ADRC-TAE Issue Brief: Portable Technology

I. Introduction

Aging and Disability Resource Center (ADRC) grants, a cooperative effort of the Administration on Aging (AoA) and the Centers for Medicare & Medicaid Services (CMS), seek to effect systems change by helping states create a single, coordinated system of information and access for all persons seeking long term support.

At the state level, ADRCs are providing information about, streamlining access to, and supplying assistance with, long term supports and services and related benefits. Some of the challenges ADRCs face in streamlining access to their services include how to serve clients with limited mobility, how to serve large areas with scattered populations, and how to collect, evaluate and share large amounts of data with other agencies and service providers.

Portable or mobile technology, referring to devices that can be easily carried from place to place, may help overcome these challenges, allowing ADRC staff to collect information from clients in the field with minimum paperwork and minimum duplication of efforts.

This issue brief provides some basic information about the most commonly used types of mobile technology, examples of how other non-profits and ADRCs have used mobile technology to serve consumers, and some issues for ADRCs to consider before adopting mobile technology as a service delivery tool.

II. Types of Portable Technology

A. Laptop Computer

Laptop computers have the same basic hardware, software, and operating systems as desktop computers, and function essentially the same way. This can be an advantage, particularly if staff are used to working with forms and databases on a desktop and are comfortable with that format. Users input data using a keyboard.

Laptops are expensive, generally costing from about $1,000 to well over $2,000. Laptops are also larger and heavier than other portable devices.

B. PDA

The Personal Digital Assistance (PDA), also referred to as a pocket or handheld PC, is the smallest of these portable devices. Originally, PDAs were designed as electronic organizers for phone numbers and appointments. In recent years, manufactures have added the capacity to run application software and access the internet to PDAs; many now incorporate cameras and phones as well. The PDA remains a complement to, not a replacement for, a desktop or laptop

computer because the PDA does not have a hard drive. The PDA must be synchronized with the user's main computer in order to transfer information from one device to the other.

How the user inputs data varies from model to model. Some PDAs have a stylus, touch screen, and handwriting recognition software that converts characters to text. Some of these programs require users to learn a specialized alphabet. There are also PDAs with miniature keyboards, and most PDAs can be connected to a full size keyboard.

The main advantage of PDAs is their size. Much smaller and lighter than laptops, they are also generally less expensive, with prices ranging from $150 to $650 dollars, depending on capabilities. However, the small screen size of PDAs can be a disadvantage, as only a very small amount of information is visible on the screen at any one time. Data entry using a stylus or miniature keyboard can also be difficult and take time to learn. PDAs may be best for collecting short fields of data but not suitable for recording longer narrative data.

D. Tablet PC

A Tablet PC is a form of laptop computer with a touch sensitive screen. The user can write directly on the computer screen with an electronic pen to open and select files, make choices for multiple choice questions, and handwrite notes and data. There are several styles and sizes of Tablet PCs, some of which look like standard laptops, but allow you to rotate the screen and lay it flat over the keyboard, and some of which have no keyboard at all. Tablet PCs are priced much like other laptops, ranging from $1,000 to over $2,000.

E. Web Phone

A web phone is a cellular phone that can also access the internet, allowing the user to browse certain web sites and send and receive email. While the ability to access the web is becoming a standard feature of most cell phones, the screen size is very small, and any data entry must be done on the phone's small numeric keypad. The price of a web phone can be comparable to a PDA, $150 to $650 dollars, but like a regular cell phone, the price often varies with the monthly services plan you purchase. Some web phones incorporate all the features of a PDA.

III. Background

Social Services providers have begun to adopt mobile technology, particularly over the past five years. Service providers have used mobile devices in two main ways; 1) to access information and resources in the field; and 2) to gather and record client data.

Over the same time period, technology has changed dramatically and the devices and capabilities described in this section may not correspond to what is currently available.

A. Access to Information

Providers like the Community Link Service of Montreal General Hospital and the Visiting Nurses' Association Home Health Systems of Santa Ana have used PDAs primarily to access information about clients or resources while in the field.

