/her work.

##### **3.1.2 Reduction in Stress and Exposure to Pollution**

The telecommuter no longer faces rush-hour traffic (Ford & Butts, 1992). Some telecommuters who already work from home appreciate the ability to start work without wasting time in traveling. Some telecommuters also value a reduction in the stress of commuting especially if they have to use the crowded rail or road

routes. Furthermore, these commuters are also susceptible to exposure to large amounts of pollution caused by multitude of vehicles on road including scooters, motorbikes

##### **3.1.3 Time flexibility**

Flexibility is an attractive feature of telecommuting. Telecommuter has a core time in theory, but in practice he can do his office work whenever he wants (Kinsman, 1987). For instance, a telecommuter can take a day or two off when he is heavily involved in social work. With a traditional job, an individual has to be in the office from 9 a.m. to 5 p.m. In essence, telecommuting can offer the workers the flexibility at work as long as the work is completed on time and to an acceptable standard (Stanworth, 1991). A telecommuter can better arrange his life and probably has more freedom for social interaction - meeting dentists' appointments, having coffee with friends and go shopping (Kinsman, 1987).

A telecommuter's ability to modify working schedules give rise to another benefit - balancing work and home life (Stanworth, 1991). This feature appeals particularly to working mothers 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, Korte & Robinson, 1990). Telecommuting has made it possible for people to make a fuller contribution to family life and to see more of their children. Parents can alter work patterns to suit themselves in order to cope with commitments like sick children or school holidays.

##### **3.1.4 Job satisfaction**

High level of job satisfaction is derived from the time flexibility in telecommuting. A survey (Huws, Korte & Robinson's Survey, 1990) of commuters in Europe found consistently high satisfaction levels with all aspects of their working life.

Compared to traditional work, the telecommuting environment was felt to be very much more relaxed (Kinsman, 1987) in spite of given deadlines. With less direct management contact, a person has to be self-motivated and organize himself/herself more than working normal hours in office setting. This could improve one's time management and general effectiveness. Many telecommuters in the United States have pointed out that the home with no distraction is a most stimulating working environment (Kinsman, 1987).

In addition, the telecommuter need not conform to the culture of company (Huws, Korte & Robinson, 1990). He/she need not bother about how to communicate with people in the office. He/she need only fully concentrate on carrying out his/her duties.

##### **3.1.5 Avoiding the career gap**

Telecommuting can avoid a career break for women after statutory maternity leave (Stanworth, 1991). Hence, it enables women to earn income while providing their own child care as well as a chance to remain on the career ladder of the organisation. Skills already acquired by the women would not then go to waste. Also, they can keep up-to-date with skills, which otherwise would rapidly

become redundant in this dynamic environment. Thus, people are able to work in whatever way that fits in with the rest of their life - maintaining and then developing their careers at the speed which suits them (Kinsman, 1987).

### **3.2 Drawbacks for Employees**

#### **3.2.1 Social isolation**

The major drawback of working at home is the reduced opportunity to interact with co-worker and participate in the informal communication network in office (Cummings, 1992).

Day-to-day loneliness is a feature of telecommuting, even when it is supplemented by visits to employers, telephone contacts and electronic messages (Stanworth, 1991). A telecommuter will miss the human social contact one can get in the office environment such as office chit-chat and gossip. Telecommuters might feel disconnected from the organizational culture and thus deprived of the sense of belongingness.

Conversations during coffee breaks or at after-hours gatherings give people a chance to learn about what is going on within the organisation, and to be part of a work group. 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 "problem-solving" barrier (Kinsman, 1987). Telecommuter cannot physically turn to some one else for casual advice. People are nervous about going to the lengths of ringing up to ask, for fear of appearing incompetent or even foolish. What is missing here is being able to compare notes with the person at the next desk and interacting informally with them to get help.

#### **3.2.2 Potential conflicts between work and home life**

Although telecommuting can resolve conflicts between home and work life, it can also exacerbate them (Stanworth, 1991). The individual telecommuter must learn to separate work and domestic responsibilities. That requires a good deal of will-power and determination. Women who are combining office work and childcare have a particular difficulty in separating the conflicting pressures (Stanworth, 1991). The noise of a young family can be disruptive to concentration (Huws, Korte & Robinson, 1990).

There is evidence that conflicts will be exacerbated if relationships at home are already poor or if one partner do not sympathize with the other working at home (Stanworth, 1991). Home is the psychological domain of the woman, and if her husband becomes a home-based worker, she may feel that her territory is being invaded. 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).

