The Impacts of Telecommuting on Organizations and Individuals: A Review of the Literature

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ABSTRACT

Based on a literature review, this paper identifies the positive and negative impacts of telecommuting on both the organizations and employees. Some recommendations concerning the management of telecommuting in organization are provided. In addition, the paper reviews the existing literature to identify factors leading to successful telecommuting programs, especially with regards to choosing the appropriate jobs and employees and changing managers' preconceived attitudes and traditional behaviors. Furthermore, this paper lists several essential steps that organizations should follow when implementing a telecommuting program.

RÉSUMÉ

En se basant sur une revue de la littérature, cet article identifie les impacts positifs et négatifs du télétravail sur les individus et sur les organisations. Des recommendations concernant la gestion des programmes de télétravail sont proposées. De plus, cet article identifie les facteurs clés pour le succès du télétravail, tout particulièrement en ce qui concerne le choix des individus et des tâches. Finalement, les étapes essentielles à l'implantation d'un programme de télétravail en organisation sont présentées.

MOTS-CLÉS

Telework, telecommuting, literature review, IT impacts

INTRODUCTION

Several factors have contributed to the emergence of telecommuting. First, more and more companies are downsizing their operations in the hope of lowering costs by reducing office space. Second, increased U.S. and international competition has led many companies to adopt extended workdays and flexible work schedules in order to better respond to customer needs and to retain and attract skilled employees. Third, computer and telecommunications technologies are becoming increasingly affordable and cost-effective, which enables a strong penetration of Information Technology (IT) in the organization (Brimesk and Bender, 1995). As a result, telecommuting (also known as telework) has grown from its modest beginnings in the early 1970s to achieve an unprecedented level today. In the United States, many organizations have adopted telecommuting (e.g., the California government, Pacific Bell, IBM, Panasonic, AT&T, Travelers Corporation, Apple Computer, and J.C. Penney). In fact, according to a survey of senior executives conducted by the William Olsten Center for Workforce Strategies, more than half of all North American companies currently allow their employees to telecommute (Source: http://www.thirdage.com/news/archive/971205-05.html). Several Canadian organizations also use telecommuting (e.g., Bank of Montreal, Bell Canada, British Columbia Hydro, British Columbia Telephone, Canadian Government, IBM Canada, National Bank, Purolator Courier, Royal Bank). Bell Canada, for example, employs more than 5000 telecommuters in the province of Quebec alone (Source: http://www.sistech.qc.ca/ archive.html).

Telecommuting is expected to continue growing in the years to come. According to the Gartner Group, over 30 million Americans will be telecommuting by the year 2000 and roughly one third off all jobs will be done, in part at least, through remote access. The Gartner Group predicts that, globally, the number of telecommuters should reach 137 millions by 2003. (Source: http://www.sistech.qc.ca/archive.html). According to Statistics Canada, over 1,500 000 Canadians are expected to work from home by year 2001 (Source: http://www.sistech.qc.ca/archive.html).

The objective of this paper is to provide a comprehensive assessment of what we know on the impacts of telecommuting on organizations and individuals and to present the main elements of effective management of telecommuting based on experience and empirical research. The paper is divided into four parts. First, telecommuting is defined, its components presented, and various types of telecommuting are discussed. Second, the effects of telecommuting on organizations and individuals are examined, and third, the main elements of effective management of telecommuting are presented. The paper ends by identifying some key factors for successfully implementing telecommuting programs.

DEFINITION AND COMPONENTS OF TELECOMMUTING

Telecommuting can be defined as a "work arrangement in which employees perform their regular work at a site other than the ordinary workplace, supported by technological connections" (Fitzer, 1997, p.65). Telecommuting represents an expansion of the places and times considered auspicious for work. Three principal components of telecommuting can be identified (Pinsonneault and Boisvert, 1996): utilization of information technology (IT), link with an organization, and de-localization of work. First, telecommuting depends on the processing, manipulation, and transformation of information. Thus, IT represents one of the major components of telecommuting because it enables workers to be in constant communications with their organization and their colleagues. Second, contrary to independent workers, telecommuters have ties with an organization (Bailyn, 1994). Telecommuting is not limited to permanent workers, as employees working on a contractual basis may also telecommute. However, distinctions exist between the type of telecommuting that is prevalent in each group. Authors generally recognize that telecommuting by contractual employees engenders a greater number of difficulties (Huws, 1984, 1993; Ramsower, 1985). This type of telecommuting usually includes clerical work where employees are remunerated on a piecemeal basis, or more infrequently, on an hourly basis. Moreover, Olson (1988) has suggested that the negative impacts generally attributed to home-based telecommuting do not stem from the location itself, but rather, from the contractual nature of the arrangement. Third, telecommuting is not constrained by time and space (Nilles, 1994; Olson, 1988). The de-localization of work takes four main forms: telecommuting from home (home-based), satellite offices, neighborhood work centers, and mobile work. Home-based telecommuting is usually performed in a dedicated area of the worker's place of residence. For this type of telecommuting, equipment installation fees are usually subsidized, entirely or in part, by the organization (Gordon and Kelly, 1986; Nilles, 1994). Satellite offices takes the form of a small organizational affiliates generally located in proximity to residential areas where a telecommunications link with headquarters is permanently maintained (Doswell, 1992; Nilles, 1994). This type of telecommuting represents an interesting compromise for organizations that desire to keep their employees in more traditional surroundings but closer to their homes. A distinction can be made between satellite offices and neighborhood work centers. The later are not organizational units, but instead, are private information centers that possess telecommunication tools that are generally shared by employees from various enterprises (Olson, 1987a; Di Martino and Wirth, 1990; Nilles 1994). Mobile work, on the other hand, is a form of telecommuting that is not limited to any specific "brick and mortar" location. Mobile work empowers employees with the capacity to perform activities in different places and in an ad-hoc fashion, such as, in a car, in a plane or in a hotel room. It includes such advantages as enabling better and more personalized customer service by allowing organizations to dispatch sales representatives directly to customer locations (Davenport and Pearlson, 1998). Therefore, telecommuting is not restricted to any one particular form and is not limited to working from home on a full time basis.