The Community Link Service (CLS) of Montreal General Hospital uses PDAs to provide home and community based services to individuals with mental illnesses. Before adopting PDAs, team members carried a ten page printout of client information, which was updated every week. PDAs allowed staff to carry with them a secure database of personal and medical information about clients, along with a drug interaction database, and their appointments calendars. Team members also used a street-finder application to help find clients' addresses. CLS chose PDAs over laptops because of size and weight, and concerns that the laptops might intimidate patients. They piloted several models of PDA.[1]

The Visiting Nurses' Association Home Health Systems (VNAHHS) in Santa Ana, California piloted the use of mobile technology in 2001, giving Palm Pilot handheld PDAs to 75 visiting nurses initially and then expanding the program to all visiting clinicians. Nurses used PDAs to access medical files, and also to record patients' vital statistics and complete electronic nursing forms during home visits. The PDAs also allowed nurses to upload and send data from their homes, rather than driving to a central office to drop off forms, and to download an updated database of patient information every morning. The Association feels the pilot was successful in part because the nurses were using the PDAs for tasks the devices are suited to – collecting short data fields like heart rate and blood pressure, and not trying to take medical histories or enter large blocks of text.[2]

For VHAHHS, adopting mobile technology has improved the accuracy of documentation, increased clinician satisfaction, decreased reporting time, and reduced paperwork 50%. Nurses who previously spent three to four hours per shift on paperwork now spend one to one-and-a-half hours per shift. [3]

B. Collecting Client Information

Many providers, like VNAHHS, have also used portable technology to collect client information in the field and transfer it to a central location or database.

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1 Warren Steiner, MD, FRCPC, "Handheld Computer Use in a Psychiatric Outreach Program. "Canadian Psychiatric Association: Bulletin, October 2003. Online. Available: http://www.cpa-apc.org/Publications/Archives/Bulletin/2003/october/steiner.asp

2 Nicole Wallace, "Good Works in the Palm of a Hand," *The Chronicle of Philanthropy,* September 20, 2001, reproduced with permission online. Available: http://www.benton.org/publibrary/practice/features/handheld.html See also; http://www.unites.org/html/resource/unites/unites1.htm

3 Christine Harland Williams, "Palm handhelds treat home health ills," *Computing Unplugged.* Online. Available: http://www.palmpowerenterprise.com/issuesprint/issue200110/nurses.html Accessed: February 1, 2006, and Carol Lindsay, RN, "PDAs give nurses more time," *Nurse Week*, Online. Available: http://www.nurseweek.com/etalk/pda_print.html Accessed: February 1, 2006.

The Oklahoma Department of Human Services piloted the use of handheld PCs to enter communications and relevant information during child abuse investigations. Caseworkers also used the devices to check the central database for previous abuse referrals involving the same individuals. Initially, the program used a word processing device called the AlphaSmart keyboard, and then switched to a device with more capabilities.[4] Oklahoma chose a handheld PC that was a cross between a PDA and a laptop because it had more capability and built-in software applications than the portable keyboard, but was less expensive and easier to carry than a laptop.[5] Budget constraints during the selection process stopped the state from implementing new mobile technology, but the staff of the Children and Family Services division hope to do so in the future.[6]

The HIV Prevention Project of the San Francisco AIDS Foundation used handheld devices to collect data at needle exchange sites. The Project found that using PDAs made data collection more uniform, meant that data was immediately reviewable, and reduced paperwork. However, users also found that it took slightly longer to input data than it did to record it on paper, and that using the device meant there was less eye contact between the interviewer and interviewee. Users began making a conscious effort to greet clients and make eye contact as often as possible.[7]

The United Kingdom has put national resources into using mobile technology to deliver local government services. Project Nomad paired central and local government funding to pilot the use of mobile technology in services from building permits to headstone inspections. Two case studies, Cumbria and Cambridgeshire, may be of particular interest to ADRCs because they involve eligibility assessments for social services.

The Cumbria City Council pilot program gave Social Services Financial Assessment Officers (FAOs) Tablet PCs, which they used to make financial eligibility determinations. Before the pilot, FAOs collected information at a client's home, returned to the office to transcribe and file the information, and then mailed the notice of eligibility to the client. Part of the pilot was the creation of an integrated electronic form which automatically calculated eligibility. The form included drop down menus for input, as well as sequential input fields that did not advance

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4 The AlphaSmart keyboard is a notetaking device which consists of a portable keyboard with a built-in word processor... The AlphaSmart has a very simple operating system, which means it is easy to use, but also that it can only be used to write text and transfer it to another computer for storage or printing. For more information about the Alpha Smart keyboard, see http://www2.alphasmart.com/ or http://www.ldresources.org/?p=53.

5 This type of device, which resembled a miniature laptop, does not appear to be manufactured any longer.

6 Handheld Devices and Social Work Practice, NCRITCW, April 2003. Online. Available: http://www.nrccwdt.org/docs/ttt_handheld.pdf *and* email from Bill Hindman, Programs Administrator, Children and Family Services Division, Adoption, Research, and Technology Unit, February 3, 2006.

