SuperSASaPharmalisticTelecommutosis

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Abstract

Can a SAS programmer in the pharmaceutical industry telecommute? This paper attempts to address this question by surveying the technical, political, and sociological issues that arise when you start to consider telecommuting. What types of connections and software can a SAS programmer use? Is telecommuting more efficient or less efficient than being there? Is security a problem? Who are good candidates for working remotely? Why isn't everyone doing it?

Introduction

After telecommuting for the past six years, I have experienced the rewards, but also the penalties, of working remotely. In most cases, the outcome, whether negative or positive, depends on the individual and his or her environment rather than the act of being remote. This discussion attempts to organize the issues and address the pros and cons of each.

Reasons for Telecommuting

Personal Reasons

Most of the following arguments for telecommuting could also serve as arguments against, but for now assume the best.

1) Pleasant Working Environment

Your working environment is very important and requires some serious thought. Most people consider working in their own home very seductive, but spend very little time or money ensuring that their work environment is ergonomic and comfortable. If you are going to spend 8 to 10 hours a day sitting in a chair, you should splurge on an expensive work chair. Make sure you have room to spread out and work efficiently.

2) No traffic

Avoiding the daily commute is one of the greatest benefits of telecommuting. By staying home, you have more time for working, avoid the stress of driving, start the day more relaxed, and decrease the probability of involvement in an automobile accident. Depending upon your insurance company, you may get an insurance discount.

3) Fewer interruptions

When you work at an office, you are at the mercy of many roaming, stir-crazy employees. If you happen to be an interesting person, you may find everyone taking a break at your desk. When you work at home, you do not have that interruption, but you may have different distractions that you must avoid. These temptations are discussed later.

4) Fewer meetings

At many companies, you get invited to meetings, because it is easy and everyone wants to be polite, assuming you would be insulted if you were not included. By working at home, you get invited only to meetings that are really important for you or the organization.

5) More flexibility

Flexibility is a great thing. If you are not fighting a deadline and you do not feel like working or your efficiency is dwindling, you can stop for the day. Of course, this assumes that you are not charging your employer or you at least make up the time later. You can run errands when most people are in their office and not on the road. You can work extra long hours when you need to make a deadline without living in the office or dreading the dark parking lot.

6) Increased productivity

By working at home alone, you can manage your work and concentrate on completing your projects. With the right attitude, environment, and equipment, your productivity will soar.

7) Better lunches

One again, this advantage depends on the individual. If you have good leftovers or spend the time shopping for nutritious lunch food, you may experience a culinary benefit to working at home. On the other hand, some companies offer better cuisine than you may scrounge up out of your refrigerator.

Corporate reasons

1) Increased productivity

For all of the reasons listed above, your employer or client will benefit from the increased productivity. Most honest people want to be productive and yearn for new knowledge and recognition. Results provide the best metric for employee performance, not physical appearance in the cubicle.

2) Potential to work more hours

Many employees must drop everything and head home at a specific time in order to catch their car pool, pick up their kids, or beat the traffic. If you work at home, you can continue until you reach a more appropriate stopping point or you can continue working later in the evening. In any case, you are set up to produce even when it snows.

3) Reduced demand for resources

From a pure economic standpoint, corporations benefit more as a larger percentage of the employees and contractors work at home, because of reduced demand for office space and parking space. Whether the
company saves on equipment will depend on the situation. Obviously, if the employee or contractor provides his or her own equipment, the employer saves. Telecommuting technology does, however, impose some expense.

**Reduced office politics**

If you are the only one in your office, politics loses its interest. Telecommuters tend to join in office politics less than employees who work in a company office. As a telecommuter, you determine if you have a window office, not the corporate hierarchy.

Unfortunately, an unevenly bestowed privilege to telecommute can lead to more political unrest. Employees remaining on-site may resent or mistrust the telecommuter. More on this later.

**Global reasons**

1) **Reduced contribution to pollution**

Less driving means less air pollution and less demand for oil, whose extraction may lead to habitat destruction or water pollution. Reduced need for parking means less runoff from hardened surfaces. It seems obvious that telecommuting is environmentally friendly.

We may find some less obvious side effects that are not good for the environment, but it is hard to imagine any at this point. Some people may argue that telecommuting encourages urban sprawl or the movement of people into remote areas, which would lead to increased forest destruction and longer distances to travel for non-work related purposes. At this time, most telecommuters do tend to stay within reach of good telephone and electrical service, so there is a limit to how remote we can go.

2) **Reduced need for more highways**

Continuing our logic of reduced driving, we would need fewer highways to move large masses of people. Unfortunately, the population still seems to be growing faster than the number of telecommuters.

