Information and Communication Technology (ICT): In the Service of Human Services

Sam Lanfranco

Abstract

Information and communication technology (ICT) is confronting human services with new challenges and opportunities at the individual, organizational and community level. This goes beyond increased efficiency and effectiveness in the organization and delivery of services. ICTs are expanding our perceived realities, and changing how we construct social structures and carry out social processes. The ICT-enabled electronic venue both raises the importance of collaboration and knowledge networking across all elements of the stakeholder community, and provides a venue for those efforts.

Introduction

The ongoing revolution in information and communication technology (ICT), and its associated societal changes are confronting human services stakeholders with new challenges and new opportunities. In the space of a decade ICT has gone from being primarily a set of computational and communications tools for academic and research use to being directly, or indirectly, part of the fabric of daily life. The ICT-enabled "electronic venue" has become a place and workspace that involves virtually all of society's organizational structures and social processes.

The analysis that follows is designed to provide a framework to help understand those changes as they impact on human services stakeholders in pursuit of their diverse policy and service objectives. Its purpose is to help human services stakeholders identify and organize their strategies in response to these ICT-enabled challenges and opportunities.

The challenges facing human services in the presence of the ICT revolution are captured in the old story about six blind Indians trying to describe an elephant. In the John Godfrey Saxes' (1878) poem "The Blind Men and the Elephant", each extrapolates what an elephant is, based on the limited experience of touching the animal. Descriptions include: wall, spear, snake, tree, fan, and rope. John Saxe concludes the poem noting

that each was partly in the right, and all were in the wrong, and adds an oft forgotten nineteenth century Victorian moral postscript:

> So oft in theologic wars, The disputants, I ween,
> Rail on in utter ignorance, Of what each other mean,
> And prate about an Elephant, Not one of them has seen!

In the traditional story a wise Rajah, awakened from his nap by the argument, says: "Each man touched only one part. Perhaps if you put the parts together, you will see the truth." We have here both an example to how some have approached ICTs in social services, as well as an appeal to consultation and knowledge networking. Consider the elephant as an ICT-enabled knowledge sharing workspace, with the potential to facilitate the work and goals of human services recipients, service providers, funding sources, and policy makers, individually and in concert.

The following sections first situate the meaning of ICT for social process within the history of ICT development. This is follow by a framework for understanding the ICT driven challenges and opportunities facing human services stakeholders. The framework then explores the challenges and opportunities confronting service providers in the pursuit of diverse human services objectives at the individual, organizational and community level.

The goals here are two-fold. One is to better equip everyone from policy makers and managers through to service providers and clients, to better understand and work within the electronic workspace. The second is to help social service agencies to move beyond their traditional structures and processes and incorporate ICT-enabled structures and processes that allow them to improve knowledge management and knowledge networking within (and beyond) their organizations, and promote their development as learning organizations.

Human services organizations often embrace change and policy strategies that border on those used in countries with poorly governed dictatorships. They resort to leadership change (coups) or embrace un-validated ideas when they should be looking to the considerable knowledge within their staff and clientele (See Hamel, 2002 for a discussion of organizational change strategies). A current example of this is with regard to "abstinence only" programs to prevent HIV, motivated more by religious and ideological considerations than by evidence (Underhill, Operario & Montgomery, 2007).

A Brief ICT History

There is a wide division of opinion on how human services should do what it does, but there is some agreement on the mission. The shortest

version of that mission is to close the gap between society's haves and have-nots. How this is done, at what level (individual, societal) ignites passions. These issues are reproduced within the human services-ICT nexus. At one level there is a drive to use ICT to increase agency and program efficiency and effectiveness. At another level the focus is to close the ICT-based "digital divide" in order to enable the "have-nots". In record time the goal of ICT access has been elevated to an integral element of social policy (see the International Telecommunication Union's World Summit on the Information Society website).

To understand the challenge here, and the link between ICT and human services, it is useful to take a brief tour through the significant technology milestones behind the "digital revolution".

The earliest of computer designs (circa 1822-35) are attributed to Charles Babbage (1791-1871) whose designs were not completed in his lifetime (Science Museum, n.d.) His analog computer designs were similar in spirit to those for Jacquard's mechanical weaving looms from the turn of the 19th Century. His wife, Lady Ada Lovelace, daughter of the British poet Lord Byron, joins this history as the world's first computer programmer. Her writings on Babbage's "Analytical Engine" became a premier text for explaining what we now know as computer programming.

Mechanical advances were made in computing and calculation over the next century. Shortly before World War II there was an accelerated interest in digital computing machines. The ENIAC (1946) and UNIVAC (1950s) were used by the U.S. Census department then soon by research, military and commercial users. Computers were large, expensive, and in 1947 noted computer engineer Howard Aiken, predicted that six such computers (each with less capacity than today's notebook computer or cell phone) would be sufficient to satisfy the computing needs of the entire United States.

A parallel stream of technical advances was setting the stage for the digital revolution. Miniaturization set the stage for integrated circuit architecture. In the 1970 milestone year the first microprocessor patent is issued, Fairchild introduces a static memory chip, Intel introduces a dynamic memory chip, and builds its first microprocessor. Programming techniques and languages are quite advanced by 1970, when Bill Gates and Paul Allen (soon to be Microsoft) are offered PDP-10 computer time in exchange for programming work.

By 1970 the foundations are set for the microcomputer revolution of the 1980s. Had the digital revolution stopped at that point, there is little doubt that microcomputers, both small and large, would have become as pervasive as electric motors during the industrial age. Electric motors shaped and changed organizational structures, human processes, and human services. Industrial unions (based on workplace) grow at the

expense of craft unions (based on skills). There is the growth of the company town and the factory worker family. Computer-enhanced-industrialization would have presented, and is presenting, challenges and opportunities similar to those presented by electric motors.