THE IMPACT OF TELECOMMUTING ON ORGANIZATIONS AND INDIVIDUALS

Impacts on Organizations

Telecommuting can transform the organizations numerous ways. Figure 1 lists the potential organizational impacts that have been identified in the literature.

Positive Impacts

Lower absenteeism (Duxbury and Higgins, 1995; Fitzer, 1997; Greengard, 1995; Gordon and Kelly, 1986; Huws, 1993; Kraut, 1987; Mahfood 1992; Nilles, 1994; Wilkes, Frolick, and Urwiler, 1994)

Increased feelings of belonging with the organization (Chapman et al., 1995)

Increase in loyalty (Caudron, 1992; Pratt, 1984)

Increased ability to retain best employees and attract new employees (Baig, 1995; Christensen, 1992; Cross and Raizman, 1986; Davenport and Pearlson, 1998; Di Martino and Wirth, 1990; Froggatt, 1998; Gordon and Kelly, 1986; Kraut, 1987; Mahfood, 1992; Olson, 1987b, 1988; Psikurich, 1996; Ruppel and Harrington, 1995)

Increased productivity (Alvi and McIntyre, 1993; Barthel, 1995; Baruch and Nicholson, 1997; Coté-O'Hara, 1993; Duxbury and Higgins, 1995; Gordon and Kelly, 1986; Huws, 1993; Katz, 1987; Kirkley, 1994; Kraut, 1987; Mahfood, 1992; Nilles, 1994; Trembly, 1998; Weiss, 1994; Xenakis, 1997).

Decrease in office rental costs; decreases overcrowding at the central office (Apgar, 1998; Christensen, 1992; Davenport and Pearlson, 1998; Gordon and Kelly 1986; Katz, 1987; Kirkley, 1994; Kraut, 1987; Mahfood, 1992; McCune, 1998; Nilles, 1994, Olson, 1987b)

Quicker responsiveness to customers and to unexpected events such as natural disasters (Eldib and Minoli, 1995; Fitzer, 1997; Katz 1987; Korzeniowski, 1997; Nilles 1994);

Increased organizational flexibility (Nilles, 1994; Olson 1987b; Ruppel and Harrington, 1995)

Better usage of information systems (Gordon and Kelly 1986, Hamilton 1987)

Negative Impacts

Greater absence of best employees from the office (Gordon and Kelly, 1986; Johnson, 1997)

Loss of synergy in the organization (Fitzer, 1997; Hamilton, 1987)

Difficulty in managing telecommuting makes supervisors dissatisfied (Christensen, 1992; Fitzer, 1997; Gordon and Kelly, 1986; Katz, 1987; Nilles, 1994; Solomon and Templer, 1993)

Increased data security concerns (Gray et al., 1993; Katz 1987)

Difficulty in objectively evaluating the financial benefits of telecommuting (Alvi and McIntyre, 1993, Doswell, 1992)

Figure 1. Potential Impacts of telecommuting on organizations

Positive impacts on organizations. According to a survey by Solomon and Templer (1993), 75% of companies that implemented telecommuting reported being satisfied or very satisfied with the experience and only 8% were dissatisfied. These results suggest that there exist many benefits that organizations can derive from telecommuting. First, several studies suggest that telecommuting reduces absenteeism, increases employee loyalty to the organization, and increases their general satisfaction. Olson (1987b) studied 20 employees across 20 organizations that had either adopted telecommuting or had started pilot projects and found that the telecommuting reinforced the existing relationship between workers and their organizations. Moreover, telecommuting was found to allow organizations to retain employees that might otherwise have left and attract skilled employees who were unwilling to relocate and for whom flexibility was important (Davenport and Pearlson, 1998; Di Martino and Wirth, 1990; Psikurich, 1996). These benefits can probably be attributed to the fact that telecommuting reduces the constraints imposed by traditional work environments (e.g., schedules and travel), increases the cohesion between work and family life, and made the employees feel that managers cared about them.

Second, improved productivity and quality of work associated with telecommuting is probably the most cited organizational benefit in the literature. However, few empirical studies directly and objectively measured the productivity gains. Managers often resort to subjective methods of evaluation (Connelly, 1995; Duxbury and Higgins, 1995; Mogelonsky, 1995). Some telecommuting specialists evaluate the increase in productivity to be between 15 and 50% (Alvi and McIntyre, 1993; Barthel, 1995; Baruch and Nicholson, 1997; Coté-O'Hara, 1993; Gordon and Kelly, 1986; Kirkley, 1994; Langhoff, 1996; Weiss, 1994). A survey conducted on 20 telecommuters, 17 supervisors, and 23 co-workers at Statistics Canada indicates that telecommuters strongly respected scheduling constraints and were able to organize their work in such a way that family obligations did not interfere with work (Duxbury and Higgins, 1995). Overall, there are some indications that telecommuters are more productive than then colleagues. Huws (1993) reports that telecommuters were 47% more productive than their colleagues (based on evaluations from their supervisors). Furthermore, the author reports that 25% of the work performed by telecommuters was of higher quality than comparable work performed by "traditional" workers. Several companies report similar impacts. For instance, American Express' output assessments suggest that the work performed by its teleworkers is 43% superior to that of employees that work in offices (Source: http://www.sistech.qc.ca/archive.html). Likewise, New York Telephone reports a 43% average increase in productivity associated with telecommuting, while Control Data Corporation estimates the productivity gain at about 20% (Clutterbuck, 1985). A survey conducted at Nortel indicates that 88% of its telecommuters reported increased productivity with an average improvement between 10 and 22% (Froggatt, 1998). Baruch and Nicholson (1997) found that over 70% of the 62 telecommuters (i.e. managers and professionals) they studied perceived themselves as working more effectively than in a traditional work arrangement. Several factors can explain the increase in productivity of telecommuters: lower levels of interference and interruptions, better work environment, the possibility of choosing more convenient working hours, more time spent working, and a stronger focus on achieving the required results rather than simply being physically present at work (Guimaraes and Dallow, 1999). Eldib and