#### **3.2.3 Feeling of 'guilt'**

The women's dual role of combining work with parenting has also caused another psychological problem -

guilt. The strain was that domesticity conflicted with work, sick children being a particular difficulty (Kinsman, 1987).

The feeling of guilt is reported by both women and men. A study undertaken by Huws (1984) in US stated that some of the telecommuters felt guilty when they were at home but not working, even during leisure hours. Even having a cup of coffee can make the telecommuter feel uncomfortable.

#### **3.2.4 Impediment to career growth**

As the telecommuter is not assigned the important key objectives of the job, it limits his/her opportunities for promotion (Stanworth, 1991). The work is sometimes more mundane and less intellectually demanding than the skills of the telecommuter warrant (Kinsman, 1991). Telecommuters also dislike the sense of feeling left out, or 'not as professional' in the eyes of the employers. However, this could be a transitory phenomenon.

Telecommuters also face problems with today's management philosophy. They suffer from the "out of sight, out of minds" syndrome (Cummings, 1992). Telecommuting tends to impede employees' career growth because they lack the direct day-to-day interaction with their supervisors. Their counter parts in the office have a better chance to be known and so they may be able to advance up the career ladder quicker. Since the telecommuter has limited face-to-face contact with fellow employees, finding evidence of the interpersonal skills necessary for managerial positions becomes difficult. It is difficult to judge whether or not a telecommuter has what it takes to be a team player.

The employee's work as a telecommuter can serve as evidence that he would rather not be around with 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.

#### **3.2.5 Increase in equipment and utilities costs**

Some employers are willing to pay for the necessary equipment to effectively work from homes but most of them ask telecommuters to buy their own supplies, or at least contribute toward the cost (Cummings, 1992). Hence, it increases the telecommuter's expenditure.

Furthermore, the telecommuter also has to bear additional utilities cost. This is because personal computers and other equipment required for telecommuting have high consumption of power.

### **3.3 Motivators for Employers/Organizations**

#### **3.3.1 Productivity gains**

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 was observed to have increases of 30% - 100%. This outcome is analyzed from the perspectives of managers and operational level employees. Managers are professionals and they therefore belong to a qualified and

self-motivated group of people. The nature of their jobs, unlike that of the operational-level workers, are not directly linked with the production of a tangible output but rather more that of a supervisory, information analyzing and decision making role. As such, if they are not physically present in the office settings performing their respective roles, they may not be effective and hence not deserving the high pay that they are draw. However, telecommuting may be feasible to the extent the information analyzing, and decision-making roles can be accomplished from home by electronic communication means like fax, telephone, e-mail, teleconferencing etc. However, if a manager has to oversee his subordinate directly and his physical presence is very important, then telecommuting may not be viable.

One factor that will cause an increase in the productivity of the operational-level employee is the fact that the employee will be less distracted when working at home. When working on-site, there tend to be a lot of distractions (Lozano, 1989). A good example is the "never ending" phone calls of inquiry from either within the organization or from external parties. Lots of precious time are wasted just to attend to these calls (Kinsman 1987). If the manager belongs to top management and is only involved in the strategic planning and formulating of long term goals, telecommuting will be more applicable as he only needs to pass down his instructions to his subordinates and his physical presence is not required (Cummings, 1992). As a result of telecommuting, the productivity of operational-level employees can also be expected to improve since they will save on travel time and have more time to spend on their work. When they have more time for the same piece of work, the quality of the work produced by the operational-level employee would naturally be much better (Christensen, 1988). Actually, when traveling to work is not required, time conservation is not the only advantage. By avoiding the rush hour, the employees will not feel the frustration of getting caught in the traffic and they will distractions

### 3.3.2 Reduction in overhead costs

If an organization is burdened by a high fixed overhead, it may not be able to employ its resources in the most efficient manner. For most telecommuting schemes under study, the people are paid 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 (i.e., the only difference is the telecommuter works at home rather than in the office), telecommuting will not constitute a motivator to the user organization (Strizich, 1992).

Employers can save on parking and office spaces as there will be fewer staff around. Some employers have opted for telecommuting as a way to rationalize office space usage or avoid a move to larger premises or building annexes and extensions to existing premises. Organizations feel that retaining an office in a prestige location will create a positive image among clients, customers and the

general public. However, such a prestige location comes at a high price. It is often not economical to occupy a large area.

