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# THE BENEFITS AND LIMITATIONS OF TELECOMMUTING

*Jerome H. Collins and Joseph "Joe" Moschler*

This article explores the benefits and limitations of telecommuting on individuals and organizations within the Department of Defense. Telecommuting is linked to increased employee satisfaction with the employer, reduced employee turnover, and increased employee productivity. However, the authors also identify the limitations of telecommuting, such as employees feeling isolated from their co-workers and managers' concern about decreased productivity among telecommuting employees versus those in the traditional office setting. The authors present findings from a review of the research on the benefits and limitations of telecommuting. Additionally, a case study of telecommuting in a Department of Defense organization is presented to show a tangible cost-benefit analysis of telecommuting to an organization.

**T**elecommuting has gained considerable attention in recent years. This is due in part to organizations, both in the private sector as well as the public sector, using telecommuting to accomplish organizational goals and to affect the organization's "bottom-line" results. This can be seen in such organizations as AT&T, IBM, and Sun Microsystems. Within AT&T, one-third of the company's managers are not bound to a particular worksite (Conlin, 2006). Similarly, 40 percent of IBM's workforce has no official office (Conlin, 2006). The tangible benefits of telecommuting are enormous. Sun Microsystems allows half its employees to work anywhere they want, and by so doing, estimates that it saves \$300 million a year on real estate costs (Conlin, 2006).

The federal government has also made some significant progress in implementing telecommuting. Some agencies have fully embraced telecommuting with positive results. For instance, the United States Patent and Trademark Office (USPTO) is recognized as a pioneer in the area of telecommuting. It has established two very successful telecommuting programs. The "Trademark Work-at-Home" program has 86 percent of the total number of trademark attorneys working from their homes

the majority of the week, and going into the office one day a week where they share office space. Similarly, the “Patent Hoteling” program has 1,000 patent examiners participating in the telecommuting program. In total, the USPTO has 40.7 percent of its workforce in telecommuting arrangements (Byrne, 2007).

The United States Congress has been actively involved in promoting telecommuting throughout the government. Starting as far back as the year 2000, Congress mandated that agencies should “establish a policy under which eligible employees of the agency may participate in telecommuting to the maximum extent possible” (Office of Personnel Management, n.d.). For instance, the Telework Improvement Act of 2007 (H.R. 4106), co-sponsored by Representatives Danny Davis (D-IL) and John Sarbanes (D-MD), is intended to encourage federal agencies and employees to utilize telecommuting, especially in the area of Continuity-of-Operations, commonly known as COOP (Walker, 2008). The bill was passed by the House in June 2008, but has yet to be voted on by the Senate. Similarly, Senate Bill S.1000, The Telework Enhancement Act, was introduced in 2007 and requires agencies to create a telework policy for their specific agency and provide training to their employees—including managers—on utilizing telework (Holmes, 2008).

The terms *telework* and *telecommute* are at times used interchangeably, and there are definitions for both. Telework has been defined as any form of substitution of information technologies (telecommunications and computers) for work-related travel (JALA International, n.d.). Telecommute is defined as that portion of teleworking that applies to the daily commute to and from work (JALA International, n.d.). For instance, a person who participates in a meeting using video teleconferencing equipment would be considered a teleworker since he or she did not have to travel to the meeting. A person who performs some portion of their work either from home or another worksite without having to travel into work would be considered a telecommuter. Therefore, all telecommuters are teleworkers, but not all teleworkers are telecommuters. From a federal government standpoint, the Office of Personnel Management (OPM) uses the term telework for reporting purposes and for all other activities related to policy and legislation. OPM defines telework as work arrangements in which an employee regularly performs officially assigned duties at home or other worksites geographically convenient to the residence of the employee (Office of Personnel Management, n.d.).

The underlying issue is not what telework or telecommute are, but what they are trying to accomplish. From an academic level, Tietze and Musson (2003) state, “Paid work has become ‘flexible’ and is no longer exclusively associated with particular geographical settings.” In other words, work is not a place to go but an “activity” that can be done anywhere and anytime. From a practitioner level, a manager from a Seattle, Washington, public relations firm summed it up succinctly: “As long as you get your work done, it doesn’t matter too much where you do it” (Gardner, 2006). Throughout the rest of this article, telecommuting will be used to describe this activity.

Telecommuting is becoming more of a topic for discussion for two reasons: a) more jobs and managers are amenable to allowing telecommuting, and b) more individuals are requesting the option of telecommuting. As Potter (2003) states, “Employees are requesting the option of working at home to avoid potential workplace

threats, to reduce anxiety, and to get the job done.” This moving of the work to where the worker is does have limitations (Igbaria & Guimaraes, 1999). The main one cited is that managers often believe they have reduced insight into what their employees are doing unless they can physically see them at work.