There is, however, a second and more profound leg to the digital revolution, a leg that has a fundamental impact on the opportunities and challenges facing all sectors of society, including human services. By the early 1960s the US had created the Advanced Research Projects Agency (ARPA). ARPA was part of the U.S. reaction to the 1957 Soviet launch of Sputnik. Key people in ARPA saw the advantages of interactive (real-time) computing and the use of networked access to facilitate communications within a community of researchers.

The result was ARPANET, a network of research computers that supported interactive shared access across time and space. This development was important. The technology shifted from being a tool to being part of the workspace within which the researchers worked and carried on communications with each other. It marked the start of collaboration and interaction across time and space at speeds and a scope that were previously unthinkable. Being "thinkable" has opened up now possibilities. What is important here is that this marks both a new stage in the development of knowledge networking, and -more important- as a new venue for the construction of (social) organizations and conduct of social processes.

Knowledge networking has always occurred, be it in the local coffee shop after market day, around the local water tank on laundry day, by apprenticeship in the workplace or via formal training in the classroom. This new stage extends participation via electronic networks into a virtual (but real) digital domain. It changes how structures and processes can and will operate across time and space. It strengthens both synchronous and asynchronous communications, and strengthens it both between individuals and within groups. ARPA understood this from the beginning and has written:

> The ARPA theme is that the promise offered by the computer as a communication medium between people, dwarfs into relative insignificance the historical beginnings of the computer as an arithmetic engine. (ARPA draft, III-24, cited in Hauben, para 7).

By 1968 work was begun to link dissimilar computers in diverse locations into a single network of computers. The main rationale was to expand the electronic workspace, the electronic venue within which researchers organized into teams and conducted their work.

The history of the development of ARPANET is instructive in understanding how knowledge networking for research and learning is unlike the wooden and semi-mechanical versions of knowledge networking that lie behind today's primitive efforts to cast websites as archives, gateways and portals for knowledge. That history gives insights into the culture of knowledge sharing, and the important role of knowledge give-and-take, as opposed to knowledge archiving, in the advancement of knowledge and its application. A similar philosophy lies behind the open source software movement (Open Source Initiative, n.d.). This philosophy and culture has roots and implications that reach into the very heart of human services.

The next milestone in this progression toward the digital social process venue was the Transmission Control Protocol/ Internet Protocol (TCP/IP), a software design for transmitting data over networks. Using TCP/IP allowed operation in an expanded digital space, across the resources of the network, and across time and space.[1] Had developments stopped at that point the Internet would have remained the exclusive preserve of large organizations, those with the budgets and skilled human resources to take advantage of the technology and the networks.

Three more developments had to occur before these technological advances became the digital revolution, as we know it:

- The microcomputer with its cost and skills requirements increasingly within the range of everyone, including the stakeholders involved with human services.
- The World Wide Web as set of markup protocols (HTML, etc.) that allow content searches on remote hosts.[2] Previous protocols required that one know the name and location of a digital object in order to request it from a remote host.[3]

[1] TCP/IP had other strengths of particular interest to the military. It could route information and commands across the multiple nodes and multiple pathways of a network of networks without depending on a particular pathway. This is of strategic importance when nodes are subject to failure or destruction by hostile action. While this importance led to military funding, the non-military goals of research, learning and knowledge sharing should not be minimized.

[2] The World Wide Web, more commonly known as a web server, was developed initially as an in-house service to assist communities of researchers.

[3] For a brief moment in history a Canadian application called Archie, originally developed at McGill and working like a global file directory, served to assist in the location and retrieval of file-based digital objects.

- The Internet browser as a user-friendly interface for navigating the World Wide Web via the Internet.

This technology-driven revolution is having profound implications for the human services sector. To understand this we turn to conceptualizing human services in the presence of the ICT-enabled digital workspace.

ICTs, Human Services and Social Process Workspace

To understand how ICTs impact on human services it is useful to step back and reflect on how we commonly understand reality. While this may look like a retreat into an arcane level of discussion, it has practical implications for human services. For example, the "reality" of drug addiction or homelessness may be quite different for the addict or the street person than it is for the human services agency running a needle exchange or shelter for street people.

The main purpose here is to review how we construct social structures and carry out social processes within our realities. This does not mean having to choose between understanding reality from a post-modernism, a structuralism, or any other perspective. We are concerned with some of the common features present in whatever way we socially construct that reality. A secondary purpose of this exercise, in passing, is to demystify the notion of "virtual" in the term "virtual reality" as applied to human activity within the electronic venue.

One feature of commonly understood reality is the treatment of literal time and space. Things occupy a location at a point in time, and move across space with the passage of time. We use the term "commonly" here to recognize that at some level the reality of time and space is more complicated than this. At one level of understanding the Heisenberg Uncertainty Principle states that if we know precisely where an object is, we don't know where it is going (American Institute of Physics & Cassidy, 2002). However, even Einstein, the father of relativity theory, resorted to commonly understood Newtonian action and reaction physics when playing pool. The 'reality' we live and work in can quite comfortably incorporate several different constructs within that reality at one and the same time.

From the dark recesses of the history, interwoven within that reality, is faith-based religion. Faith-based religious dimensions overlay the literal dimensions of time and space, both expanding and constraining the resulting social organization/social process venue. Consider, for example,

---

Archie was quickly rendered redundant by the World Wide Web technology.

the role of faith-based beliefs and organizations, in society's views on birth control and abortion, which is at the heart of the arguments around abstinence-only programs and the US government's restrictions on international population planning programs.