Minoli (1995) suggest that productivity gains are linked to the elimination/reduction of traditional commuting which is compensated by a telecommuter's willingness to work longer hours.

Third, telecommuting allows organizations to reduce certain expenses. Typically, lower costs can be realized from reducing office space, energy consumption, parking spaces, and overcrowding of offices. For example, in the U.S., IBM reported saving US$75 million by selling buildings and reducing its leased office space (McCune, 1998). Ernst and Young was able to save US$25 million annually by reducing office space by two million square feet (Monnette, 1998). At AT&T, the alternative work initiative is estimated to have saved the company US$460 000 annually (Apgar, 1998). IBM Canada, reports annual savings of Cnd$35 million primarily due to a 55% reduction of their office rental costs (Greengard, 1994).

Fourth, telecommuting allows greater organizational flexibility and a better capacity to quickly respond to unexpected events. In fact, several organizations use telecommuting to decentralize their operations and to organize them into networks. Among the several benefits identified in a survey of 252 IS department heads (Ruppel and Harrington, 1995) was the organization's ability to continue operating in emergency situations (Fitzer, 1997). For instance, during the recovery and rebuilding following a series of earthquakes, many Californian companies relied on telecommuting to continue their daily operations, and have made these work arrangements permanent due to their initial success (Eldib and Minoli, 1995; Fitzer, 1997). Organizations may also increase their flexibility by hiring workers under various contractual arrangements (e.g., on a temporary basis). Telecommuting also enables an organization to provide flexible working hours for its employees.

Finally, telecommuting allows for a more efficient usage of the organization's information system, particularly during non-office hours (e.g., at night and on weekends) (Gordon and Kelly, 1986; Hamilton, 1987).

Negative Impacts on Organizations. Telecommuting can also have negative organizational impacts. Often, the employees that are better suited for telecommuting (i.e., motivated, well-organized, and not requiring constant supervision) are those that companies would rather retain on-site (Johnson, 1997). Another possible problem that may arise is the loss of synergy caused primarily by the physical absence of key employees from the office. In fact, the coordination and motivation of all employees, the valorization of a common culture and feelings of belonging are much more difficult to sustain in the context of telecommuting. Davenport and Pearlson (1998) note that traditional offices serve several functions such as helping maintain a corporate culture and identification/loyalty with the company and that these functions are difficult to maintain in a telecommuting arrangement. A survey aimed at identifying the factors underlying corporate resistance to telecommuting in the UK, indicates that over 35% of the 115 senior personnel managers studied believed that telecommuting threatened corporate structure and identity (Gray, Hodson, and Gordon, 1993).

A second negative impact is the discontentment of those managers in charge of telecommuters. This often arises due to managers' difficulty in adapting their management styles to the new reality imposed by telecommuting (Christensen, 1992). Third, the security of transmitting corporate data via telecommunication networks concerns managers (Gray et al. 1993; Katz, 1987). More telecommuting is being done over the Internet. However, because of its openness and ubiquity, manager are concerned that company data can not only be intercepted but also manipulated by unauthorized parties (Greenstein and Feinberg, 1999). This, however, seems to result from a misunderstanding of the different security measures available. Finally, although Nilles (1994) suggests that most telecommuting programs are profitable after one year in operation, it is often difficult to objectively evaluate the financial benefits of such programs. (Alvi and McIntyre, 1993; Doswell, 1992).

The Impacts of Telecommuting on Individuals

Figure 2 lists the potential impacts of telecommuting on individuals.

Positive Impacts	Negative Impacts
Reduction/ elimination of transport time (Baruch and Nicholson, 1997; Christensen, 1992; DeSanctis, 1984; Mahfood, 1992; Nilles, 1994; Olson, 1988; Pratt 1984)	**Feeling of isolation** (Chapman et al., 1995; Fitzer, 1997; Guimaraes and Dallow, 1999; Huws, 1984, 1993; Johnson, 1997; Katz, 1987; Kinsman, 1987; Olson, 1988; Reinsch, 1997; Solomon and Templer, 1993)
Cost savings related to work habits (e.g., travel, clothing and food) (Baruch and Nicholson, 1997; DeSanctis, 1984; Olson, 1988)	**Reduction in chances of promotion** (Chapman et al., 1995; DeSanctis, 1984; Gordon and Kelly, 1986; Hamilton, 1987; Katz 1987)
Flexibility in the organization of work hours and leisure activities (DeSanctis, 1984; Di Martino and Wirth, 1990; Olson 1988; Reinsch, 1997)	**Tendencies to overwork** (Fitzer, 1997; Gordon and Kelly, 1986; Nilles, 1994; Olson, 1988)
Increase in Productivity (Baruch and Nicholson, 1997; Caudron, 1992; Côté-O'Hara, 1993 ; Di Martino and Wirth, 1990 ; Duxbury and Higgins, 1995; Huws, 1993; Olson, 1988; Reinsch, 1997).	**Potential decrease in frequency of intra-organizational communication for full-time telecommuters** (Ramsower, 1985; Richter and Meshulam, 1993)

