Perspectives on New Information Technologies for VHA

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Introduction

The pace of technical innovation in the information and technology industry over the past decades has been dramatic and accelerating. The typical automobile on the road has more computing power than the Apollo Lunar Landers. The initial PDP 11 computers used to support DHCP in 1983 used a "high speed" Unibus to connect the computer and its internal memory at a distance of a few inches. Today, patients can access the Internet via cable modems at a faster rate, from anywhere in the world.

Although it is impossible to predict exactly what will happen in the next 5-8 years, we can be sure that the growth in computing and communications capabilities will continue dramatically. These capabilities will not only make current information systems faster and less expensive, but they will also create fundamentally new ways of thinking about the way organizations use these technologies. The purpose of this paper is to describe some of these technologies and ways of viewing them through fresh perspectives.

The emergence of Amazon.com could not be understood from the perspective of bookstores in shopping malls, nor could Napster be understood from the perspective of the music industry. Similarly, the effects of new internet and communications technologies cannot be understood from the perspective of the current health care system. These changes may be not necessarily be "friendly" growth paths; they may require some major changes in standard patterns of thinking. Nevertheless, they are important to consider when dealing with technology innovation.

Some of these perspectives are:

1. Intense Internet growth moves to the "edge" of the net, focusing on individuals rather than web servers. Peer to peer (P2P) architectures change the technical landscape, sometimes inverting the role of enterprises and individuals. (see Appendix C) Individuals become the center, surrounded by the enterprises which provide services to them. Section 1 describes Microsoft's HailStorm technology is a leading candidate to play this role, which creates both opportunities and concerns for future VHA information architectures.
2. The scale and interactivity of these technologies creates new opportunities to use them for VHA health activities. In order to do so, we need to look at health from a broader perspective, including preventative health as well as new forms of trust and community formation. Section 2 discusses health and the network effect.
3. Complementary currencies – such as frequent flier mileage programs – are becoming easier to create with modern information technology. One way to build community and overcome accounting difficulties is to define a complementary currency for Veteran's Health. A scenario for creating "VHA Health Bucks" as a complementary currency for health is discussed.

1. Inverting Perspective

The VHA Enterprise Architecture is, by definition, an enterprise-focused perspective of information technology within VHA. Understandably, this perspective places the VHA at the center of people and organizations with which the VHA is involved. These "stakeholders" represent the critical paths of information flow from the enterprise perspective. The following chart from the VHA Enterprise Architecture illustrates this perspective:[1]