Office supplies such as paper, stationery, etc. can also be controlled better. In large companies, costs of providing these essentials are quite significant. 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. Sometimes the company may not reimburse some office supplies that are essential for these telecommuters. Whether they will be reimbursed or not, greater care will be taken because they know they are accountable.

### 3.3.3 Development of Managerial Skills for the Future

Contrary to the perception of many employers, instead of reducing a manager's effectiveness, telecommuting helps in improving their managerial skills. Without having face-to-face contact with his subordinates, a manager now needs to plan much better the allocation of tasks for his employees. He also has to learn how to monitor his subordinates from a distance (Korte, 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). In any case, for the corporations of the future, where managers will have to increasingly manage and coordinate from distance, telecommuting is an effective training ground.

### 3.3.4 Retention of staff

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 kid after maternity, she does not have to quit her job now since telecommuting can provide a solution. With telecommuting, she can accomplish her assigned tasks from home and yet at the same time look after her new born kid. Similarly, for an employee—male or female—who is temporarily disabled due to accident, injury, or some disease and has been advised not to travel, telecommuting will be boon both to the employer and the employee. This is an advantage to the company because it does not have to waste resources recruiting new employees and training them from scratch (Kirschenbaum, 1989). Besides, the new employee will take some time to familiarize himself with the work and work environment (learning curve effect) and this would mean an unnecessary drain on the company's resources.

### 3.3.5 Tapping additional sources of Manpower

Telecommuting has the potential to open up new manpower sources. The human resources of retirees, housewives with younger dependents, students, and handicapped still remained largely untapped. The telecommuting-enabled employability of housewives and handicapped (disabled) is already discussed in the previous section. A project for training the disabled (to work from home) in the United Kingdom has demonstrated that such training is viable and such people can attain a standard of

skills suitable for employment. Other disadvantaged groups who may be employed through telecommuting are home-carers, the long-term unemployed, patients in hospitals, senior citizens in nursing homes and convicts in prisons. The society at large will benefit from their services. More importantly, these people are given a chance to make their lives more meaningful (Kinsman, 1987).

### 3.3.6 Higher computer literacy

Telecommuting entails the acquisition, installation, use, and maintenance of computers and network devices. Hence, 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.

## 3.4 Drawbacks for Employers/Organizations

### 3.4.1 Loss of control and coordination of employees

Employers perceive that managing telecommuters will require extra costs and resources. Though this may not be true, it impedes the employers from implementing telecommuting. According to most employers, there is no visible check on punctuality and diligence and this will pose a problem when the management is trying to evaluate the employees for promotion purposes. 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, 1988). When this "power" is taken away from them, they may be demotivated, and it may lead to dysfunctional behaviour. Telecommuting involves control and supervision from a distance which is much harder than control and supervision on site. 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 (Ursula, 1990).

Certain jobs require a lot of coordination and group discussions. However, it is very hard to achieve for telecommuters in a cost effective manner. To facilitate communication among groups of people, advanced technology such as video conferencing will have to be deployed. Such facilities are costly at present. However, as technology advances, it will become more affordable and difficulty in coordinating employees will not be a barrier to telecommuting anymore.

### 3.4.2 Legal liability

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).

### 3.4.3 Additional training costs

When the company recruits the employees, they may not have the skills necessary to use telecommuting devices and use needed computer software. The company will have to incur costs to train these staff. 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).

### 3.4.4 Equipment Acquisition Costs

If the company provides all the necessary hardware and software to each and every telecommuter, the resulting costs can be prohibitively high. The company may also have to fork out additional funds for insuring these equipment. Furthermore, as the equipment is not under the direct control of the company, a higher insurance premium will be charged to cover the ensuing additional risk. However, in most cases, the employees are expected to pay their own computer equipment (Kelly, 1988).

### 3.4.5 Costs of communication

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 perform a cost-benefit analysis before implementing telecommuting (Cross, 1986).

### 3.4.6 Data and equipment security

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.

**Table 1: Motivators and Drawbacks**

Individual motivators	Individual drawbacks
Reducing costs	Social isolation
Reduction in Stress and Exposure to Pollution	Potential conflicts between work and home life
Time flexibility	Feeling of "guilt"
Job satisfaction	Impediments to career growth
Avoiding the career gap	Increase in equipment and utilities costs
Organizational motivators	Organizational drawbacks
Productivity gains	Loss of control and coordination of employees
Reductions in overhead costs	Legal Liabilities
Development of managerial skills for the Future	Additional Training Costs
Retention of Staff	Equipment Acquisition Costs
Tapping Additional Sources of Manpower	Costs of Communication
Higher computer literacy	Data and Equipment security

## 4 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

manufacturing/engineering, computer sales/service, transport and communication, education and training, banking and finance and government. A total of 62 responses from 62 organizations (representing 31% of the sample size) was received.