**Types of Connections**

The number of ways to connect to your corporate office have increased almost exponentially in the last few years. For this discussion, we will group the methods into four broad categories:

- “dumb” terminal emulation
- remote control
- remote node
- client–server

Many will note that you can identify overlap between these categories, but please accept them for discussion’s sake. They actually reflect modes of operation rather than a connection protocol.

We could also use the communications protocol or access method as the classification criteria, but that gets even messier due to the flexibility and overlap that exists in communications technology today. If you add SAS/CONNECT software into the picture, you add still another layer that is intertwined with the communications protocol.

For this discussion, we will describe each protocol as it relates to each of the four broad categories listed above. For those who want to know more about communications, I recommend focusing on TCP/IP and starting with a book, such as “TCP/IP for Dummies”. I will not elaborate on the details of TCP/IP in this discussion. Although many companies still do not provide TCP/IP connections to their systems, this access method will become the norm whether you use it through the Internet or by direct telephone line, ISDN, or T1 connection.

If your access methods are limited, SAS software may offer you a link through SAS/CONNECT, which provides an excellent development environment. To determine what links are supported for SAS/CONNECT software, refer to the SAS/CONNECT Usage and Reference and the latest Changes and Enhancements manual that discusses SAS/CONNECT. For example, the 6.11 Changes and Enhancements documents all possible connections and access methods available for SAS Release 6.11 and 6.12.

“Dumb” terminal emulation

Terminal emulation is the simplest and most common form of remote communication offering a wide variety of options. The software and methods you use will depend on the hardware platforms or operating systems involved.

With terminal emulation, you are generally performing all tasks on the remote host. This makes it simple, because normally your only software requirement is the terminal emulation package. Unfortunately, this approach puts you at the mercy of the remote host and its performance. Typing or editing programs can be frustrating when you get a response from the remote about every 10 seconds.

The following list identifies some of the more common options:

1) **Asynchronous**

Asynchronous connections require a PC, a modem at both ends, a telephone line, and a terminal emulation package. The typical asynchronous terminal emulation package provides emulations for TTY, ANSII, VT100–VT320, IBM3270, IBM FTERM, Televideo, and more. Many software packages provide this type of connectivity, including CrossTalk, HyperAccess, and ProComm Plus.

For 3270 terminal emulation, you can also use an ADLC interface to utilize the HLLAPI access method. For example, you can dial a local number to access the Advantis network with their proprietary Passport software to access IBM mainframes, for which you are authorized, anywhere in the world. Wall Data also provides an ADLC interface through their Rumba product.

Asynchronous terminal emulation is simple, cheap, and widely available, but it can be slow due to your modem, your line speeds, or the load on the remote host. Graphical user interfaces tend to be rather limited. Processing can occur only on the remote host, unless you follow a cumbersome procedure to simulate the client-server model of manually downloading, processing, and uploading.

2) **Synchronous - SDLC**

Although SDLC offers a very nice HLLAPI connection to the IBM world over a phone line, it is painful to configure, requires additional hardware (synchronous modems and an SDLC card installed in your PC) and communications software that supports SDLC. Most companies do not want to bother setting up an employee with this type of connection, not to mention a contractor. However, if you can get past the installation hassles, plan to stick with the IBM 3270 interface, and have the necessary equipment, this can provide an excellent connection.

3) **TCP/IP**

TCP/IP overlaps and surpasses both asynchronous and synchronous connections described above. If you can get a TCP/IP connection, you
can still rely on terminal emulation, but the options are much better. If you prefer a simple, cheap solution, you can always utilize Telnet to provide the same emulations you used with an asynchronous connection.

With products such as Hummingbird’s Exceed 5 and Exceed/Xpress Remote Access, you can use any of the terminal emulations described above, including HLLAPI. In addition, you gain access to X Windows networks. Unfortunately, the remote access product requires Xpress/Host running on the remote host, which means your employer must provide this support.

Remote control

Remote control is really a high-performance graphical version of terminal emulation and most often connects two PCs or a server running the same operating system. As the name implies, the telecommuter would take control of a computer that is physically located at the corporate office. If that computer is tied to a network or mainframe computer, the remote control user gains access to those domains also. The telecommuter sees the graphical user interface of the corporate PC and utilizes all of the software on that PC as if the telecommuter were physically located in the corporate office.

Remote control requires that the telecommuter’s PC use a specific remote control software, such as pcANYWHERE, that communicates with compatible host software at the corporate office. This approach also requires that a computer session at the corporate office be dedicated to the remote user. In the simplest configuration, you would need a dedicated PC at the corporate office for each remote user that is dialed in. More advanced configurations utilize a specialized server, such as those provided by Citrix Systems, Inc., that can support multiple user sessions within a single computer.