Figure 2. Potential Impacts of Telecommuting on Individuals

Positive impacts on individuals. As indicated in Figure 2, telecommuting can have both positive and negative impacts on individuals. One of the major benefits of telecommuting stems from the elimination or reduction of the time needed to physically commute to work. Baruch and Nicholson (1997) note that 75.5% of the 62 part-time telecommuters (i.e. managers and professionals) they interviewed reported that telecommuting allowed them to save over one hour a day in commuting. By reducing the time and distance that must be traveled to work or by completely avoiding traditional forms of commuting, telecommuting can help alleviate high levels of stress. Moreover, telecommuting provides individuals with the potential to reconcile their personal lives with their work-related obligations. It provides individuals with more freedom in managing their time between work, leisure activities, and family responsibilities (Reinsch, 1997). In a survey of 20 part-time telecommuters, increased flexibility and personal control over work and life were judged as being the most important motivators for telecommuting (Knight and Westbrook, 1999). In fact, this increased flexibility seems to be the cause of higher levels of employee satisfaction and productivity. Ninety percent of Northern Telecom's (Nortel) telecommuters reported greater job satisfaction and 73% of them reported experiencing a decrease in stress level (McCune, 1998). Richter and Meshulam (1993) note that telecommuting allows individuals to be more productive because it enables them to work when their creativity is high (which for some employees may not correspond with regular office hours). Also, telecommuting lowers the number of distractions in the traditional office environment, thus allowing greater concentration and focus on important tasks (Côté-O'Hara 1993; Huws, 1993; Nilles, 1994; Pratt, 1984). The results of a survey of 20 telecommuters indicate that 58% of them believed that greater tranquility allowed them to be more productive (Duxbury and Higgins, 1995). Similarly, both Côté-O'Hara (1993) and Di Martino and Wirth (1990) suggest that it is the lower number of interruptions and the increase in attention and motivation due to the elimination of the stress caused by daily commuting that lead to productivity gains. Telecommuting can also lower the costs associated with work, such as travel, clothing and restaurants (Nilles, 1994; Pratt, 1984).

Negative impacts on individuals. Telecommuting may also produce some undesirable effects on individuals. For example, recently, the German Union of Bank Employees has raised several concerns related to telecommuting such as: increased levels of overwork, the invasion of personal life, a loss of confidentiality, the lack of adequate feedback related to work performance, and with the social isolation of telecommuters (Source: The Sun, March 14th, 1999). In fact, feelings of isolation and the loss of morale are the most commonly cited drawbacks of telecommuting (Fitzer, 1997; Haddon and Lewis, 1994; Huws, 1993; Solomon and Templer, 1993). In a study conducted with 103 telecommuters, 29% of respondents identified being left out of office communications and the feeling of isolation as important disadvantages of telecommuting (Reinsch, 1997). Also, Duxbury and Higgins (1995) reported that 23% of supervisors (n = 17) believed that communication problems had arisen during a pilot project conducted at Statistics Canada. However, very little empirical evidence exists to substantiate these claims. In fact, Katz (1987) argues that the loss of morale does not depend on the particular work environment in which the telecommuter works, but rather, to events concerning the type of work itself. Also, lower morale might happen during the

first weeks of telecommuting because individuals can feel isolated at first. Apgar (1998) describes one AmEx unit using a 'buddy system' where remote workers contact on-site colleagues each morning. Their topics of conversation are not restricted; instead, the company wishes to promote informal chats about a variety of topics that employees used to engage in "around the water cooler in a commercial office" (p. 135). Companies can stimulate social interactions between co-workers and telecommuters and reduce feelings of isolation by limiting the number of days employees telecommute to less than five and making sure that telecommuters attend company meetings and social events (Guimaraes and Dallow, 1999; Johnson, 1997).

Another potential negative impact related to telecommuting is the emergence of conflicts between family and work related roles (Hartman, Stoner, and Arora, 1991; Richter and Meshulam, 1993). Such situations usually arise when telecommuters, working from their homes, become less productive because distractions and interruptions abound (Mogelonsky, 1995). Not surprisingly, results from a survey conducted with 97 telecommuters showed that family disruptions were significantly negatively correlated with telecommuting satisfaction ($p = 0.004$) (Hartman, Stoner, and Arora, 1991). However, such problems can generally be avoided by ensuring that one room in the home is reserved specifically for telecommuting purposes and that family members support the initiative (Baruch and Nicholson, 1997; Nilles, 1994; Weiss, 1994).

In addition, telecommuters often feel a lack of organizational support, which creates other problems. A survey of 119 employees in 25 North American companies indicates that lack of organizational support for telecommuters was positively correlated with perceived stress levels (path coefficient. $= 0.422$, $p < 0.001$), which was significantly and negatively associated with satisfaction with both the job and non-work life (Dixon and Webster, 1998).