In modern times the science-based dimensions of the psyche have further expanded that reality. During the Christian Inquisition aberrant behavior was explained as being possessed by the devil, or holy spirits, to the detriment or benefit of the individual. By mid-last century the psyche had been legitimized and such behavior was explained by reference to psychological states of the mind. Behavior that would have been resulted in burning at the stake during the Inquisition can now gain acquittal of criminal charges on psychological grounds. The lesson here is while the religious and psychological dimensions are not literal, they are nevertheless real.

Such is the case with the technology-based electronic venue. Simply put, while the digital venue exists only in an electronic space, it is nevertheless real in that it is part of the landscape that facilitates, constrains, and shapes organizational structures and social processes.

Figure 1

ICT and the "Real" Social Process Venue

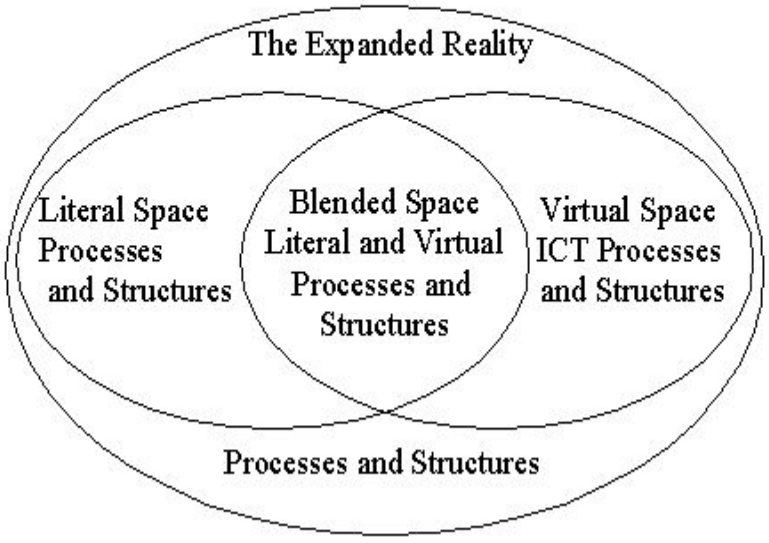


Figure 1 illustrates a fundamental point about the ICT driven revolution, and a fundamental difference in the impact of ICTs as contrasted with (for example) an electric motor driven revolution.[4] ICTs are tools much as electric motors are tools and they both impact on the social process space. However, ICTs also expand the social process space, the venue in which we create social structures and carry on social processes. True to its origins as the underpinnings of a collaborative research community, ICT not only expanded our capacity to process digital information, it also provided a venue for new ways to build organizations and new ways to carry out work, including the human services work of community and social discourse.

At this point it is not necessary to differentiate between the aspirations and objectives of the various stakeholders involved in human services. While these aspirations and objectives can be at cross-purposes, and frequently are, we can gain insight by reference to an undifferentiated stakeholder. The following analysis applies equally to any stakeholder in a community, an organization, or a process, as well as the community, the organization or the process itself.

Simply put, the emergence of this new reality, with its electronic venue, presents the following set of challenges to all stakeholders. For purposes of analysis let us denote all the actions that can be taken (building structures, carrying out processes, doing work, pursuing objectives) as "things". For organizational structures, for processes, for work and objectives, the challenge is to answer the following questions:

- What old things should continue to be done in the old (non-ICT venue) ways?
- What old things are best done in the new ICT-enabled venue?
- What new things are now possible in the new ICT-enabled venue?
- What new and old things can now best be done in a blended old plus ICT-enabled venue?

It comes as no surprise that there has been an explosion of experiments designed to do old things in new ways, and new things within the new venue. Many of the ICT success stories represent little

[4] There are however elements in common with the invention and deployment of electricity. Electricity was both a source of power, to power motors, and the basis for new services (telephone, radio, recording devices) that created a new and expanded synchronous and asynchronous communications venue. As with the printing press, this changed processes and structures and how they operated across time and space. This is part of what Canadian Marshall McLuhan (1968) meant by his enigmatic statement "The medium is the message".

more than exploiting how the electronic venue relaxed existing constraints on activity and expanded opportunities.

Commercial successes such as Amazon, eBay and Google are good examples. A brief tour though the commercial sector is instructive. Amazon deals in readily identifiable objects, books, and efficient delivery. eBay, even as it matures, is a (garage sale and flea market) retail expeditor, using the electronic venue to overcome the constrained of time and space. Google is a knowledge-inventorying tool. Part of each of those successes is, of course, the search and transaction support enabled by the technology, as well as the ability to use the electronic venue to facilitate efficiency and effectiveness in the delivery of literal or virtual goods and services. Since each of these examples exists in an oligopolistic market, each is keenly aware of the presence of the others, and of existing and potential rivals, so one will expect cross sector competition and inter-sector penetration as entities jockey for market dominance.

As uses of this electronic workspace mature, driven by competition, they are first transforming the commercial and industrial landscape. It is no surprise that virtual commercial services (accounting, management decision making tools, etc.) are at the forefront of such changes as companies seek first mover advantage. On the consumer side digital audio, video, and communications are on the front line of those changes. Again, commercial interests seek first mover advantage and market share as growing bandwidth access and falling digital storage costs cause customers seek, use and store digital objects (music, video).[5]

For example, while there are struggles around what business plan is appropriate to deliver audio and video, it is clear that the old ways are dying. The wounded and casualties at this point the audio/video retailers and the media production companies. There will still be creators and consumers. Unclear are the organizational forms and sustainable processes that link creators to consumers. Will this "disintermediation" (removing the middle of the process) shorting the value chain between provider and consumer/client, or breed new forms of intermediation? The same question can be asked with regard to the provision of human services.