The advantages of remote control are the simplicity and ease of use. You do not need to duplicate software products on both the local and remote machines. You normally do not have to worry about file synchronization, because you leave most of your files on the corporate PC. Configuring access to network and mainframe resources is simple.

If you are a frequent traveler, who needs to dial back to the home office regularly, the remote control option is convenient. With a simple set of modems, you can remotely control the same PC you normally use on a daily basis at the office. Switching between the two modes is painless.

On the down side, the interface can be slow, because, in addition to the slow response of the host network or mainframe, the technique requires that the window images be transmitted to the remote users frequently. Remote control becomes costly when implemented on a large scale, because you essentially need two PC’s for each telecommuter. By using this technique, you negate the potential for cost savings in reduced equipment expenses for telecommuting.

You can establish a remote control session over standard phone lines using standard modems. For better performance, you can use an ISDN connection, but this would not be feasible if you plan to dial in while traveling. If your remote control product supports TCP/IP, you would, technically, be able to use the Internet to connect to your remote control server, but you will need to get through the corporate firewalls and security. It is rare to find companies that offer this type of link to outsiders, although security software advances are improving the feasibility of this type of access.

Remote node

With a remote node connection, the telecommuter connects as a node on the network, which essentially gives the remote user access to any network servers and drives as if they were physically connected to the network via network cable. The only difference is that the connection from the telecommuter’s PC to the network is slower.

File transfer becomes a simple matter of drag and drop. To edit or browse a file, you just need to open it with whatever software you need to use. You must be careful, however, if you plan to process a remote file. For example, if you want to sort a remote file with PROC SORT and you issue a local LIBNAME to the remote file, SAS automatically downloads the entire file to your system, sorts it, and uploads it back to the network location. This is not desirable and a hidden danger in remote node, but we will discuss the solutions to this problem in the client-server discussion.

Remote node connections can be established using a wide variety of hardware and software. Using standard phone lines and modems, you can establish remote node connections under Windows 95 and Windows NT using Remote Access Services (RAS) or with OS/2 using LAN Distance. You can also make the connection using routers by either a router to router or a modem to router link. By connecting to the router, you become part of the network. For example, Cisco, Shiva, 3Com, and Ascend all provide routers that handle single user or multi-user dial-in access to remote node connections. Most offer single user support that can be configured to handle standard phone lines or ISDN.

Again, if you are using a TCP/IP (usually a PPP) connection, you can also access a remote network through the Internet. The Internet provides a convenient connection, but you must be authorized to reach your corporate network and you work at the mercy of Internet performance and Internet service provider reliability.

Several products, such as WinFrame Enterprise, now offer hybrid solutions that support remote control and remote node over any communication protocol, including TCP/IP. They promote their functionality for use over the Internet.

Client-Server

Client-server processing requires either a “dumb” terminal connection or a remote node connection, so this category is an alternate processing method rather than a connection method. Since I am focusing on telecommuting SAS programmers, I will only discuss client-server from the SAS/CONNECT perspective.

Client-server computing enables the telecommuter to control where any process runs and to access files on both the local and remote machines. To utilize the client-server method effectively, the SAS programmer needs to understand his or her client-server environment and what each program or process attempts to do.

Using SAS/CONNECT software to establish a client-server link enables you to reduce many of the headaches related to terminal emulation or remote node connections. Once you establish a SAS/CONNECT session in conjunction with terminal emulation, you can easily move frustrating functions, such as editing and debugging, back to your local computer. If you are developing programs that access a large database, you can create subsets and download them to your local machine, enabling you to test and debug on the local, and hopefully faster, computer.

Telecommuting with a client-server session offers the best of all worlds. If your employer only offers an asynchronous connection, you can utilize the graphical user interface of your PC while still accessing the data on the remote by using SAS Institute’s Remote Compute Services. Unfortunately, with an asynchronous connection you must login with SAS Institute’s primitive TTY program and hot key over to your SAS sessions. To use a reasonable terminal emulation, you must logout and log back in again using different software. Also, the only PC operating system that supports asynchronous SAS/CONNECT is OS/2. For some reason, SAS Institute forgot that Windows NT was truly multitasking.

SAS/CONNECT works well over a remote HLLAPI connection for both ADLC and SDLC, but you must sign off from SAS/CONNECT.
each time you need to access ISPF. HLLAPI is supported from all Windows and OS/2 environments.