Some studies indicate that telecommuting on a part-time basis, that is 1 to 3 days per week, reduce of eliminate several disadvantages (Huws, 1993; Duxbury and Higgins, 1995). Weiss (1994) notes that limiting telecommuting to two or three days a week ensures business and social interactions. A six-month study of 16 telecommuters conducted by Ramsower (1985) provides evidence of the benefits of part-time telecommuting. Results indicated that part-time telecommuting arrangements did not negatively impact intra-organizational communications. Conversely, full time telecommuters experienced decreases in the amount and frequency of communications and difficulties to ask questions and talk to colleagues. However, Duxbury and Neufeld's (1999) six months longitudinal study of 36 part-time telecommuters (averaging 15.8 hours/week, standard deviation = 14.82 hours/week) indicates that communications between telecommuters, their managers, and their co-workers was not affected by telecommuting. Similarly, Fritz, Narasimhan, and Rhee (1998) indicate that the 170 telecommuters they studied did not perceived that telecommuting hindered their communications with co-workers.

MANAGING TELECOMMUTING

Telecommuting, simply by the fact that employees are not physically present at the work place, transforms traditional management practices. Telecommuting requires a transition from activity and time-based management to project management and result-based evaluations (Di Martino and Wirth, 1990; Grensing-Pophal, 1999; Guimaraes and Dallow, 1999). Alvi and McIntyre (1993) and Kepczyk (1998) and Johnson (1997) suggest that employee evaluation should be conducted in terms of quality, quantity, timeliness, and the degree to which objectives are met, rather than on an hourly basis. In their study of 316 telecommuting employees in 18 companies, Guimaraes and Dallow (1999) found that in general, employees perceived their supervisors to be results-oriented rather than activity or effort oriented, and to have a positive attitude about telecommuting.

The telecommuting literature converges with this finding, as it indicates that managers' resistance to telecommuting greatly hinders its diffusion in organizations (Christensen, 1990, 1992; Eldib and Minoli, 1995; Haddon and Silverstone, 1992; Huws, 1993; Grensing-Pophal, 1999; Kavan and Saunders, 1998; Solomon and Templer, 1993). In a survey of 91 chief executive officers of Canadian companies, Solomon and Templer (1993) identified "supervisor attitudes" as one of the most frequently cited problems of implementing telecommuting. Typically, managers expect and fear the arrival of problems related to the supervision and control of telecommuting employees (Caudron, 1992; Haddon and Silverstone, 1992). The results of a 1995 AT&T survey conducted with 200 senior managers from fortune 1000 companies shows that 63% of them perceived that reduced control and supervision represented a major drawback of telecommuting (Johnson, 1997). Typically, managers believe that, because telecommuting decreases the frequence of face-to-face contacts, telecommuters often loaf (Fitzer, 1997) Such beliefs also affect employees. Several authors have noted that employees often fear that they will miss out on important information and promotions if they are out of their manager's sight (Adams, 1995; Connelly, 1995; Humble et al., 1995; Weiss, 1994). It seems managerial resistance to telecommuting can often be attributed to a strongly held belief that telecommuters cannot be monitored and effectively managed because of the lack of direct supervision (Caudron, 1992).

The manager/supervisor should…

- Establish a relationship of confidence between the worker and managers. This represents a crucial element for the success of any telecommuting project (Caudron, 1992; Christensen, 1992; Guimaraes and Dallow, 1999; Olson, 1987).

- Enable good communications on a regular basis and insure that communication is effective between telecommuters and the other members of a team. Managers should always be open to the comments of individuals and should adopt a supportive role of 'mentor' (Kirvan, 1995; Staples, 1996; Staples et al., 1998; Guimaraes and Dallow, 1999; Mahfood, 1992).

- Establish precise goals and objectives. This should be done in collaboration with both telecommuters and all other employees involved. The manager should then attribute the resources necessary to the realization of each step needed to achieve these goals and objectives (Davenport and Pearlson, 1998).

- On a regular basis, evaluate and provide feedback on the work of telecommuters and take corrective measures when their work practices deviate from the pre-established goals and objectives (Gray et al. 1993; Weiss, 1994).

- Ensure that telecommuters participate in organizational activities and are kept informed of events concerning the organization (Apgar, 1998; Guimaraes and Dallow, 1999).

- Consider the telecommuter like any other employee. Managers should not make the telecommuter "an exception to the rule" (Fitzer, 1997; Knight and Westbrook, 1999).

Figure 3. Some elements of management in the context of telecommuting

The above discussion clearly indicates that as workers move away from the office, managers need to change their managerial style (Richter and Meshulam, 1993). Some elements of effective management in the context of telecommuting can be identified in the literature and are presented in Figure 3. It is clear that one of the necessary conditions for the success of any telecommuting initiative is mutual respect, confidence and trust between employees and managers (Caudron, 1992; Chistensen,

1992; Duxbury and Higgins, 1995; Guimaraes and Dallow, 1999; Olson, 1987a). This condition necessitates that both employees and managers mutually acknowledge each other's abilities and aptitudes. Huws (1993) identifies three different management styles that are being practiced by successful telecommuting managers. The "at hands reach" approach (where the work of employees is closely and frequently monitored) appears to be effective when telecommuters possess minimal qualifications and are remunerated on a piecemeal basis. In the "collaboration" style, targets are mutually agreed between teleworkers and managers. In this approach, managers frequently meet teleworkers and supplemental team meetings are often scheduled. This style is especially well suited for permanent employees with whom managers have a close relationship and extensive communications. The "relationship of trust" style (a laissez-faire approach) generally applies to self-managed senior professionals that have contractual employment arrangements or work autonomously, are often paid on an hourly basis.