---

[5] Consumers generally under appreciate the magnitude of these technology changes. Users tend to focus on functionality at a point in time and not the history of changes in functionality. For example, storage costs have been falling by about 2/3rds a year for the past 20 years. Per unit digital storage costs in 2004 are about one-millionth of what they were in 1984. Storage capacity for a single song runs a fraction of a cent on fixed media (hard-drive) to a cent or two for mobile medial (mp3 devices).

If the above example were a model of the full impact of ICT on society there would be little new and novel in the challenges (and opportunities) confronting human services. The electronic venue allows disintermediation within the process, much as online airline and hotel reservations allow disintermediation in the traditional role of travel agencies, and offshore call centers are taking jobs from local call centers. Airlines expect to have moved away from paper tickets to less costly and more efficient eTickets within three years. Is there any reason to expect the administration of social service entitlements to follow a different path?

However, human services will have to deal with the human consequences of disintermediation (joblessness, impacted communities, changes in social policy, retraining, etc.) at two levels. One is the level of their clients and the other is at the level of the human services organizations themselves. Human services organizations and professionals would be looking to the uses of ICT to enhance organizational and personal efficiency and effectiveness. Social policy would be looking at the downside impact of ICT on the job plight of the jobless, and the upside impact as a potential market for the placement of retrained clients. Everybody will be looking at the prospects for greater transparency and inclusive participation by stakeholders.

The full impact of ICTs on the structure and function (organization and processes) of human services is better understood with reference to Figure 2 "Matrix of Process and Structure Relationships". It depicts a three-layered relationship with (or more properly within) the ICT-enabled electronic venue. As well, it indicates the complexity of interlaced relationships between, and beyond, the three listed major stakeholder groups. The table also identifies some of the challenges to the human services sector that have barely been addressed by the current uses of ICT in human services. In the concluding section of this article we return to Figure 2.

The Quadrant Model of the Electronic Venue

We now consider how entities (organizations, communities, individuals) can view and situate their use of ICTs in the field of human services. For a typical entity we can depict its existing, or potential presence in, and use of the electronic venue as in Figure 3. The structures and processes can apply to a formal (individual, organization) or informal (group, community) entity.

The entity's presence in, and uses of, the electronic venue can be partitioned into four quadrants:

- Administration and Management

- Service and Produce Delivery
- Research and Learning
- Communication with the Rest of the world

Figure 2
Matrix of Process and Structure Relationships

How / Who	**Intranet:** ***Within*** Organization / Community	**Extranet:** ***Across*** Organizations / communities	**Internet:** ***Beyond*** Organizations / communities
Clients	**Clients working with clients** *Empowerment & community of concern*	**Clients working with HS workers and researchers** *Stakeholder Voice*	**Clients and the rest of the world** *Economy/Society Inclusion/Exclusion*
Human Services Workers	**HS workers working with HS workers** *Community of Practice & KN*	**HS workers working with clients and researchers** *Service Delivery & Collaboration*	**HS Workers and the rest of the world** *KM / KN Learning & Advocacy*
Researchers & Policy Makers	**R & PM working with R&PM** *Community of Interest KM & KN*	**R & PM working with clients & HS workers** *KM & KN Learning & Advocacy*	**R & PM and the rest of the world** *KM & KN Learning & Advocacy*

Within each quadrant, that presence can be further divided into three types of electronic venue activities:

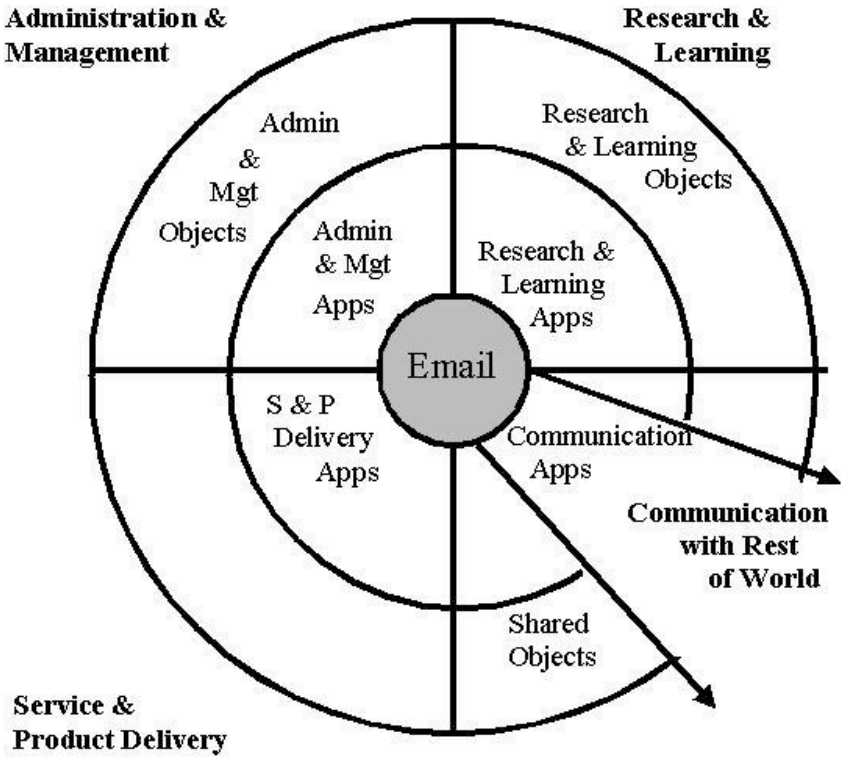
- The assembly and archiving of digital objects (data, text, multi-media)
- Applications (supporting assemble, processes, use, and delivery of digital objects)
- Communication (person-to-person one-to-one, one-to-many, and many-to-many)

On the surface it would appear that a business model approach to the challenges of using the electronic venue effectively would simply involve filling the appropriate quadrants with appropriate objects (data) and

applications. We consider that approach first, and then revisit the deeper dimensions of the challenges and opportunities that the electronic venue presents to human services.