Once again, TCP/IP is the big winner for convenience. Once you have established a TCP/IP connection, you can simultaneously run both a SAS/CONNECT session and a terminal emulation session, which uses other software such as HyperAccess. In addition, because TCP/IP provides a peer-to-peer connection, you can utilize SAS software’s Remote Library Services in addition to the Remote Compute Services.

If you are developing a client–server application that will run at the corporate office, your remote connection will function exactly the same way as the local connection. In other words, programming for a remote client–server application is identical to programming for an internal client–server application.

**Efficiency of Telecommuting**

Efficiency is essential if you want to continue telecommuting. You do not want to penalize your employer or client as a result of your telecommuting. The key to efficiency is planning your telecommuting environment and utilizing the necessary tools.

Before you begin telecommuting you must:

1. Evaluate the throughput of the remote processor.
2. Evaluate the speed of your connection.
3. Evaluate the availability of modems or ports.
4. Study the project to determine what data is necessary.
   a) Are you permitted to download the data?
   b) Can an “intelligent” subset be created and downloaded?
   c) Is software on the local machine compatible with the software on the remote?
5. Schedule big downloads for off hours or during your down time. Do not sit and watch the download, especially while the clock is ticking.
6. Devise a source management strategy. Determine whether to maintain duplicate files on local and remote machines and how you will maintain synchronization and apply changes.
7. Prepare a plan for dealing with databases.
   a) Can you duplicate or simulate the database locally?
   b) Must you always hit the real database with SAS/ACCESS and SAS/CONNECT?
8. Devise a test plan and determine when and whether testing should occur on the remote, the local, or both.

As you telecommute, you should:

1. Develop customized signon scripts, macros, or applications to reduce repetitive functions.
2. Create customized upload and download macros or applications.
3. Save reusable programs for creating subsets of data.
4. Develop or utilize source management software according to your plan.

5. Save contents listings of all relevant data sets on the remote host.
6. Create programs or applications that duplicate the functions that you get from the terminal emulation sessions, so you do not have to sign off and sign on repeatedly.
7. Write your applications so it is easy to switch between local, client–server, or remote processing, thereby:
   a) improving development efficiency while permitting real tests
   b) enabling users to demonstrate applications on a stand-alone PC.

Get the right equipment and software. Local processing can be much faster than the remote, but you must have a reasonable computer in your home office. With multitasking operating systems, such as Windows NT and OS/2, it pays to get as much memory as you can afford. Also do not make your employer or client pay for the fact that you do not have room on your hard disk. No one wants to pay for you to download the same files repeatedly.

Manage your time wisely. Allocate large chunks of time for work. You cannot work in one hour blocks and expect to be efficient, unless you are just making adjustments or performing minor tasks. Depending upon the person and project, full efficiency may not be reached for 10 to 30 minutes after starting to work. Complex tasks such as system design or statistical analysis cannot be performed efficiently in small or interrupted blocks of time.

**Political (Management) Concerns**

One of the biggest reasons that telecommuting is not more widespread is that management cannot visualize how it can work. According to a survey by RHI Consulting, 61% of all chief information officers in companies with 20 or more employees prefer on-site contractors. Many of the concerns that lead to this statistic are justified, while some are not. In any case, the feasibility really depends on the people involved and their exact responsibilities.

1) **Ethics and honesty**

Trust is probably the most important attribute that must be earned by the potential telecommuter. If you have not demonstrated your ethical integrity and honesty or you just do not have them, don’t be surprised when you are not approved for telecommuting.

Managers, on the other hand, need to give credit and reward those who are reliable and honest. If you believe in McGregor’s Theory Y, you should understand that most employees will work hard, even when off-site.

2) **Control and access**

Managers typically feel that they will lose control of the employee or project, if they are not physically in the same building. If you have clearly defined the objectives and your employees are truly empowered to get the job done, how often do you really need to see their faces? Telecommuters are always a phone call or email away. You can check their work regularly, if you establish source management policies and monitor results.

3) **Communication between team members**

Team projects used to be almost impossible for telecommuters, but today with thoroughly designed projects, well defined procedures, and the continual improvements in groupware, distributed teams achieve as much as centralized teams, if not more. Telecommuters must make the effort to communicate whether by phone or other means. The act of
bouncing ideas off a peer is important, so make the effort to call other
team members or coworkers. If they are busy, they will let you know.

4) Cost

I have already addressed most of the cost issues. The biggest problem
lies in the telecommuting technology. Several studies have suggested
that supporting mobile users is very expensive and time consuming, but
mobile users tend to be non-technical employees in sales or other
disciplines. Telecommuting SAS programmers, on the other hand, are
not usually mobile and tend to be more technical, so need less hand
holding.