#### 4.1 Demographics

##### 4.1.1 Characteristics of Respondents

The profile of the respondents is presented in Table 2.

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

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%

##### 4.1.2 Characteristics of sample organizations

Table 3 below presents the characteristics of the organizations.

**Table 3: Organizational Profile**

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 During Office Hours	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%

The findings 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. In this quarter of organizations, the majority (77%) express a positive attitude towards adopting the above work arrangement officially. Thirty percent of these respondents expresses 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.

##### 4.1.3 Ranking of motivators and drawbacks

Table 4 presents the rankings of motivators and drawbacks.

**Table 4: Ranking of motivators and drawbacks**

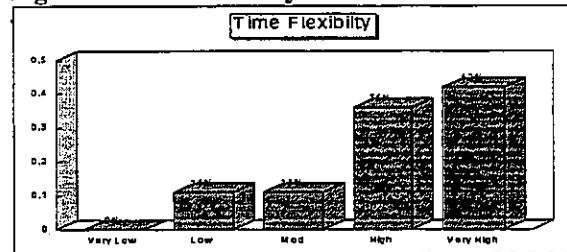
Motivators	Score	Rank	Drawbacks	Score	Rank
<b>Individual</b>			<b>Individual</b>		
• Time Flexibility	4.09	1	• Impediment to Career Growth	4.12	1
• Reduction in Child Care Costs	3.88	2	• Social Isolation	3.38	2
• Savings in time/cost of commuting	3.88	2	• Conflicts between Work & Home	3.03	3
• Savings of Clothing Expenditure	3.41	4	• Increase in Equipment Cost	2.84	4
• Increase in Job Satisfaction	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

## 5 Discussion of Results

### 5.1 Individual Motivators

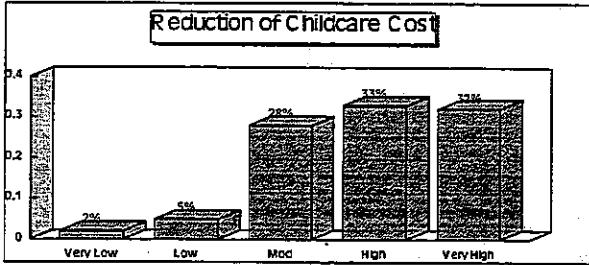
A detailed analysis of the responses to each of the individual motivating factors follows.

**Figure-1: Time flexibility**



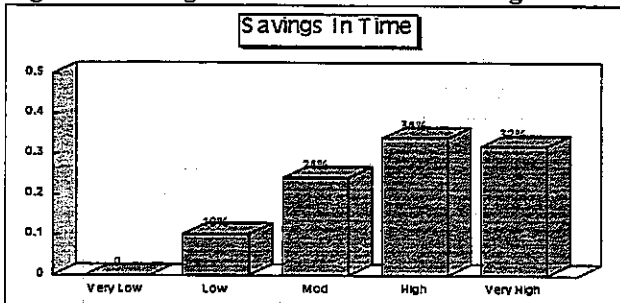
The factor "time flexibility" is the highest ranking individual motivator in table 4. Figure 1 shows that almost 80% of the people rated this factor as having "high" to "very high" importance. Flexibility in working times, the ability to combine childcare with work, to meet other family demands and to combine other activities with work have 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. In a survey carried out for the UK Equal Opportunities Commission in 1982, 95% of the respondents were mothers of school-age or pre-school children (Huw, Korte and Robinson, 1990). However, most men also value these opportunities -- Olson (US) found that 66% of the respondents working at home were male (Olson, 1987). Therefore, it is clear that flexibility is or is perceived to be a significant advantage both in European and Singapore context.

**Figure-2: Reductions in childcare costs**



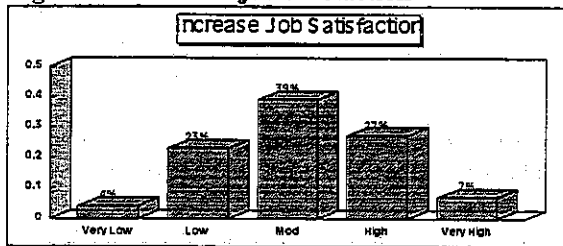
As depicted in Figure 2, more than half of the respondents perceived this benefit as of high importance (33%) or very high importance (32%). In some US cases, the choice of telecommuting by parents of young children is seen as necessary because of the unavailability or excessively high costs of daycare facilities (Huws, Korte, and Robinson, 1990).