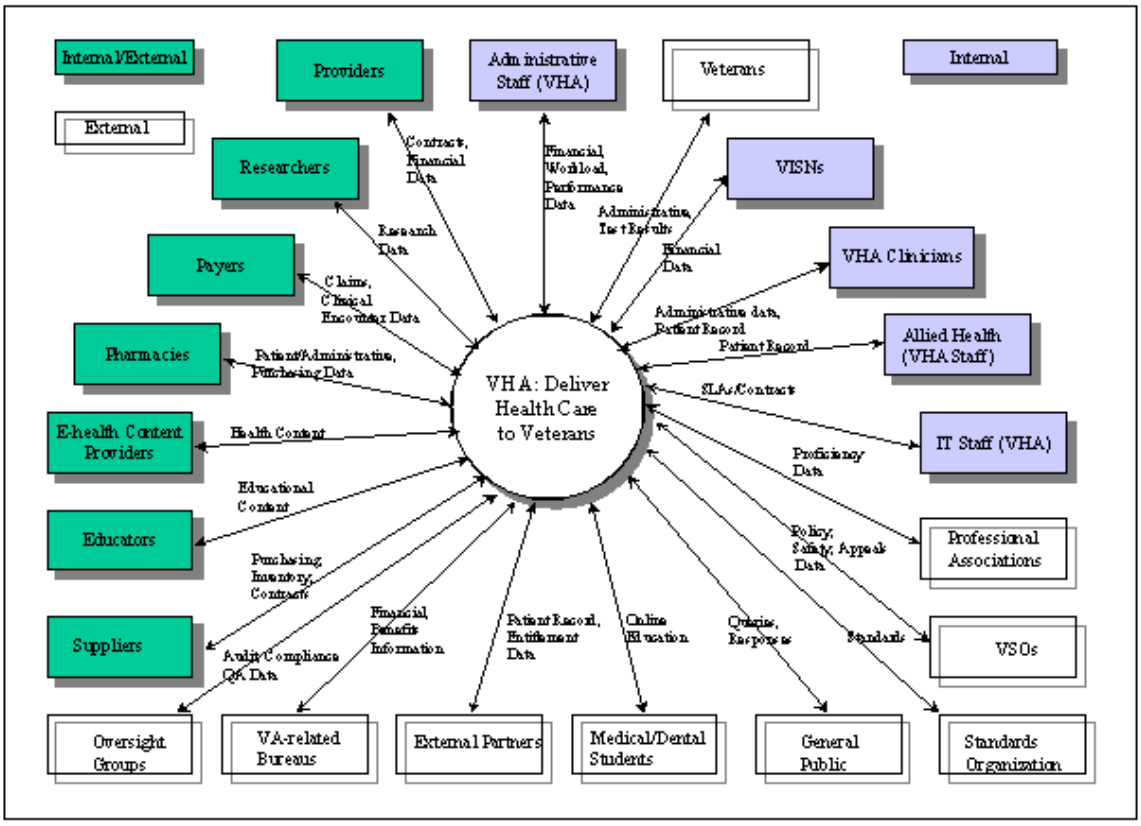

Figure 1 VHA Enterprise Architecture puts VHA at center

An alternative perspective – viewing from the edge – would be to put the individual at the center of the diagram. The spokes radiating out from the person would reflect the "stakeholders" in that person's health, of which the VHA would be one spoke. There would be many other organizations, people, and enterprises which relate to that person's health. VHA flips from being "inside" the circle of enterprises to being on the edge of its patient's health activities.

[1] http://www.va.gov/vha-ita/ita/2001/EA2001v3final_1100.html

HailStorm

Microsoft has announced a software architecture called HailStorm (to be released in late 2001) which reflects this perspective:[2]

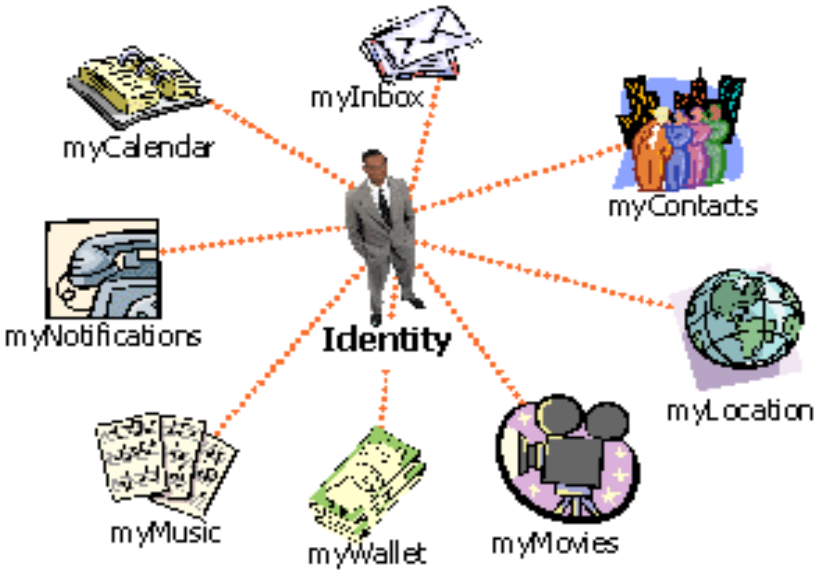

Figure 2 Microsoft HailStorm puts individual at center

Instead of people having to adapt to each technology, "HailStorm" services help different technologies cater to the user and provide a consistent experience across an individual's entire "personal network." "HailStorm"-based solutions allow users to manage and protect their personal information, as opposed to today's world in which it is scattered across the technology landscape, with no ability to control the privacy of their information. In addition, these solutions will allow different technologies to work together in tandem, saving the individual from acting as the integration point between all the technologies in their life.

Microsoft has designed an initial set of generalized services which radiate around the individual: The initial set of HailStorm services which have been announced are:

- myAddress - electronic and geographic address for an identity
- myProfile - name, nickname, special dates, picture
- myContacts - electronic relationships/address book
- myLocation - electronic and geographical location and rendez-vous
- myNotifications - notification subscription, management and routing

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[2] Microsoft's Bill Gates Previews New "HailStorm" Technologies to Usher In New Era of More Consistent, Personalized and User-Centric Experiences, March 19, 2001 http://www.microsoft.com/presspass/press/2001/mar01/03-19HailstormPR.asp

- myInbox - inbox items like e-mail and voice mail, including existing mail systems
- myCalendar - time and task management
- myDocuments - raw document storage
- myApplicationSettings - application settings
- myFavoriteWebSites - favorite URLs and other Web identifiers
- myWallet - receipts, payment instruments, coupons and other transaction records
- myDevices - device settings, capabilities

Using Hailstorm, an appointment with the VHA could be sent to to the veteran's "myCalendar." This would then appear on the person's time management system, whether is was a personal computer, PDA, cell phone, web site, or paper-based postal mail notification. The flexibility to choose how and where to direct these appointments would be controlled by the individual, not the enterprise.