Figure 3

Human Services Entity's Virtual Venue



Northwest Quadrant: Administration and Management

Organizational human service entities first embraced the electronic venue in the administration and management quadrant. This was driven mainly by efficiency gains surrounding financial and human resource records management, accountability requirements imposed by funding sources, and by the fact that off-the-shelf applications were suitable for computerizing administrative tasks. Such applications required only limited computer competency within an entity.

One of the slower administrative applications has been in the area of client record keeping. In health care, where client-record keeping takes on greater importance, the challenges of maintaining current records have

been formidable. Problems range from the burden of data entry and record updates to issues of confidentiality and compatibility between parts of the record keeping system as the patient/client moves from service to service. The prime driver in the development and application of client record systems has been more to handle billing requirements and less the information needs of provider staff and clients. This is an area where remote data monitoring and artificial intelligence data analysis is seen to hold promise, especially for use in "preventative" and "early warning" diagnostic systems that feed analysis and advice back to the client as well as usable forms of diagnosis to the care givers and service providers.

The gap between needs and potential here is even greater when we recognize the intersection between health services and human services, especially as population health and the social determinants of health and well intersect with human services.

The client record challenge illustrates the "richness" of both the challenge and the opportunities. It is to establish a format and a procedure for data collection that serves the interests of administration, of those involved in service delivery, of the funding sources, and of the client. Such record-keeping should also serve to assess and monitor the organizational "health" of the institutional service provider. Thus, with reference to Figure 2, the challenges of the electronic venue for administration and management go far beyond orderly administrative, financial and patient record keeping.

Southwest Quadrant: Services and Goods Provision

On first reflection it would appear that the uses of the electronic venue for service and product delivery involves the dual challenges of "know the client" and "know the products". Much of human services work involves matching the circumstances and needs of clients, be they individuals or groups, to deliverable services, products, and appropriate referrals.

However, again as we will see below, and with reference to Figure 2, the challenges of the electronic venue for services and goods provision go far beyond arming the human services provider with a better client record and more complete menu of deliverable products and services. They involve "know thyself" for the provider and "know thyself" for the client as well.

Northeast Quadrant: Research and Learning

It is here, the northeast quadrant of the entity's presence in the electronic venue that one begins to see the profound impact that that ICTs will have on human services. The traditional image of a human services entity

involves little research *per se*, with learning focused on in-service staff training. . Skills and knowledge are thought of as individually based, with a long "shelf life" (as good tomorrow as today), a long 'half life" (slow rate of obsolescence in use), and sustained largely through "learning by doing" and "in service" training opportunities. This is an area where remote data monitoring and artificial intelligence data analysis is seen to hold promise, especially for use in "preventative" and "early warning" diagnostic systems that feed analysis and advice back to the client as well as usable forms of diagnosis to the care givers and service providers.

The ICT revolution is challenging this model in several ways. The first challenge is from the fact that the circumstances of clients and of service provision are being transformed at a faster rate that in the past. The knowledge and skills of the provider and the client have shorter shelf lives and shorter half-lives. Learning by doing has to be complemented by learning while doing. The challenge is to move from episodic in-service training to continuous and "just in time" learning, and to move from episodic client education (or re-training) to strategies that promote continuous client learning.

The second, and major challenge, is found in the greater recognition that entities, as entities, possess implicit institutional (collective) and tacit knowledge important to the objectives and delivery of human services. This includes organizations, communities and other entities on both sides of the human services provider/client relationship. The drive to capture (and reify) this tacit knowledge is driven on the one hand by the desire to retain it and on the other hand the desire to share it, especially in an era of high staff mobility and turnover. Some of the reality "imposed" on human services comes from social trends at large. Increasingly human services staff view their jobs as "my current job" and less as "my career and my calling". This makes the dual task of recruiting skills and retaining organizational knowledge much more difficult. This author has encounter Canadian long term care facilities where the annual staff turnover rate was in excess of 125%.

A third challenge is the growing demand for greater accountability to funding sources, clients and the public in general. This is equally true for public sector, private sector and third sector (voluntary, NGO, civil society) organizations. These carry with them research like demands involving data collection and analysis, in the pursuit of transparency, accountability, and performance levels as set by external standards.

In total these challenges move learning from a support role for staff and service to a central organizational objective. They elevate the importance of an internal research culture from that of an "in-house" service to the level of an essential component for excellence in organizational behavior and service provision. The ICT challenges can be summed up in the frequently used, but frequently misunderstood,

concepts of knowledge management and the knowledge organization, and the quest for "learning organization" status. Equally poorly understood is the need for this learning to fuel innovation within the service delivery agency and an appropriate management culture.

