



One of the most difficult problems facing government managers who want to implement new technology is anticipating how it will affect work. Of course, the primary goal is to improve performance. However, it is nearly impossible to take into account all the human, organizational, and external influences that may impact how well that goal is achieved. Until the technology is put to work, planning is often little more than speculation. This is particularly true with mobile technology, which may have substantial potential, when combined with wireless networks, to expand the time, locations, and effectiveness of many types of government work. Fully exploiting this potential, however, presents a complex problem for government managers.

Recent work at CTG provides some valuable information to help government decision makers deal with these issues. This opportunity came in a project to assess how laptop use affected child protective service work (CPS) in New York State. In this project (Assessing Mobile Technologies in Child Protective Services), the NYS Office of Children and Family Services (OCFS) engaged CTG to conduct an independent assessment of the use of mobile technologies in CPS casework. OCFS took a systematic, staged approach to deployment and testing these mobile technologies that yielded a large amount of useful information about the policy, management, and organizational influences on integrating technology into a mobile, human service workforce.

Mobile government, or m-government, is a term broadly defined as “government’s efforts to provide information and services to public employees, citizens, businesses, and nonprofit organizations through wireless communication networks and mobile devices.” However, the terms mobile and wireless are often used interchangeably, as mobile implies technologies that are portable and wireless implies that a device can be connected wirelessly to local or wide area networks. (Moon, 2004)

HOW DO INDIVIDUALS AND THE ENVIRONMENT AFFECT MOBILITY?

When technology is put into the hands of front line government professionals, it becomes quickly apparent how and where the technology fits into their specific work. That fit will depend on the individual and his or her work preferences, the nature of the work itself, on the capabilities of the technology, and on factors in the environment; all of these elements can have an impact on whether mobile technologies are readily adopted and used effectively. Every factor is important in its own right and in combination with others. For example, working in a car between appointments in the summer may be feasible for a CPS worker in rural upstate New York, but not in the winter.

Individual Factors

Individual differences among workers can play an important role in how mobile technologies are ultimately used. One size does not fit all. Each person brings his or her own history, experience, and personal circumstances to any work position, along with already formulated general attitudes and preferences. Since mobile technologies are used to increase mobility while completing work functions, these personal circumstances and attitudes will play an important role in their adoption.

Factors such as where a person lives in relation to work and modes of available transportation can affect his or her ability to use mobile technologies. Some people have long commutes via public transportation and will take

advantage of this time to do work. Others may not feel safe or comfortable working with an expensive piece of technology on public transportation or in other crowded areas. In rural areas where connectivity is unreliable, "connecting" from home may not be an option.

In addition, the skill sets that people amass throughout their careers impact which technologies they are most comfortable using. Some people may be very comfortable using a laptop, while others may prefer to dictate their notes via voice recognition software on a laptop or using a cell phone to call a telephonic dictation service. Taking into consideration individualities when selecting a technology can also help with buy-in and acceptance. People may be more willing to try something if they know that management spent time understanding their needs.

Nature of the Work The nature of the work plays a tremendous role in choosing a mobile technology. Depending on the focus of the work and the type of work (non-routine and less structured or highly automated and structured) some technologies may not fit. For example, transportation professionals who monitor critical infrastructure such as roads and bridges may need different technologies than a foster care caseworker who interviews families for potential child placement. Field work within each profession or area of government is situated within its own mission, functions, policies, and practices, so not every technology will work the same way within every context.

For example, CPS caseworkers spend a considerable amount of time interviewing families and observing home-life situations. Using some types of technology in this intimate environment therefore may not be productive. One of the caseworker's goals is to establish a rapport with the family, which is primarily done by making eye contact, actively listening, observing the surroundings, and showing physical signs of attentiveness. Subsequently, in this situation, using a wireless laptop within someone's home may not be practical, but rather using it immediately after the visit to quickly recall conversations and surroundings can improve the timeliness and accuracy of documentation.

On the contrary, public utility workers who monitor and service electrical, gas, water, and wastewater systems must also take detailed readings and document findings, but in this context the goals are different, because they are not also charged with establishing relationships. Therefore, using a handheld device to document numerical or technical infrastructure conditions can be used in real time.

Capability of Technology

Different mobile technologies offer a range of capabilities when out in the field. Some technologies, when considered independently, cannot perform a host of functions. Cross referencing critical work tasks with each technology's capabilities will show how much can be accomplished from the field. For example, a cell phone can be used to make phone calls and to dictate notes to a telephonic dictation system, but in most cases cannot be used for documentation or retrieving information. Digital pens can be used in the field, but must also be accompanied with a PC or laptop to digitize the information. In CPS work, CTG found that wirelessly connected laptops provide more capabilities for both receiving and entering information than any other device tested.

To create opportunities to work in multiple locations one should determine if the chosen technology offers the quickest and easiest way. Is the technology adding steps to work processes or is it making work more streamlined? For example, documentation is a common function performed in the field. In its simplest form, the steps of documentation are to move data gathered while doing work in the field into a digital format so that it can be stored electronically. Boiling down the number of steps in this process can maximize time, so it is important to carefully study the steps involved in taking information from an analog to digital state with different mobile technologies.

Devices and Connectivity

Device and accessory characteristics play an important role in how or even if the technology gets used. If a device is heavy and short on battery time, workers may decide to leave it behind at the office to avoid physical discomfort. Devices that are light, yet durable, that fit into work bags and have a long battery life are more likely to be used.

Connectivity is one of the most pivotal components of mobility. As mobile and wireless are terms that are interchanged often, connectivity is the foundation to constant access. Workers in rural areas or urban neighborhoods with tall buildings may find various limitations in connectivity that limit the benefits of a mobile device. As such, if establishing and maintaining a connection with a device is difficult, it can easily lead to a level of frustration where the workers don't want to deal with it.