7 Nicole Wallace, "Good Works in the Palm of a Hand," *The Chronicle of Philanthropy*, September 20, 2001, reproduced with permission online. Available: http://www.benton.org/publibrary/practice/features/handheld.html See also; http://www.unites.org/html/resource/unites/unites1.htm

until correctly filled in, minimizing human error. With their mobile technology, caseworkers could fill out the form at the client's home, and then use a portable printer to print out an assessment letter on the spot. Cumbria chose the Tablet PC because PDAs were too small for the level of data entry required and to avoid the screen and keyboard noise of laptops and maintain the level of interaction between the client and caseworker as much as possible. Caseworkers liked the Tablet PCs because they mimicked the use of a pad and pen, increasing the level of comfort with technology for both client and caseworker, and minimizing the amount of intrusion into the client's space.

The use of Tablet PCs reduced duplication of effort and the need to recontact clients after the initial interview – especially important because caseworkers in Cumbria covered a large geographic area. Lowering the number of repeat home visits also reduced travel costs and the amount of time caseworkers spent on individual cases. Management took a number of steps to make sure the pilot project went well, including reducing casework quotas to allow time for training, involving caseworkers in the design and testing process, and addressing human resources issues before implementing changes.[8]

While the FAO pilot project was a success, a similar attempt in Cambridgeshire was one of Project Nomad's few failures. The Cambridgeshire County Council wanted to create an integrated assessment tool that could be used by the social worker, district nurse, or occupational therapist that first had contact with an elderly client. The goal was to end the need for long, duplicative assessments by each separate agency by having the first caseworker use a Tablet PC to fill out the assessment and to access any relevant information from existing databases. This project did not make it past the trial stage – the County had a series of problems getting the software to work at all, and when those problems were resolved, the software worked too slowly - the assessment form took ten minutes to download or upload, and during that time, the whole system was slowed down.[9]

IV. Approaches: ADRC Grantees

Many states are working to streamline their processes by using online resource directories, and by creating online intake and assessment tools that apply to multiple programs and can be used by multiple agencies. Mobile devices could allow ADRC staff to use these tools when they are with clients in the community and out of the office away from their desktop computers. Several grantees have already begun using mobile technology to improve access and services for clients.

Arkansas (2004)

Arkansas is using a web-based case management system that includes a comprehensive database, an Information and Referral Contact Record and a Consumer Assessment Referral and Enrollment (CARE) tool. The Contact Record enables I&R staff to record consumer contact

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8 Research: Nomad Approved Case Study, "Cumbria City Council Electronic Financial Assessm```ent," *Project Nomad, 2004.* Online. Available: http://www.projectnomad.org.uk/docstore/12/pdf/369_CumbriaCCFinancialAssessmentsCS.pdf

9 Research: Nomad Approved Case Study, "Cambridgeshire County Council Single Assessment Project," *Project Nomad, 2004.* Online. Available: http://www.projectnomad.org.uk/docstore/12/pdf/371_CambridgeshireCCSingleAssessmentProcessCS.pdf

and demographic information, referral requests, referral outcomes and follow-up summaries. The CARE Tool, which functions as a single entry point for LTC services, enables multiple agencies to enroll clients and record and track client information using the single system. Case managers are using laptops in the field to fill out and submit level of care assessment forms. They are also using portable printers with scanner capability to copy financial documents for eligibility determinations so that clients no longer have to entrust the originals of their personal documents to a third party for copying.

However, in a 12-county rural area of Southwest Arkansas, where Arkansas' first pilot site operates, internet access is not always available. This is especially true in areas case managers travel to for home visits. To meet this technological challenge, RTZ Associates, Inc., Arkansas' technology contractor, is creating PC versions of the online applications to enable case managers to enter data while in the field. That data can later be uploaded into the online system. Arkansas is currently field testing the PC version of the CARE tool.

While Arkansas has encountered some challenges changing from a manual to a web-based case management system, the application of mobile technology such as cell phones, notebook computers, and portable printers/scanners has enhanced communications between case managers and provider agencies. The use of mobile technology has also saved time and travel expense and sped up the eligibility process for clients.

Washington, D.C. (2005)

While some of the District of Columbia's online tools are still in development, caseworkers are already using iPAQs, handheld PDAs equipped with a digital camera, to serve clients in the field. Caseworkers can take pictures of financial eligibility documentation in the client's home using the iPAQ, and then upload the image and send it to the Medicaid agency to support the client's application. Clients do not have to find a way to copy documents, or give original financial documents to someone else to copy, and caseworkers save time and travel expenses because they do not have to make multiple home visits to pick up and drop off documents.[10]

Iowa (2004)

Iowa's Seamless Project integrated a software system with the state's case management program for the frail elderly, which also serves as the gateway program for Iowa's elderly HCBS waiver. Using Seamless software, case managers in the field are able to collect financial and functional eligibility information on laptops and Tablet PCs. The goal is to be able to send this information electronically to the Iowa Foundation for Medical Care (IFMC) where the level of care determination is made, and to the Iowa Dept. of Human Services (DHS) where income eligibility is determined. Case managers can currently send level of care information to IFMC electronically, but financial eligibility is still a paper-based system.