Southeast Quadrant: Communications with the "Rest of the World"

To some extent the southeast quadrant is the "Pandora's Box" of the electronic venue. As the earlier quote with regard to ARPANET stated, it is communications capabilities and not computational capabilities that are at the heart of the ICT revolution. The same communications facilities that can facilitate global coordination across commercial or military ventures can be used to facilitate collaboration, cooperation, and coordination across human services entities, be they organizations or communities of all sorts.

Marshall McLuhan (1962,1964), in a pre-Internet world, argued that communications would create a global village, built around something akin to one global central nervous system. The Internet, as a network of networks, has collapsed some aspects of time and space to the virtual scale of that "global village".

However, rather than understanding the Internet as creating a single virtual global village, linked by one central virtual nervous system, the electronic venue is creating a multitude of venues able to receive, transmit and share digital objects. The result is multiple intentional communities comprised of diverse entities across the globe. These intentional communities are connected via ICT and are built around a multitude of interlaced virtual central nervous systems. The "glue" within these "nervous systems" tends to be networked communities of concern, interests, or practice. They tend to extend well beyond the knowledge management intranets being built within organizations. There are strategic and behavioral reasons for such intentional virtual communities to prosper beyond the organization and languish within the organization. Peer-to-peer dialogue is more open when it is not being monitored – formally or informally- by work colleagues, and is more difficult when carried on in a hierarchical organizational structure. This presents challenges and opportunities for the organization, as well as the individual.

All this is important for human services at two levels. At one level it means that knowledge management, knowledge networking, learning and research are now global undertakings. They require a presence and strategic participation in multiple virtual communities, some located locally and some at a distance. At another level it means -for example- that a service provider or a client, as an individual or a community, may be literally local, literally distant, or virtually both a local and a distant

member of multiple communities. This poses interesting challenges for both policy and the provision of human services.

The Concentric Rings of the Electronic Venue

The concentric rings of the electronic venue represent three layers of activity but unlike the rings of a tree, they are progressively more "alive" as one moves to the center. The "historical objects" (akin to the dead heartwood of the tree) is on the periphery and the living actions are at the core.

Digital Objects in the Electronic Venue

The raw material of the electronic venue is digital objects and digital commands. On the one side the objects consist of numeric, text, audio or video in digital format and amenable to computer manipulation. On the other side digital commands consist of the programs and applications that run on, and control, the computer. These operations can be as basic as sending or getting objects, or as complex as modeling, analysis and decision-making.

One of the challenge for a human services entity is to know what objects are relevant, which should reside "in-house", which should be sourced from outside, which objects should be shared, and for each, under what terms. This is more complex that it looks since some human service organizations extract value from what the control (information, policy, services) rather than from what they know. Since the ultimate goal is to turn information into usable relevant knowledge, these are not trivial issues. The digital objects have to serve the interest of all four quadrants of the electronic venue.

Applications: From Objects to Usable Knowledge

The applications challenge for the northwest is least acute. Administration and management tasks have much in common across organizations and are facilitated to a large extent by standard off-the-shelf applications. The major challenges here are increased transparency and accountability.

The applications challenge for the southeast, for communications with the rest of the world, looks to be fairly straightforward. In the language of Figure 2, once the strategies for internal (Intranet), and client/supplier/collaborator (Extranet) communications are established, those applications can easily serve external (Internet) communications. The real challenge is to know how to beneficially use such communications for knowledge management and to support being a

learning organization, especially when organizations fall back on "knowledge is power" rather than "knowledge for empowerment".

The applications challenge is most acute for the quadrants of the northeast (research and learning) and the southwest (service and product delivery):

1. What applications will support continuous learning at the individual and institutional levels?
2. What is the appropriate research to support being a learning organization?
3. Who is to be included within the group, and who is to be excluded?

Some research is "data mining", i.e. extracting knowledge from in-house data. Some research is to locate relevant knowledge from external sources and use it effectively in-house. Early activities in this area consisted of developing computer-aided learning applications; current thinking includes a large role for knowledge networking within intentional online communities of concern, interest and practice.

The delivery of services and products in the human services sector is more complex than for market and commodity based services and products. They are seldom designed and supplied in the face of full market forces. They are subject to direct control through policy legislation. Lastly, their appropriateness depends on the context in which they are provided and the context in which they are received.

In short, there is need for applications that support consultation across all sides of the delivery process. With demand for commercial products consumers "vote with their dollars". In human services all stakeholders (clients, funders, public) are increasingly seeking a right or greater entitlement to participate in the design and delivery of the service or product.

The challenge in this arena is how to use the electronic venue, via a provider/client community workspace, to achieve better policy and service outcomes. This goes beyond efforts to achieve in this the context of one-to-one interaction, in either literal or virtual venues. This suggests more of a role for the electronic venue in the support of interlaced communities of participants.

Communications: Email and Intentional Electronic Communities

The heart of Figure 3 is simply labeled "Email". This convenient shorthand refers to an individual or an entity's core ability to use ICT to send, fetch, or receive intentional communications within the electronic

venue. It has been argued that email is the original, if not the ultimate, "killer ICT application".[6]

In the evolution of online applications there appears to be a convergence between the strengths of one-to-one and one-to-many email, websites, email lists (e.g. listserv), and blogs. One example is wiki software which combines the ease of use of email with access to the sophisticated features webpages, blogs and lists. The Wikipedia is an example (see wiki.org, 2002).

The cost and time-across-distance advantages of email are well recognized. What is less recognized is the role of intentional electronic communications for continuous learning, just in time learning, lurker learning and knowledge transfer. Much of this learning takes place less within formal online learning venues and more within virtual communities of concern, interest and practice. The role of intentional electronic communities in knowledge networking, and their implications for knowledge management strategies are of strategic importance for human services and human services management. They are addressed in the concluding section of this chapter.