**Figure-3: Savings in time/costs of commuting**



From the graph shown in Figure-3, 66% of the respondents consider this factor 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, Korte, Robinson, 1990 ; Kinsman, 1987 ; Stanworth, 1991). The Empirica Telework Survey conducted in US indicated 69.7% of the telecommuters think that reduction of commuting time and expenses is an important facilitating factor and rank it sixth out of a total of eight factors.

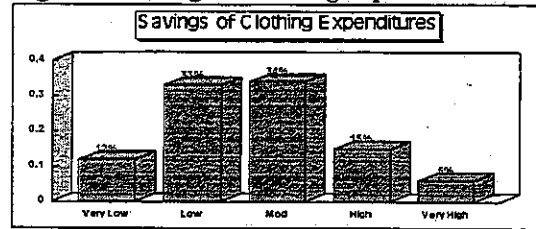
**Figure-4: Increased job satisfaction**



As revealed by Figure-4, about 34% respondents rated the factor "increase in job satisfaction" as high to very high in importance. Huws, Korte and Robinson (1990) found consistently high satisfaction levels among telecommuters. Their sample tended to be biased towards highly qualified staff. While our sample also consists of computer professionals with high qualifications, this factor only ranked fourth in importance. The difference may be due to the fact that the Singapore computer professionals have not actually tried out telecommuting and thus feel

uncertain about their job satisfaction.

**Figure-5: Savings in clothing expenditures**

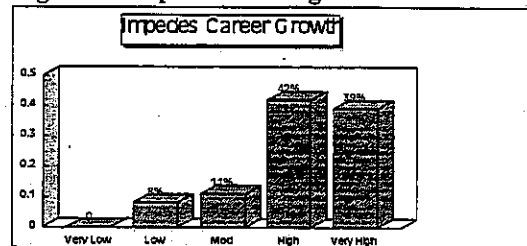


As portrayed in Figure-5, only 21% of the respondents feels that "savings of clothing expenditure" (ranked last) is a highly or very highly important factor. There are no existing comparative studies for this factor.

## 5.2 Individual Drawbacks

Individual drawbacks are detailed in the sections below.

**Figure-6: Impedes career growth**



The factor "impediment to career growth" is seen as the most significant individual drawback. From figure-6, eighty-one percent of the respondents consider it of high or very high importance as a disincentive to telecommute. In contrast, the Empirica survey (US, 1990) of telecommuters shows 35% thought that their current chances of promotion were disadvantaged while 11% believed them to be enhanced by telecommuting. It seems that Singapore respondents feel more 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 no formal telecommuting in place yet, so employees feel uncertain about their career growth if they work from home.

**Figure-7: Social isolation**

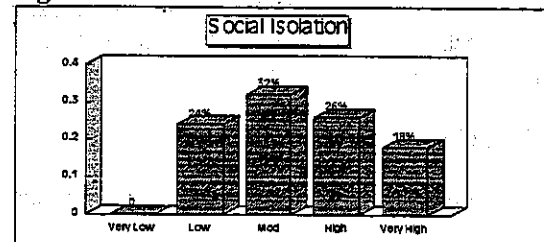
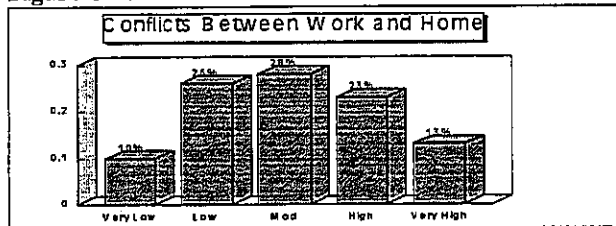


Figure-7 summarizes the results for the second most important drawback - social isolation. Forty-four percent of the respondents feels that social isolation is an important or very important factor in influencing their decision not to telecommute. The Diebold survey (Diebold Group, US,



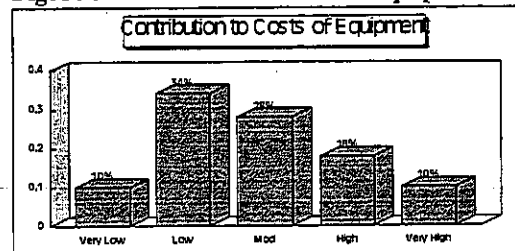
1987) found that 56% of telecommuters surveyed mentioned social isolation as a disadvantage, which rose to 70% among the women in the survey (Huws, Korte, and Robinson, 1990). The conclusion drawn by Olson was that the need for social interaction may in part be a function of personality type, with wide variations between individuals (Olson, US, 1982). 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.