5) Security

Pharmaceutical data is extremely sensitive. So security is a big factor
telecommuters who handle clinical trials data. Fortunately, most
pharmaceutical companies have budgeted sufficient amounts of money
to utilize the most advanced security systems and firewalls. Do not
assume that gaining access is a trivial matter, but you can assume that if
a connection exists, they have a secure gateway for passage.

6) Fairness

Touching again on the topic of politics, the option to telecommute can
strain morale if that privilege is not bestowed evenly, or at least fairly.
Obviously, not everyone wants to telecommute, but even those people
who don't may resent those who are working from home.

Also, do not be led into thinking you can work at home and care
for babies or small children at the same time. If you have small
children, use day care or, if they stay at home, make sure someone else
is watching them. You can work at home with older children, as long
as they realize you are only available for emergencies.

Personal and Psychological Considerations

Working at home is not as simple as most people imagine. You must
be mature, responsible, and driven. If you do not enjoy your work,
forget it. Before embarking on the short commute from your kitchen to
your in-home office, consider the following points:

1) Home-alone syndrome

I am not suggesting that burglars are a problem, but rather that not
everyone is cut out to work home alone. Many people dream of
working at home, only to find that they are more gregarious than they
realized. Be prepared and look for the symptoms. Before giving up,
try to schedule lunches with friends or meetings with your manager or
team once a week.

2) Motivation and focus

Avoid boredom at all cost, because it leads to a lack of motivation and
focus. Try to accept responsibility for non-critical projects as well as
critical, so if your critical project is deadlocked due to factors outside
your control, you can work on the non-critical project. Diversity is
also the key to survival.

Otherwise, use the down time to learn new skills. If you are a
contractor, go off the clock and study the latest features in SAS, read
trade journals, plan your next project, or perform any number of value-
added activities such as accounting, marketing, or calling clients. At all
costs, be productive or you will lose interest in working.

3) Scheduling and time management

As I stated earlier, you must schedule your work hours. You cannot
start at a different time every day and expect to work full time.
Optimize your errands by taking care of all your outside business in
one trip rather than four. Take the time each morning to plan your day.

If you set some goals each morning, you will feel much better about
your accomplishments at the end of the day.

4) Distractions and family

First, establish your office in a separate room that can be sealed off
from family members, who may be at home. You cannot work in a
room where others are watching television or kids are playing.

Working at home requires a commitment from family members. They
must agree that when you are working, you are not available for
conversation or assistance with household issues. You should not
assume responsibility for all errands and household chores, just because
you are home.

Also, do not be led into thinking you can work at home and care
for babies or small children at the same time. If you have small
children, use day care or, if they stay at home, make sure someone else
is watching them. You can work at home with older children, as long
as they realize you are only available for emergencies.

5) Learn hardware and software support

As SAS programmers, we have all been spoiled by the availability of
hardware and software support personnel. When you are working at
home, you must learn to solve problems yourself. Understand the
internals of your PC and your operating system. Develop a working
knowledge of your communications protocol and software. If you do
not make this effort, you will find yourself dead in the water at the most
inconvenient time. You may even risk losing your privilege to
telecommute.

6) Education by osmosis hits an impermeable membrane

One of the advantages of working in a group is learning from
coworkers. When you work home alone, you do not automatically
receive this type of input. You do not have to lose this sharing, but you
do have to make the effort to make it happen. You may have to spend
more time going to evening user group meetings or just calling
coworkers to discuss technical issues.

In addition, you will need to proactively seek out new knowledge
through technical journals and books. With telecommuting comes a
responsibility to compensate for displaced benefits.

7) The call from Ben and Jerry

Don't believe the old saying, "If nobody sees you, the calories don't
count." If you do not have the willpower to stay away from the ice
cream or cookies, you should consider not buying any or at least
finding something less damaging to munch on. Locating your office on
a different floor from the kitchen is often sufficient to discourage
frequent visits.

Summary and Conclusions

Most of the comments above are not limited to SAS programmers in
the pharmaceutical industry, but the discussion is relevant, because
more SAS programmers in the pharmaceutical industry are beginning to
telecommute.

The most important points to remember are:

- Telecommuting can be a reasonable and efficient mode of
  operation, if sufficient attention is given to the remote
  communications technology, the home-based computer system,
  and the office environment.
Telecommuting is not for everyone. Many people will not enjoy it, while others will just not succeed at it. Deciding who can telecommute is one of the most difficult challenges. Consider your personality before you commit to working in this mode.

- Proactively maintain ties with coworkers and superiors.
- Establish and follow a strict work schedule. Avoid deviating from that schedule except for special situations or occasions.
- If you can get a TCP/IP connection to the corporate office, take it.

Reference Information

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Bibliography


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