Human Services and Knowledge Management

In the previous sections we have identified a number of reasons why an organizational learning and knowledge management strategy is central to the effective functioning of human services provision. Unfortunately, it is easy to agree with that statement, and even declare it as a core organizational value, without understanding what it means in practice.

At the administrative and management level knowledge management is central to the efficient operation of the entity. At the service provision level it is essential to maintain the skills and knowledge levels of individual staff and of operating units. It is essential to identify appropriate service and product options given changes in the composition and circumstances of clients. For research, the provision of training and support for learning, it is important to understand what we include in a knowledge management strategy and what is more effective or less effective. But there is more.

A good place to start is with respect to what we mean by knowledge in the first place. There is a tendency, when looking to knowledge management strategies, to restrict our thinking to knowledge as facts, or

[6] This has nothing to do with the current troublesome problems of spam and virus messages. It goes back to the inspiration behind ARPANET has to do with what is at the heart of social process within the electronic venue, communications within an intentional community.

information, preferably assembled in searchable format.[7] There is a tendency to think of it as compendiums of "what, where, how" and "best practice" advice. There is a tendency to believe that the knowledge that is important consists of the knowledge that can be reified, codified, and accumulated in archival format.

This approach ignores several important properties of knowledge. It also ignores the context in which knowledge lives as private or tacit "object" within a community. It ignores how and when it is shared as determined by the culture of that community. Lastly, it ignores what ICTs are doing to calls for accountability, transparency and participation in human services.

These aspects of knowledge become of even more crucial importance when human service agencies face a climate of high staff turnover and large complements of temporary or contract staff, often employed to execute programs that have been sporadically awarded in response to proposals submitted to funding source requests for proposals (RFPs).

What is ignored can be illustrated by reference to a simple schema often used to explain what we mean by knowledge. It starts with data, treats refined data as information, and refined information as knowledge.

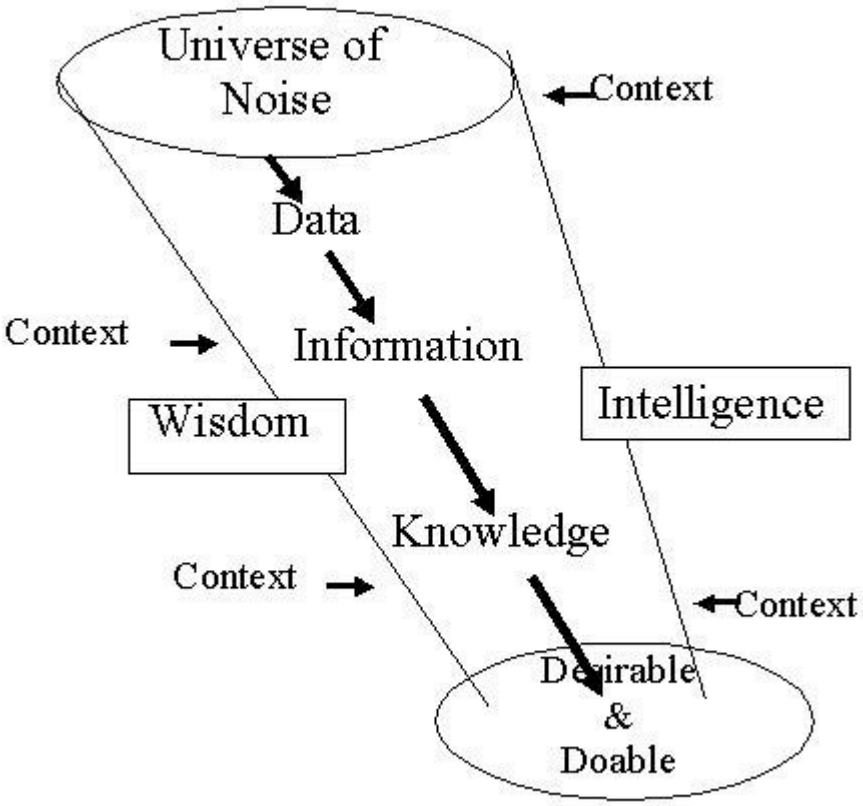
DATA > INFORMATION > KNOWLEDGE > USE

We can identify elements of the sequential refining process by recourse to the scientific method. A testable hypothesis defines data. The hypothesis is rejected, or not. That information yields knowledge as a "state of" or an "if/then" statement. This knowledge can be put to use. However, this process is not mechanical. What is missing here are the roles of judgment (intelligence and wisdom) and of context.

[7] While this is – at the core – what makes online search engines such as Google a success, that only covers a very then slice of what constitutes knowledge and how it moves across networks. Much of it is shared in passing, or on request to the group, within intentional communities of concern, interest and practice.

Figure 4

From Noise to Knowledge: A Social Process



Consider Figure 4 in which a highly stylized version of the process is depicted. All knowledge is not the result of such a purposeful quest but the figure allows us to highlight several key issues.

The first is that the sequence:

DATA > INFORMATION > KNOWLEDGE > USE

proceeds within a set of contextual factors. Those contextual factors legitimate knowledge, and meaning and usefulness of knowledge outside the context in which it was gathered can be questionable. Validity beyond initial context may hold in much of the physical and natural world. It may not hold in the socio-cultural world that is the domain of human services.

This serves as a caution with regard to knowledge transfer and transferable lessons learned. It also suggests that he process of identifying

the “doable” would benefit from mediated by the wisdom and intelligence of stakeholder communities, operating at the individual, group or community level.