**Figure-8: Conflicts between work and home**



The factor "conflict between work and home" ranked third in importance as an individual drawback (see figure 8 for analysis). Few research has been carried out on the effects of telecommuting on personal relationships within home. However, in Huws, Korte, Robinson (1990), it is stated that 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. Lotte Bailyn (UK, 1990) 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 (Monod, 1983; Lie, 1985; Chalude, 1984). The fact that the Singapore results do not show conflicts between work and home as a even stronger drawback may be attributed to the fact that the respondents are mostly male.

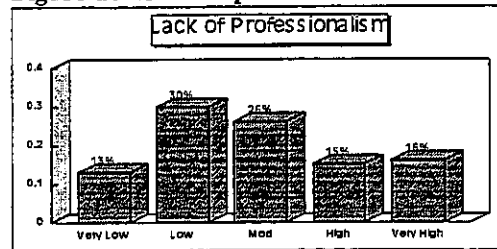
**Figure-9: Contribute to costs of equipment**



As revealed by Figure-9 above, only 28% consider this factor 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,

Korte, and Robinson, 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 Singapore survey and may be attributed to almost non-existent experience with telecommuting.

**Figure-10: Lack of professionalism**

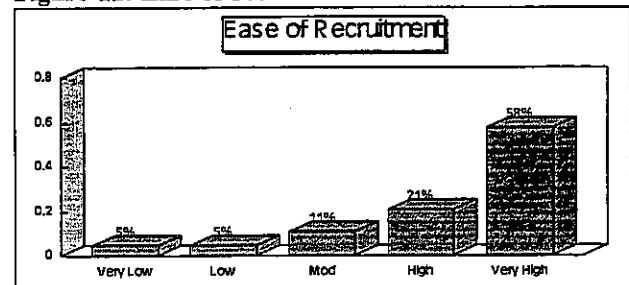


Forty-three percent of the respondents considers "lack of professionalism" as low or very low in importance, while 31% consider this factor as high or very high in importance in influencing their decision not to telecommute (refer to Figure 10). Stanworth (UK, 1991) feels that employers tend to push the responsibility for routine tasks on telecommuters. Another study in US by Huws (1983) 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 as the respondents mostly belong to the in top management cadre(63%). Furthermore, they are professionals and hence may not think they will be assigned routine jobs.

### 5.3 Organizational Motivators

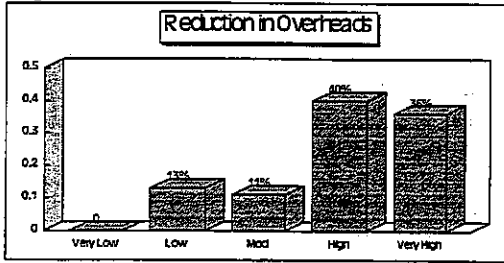
Organization motivators and their respective rankings are detailed below:

**Figure-11: Ease of recruitment**



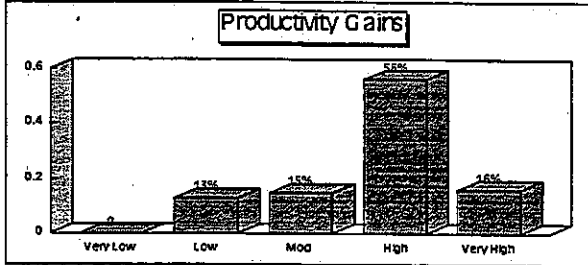
Ease of recruitment is ranked as the most important motivator for organizations to adopt telecommuting (see Figure-11). In Singapore, the labour market is rather tight. Telecommuting helps to tap additional sources of labour. Results of our survey support this point. Seventy-nine percent of the respondents views ease of recruitment as important or very important). The Empirica Telework survey conducted in United Kingdom by Ursula Huws, Werner B. Korte and Simon Robinson (1990) also came to the same conclusion -- the factors "retention & recruitment of scarce skills, reduction of employee turnover and reduction of absenteeism generally and improved coping with surplus work" occupy the top three positions on the list of organizations reasons for introducing telework.