From the enterprise architecture perspective, this could also make things more flexible. VHA would only have to issue an appointment notification in a standard format, it would not have to be concerned about how to present it on a veteran's appointment system.

Some possible uses of HailStorm for VHA might be:

HailStorm Service	Possible use by VHA
myAddress	Standard VA mailing, email, fax, and other contact information
myProfile	Specific VA information, relating to edibility, Identity presented to others (filtered by contacts), such as anonymous, pseudonymous, or identified.
myContacts	VHA health team, contact information. Entry point for trust network.
myNotifications	Health events, annual exams, vaccinations, notices about drugs, health reminders
myInbox	Integrated patient communications system, discussion management, on-line support groups, knowledge base alerts
myCalendar	Appointment scheduling, medications, refills, lab tests
myDocuments	Folder could be set up for VA information; e.g., copies of Health e-vet info could be stored there. A standard folder definition could be used to store patient info for allergies, H&P, etc.
myApplicationSettings	For VA application software, health e-vet settings
myWallet	To hold VA Dollars (see "complementary currency for Veterans" in this paper)

Figure 3 Possible Ways of Applying HailStorm to VHA

There are many VHA functionalities which could fit directly into the HailStorm model. It is also possible to think of the VHA as extending the the model. For example, Health e-Vet could be a part of a service (myHealth?) which would communicate information with the individual's health service. This information would then automatically be integrated with all of the other provider's health information.

Another idea would be to create a "myVA" service which serves the needs of veterans from the department as a whole.

Comparison of Hailstorm with original DHCP design concepts

There are a number of aspects of HailStorm which are parallel to DHCP design concepts from the early 1980's. For example:

HailStorm Service	**HailStorm Description**	**DHCP Kernel Service/concept**
myAddress	electronic and geographic address for an identity	Kernel User Parameters
myProfile	name, nickname, special dates, picture	Kernel User Parameters
myContacts	electronic relationships/address book	
myLocation	electronic and geographical location and rendezvous	
myNotifications	notification subscription, management and routing	MailMan Inbox-integrated messaging, discussions, FileMan updates, alerts, Pendex
myInbox	inbox items like email and voice mail, including existing mail systems	MailMan Inbox
myCalendar	time and task management	"Pendex" system- an integrated system to track pending things for both the user, as well as patient-oriented events for which the provider may be involved.
myDocuments	raw document storage	FileMan
myApplicationSettings	application settings	Kernel User parameters
myFavoriteWebSites	favorite URLs and	Universal NameSpace, in which

	other Web identifiers	domain name would be pre-pended to FileMan reference to communicate across all sites. This created a Universal connectivity of all DHCP web sites
myWallet	receipts, payment instruments, coupons and other transaction records	
myDevices	device settings, capabilities	Personalized user kernel parameters.

Comments on SOAP, XML, and DHCP Kernel Architectures

SOAP (Simple Object Access Protocol) is a key protocol used by HailStorm for communicating between servers. It allows transactions to flow between web servers as well as via electronic mail messages.

There are many similarities between this approach and the architectural concepts built in to the early architecture of DHCP in the 1980's. At that time, I was active in the design of the kernel, the FileMan, and MailMan. I have not kept current with the evolution of the system, but I suspect that there are still some features in the DHCP code which may be applicable. If not, the concepts may still have some potential.

The original MailMan was designed in 1984 as a network transport tool as well as many other things. It was designed in an era which required the use of 1200 baud autodial modems. Although this design is very old and based on obsolete technology, many of the concepts may be relevant to day. Here are some issues which may be relevant.