The second issue is that the desirable is a socially and ethically determined objective in the case of the social policies that underpin human services. Again, the collective wisdom of the group is important at each stage in the process from the universe of noise through to the usable and appropriate knowledge that identifies the desirable in conjunction with the doable.

Conclusions

We have tried to capture and highlight the “lessons” contained in the preceding discussion on the role of ICTs in human services. These lessons are the starting point for the human services sector's strategy for confronting and embracing ICTs in its structures, its processes, and in its delivery of services.

The first lesson is that ICTs are more than just a tool to enhance the efficiency and effectiveness of human services delivery. As an electronic venue they expand the reality that human services must face as they pursue their mission and provide services. They expand the reality in which other stakeholders (clients, policy makers, etc.) must operate. The ICT-enhanced electronic workspace changes the reality within which policies are set, the reality within which human services are structured, and the processes within which they participate. The electronic venue is both a new tool and a new context.

The second lesson is this new (expanded) reality heightens the need for entities (organizations, communities, groups) to improve their levels of knowledge management (KM) and knowledge networking (KN). Human services organizations are increasingly working in a context that involves broader time and space horizons, even when service delivery remains decidedly local. Knowledge management and networking within and beyond the entity are essential to good performance. An example of this is when an urban social services agency, serving a new immigrant clientele, needs to seek advice from knowledgeable social service entities in the client’s country of origin. Greater global mobility causes the need, and ICT offers the opportunity for consultation.

A third lesson is with regard to the nature of the knowledge that needs to be managed and networked. Only a fraction of that knowledge is the “what”, “why” and “how” knowledge of doing things more efficiently and effectively. Only a fraction is about training staff and clients in the “rules and regulations” of the game. A significant amount of the knowledge is the informal tacit knowledge carried by staff, or by the clients. Much is not amenable to codification and capture within a

"knowledge inventory" strategy. Knowledge networking is as much about networking people as it is mining data and warehousing information.

The fourth lesson has to do with training and learning. External factors and rapid rates of change are reducing the "shelf-life" and "half-life" of the skills of human services workers. This is further complicated by the fact various factors (work conditions, career advancement, etc.) promote shorter tenure in human services jobs, making the retention of "corporate knowledge" a more difficult task. This not only heightens the need for continuous "learning while doing". It also presents the entity with a challenge to sustain its corporate knowledge through a strategy of learning organization behavior.

The fifth and last major issue here has to do with how human service organizations factor in context and wisdom as they do what they do. Human services evolved from third sector (voluntary/charity) and governmental (welfare state) roots. As they have evolved they have become more policy constrained and rule-bound organizations. This leaves less scope for context and wisdom-specific considerations in service delivery at a time with ICT-enhanced opportunities are calling for more transparency and accountability.

The evolution of the management structures of human service organizations has made them more ready to adopt the administrative benefits of ICT, while making them less ready to adapt to the new realities being created by the emergence of the electronic venue as part of the broader social process reality.

Therein lays the real challenge for human service organizations. All stakeholders, from policy makers to clients, are learning, if by force of necessity, to live life within this broader ICT-enhanced social process reality. Human service workers can carry on continuous learning and learning while doing. The real challenge is whether or not human services management has the knowledge, change skills and attitudes to confront the demands for organizational innovation and change that ICTs are placing on the appropriate provision of human services.

Given the speed of change within the ICT-enabled reality, to achieve this change will require a sustained effort to re-train existing management. There is not time to simply wait for a new generation of human services professionals to come out of educational programs that, as of now, are still weak in dealing with the ICT-enabled reality that confronts human services.

References

American Institute of Physics & Cassidy, D.C. (2002) *Heisenberg/Uncertainty principle.* Melville, NY: American

Institute of Physics. Retrieved October 11, 2007, from http://www.aip.org/history/heisenberg/

Hamel, G. (2002). *Leading the revolution*. Boston: Harvard Business School Press.

Hauben, M. (n.d.). *Behind the Net - The untold history of the ARPANET*. Retrieved October 11, 2007, from http://www.dei.isep.ipp.pt/docs/arpa--1.html

McLuhan, M. (1968). *The medium is the message; with Marshall McLuhan.* Long-Playing Record. Produced by John Simon. Conceived and co-ordinated by Jerome Agel. Written by Marshall McLuhan, Quentin Fiore, and Jerome Agel. Columbia CS 9501, CL2701.

McLuhan, M. (1964). *Understanding media: The extensions of man.* Toronto: McGraw-Hill.

McLuhan, M. (1962). *The Gutenberg Galaxy: The making of typographic man.* Toronto: University of Toronto Press.

Open Source Initiative (n.d.). *OpenSource.Org.* Retrieved October 11, 2007 from http://www.opensource.org/

Saxe, J. G. (1878). The blind men and the elephant. In W.J. Linton (Ed.), *Poetry of America: Selections from one hundred American poets from 1776 to 1876.* Michigan: G. Bell.

Science Museum. (n.d.). *Babbage*. Retrieved October 11, 2007 from http://www.sciencemuseum.org.uk/onlinestuff/stories/babbage.aspx

Underhill, K., Operario, D., & Montgomery, P. (2007) Reporting deficiencies in trials of abstinence-only programmes for HIV prevention. *AIDS, 21*, 266 – 267.

Wiki.org (June, 27, 2002) *What is Wiki?* Retrieved October 11, 2007, from http://www.wiki.org/wiki.cgi?WhatIsWiki

World Summit on the Information Society (n.d.) Retrieved October 11, 2007, from http://www.itu.int/wsis/