Iowa experimented with using PDAs in the field, but found that the PDA screen was too small for its application forms, which can be up to 15 pages on paper. The amount of scrolling necessary to fill out the forms can also be an issue on the Tablets, which have a smaller screen than most laptops. Caseworkers like the larger screen size of laptops and that they can be used both in the field and as a desktop, but the Tablets are generally preferred because they allow

[10] For more information about the iPAQ, see http://welcome.hp.com/country/us/en/prodserv/handheld.html

caseworkers to gather original signatures from clients with an electronic pen. Applications must be signed by the client, and Iowa is exploring different ways to collect signatures.

The one problem area Iowa identifies with its mobile technology use is synchronization of data. Iowa originally planned to have a web-based system in which users were always connected to the main database, but this was not practical as most clients do not have wireless internet and caseworkers do not want to use clients' phone lines to access the system. Internet access generally is not always available, particularly in more rural areas of the state, so caseworkers enter data on mobile devices, and then upload it to the main system later. Problems arise because caseworkers may not update regularly, or have to share devices and enter information about a single client on multiple devices. Iowa is working on ways to identify which data is the most current so that the main system won't save older information over newer data.

Washington (2005)

Washington plans to research, purchase, customize, integrate, and launch an information management/I&R software system that can be expanded statewide to reduce duplication of effort and increase reporting capabilities at all levels (local, state and federal). In addition, their Comprehensive Assessment Reporting and Evaluation (CARE) Tool, currently in use for individuals who are Medicaid eligible, will be expanded for assessing individuals eligible for non-Medicaid funded programs. Washington also plans to improve connections with the National Aging Program Information System and the Benefits Check Up system. Currently, caseworkers in the field are using laptop computers to fill out CARE Tool and do annual service planning. After the caseworker returns to the office, the assessment is uploaded into the statewide system and service authorizations are completed.

Washington has had a very positive experience using laptops. Instead of having the client sit across from the interviewer, Washington staff have the client sit next to the interviewer so that both of them can see the screen and the developing document. Sitting together to fill out the forms generates a sense that the staff member and the client are working together and helps create a closer relationship and speed up the development of trust. Clients and their families report that before the use of laptops they would receive a stack of documents in the mail a week or even month after meeting with a caseworker and not understand them. Having watched the caseworker fill out the documents on a laptop, they were already familiar with the forms and could understand and sign them more quickly.

V. Issues

When thinking about adopting any new technology, an organization must consider how the technology will improve service delivery and client outcomes. ADRCs must also think about how mobile technology will fit into their current streamlining and MIS plans, and make sure that their technology, applications, and tools are compatible and will work well together. There are a number of questions ADRCs may want to ask themselves as they go through the decision-making process.

Mobile technology promises to improve service delivery and client outcomes for ADRCs by increasing both accessibility and efficiency. ADRCs serve a population that often has limited mobility or difficulty traveling, and the physical site of an ADRC may serve a large geographic area. Mobile technology enhances the ability of ADRCs to serve clients in their own homes, or in local senior or independent living centers.

Mobile technology also promises increased staff efficiency for ADRCs. Staff will no longer have to enter data or fill out forms from their notes after a home visit, and the number of home visits will be reduced if staff does not need to pick up and return documents, or re-interview clients. Online or downloadable databases will allow staff to access the most appropriate resources and providers for a client on the spot, and the ability of different cooperating agencies to share information and access a single client file will both enhance inter-agency partnership and reduce duplication of effort.

Adoption Decision

The first decision any ARDC must make is whether it makes sense for that particular ADRC to adopt mobile technology at all.

- What problem(s) will mobile technology help us to solve?
- What new challenges will mobile technology introduce?
- What functions will we require? Which functions are best suited to a mobile technology application?
- Which of our organization's functions are most dependent on gathering or accessing information in remote or geographically dispersed situations?
- Can our budget support this kind of investment in technology?

Device Selection

Once the decision to use mobile technology has been made, an ADRC must decide which mobile device, or combination of devices, will best meet its needs and best fit into its existing plans and resources.