**Figure-12: Reductions in overheads**



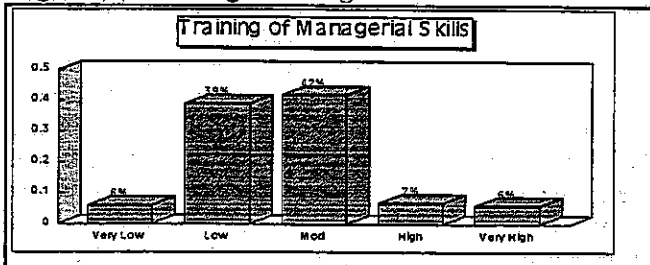
Our survey results as graphed in Figure-12 clearly show that “reductions in overhead” ranks high in importance (40%-high, 36%-very high). In “The Telecommuters” by Francis Kinsman (1987), the international managers (UK) in a survey felt that the advantage lies in the fact that a self-employed workforce involves fewer fixed overheads and this factor applies to another company in United Kingdom (CPS). Huws, Korte and Robinson (1990) and Judkins, West and Drew (1985) of Rank Xerox point out that savings in overhead cost can be realized.

**Figure-13: Productivity gains**



The factor “productivity gains”, according to Figure-13 is an important motivator for organizations to initiate telecommuting. 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. In the literature by Professor Stanworth (United Kingdom), there are claims that productivity gains of telework 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.

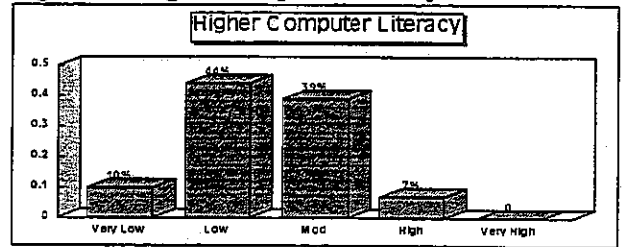
**Figure-14: Training of managerial skills**



The above factor is ranked fourth in importance by the respondents (refer to Figure 14 above for breakdown). The turnover of managers in the industry may be high, as

such, the benefit derived by training up 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, Jill, 1989). There are no comparative surveys done to investigate this factor any more.

**Figure-15: Higher Computer Literacy**

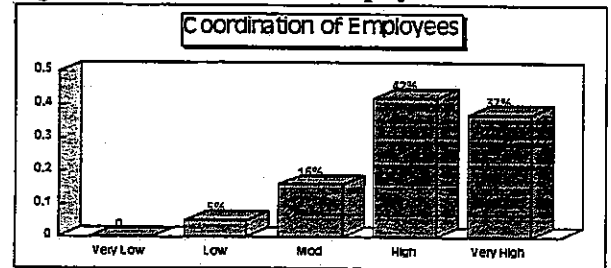


As shown in Figure-15, “higher computer literacy” is ranked the lowest (10%-very low, 44%-low). One of the respondents commented that employers are faced with the task of developing computing skills of their employees even without telecommuting. Otherwise, the company will lose out to other competitors in terms of efficiency. Hence, this is not viewed as an important motivator for adopting telecommuting.

### 5.4 Organizational Drawbacks

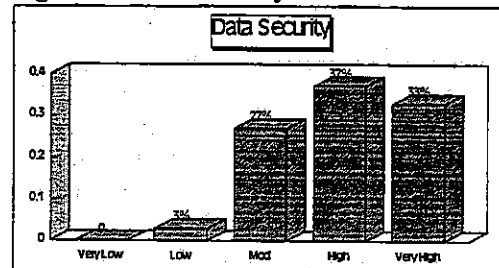
Organization drawbacks are discussed below.

**Figure-16: Coordination of Employees**



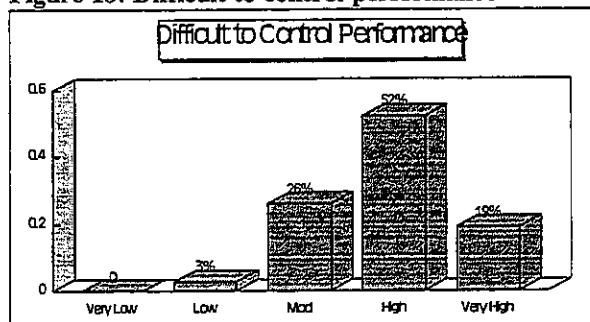
The factor “coordination of employees” ranks the highest amongst the drawbacks of telecommuting (see figure 16). In the Huws’ survey (1984), “difficulty of organizing telework” is one of the reasons that stand out as the most usual explanations for lack of interest in telecommuting. With decentralized 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.