Based upon a review of recent research done in the area of telecommuting, the rest of this article will present the benefits and limitations of telecommuting; and based upon this research, as well as the author’s professional experiences, a case study of a notional Department of Defense organization will be developed for discussion.

## THE POWER AND PRICE OF TELECOMMUTING

The growth, power, and sophistication of technology have made remote work a viable option. If technology has enabled the growth of telecommuting, then the demands of three constituencies (i.e., employees, organizations, and society) have fueled that growth (Igbaria & Guimaraes, 1999). Each of these constituents has both tangible and intangible benefits and limitations associated with telecommuting. The remainder of this article explores these benefits and limitations.

### BENEFITS

#### EMPLOYEES

One of the most significant tangible benefits associated with telecommuting is the reduction of travel time and expenses (Crandall & Gao, 2005; Schettler, 2002). Using data from the 2000 American Community Survey, Potter (2003) proposes that employees on average spend 28.8 minutes commuting to work each day. This is an increase of 7 minutes over the commute time 10 years prior. As urban sprawl continues in the years to come, the commute time will continue to increase. This total commute time equates into 57.6 minutes per day that could be reutilized elsewhere, such as for personal priorities, if employees telecommuted. This number is an average and could be higher or lower depending on the geographical area in which an individual lives. Overall, federal workers nationwide spent \$19 million a day commuting to and from work (Holmes, 2008). Since fuel prices have increased since the year 2005, the cost of commuting has increased as well.

Another tangible benefit is the ability for individuals to better balance work and family life (Baruch, 2001; Igbaria & Guimaraes, 1999). Although this could be viewed as only an intangible benefit, when telecommuting results in a reduction in the amount of daycare children require before and after school, the tangible benefits are obvious.

An intangible benefit for individuals who telecommute is that telecommuters, as has been demonstrated by numerous surveys and studies, have an increased satisfaction with their employment and employer (Igbaria & Guimaraes, 1999; Manoochehri & Pinkerton, 2003; Tremblay, 2002). Telecommuters are also not as involved in office politics, which can affect an employee’s level of on-the-job satisfaction and disrupt the traditional work setting (Manoochehri & Pinkerton, 2003).

## ORGANIZATIONS

As discussed under the employee tangible benefits section, an employee who commutes less will have more time for other priorities in his or her life. Crandall and Gao (2005) proposed that the reduction in commute time could be reprioritized by the employee for work that would help improve the employee's *productivity* and thereby benefit the organization. The next tangible benefit—and one most focused on by leadership within an organization—is the increased productivity by telecommuters. The International Telework Association and Council reported in its *Telework America 2000* research that self-reported productivity gains for those working from home were on average 15 percent; and for those working at a telework center, gains reported were on average 30 percent. Manoochehri and Pinkerton (2003) have suggested that one reason for the increase in productivity is the distraction-free environment allowed by telecommuting. Further, Nilles (1998) found that telecommuters average 2 less days of sick leave per year than traditional employees. The explanation for this could be that employees are more willing to work at home when they are sick versus going into the office sick.

Manoochehri and Pinkerton (2003) cited cost reductions experienced by organizations that have implemented full-time telework programs. Some examples are a reduced amount of office space, parking, clerical and support staff, to name just a few. AT&T reported that \$550 million in cash flow has been made available since 1991 due to telecommuting employees (Apgar, 1998).

Yet another of the benefits of telecommuting for an organization is the ability to attract and retain qualified employees (Manoochehri & Pinkerton, 2003). From an employee incentive viewpoint, telecommuting opens up new possibilities for some organizations to hire individuals who may not be able to work in a traditional environment, such as disabled workers and workers in other regions of the country or world. Looking at employee *retention* statistics, Nilles (1998) noted that the search, hiring, and training of an individual has been shown to cost an organization 25 percent of the employee's annual salary. Therefore, if telecommuting is a tool to retain employees, the cost of doing so is justified. Finally, telecommuting can also be a valuable tool for an organization's continued operation in the event of an emergency. Continuity of Operations, known as COOP, is a plan detailing work arrangements to be implemented in an emergency such as acts of nature, accidents, and/or terrorist-related incidents. Telecommuting can play a vital role in helping agencies preserve their functionality in this environment. The terrorists attacks of September 11, 2001, exemplify the need for options like telecommuting. Companies like American Express increased their use of telecommuting to maintain operations despite damage to their offices in New York City (World Resources Institute, 2004).