- How much are we willing to spend on the device, and on training, support and software?
- Is our budget for training, support, and software realistic given what we want to accomplish with mobile technology?
- Are battery life and recharging a consideration because caseworkers have to visit several remote clients in a single day?
- Are size and weight important?
- How large a screen size is necessary for the functions we want?
- How compatible is the device with our current system? Is it easy to add software or to upgrade the device?
- What will the primary use of the device be and what features would make accomplishing that task easiest for the user?
- Are the staff members who will be using the device familiar with this technology?
- Is our IT team familiar with this technology or will we have to rely on an outside source for support?
- How will confidential data be kept secure on this device?

Security presents another issue for ADRCs adopting mobile technology. Portable devices are naturally much more susceptible to loss and theft than desktop systems, and carrying expensive electronic equipment may also affect the personal safety of staff. ADRCs must ensure the security of confidential client information that may be collected on mobile devices and that their technology and procedures meet data security and client confidentiality requirements imposed on them by law.

Costs (Overt and Hidden)

While the use of mobile technology promises a number of benefits, there are also good reasons to be cautious about adopting it. As noted, cost is a serious consideration. The cost of the devices themselves varies depending on the type and size of the device, and which features and capabilities it includes. Vendors and manufacturers may offer discounts for non-profits, or have grant or donation programs. The cost of new technology, however, also includes software, networking, making sure the new technology is compatible with your current system, and perhaps most importantly, the cost of training staff and supporting and troubleshooting the new technology.

- Will the new application make other applications redundant or partially redundant?
- If the mobile technology software would be used to collect client data already entered into another system, who will design, build, and test the interface between the device and the legacy application?
- Is our IT team willing to and adequately staffed to support the new application, and if so, through which stages of the project; design, development, testing, roll-out, maintenance?
- If the data being gathered on a mobile device is required for state or federal reporting, what data mapping and collection requirements do we need to follow and demonstrate compliance with?
- Will the new device make sharing information between partner agencies and providers more difficult?

Change Process

The issues involved in adopting new technology are not purely technical. Managing change will involved managing the reactions of staff, clients, and partners to the new technology and the new procedures. Involving the staff who will be using the technology as early as possible in the decision process may help ensure that you choose the most appropriate technology, and it may also minimize resistance to change and help staff feel invested in the decision. Front-line staff may prefer a device with fewer features that is easier to use, or a smaller device that's easier to carry, or they may prefer a laptop that mimics the current desktop system as closely as possible.

- Will some staff be more comfortable with the new technology and adopt it more quickly than others? How will that affect the organization?
- If the mobile application will be used as a reference tool (for a resource directory, for example), do we need to develop a new relationship with an agency or provider to obtain that information?

- Will adopting portable technology affect our relationship with any partner agencies or providers? How?
- Would it make sense to pilot a small, well-targeted mobile technology application and evaluate that project before rolling out and implementing broader functionality?
- Who in the ADRC organization will be the project's champion, and who will manage the project? Will the same individual fill both these roles?

VI. Conclusion

Mobile technology is one way for ADRCs to meet the challenge of streamlining access and improving service delivery. Many ADRCs have client populations with limited mobility, large geographic service areas, and large amounts of data that needs to be collected, evaluated, and shared with other agencies and service providers. Mobile technology can allow ADRC staff to collect information from clients in the community with minimum paperwork and minimum duplication of effort, and to share that data more easily.

The most important question an ADRC must ask before adopting mobile technology is how that technology will improve service delivery and client outcomes. ADRCs must also consider how mobile technology will fit into their current streamlining and MIS plans and make sure that their technology, applications, and tools are compatible and will work well together. Considering how adopting new technology will affect staff, partners, and clients is also essential for a smooth transition and continued collaboration.

VII. Resources

http://www.npower.org

NPower is a national network that helps local nonprofits use technology effectively. There may be a local NPower in your state. Resources on the national website include TechAtlas http://techatlas.org/tools/ which provides technology budget templates and a total cost of ownership calculator. In February 2002, NPower New York produced the report *Mobile Technology in the Non-Profit World.* Although much of the technological information is out of date, the report is a useful guide to making a decision about mobile technology and is available at http://www.npoweraz.org/tools/mobile+technology+in+the+non-profit+world.pdf

http://www.techsoup.org/

A technology website aimed at non-profits, TechSoup includes articles on funding and managing technology, links to donated and discounted products, and discussion forums.

http://pcmag.com

An online technology magazine that lab tests products and publishes reviews. The website includes product guides and ratings for both hardware and software.

http://www.pcworld.com

The PCWorld website includes buying guides with clear advice on how to evaluate technology and well as product reviews.

http://www.cnet.com

Cnet's website includes product reviews and business buying guides for laptops, handhelds, and cell phones.

VIII. Appendix: Decision Questions

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