**Figure-17: Data security**



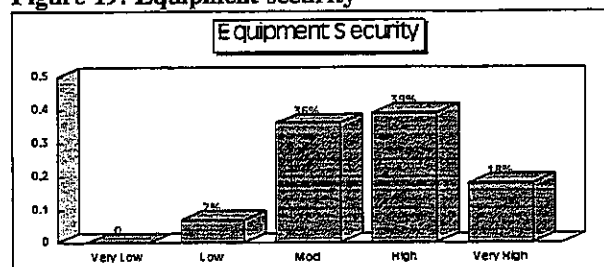
According to Figure-17, the majority of the respondents feel that "data security" is high in importance (37%-high, 33%-very high). There are no comparative studies on this factor. With telecommuting, there will be more people accessing the company's system and some of these people may not be authorized. Since organizations value their data resources, heavy emphasis has been placed on controlling access to them.

**Figure-18: Difficult to control performance**



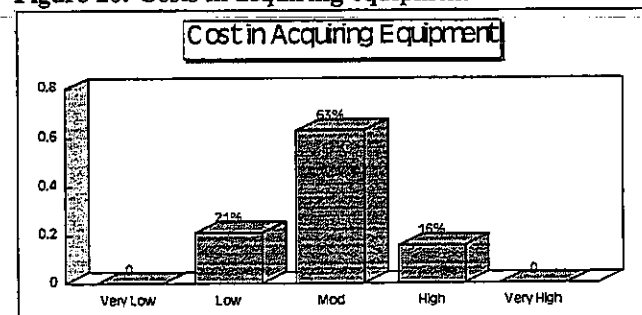
Respondents feel that the factor "difficulty in controlling performance" (ranked third) plays a rather very important role in impeding the organization from adopting telecommuting (Figure-18). In a survey conducted by Huws (1984), the lack of supervision over employees is seen as the main problem by around a quarter of the respondents in Italy and Germany and over half in France.

**Figure-19: Equipment security**



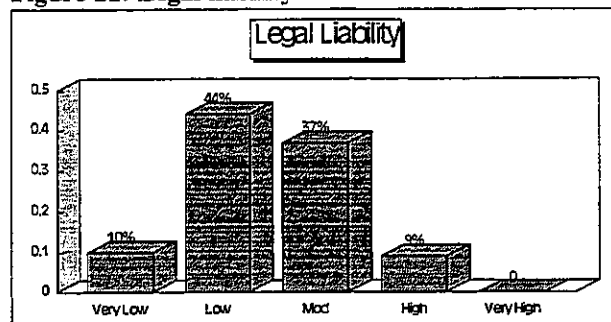
"Equipment security" is ranked as fourth in importance amongst organizational drawbacks (see Figure-19 for details). In most cases, the cost of the equipment will be borne by the individual employee making him/her responsible for the proper care of the equipment. Besides, if the organization provides the employee with the necessary equipment, there will be some form of penalties for any damages to equipment requiring the concerned employee to pay for the repairs.

**Figure-20: Costs in acquiring equipment**



As presented in Figure-20, the factor "costs in acquiring equipment" is not seen to be high in importance by most of the respondents. A matching factor cannot be found in the surveys carried out overseas. In Singapore, computers and telephones are prevalent in many homes. With the infrastructure in place, the costs of acquiring additional equipment will not be prohibitive.

**Figure-21: Legal liability**



As portrayed in Figure-21, most respondents (10% very low, 44% low) do not feel that fear of legal liability is an important factor impeding their organization from adopting telecommuting. This factor does not feature 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.

## 6 Conclusions

Telecommuting in Singapore is still in its infant stage. 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 NCB, NUS and NTU in promoting its awareness, the results of this and other surveys in Singapore showed that people still do not see telecommuting as a viable way to work. 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 in-depth understanding of this new work-arrangement. They are skeptical of whether the perceived benefits will actually be reaped. Furthermore, telecommuting will have a great impact on the organization and its employees. People are naturally resistant to change. Hence, it will take some time before people will be receptive towards telecommuting. In light of the skepticism, perhaps organizations can be encouraged to adopt the telecommuting scheme as a pilot scheme to tease out the practical problems of telecommuting before they adopt the full scheme.

## References

(Available upon request via e-mail).