The key to the successful use of telecommuting in the event of an emergency is an effective telecommuting program in place to ensure the capability is operational and thoroughly tested. This means that as many employees as possible have the proper connectivity, equipment, and current arrangements in place to ensure a viable distributed workforce. This also implies the agency's telecommuting expectations have been communicated to all employees such that in the event its COOP plan must be activated due to an emergency situation, there will be a smooth transition to this

mode of operation. Many federal agencies already require their essential personnel to have telecommuting agreements in place. More extensive adoption of telecommuting will enhance an organization's ability to be effective in a COOP environment. The Telework Improvement Act mentioned previously would require agencies to incorporate telecommuting into their COOP plans (Walker, 2008).

## SOCIETY

The tangible benefits to society include such things as the reduction in the number of vehicles on the road, which in turn reduces the number of road expansion projects that need to occur (Manoochehri & Pinkerton, 2003). A study done in Japan showed that telecommuting would lead to a 6.9 percent to 10.9 percent reduction in congestion in Tokyo (Mitomo & Jitsuzumi, 1999). Also, with less commuting, there will be a natural decrease in fuel consumption and resultant decrease in pollution. More specifically, telecommuting reduces pollution, resulting in fewer emissions from commuter vehicles; less business travel, such as air travel and rental cars; and less energy consumption for heating, cooling, and lighting office space (World Resources Institute, 2004).

The intangible benefits of telecommuting to society include the opportunity for organizations to support local, in particular rural, communities by allowing more people to work from home and contribute to the economies of their local communities (Baruch, 2000; Baruch, 2001).

## LIMITATIONS

### INDIVIDUALS

One of the prevalent challenges that individuals report when telecommuting is the feeling of isolation that occurs (Baruch, 2001; Manoochehri & Pinkerton, 2003). If the telecommuter is truly isolated from the organization, then this could lead to the person being passed over for promotions or not getting a choice assignment (Baruch, 2000; Baruch, 2001). Another concern of telecommuters is that their personal life will more often conflict with their work life (Crandall & Gao, 2005).

### ORGANIZATIONS

The limitations, as seen by the organization, of telecommuting include the lack of control over telecommuters versus traditional employees, loss of teamwork benefits, and concerns with health and safety of the employees outside of the office environment (Baruch, 2000; Baruch, 2001). However, the more tangible cost of providing the telecommuting employee with the right tools to perform their tasks is probably of most concern to the employer. The U.S. General Services Administration (2006) reported that total annual spending by government agencies on telecommuting information technology ranges from \$310 to \$5,420 per user, with an average per user cost of \$1,920.

Another major telecommuting concern of many agencies is information security (Holmes, 2008). Workers are often prohibited from taking home information that is considered sensitive, thus limiting their ability to work at home (Holmes, 2008). Some security measures may be implemented, such as encrypting data on laptops, but this increases expense and the workload for information technology managers (Holmes, 2008). Until the information security issue can be satisfactorily addressed, government agencies will be reluctant to more widely implement telecommuting.

## SOCIETY

The final discussion in the limitations of telecommuting is that of the limitations on society. As individuals start to telecommute, they become isolated from social institutions (Baruch, 2000; Baruch, 2001). This could lead to individuals becoming socially isolated from each other and having fewer face-to-face relationships (Crandall & Gao, 2005). This could also be viewed as an organizational limitation, since a considerable amount of work effort takes place utilizing teams. Isolation by team members could have a considerable impact on the productivity of those teams

## APPLICATION TO THE DEPARTMENT OF DEFENSE

This article has examined the benefits and limitations of telecommuting; now is the time to apply these findings as well as the professional experiences of the authors to a notional case study of a Department of Defense organization. For the purposes of this case, the authors assume a small department (~350 employees) within a larger organization will begin to implement a telecommuting program with its employees. Currently, an established telecommuting program already exists within the larger organization, so no new policy will need to be established to implement the telecommuting program in the department. For the purpose of this notional case study, the authors will assume that even though the benefits to individuals and society are very important, only the benefits to the organization will be important enough to *motivate* management to allow telecommuting arrangements for their employees. The vast majority of the employees within the department have positions that are amenable to telecommuting arrangements. Based upon the U.S. General Services Administration's Telework Technology Cost Study recommendation that from 25 percent to 50 percent of the workforce should telecommute, an assumption will be made for this analysis that 25 percent of the department's personnel should telecommute to determine the costs and benefits for the organization. This could be viewed as 25 percent of the employees are in a full-time telecommuting program or that 25 percent of the overall work-hours for the entire organization are accounted for as telecommuting hours.