Notwithstanding the approach favored, telecommuting requires well-structured and constant communications between the telecommuter and the manager. In the survey conducted by Guimaraes and Dallow (1999), telecommuters identified the "ability to communicate well with others" as one of the most important manager characteristic. In a study on the relationship between 103 telecommuters and their managers, Reinsch (1997) found that established relationships began to deteriorate after about seven months into the project. The author suggests that, during the first few months, a strong sensitivity exists towards telecommuters because of the newness of the arrangement, but that negative consequences emerge after the initial excitement fades. Because the telecommuter is no longer expected to adhere to regular office hours, managers should be more easily accessible; moreover, it becomes essential to adequately plan meetings, communications, and the exchange of documents (Mahfood, 1992). Hartman et al.'s, (1991) study of 97 telecommuters indicates that adequate communications and technical/emotional support was significantly and positively correlated to their satisfaction with telecommuting ($p < 0.01$).

Another problem often associated with telecommuting is managers' feeling of loosing direct control over employees (Huws, 1984; Kinsman, 1987; Olson, 1987a). Nevertheless, it seems that managers can use alternative strategies in order to compensate for this loss. These practices include such measures as control by electronic means (e.g., verification of access time and consulted files; Olson, 1985), increased control by the use of formal and rigorous specifications (e.g., targets, detailed procedures and formalization; Huws, 1984; Kinsman, 1987), and finally, market control mechanisms (e.g., lump-sum payment based on results or on a piecemeal basis; Haddon and Lewis, 1994). Guthrie and Pick (1998) reported the attitudes of 134 professionals in the Los Angeles area regarding what represented ethical behaviors when managing telecommuters. Results showed that keeping logs of telecommuters' connect time and performing telephone spot checks were not perceived as being unethical control measures. Davenport and Pearlson (1998) suggest that customer satisfaction levels may be used as a means for evaluating certain telecommuters because one may consider it as indicative of the virtual worker's performance. Also, previous first-hand experience with telecommuting is an important asset for a manager.

It provides familiarity with the different facets of telecommuting and enables managers to better respond to the expectations of telecommuting employees (Haddon and Lewis, 1994).

Alternatively, managers can reduce reliance on control mechanisms and adopt a more appropriate results-oriented approach. When managers use goals andquotas, they should be reasonable and attainable, but nevertheless, challenging for the telecommuter (Davenport and Pearlson, 1998; Mahfood, 1992). Gray et al. (1993) suggest defining 'milestones' in order to clearly establish what is expected on what date. Companies usually set the same standards for both telecommuters and office workers although some companies do expect higher performance from telecommuters (Fitzer, 1997).

IMPLEMENTING A TELECOMMUTING PROGRAM: THE IMPORTANCE OF PLANNING

Several benefits can be derived from telecommuting, but to achieve them, managers have to proactively manage the potential business problems associated with telecommuting programs. If the decision to proceed with the implementation of a telecommuting program is warranted, there are several essential steps that should be followed in order to maximize the chances of success. Figure 4 presents the main success factors that have been identified in literature.

Success factors include…

- Clearly establishing the program's goals and objectives. Is the aim to develop a large-scale program or should the scope be restricted to a specific group of employees? In any case, an assessment of the existing and potential interdependencies between the individuals involved is crucial (Christensen, 1992; Gray et al. 1993).

- Developing guidelines; establishing policies concerning eligibility to the program and its duration, considering what equipment will be required, and determining the selection process of candidates (Apgar, 1998; Christensen, 1992; Guimaraes and Dallow, 1999; Weiss, 1994).

- Selecting employees and managers that will help ensure the success of the telecommuting program. This should be done on a voluntary basis. Evaluating each candidate's profile, and whether the type of task is appropriate for telecommuting (Baruch and Nicholson, 1997; Christensen, 1992; Fitzer, 1997).

- Ensuring that both managers and employees receive proper training. They should be trained to work effectively in the context of telecommuting, including making sure that they can properly use IT equipment and the communication channels (Davenport and Pearlson, 1998; Fritz et al., 1998; McCune, 1998; Staples, 1996; Staples et al., 1998).

- Writing-up a formal contract that specifies the responsibilities of the participants and clearly states the organization's expectations. The contract should also state who will supply the equipment and explain the process of termination (how much notice is to be given and under what conditions termination will occur). Verifying whether such considerations as insurance coverage, responsibility in the upkeep of the equipment and payment of over-time are specified in the contract (Gerber, 1995; McCune, 1998).

- Ensuring an adequate physical and technological environment with all the necessary technical support. If technologies such as e-mail and video conferencing are to be utilized, then an evaluation of the organization's technical background with such tools is necessary (Davenport and Pearlson, 1998; Fritz et al., 1998).

- Determining how telecommuters' performance will be assessed for remuneration and promotion purposes. Managers should also ensure that remuneration and reward systems are considered as being equitable by both the telecommuters and their colleagues (Fitzer, 1997; Hartman et al., 1991).

- Preparing a calendar of events that will allow all members of the organization to meet on a regular basis (Christensen, 1990, 1992).

- Ensuring that data security measures are put into place (Katz, 1987; Weiss, 1994).

Figure 4: Organizational considerations for successfully implementing a telecommuting program

First, managers should know why telecommuting is being considered and exactly what benefits they hope to obtain from it. This will later allow the organization to evaluate the success of the program and decide whether any corrective measures should be taken. A pilot-project may be necessary to allow the organization to experiment with the various human and organizational dimensions of telecommuting (Apgar, 1998; Christensen, 1990; Guimaraes and Dallow, 1999; Niles, 1994). Apgar (1998) notes that an alternative work program involves many innovations and departures from deeply held norms and needs to be implemented in a phased and progressive approach. Weiss (1994) notes that the only real way to evaluate whether telecommuting will be successful in an organization is to experiment with it on a trial basis with three or four employees. At Merrill Lynch, for instance, candidates are acclimatized in a simulated home office for a period of two weeks (Apgar, 1998). Such measures not only enable employees to assess for themselves whether telecommuting is right for them, but also, minimizes the company's risk of selecting inappropriate employees that may want to revert back to traditional office work after an important investment in remote-work equipment has been made, similar to what happened at Xerox (Davenport and Pearlson, 1998). It is also important for managers to monitor the pilot project over a period of several months (Gray et al. 1993).