Finding the right balance between what the individual wants, the realities of the work, the device capabilities, and the overall connectivity options can help guide public managers in making the best technology choice.

DOES THE ORGANIZATION SUPPORT MOBILITY?

When government agencies decide to support their staff by offering mobile technologies, it is sometimes seen as strictly a technology project. In reality, mobile adoption is an organizationwide change that needs programmatic and policy attention. Introducing technology means that the work conditions are changed and the environment is modified, therefore existing policies, practices, and regulations may need to be updated or even created. Government managers need to decide exactly how mobile they really want their workforce to be and take the appropriate measures to ensure that level of mobility.

Revisiting current policies to make certain that they are still valid and appropriate for the new environment is critical. The types of policies and practices that seem to be affected by increased mobility include working from home, work time scheduling, compensation for work outside normal hours, and ensuring privacy and security of government data. But policies aren't the only area needing attention. Established technical infrastructure must be reviewed to identify if and how it can support a more mobile workforce. Maintaining devices and infrastructure that remains on site is different from maintaining ones that are in constant movement.

Policies

One of the goals of introducing mobile technologies is to enable workers to complete work functions outside of the traditional office. In many cases, this includes doing work at home, either within or after regular work hours. However, many government organizations do not have policies that address working from home or they have policies prohibiting it. In either case, policies or lack thereof could hinder the intended productivity gains or mobility of workers. If the goal is to make the professional as mobile as possible, then developing policies that support this goal is essential.

For example, if CPS caseworkers have wirelessly connected laptops, they can receive case information anywhere. This means they would not have to commute to the office first thing in the morning before making home visits; they could check all files from home then go straight to their visits. In another example, state lottery representatives also spend a large portion of their time in the field inspecting lottery machines in local businesses on a regular basis. All information about the machine, location, and environment must be collected. Allowing these representatives to finish entering data from home would increase efficiency in visiting all the locations they must inspect each day.

The policies for overtime and compensatory time can present concerns if there is no provision for compensation for working with the mobile technology after regular work hours. If the technology is a change for the organization, it may require them to look at the processes that govern overtime and compensatory time. In some cases, management practices are such that overtime is only for extra time spent in the office. Compensating for work not completed in the office may have to be tied to production of deliverables or written descriptions of work completed.

System Design

Integrating mobile technologies into existing systems will require varying amounts of organizational resources and effort. For example, some technologies require a change in overall network design, such as the introduction of wirelessly connected laptops, while other technologies do not require any back-office reconfigurations. Technologies such as cell phones and PDAs may not require changes, however, some handheld devices and almost all wirelessly connected laptops and tablets that connect directly to a central information system will generally cause a need for configuration, policy, or general practice changes. In many cases, all direct access into a central information system is governed by specific security rules and regulations, some set forth by the agency and others by governing bodies. Subsequently, moving through the connection process may result in routing users through a series of time consuming log-ons, sometimes negating any efficiencies realized by the mobility.

Allowing government workers to do work from multiple locations is not just a technology issue, or even a mobility one—it's an organizational change and a leap in the direction of conducting government work differently. This type of large scale change requires multiple perspectives to help identify the range of factors that can promote or hinder the way work will be done.

IS INCREASED MOBILITY THE GOAL?

In many cases, when an organization agrees to buy mobile technologies the reasons are centered around increasing workforce mobility or increasing the ability to do work in the field. But if you dig deeper, descriptions of mobility are followed up with statements like "change in productivity," "using time more efficiently," "increased opportunities to work," and "increased satisfaction and morale." All of these are important and justified goals but

are usually not communicated as much as increased mobility—at least in the beginning. Asking questions such as “what change are we expecting?” will help start to uncover assumptions about how others think mobility will impact the work.

Productivity

Increasing employee productivity is often the number one reason for adopting mobile strategies. Mobile technologies allow employees to communicate in new ways and access and enter information from critical applications without returning to the office. Productivity is often described as being more timely, doing more, or catching up on work. While productivity gains can be realized with mobile technologies, it's important to specifically state what changes are expected. In the case of the CPS caseworker, changes in productivity were specifically stated as more timely documentation of progress notes or a decrease of backlog in documentation, which results in more case closings. Identifying how productivity might change with the technology can certainly help in setting expectations before it's deployed.

Satisfaction

Increased satisfaction and higher employee morale is always a good thing. If people feel valued because the organization has chosen to invest in technologies for them, their overall performance may increase. More specifically, mobile technologies may give some employees increased autonomy, which can result in their feeling more trusted and valued within the organization. This validation can be just as powerful as productivity gains. In many organizations that are constrained by tight resources and budget deficits, employees may not always get the resources needed to do their jobs. Efforts that increase morale could bolster job satisfaction and potentially affect performance. Stating in a public way that investments in mobile technologies are an investment in the people may potentially be one of the best ways to get and keep everyone on board.

CONCLUSION

The notions about how mobile technologies will be used are not always what actually happens. This is normal and many times, expected. Technology sneaks into workplaces and impacts the environment in ways that most do not think about until it's at the front door. In the case of NYS OCFS, one of the original assumptions was that the mobile device would be used mostly in court and at or in-between appointments. However, in all three deployments, CTG found that caseworkers most frequently used the mobile technologies at home. This was a little surprising in the first effort, but was then confirmed as it emerged as a major finding in the subsequent efforts. These sort of findings that differ from original assumptions make it necessary for government managers to take proactive steps to address the human and organizational issues that may affect mobility.

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