The table shown here shows the cost-benefit analysis performed on the notional Department of Defense organization. As is seen in the analysis, the increased benefit to the organization per person per year would be \$90,335 due to telecommuting implementation. If 25 percent of the workforce, or the equivalent of 87 work-year hours, were to take part in the telecommuting program, this would have a net benefit to the organization of \$7,859,225 per year. With this in mind, one of the limitations of this

Benefits (per employee):	Value per Employee (\$) per year					Assumptions
	Year 1	Year 2	Year 3	Year 4	Year 5	Analysis will only be done for 5 years since that is the length of time the department typically retains employees.
Productivity Increase	\$ 16,875.00	\$ 17,381.25	\$ 17,902.69	\$ 18,439.77	\$ 18,992.96	This is based on the worst-case productivity increase of 15% reported by the International Telework Association and Council in their Telework America 2000 research report. Assuming a 2,000 hour year. The beginning hours of productivity will be assumed to be 5 hours out of 8 hours. Therefore the increase will be 0.75 hours per day or 187.5 hours per year. A department rate of \$90.00/hour will be used.
Reduced Facilities Space	\$ 28,571.00	\$ -	\$ -	\$ -	\$ -	This is based upon the authors' professional experience concerning the cost of 35 additional office spaces; infrastructure to support those individuals would be approximately \$1.0M. This will only be assumed for one year since a building is sunk costs.
Reduced Absenteeism	\$ 1,440.00	\$ 1,483.20	\$ 1,527.70	\$ 1,573.53	\$ 1,620.73	This is based upon the Nilles (1998) report that individuals who telecommute take two less sick days per year than those who don't. Assuming 8-hour days, that equates to 16 hours. Based upon a department hourly rate of \$90.00/hour.
Subtotal:	\$ 46,886.00	\$ 18,864.45	\$ 19,430.38	\$ 20,013.30	\$ 20,613.69	
Net Present Value (Benefits):	\$ 116,646.60					
Costs (per employee):	Value per Employee (\$) per year					
	Year 1	Year 2	Year 3	Year 4	Year 5	
Information Technology	\$ 5,420.00	\$ 5,582.60	\$ 5,750.08	\$ 5,922.58	\$ 6,100.26	This is based upon the worst-case numbers given by the U.S. General Services Administration in their report titled Telework Technology Cost Study of between \$310.00 to \$5,420.00 per telecommuter for IT equipment and support.
Net Present Value (Costs):	\$ 26,310.68					
Net Present Value (Cost-Benefits Analysis)	\$ 90,335.92					
Entire telecommute population (25% solution)	\$ 7,859,225.24					Total department workforce of 350 people. 25% will telecommute or 87 people.

Note: Inflation rate and rate of return were set at 3%.

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analysis is that all assumptions remained stable throughout the 5-year period. This is a broad assumption since nothing in a public sector organization is stable. Therefore, a more thorough analysis of the instabilities in the workforce and the tasking should be performed during future research into the cost-benefit of telecommuting programs.

## CONCLUSIONS

In summary, the benefits of telecommuting are numerous and multi-faceted. Primarily, it serves as a powerful tool to increase certain workers' productivity, morale, and overall job satisfaction. This translates to cost benefits for the organization, both from increased worker productivity and from reduced operating costs. As indicated by the analysis of the notional organization, these benefits are significant. Another benefit of telecommuting is the ability of an organization to continue operations in the event of an emergency. Events such as Hurricane Katrina have highlighted the need for having tools in place like telecommuting to ensure functionality. However, limitations of telecommuting still exist for all three of the constituents and should be recognized prior to implementing any telecommuting plan. The cost of providing telecommuting employees the proper tools is a concern for organizations as is maintaining proper information security. Perhaps the most significant of these limitations seems to be the reluctance of managers to allow telecommuting because of the perception they will not have control over their employees (or to the degree that they would if the employees worked at the office). However, as Daniel A. Green, deputy associate director of the Office of Personnel Management states, "Managers should measure employee performance by results, not physical presence" (Rosenberg, 2008). To conclude, telecommuting can be a valuable tool to entice individuals to work for *the Department of Defense* and, if managed properly, can be used not only to attract and retain employees, but also to help them become more productive in their chosen career fields.