Second, managers should make sure that the home-office is equipped with ergonomic furniture and computer equipment (McCune, 1997) and that security measures are enforced (Gray et al. 1993; Weiss, 1994). Moreover, if the equipment is supplied by the employer, the company should specify the limits of personal use (Fitzer, 1997). Clearly describing what performance measures will be used for employee compensation and promotion is also important. Because of management's inability to directly supervise its telecommuters in the traditional sense, compensation based on hourly work may not be appropriate. Instead, measures such as the number of projects completed by the telecommuter (McCune, 1998), on-time deliveries, error rates, quality standards, and customer satisfaction (Fitzer, 1997) may be better measures for compensatory assessments. According to the results of a study conducted across 11 organizations with 97 telecommuters, the performance evaluation system adopted by the organization was found to be directly related to telecommuters' productivity ($p < 0.05$) and satisfaction ($p < 0.01$) (Hartman et al., 1991).

Third, managers need to identify the tasks that are suitable for telecommuting. Typically, these are tasks with high informational content, that can be easily decomposed into subtasks, and that necessitate few and infrequent direct contacts with colleagues but require extended periods of concentration in order to be completed successfully. Baruch and Nicholson (1997) suggest that telecommuting is especially appropriate for two types of jobs: low autonomy level and technologically simple jobs, for which remote control is easy, and highly autonomous jobs and professions where managers can rely on trust. Similarly, Richter and Meshulam (1993) suggest that both very routine and very complex tasks seem especially adequate for telecommuting. Moreover, Fritz et al., (1998) found that higher task predictability and increased satisfaction with office communications for telecommuters were significantly associated (beta coeff. = 0.15, $p = 0.004$). According Guimaraes and Dallow (1999), tasks that are

most appropriate for telecommuting have well defined objectives and require little need for access to equipment, materials, and services that are available only at the central office.

Fourth, as illustrated in Figure 5, research indicates that some individuals characteristics might facilitate telecommuting.

Task characteristics	Individual characteristics
Possess a high informational content. The work is decomposable into several sub-tasks and the means necessary to accomplish and measure each one is easily identifiable (Fitzer, 1997; Olszewski and Mokhtarian, 1994)	**Autonomous, requiring minimal super-vision; very motivated, and self-disciplined** (Baruch and Nicholson, 1997; Davenport and Pearlson, 1998; Fitzer, 1997; Kepczyk, 1998; Weiss, 1994)
The work can be performed with relati-vely little face-to-face contact with collea-gues (Duxbury and Higgins, 1995; Fitzer, 1997; Weiss, 1994)	**Highly skilled and communicating well with others** (Baruch and Nicholson, 1997; Guimaraes and Dallow, 1999; Weiss, 1994)
Completion requires extensive periods of mental concentration (Bailyn, 1994; Fitzer, 1997)	**Feels comfortable with the IT components. A basic knowledge of the organization's information system is preferable** (Baruch and Nicholson, 1997; Guimaraes and Dallow, 1999; Kepczyk 1998; Staples et al., 1998)
Tasks that are predictable and have well defined objectives (Fritz et al. 1998; Guimaraes and Dallow, 1999)	**Has social contacts aside from family and those at work. Prefers work with little so-cial interaction** (Baruch and Nicholson, 1997; Humble et al., 1995, Richter and Meshulam, 1993)
Tasks that do not require any specific physical location and that do not depend on access to special materials, equip-ment, or services (Duxbury and Higgins, 1995; Fitzer, 1997; Guimaraes and Dallow, 1999)	**Volunteers for the telecommuting project** (Knight and Westbrook, 1999; De Sanctis, 1983; Huws, 1993; Mahfood, 1992; Nilles, 1994)
Tasks for which the steps and expected start and end dates for the various parts of the project can be clearly identified (Gray et al., 1993)	**Has a trusting relationship with his/her manager/supervisor** (Baruch and Nicholson, 1997; Weiss, 1994)
The work can be accomplished without continual supervision and the working conditions are not dictated by union norms (Baruch and Nicholson, 1997; Kepczyk, 1998)	**Has a positive attitude towards Telecommuting** (Guimaraes and Dallow, 1999; Johnson, 1997; Solomon and Templer, 1993)
The work includes either very com- plex tasks or extensive routine treat-ment of information (Richter and Meshulam, 1993)	**Highly productive and dependable. Loyal to the organization** (Guimaraes and Dallow, 1999; Mahfood, 1992)
Intensive use of computers and/or telecommunications technology (Di Martino and Wirth, 1990; Weiss, 1994)	**Has not a tendency to overwork** (Alvi and McIntyre, 1993; Dunkin and Baig, 1995)
Tasks that can be easily evaluated in terms of quality, quantity, and time-liness (Baruch and Nicholson, 1997; Johnson, 1997; Kepczyk, 1998).	**Entrepreneurial and likes flexibility** (Bailyn, 1994)
	Employee who has a positive self-effi-cacy assessment about his/her ability to perform remote work (Staples et al., 1998)

Figure 5: Task and individual characteristics that better suited for telecommuting

Although telecommuting ought to be offered on a voluntary basis (Knight and Westbrook, 1999), selection of volunteers helps to increase the probability of success of such a program (DeSanctis, 1983, Huws, 1993; Nilles, 1994). It is important that telecommuters be familiar with the organization's culture and that they have worked in the organization long enough to have established contacts. For example, America West Vacations ensures that it knows the work habits of all of its telecommuters and that, in turn, they know its culture by requiring that candidates have more than one-year work experience in the company (Korzeniowski, 1997). Bailyn (1994), Baruch and Nicholson (1997), Guimaraes and Dallow (1999), Kepczyk (1998), and Nilles (1994) suggest that people who work well in a telecommuting context are self-disciplined, flexible, highly skilled, have a positive attitude toward telecommuting, have high levels of productivity, autonomous and moderately people-oriented, prefer working at home, dependable, and avoid overworking.

Employees' self-efficacy has also been found to be associated with telecommuting program success. A survey of 376 remotely managed employees (i.e., in a different building, city, state, or country – with a median distance of 483 kilometers) from 18 North-American organizations indicates that self-efficacy judgments were significantly and positively associated with work effectiveness, overall productivity, and job satisfaction (Staples, Hulland, and Higgins, 1998). IT self-efficacy was also found to be positive associated with success.

Others have looked at different personality traits that might negatively affect telecommuting success. Richter and Meshulam (1993) suggest that young and inexperienced employees do not make good candidates because they have not established contacts within the organizations that they can maintain when telecommuting. Davenport and Pearlson (1998) suggest that satisfaction with remote work arrangements may eventually suffer when office interactions are the main element in the employee's social life. Baruch and Nicholson (1997) suggest that certain personality types such as extroverts might feel socially deprived. In addition, they note that less autonomous individuals might feel disoriented when confronted with the high discretionary environment of telecommuting.

Fifth, another important factor is training. Staples et al., (1998) found that prior experience/training was positively associated with remote work self-efficacy, suggesting that organizations should implement adequate training programs in order to educate both employees and managers about telecommuting. Training should be conducted in three ways: employee training, manager training, and team training (Grensing-Pophal, 1999). Team-training consists of bringing a telecommuter and his/her manager together to discuss how the new work arrangement will impact their relationship. A crucial aspect in both employee and manager training is ensuring that good communication skills develop in order for telephone, video conferencing, and email exchanges to be effective (Humble, Jacob, and Van Sell, 1995; Grensing-Pophal, 1999) and that managers develop or increase their ability to listen and communicate (Staples et al., 1998). It is important for managers not to fall into patterns where communications with employees are strictly task-oriented. Rather, communications should be balanced with some form

of relationship-building (Davenport and Pearlson, 1998). In fact, technical and emotional communications and support from managers are critical to ensure employee satisfaction (Hartman et al., 1991). Moreover, the entire organization's workforce should also be included in the educational program because telecommuting not only affects the telecommuter but also non-telecommuters who risk losing contact with employees who partake in the program (Apgar, 1998; Grensing-Pophal, 1999). Fritz et al., (1998) conducted a survey of 170 telecommuters and found that adequate training in IT was crucial in maintaining telecommuters' satisfaction with office communication channels (Beta coeff. = 0.40, p = 0.000). Training should also encompass such activities as dealing with interruptions by family members and friends, communications with co-workers, and safety and security (Caudron, 1992). However, although training is clearly important for the success of telecommuting programs, it is often overlooked in practice. Reinsch's (1997) study of 103 telecommuters indicates that 48% of the participants had not received any form of training, and for those who had, they described it as brief, incomplete, and primarily focused on using the software.

Finally, it appears that part time telecommuting is more successful than full time programs. Hartman et al., (1991) found negative and significant correlations between the proportion of time spent at home telecommuting and perceived productivity (p=0.04). Their results indicate that employees who spent 50% or less of their work time telecommuting were more productive (p = .002) than those who spent more than 50% telecommuting.

CONCLUSION

This paper reviewed the business and academic literature and highlighted several important impacts of telecommuting on both the organization and its employees. Advantages for organizations include lower levels of absenteeism, increased levels of employee loyalty, a better retention of skilled employees, increased productivity, cost savings, increased flexibility, and the potential to quickly recover from interruptions due to unexpected events such as natural disasters. However, telecommuting is also associated with some undesirable effects such as the absence of employees from the office, a loss of synergy within the organization, and a lower security and control of organizational data. Moreover, several authors have noted that managers often experience difficulty in supervising and objectively evaluating the performance of telecommuters.

For employees, benefits of telecommuting include time and cost savings, reductions in stress levels, more flexible working hours, and fewer interruptions, which are likely to lead to greater job satisfaction and increased productivity. However, telecommuting can also lead to feelings of isolation and a loss of morale.

Some success factors of telecommuting programs were also identified. Organizations must enable effective communications between telecommuters, their managers, and co-workers and ensure that telecommuters regularly participate in

organizational activities. Managers must also provide frequent feedback and evaluate performance based on results rather than on the means used to achieve them. Adequate training should not be limited to educating telecommuters, but also, their supervisors. Training significantly affects telecommuters' self-efficacy assessment, which has a significant impact on both satisfaction and productivity. Furthermore, tasks that can be easily evaluated in terms of quality, quantity, and timeliness and that do not require constant supervision are better suited for telecommuting. Organizations should carefully screen participants to telecommuting programs. Companies should ensure that employees are interested and motivated in telecommuting, self-disciplined, comfortable with using IT, and have good personal contacts within the firm.

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