### **Keywords:**

Telecommute, Telework, Recruit, Retention, Motivate, Productivity, The Department of Defense



Mr. **Jerome Collins** is a professor of Acquisition Management at the Defense Acquisition University Mid-Atlantic Region. He teaches Systems Engineering and Program Management courses. Prior to arriving at the Defense Acquisition University, Mr. Collins was an engineering manager for the Naval Air Systems Command. He holds a BS in Electrical Engineering from the West Virginia Institute of Technology and an MBA from Florida Institute of Technology.

(E-mail address: [Jerome.collins@dau.mil](mailto:Jerome.collins@dau.mil))



Mr. **Joseph "Joe" Moschler** is a professor of Systems Acquisition at the Defense Acquisition University Mid-Atlantic Region. He teaches Systems Engineering and Program Management courses. Prior to joining the Defense Acquisition University faculty, Mr. Moschler worked for the U.S. Navy as both an aerospace and systems engineer. He served in the U.S. Air Force for 22 years in operational and acquisition assignments.

(E-mail address: [joe.moschler@dau.mil](mailto:joe.moschler@dau.mil))

## AUTHOR BIOGRAPHY

## REFERENCES

- Apgar, M. (1988, May/June). The alternative workplace: Changing where and how people work. *Harvard Business Review*, 76(3), 121–137.
- Baruch, Y. (2000, March). Teleworking: Benefits and pitfalls as perceived by professionals and managers. *New Technology, Work and Employment*, 15(1), 34–49.
- Baruch, Y. (2001, June). The status of research on teleworking and an agenda for future research. *International Journal of Management Reviews*, 3(2), 113–129.
- Byrne, J. (2007, November 6). USPTO Deputy Director Peterlin testifies at House committee hearing on telework. USPTO Press Release. Retrieved November 13, 2008, from <http://www.uspto.gov/web/offices/com/speeches/07-45.htm>
- Conlin, M. (2006, December 11). Smashing the clock. *Business Week*, 4013, 60.
- Crandall, W., & Gao, L. (2005, Summer). An update on telecommuting: Review and prospects for emerging issues. *S.A.M. Advanced Management Journal*, 70(3), 30–37.
- Gardner, M. (2006, May 8). Gas prices fuel telecommuting. *The Christian Science Monitor*, p. 13.
- Holmes, A. (2008, June 15). Telework. *Government Executive*, 40(7), 42–46.
- Igbaria, M., & Guimaraes, T. (1999, Summer). Exploring differences in employee turnover intentions and its determinants among telecommuters and non-telecommuters. *Journal of Management Information Systems*, 16(1), 147–164.
- JALA International (n.d.). What's telework? Retrieved November 13, 2008, from <http://www.jalahq.com/definitions.php>
- Manoochehri, G., & Pinkerton, T. (2003, January). Managing telecommuters: Opportunities and challenges. *American Business Review*, 21(1), 9–16.
- Mitomo, H., & Jitsuzumi, T. (1999, November/December). Impact of telecommuting on mass transit congestion: The Tokyo case. *Telecommunications Policy*, 23(10/11), 741–751.
- Nilles, J. (1998). *Managing telework: Strategies for managing the virtual workforce*. New York: John Wiley and Sons, Inc.
- Office of Personnel Management. (n.d.). *A guide to telework in the Federal Government*. OPM- VI-I-1. Retrieved November 13, 2008, from <http://www.opm.gov/pandemic/agency2a-guide.pdf>
- Potter, E. E. (2003, Winter). Telecommuting: The future of work, corporate culture, and American society. *Journal of Labor Research*, 24(1), 73–84.

- Rosenberg, A. (2008). Time for Telework. *Government Executive*, 40, 49–54.
- Schettler, J. (2002, February). Techie telecommute. *Training*, 39(2), 20.
- Tietze, S. & Musson, G. (2003). The times and temporalities of home-based telework. *Personnel Review*, 32(4), 438–533.
- Tremblay, D-G. (2002). Balancing work and family with telework? Organizational issues and challenges for women and managers. *Women in Management Review*, 17(3/4), 157–170.
- U.S. General Services Administration (2006, March 21). Task 5 cost estimates for telework scalability. Fifth in a series of reports as part of GSA's *Telework Technology Cost Study*. Retrieved January 15, 2009, from <http://www.gsa.gov/graphics/ogp/Task5CostAnalysiswAltTags 508.ppt>
- Walker, R. (2008, April 22). Lawmakers: Government can lead on telework. *Federal Computer Week*. Retrieved October 21, 2008, from <http://fcw.com/Articles/2008/04/22/Lawmakers-Government-can-lead-on-telework.aspx>
- World Resources Institute (2004, January). Gaining the air quality and climate benefits from telework. Retrieved November 13, 2008, from <http://pdf.wri.org/teleworkguide.pdf>