G.<name>	Address a message to a group, as defined in the group file of the destination's GROUP file.
O.<name>	Address a message to an option on the destination's menu system. Thus, one site could send a message to another site's computer. Note that if this capability still exists, it could be connected to the SOAP process relatively easily, allowing traditional DHCP systems to participate in SOAP exchanges through email.
P.<name>	Address a message to a patient. The original MailMan concept was to extend mail service to every patient in the VA, and to use this as a point of connection for patient-related communication and tracking. Patients who did not have access to email (this was in 1983) would get their mail digested and sent out via paper mail. Patients were to get separate baskets for appointments, correspondence, etc.
<name> (no prefix)	Address mail to a MailMan user. <name> could include the "@" syntax, which would route the message to any other RFC 822 mail system address.
F.<reference>	This was part of a "universal namespace" concept which was never

	implemented. <reference> was to be a syntax consisting of the VA domain name followed by a FileMan reference for specific data. This provided a means of referencing any DHCP site from anywhere else. The web's URL (universal resource locator) was a much more powerful definition of this idea.
Pendex	This was the name of a concept I was considering, but never put into code. The term stood for "Pending Index" and was to have been implemented as a form of cross referencing files by things which were pending. The pendex was to be organized by date and a code, indicating what to do if a scheduled event occurred and the event was not cleared. (Generating a MailMan message was one option). This would have allowed the system to track events which *didn't* occur, such as missed appointments, refills not filled, lab tests not read, etc. The Pendex could be integrated into a notification system. In many cases, things which do NOT occur are more important than those which do occur. Transaction processing technology is largely based on tracking what does occur, leaving it difficult to track missing activities. Being able to post the expectation of an activity and then being notified of its non-occurrence would be a powerful architectural tool. This could have particularly strong implications for patient safety activities.
FileGrams	Filegrams were messages of FileMan data which were formatted according to the DIQ program format of <name>=<value>. XML provides a similar function.
Data Dictionary	There is almost a one-to-one mapping between the XML DTD (Document Type Descriptor) and the FileMan data dictionary.

Industry Controversy over HailStorm Architecture

The HailStorm approach has brought considerable controversy as to the degree to which the architecture will be "open to customers but closed to competitors." There are those who fear that the approach may be built in to the Microsoft operating systems so deeply that it would put competitors at a disadvantage:

> Even before Microsoft announced its new online services plan — dubbed Hailstorm — on Monday, some of the company's leading competitors were quietly registering complaints about the effort with government antitrust regulators.
>
> The competitors, including AOL Time Warner and Sun Microsystems, allege that Hailstorm and other pieces of Microsoft's .Net initiative are designed to limit their access to customers and further leverage Microsoft's dominant Windows market share.
>
> On Friday, AOL/TW officials had a breakfast briefing with several state attorneys general involved in the government's pending antitrust lawsuit against Microsoft, which is under review by the U.S. Court of Appeals for the District of Columbia. AOL TW raised concerns that Microsoft's new products could create a

> choke point on the Internet for e-commerce, instant messaging and downloadable music. [3]

In keeping with VHA's role as a federal agency, it would be in a position to drive an open standards approach to the use of HailStorm for general use. If Microsoft chooses to make HailStorm a publicly accessible tool, then it could be of great use to VHA. If however, it becomes "open for users, but closed for competitors," then its applicability for VHA would have to be assessed accordingly.

> The obvious question is "Can a HailStorm transaction take place without talking to Microsoft owned or licensed servers?" The answer seems to be no, for two, and possibly three, reasons.
>
> - First, you cannot use a non-Passport identity within HailStorm, and at least for now, that means that using HailStorm requires a Microsoft-hosted identity.
> - Second, you cannot use a non-Microsoft copyrighted schema to broker transactions within HailStorm, nor can you alter or build on existing schema without Microsoft's permission.
> - Third, developers might not be able to write HailStorm services or clients without using the Microsoft-extended version of Kerberos.[4]

Patient Flow vs. Provider Flow

If we look at health care as a flow of activities, we find a kind of relativity. From one perspective, the provider is fixed in space and the patients flow through the clinic, hospital, or organization. From the other perspective, the patient is fixed in space and the providers flow by. This may be illustrated as follows:

	Enterprise-Centric	**Patient-Centric**
What is fixed	The Enterprise	The Patient
What moves	Patients flow past the enterprise	Providers flow past the patient
Point of Reference	Provider is fixed point of reference	Patient is fixed point of reference
Information Architecture	Enterprise Architecture	Personal Information Space
Clusters of information	Departments, functional areas, diseases, protocols	Areas of interest; communities of trust; family, career, geography, access
Duration	Encounter; "longitudinal" information for 1-50 years	Lifelong; evolving with age, interest, health issues
Information storage	Organized along enterprise and industry and enterprise definitions	Organized according to flow of interests, activities.

[3] http://www.thestandard.com/article/0,1902,22965,00.html
[4] Shirky, Clay, "Hailstorm: Open Web Services Controlled by Microsoft", May 30, 2001, http://www.openp2p.com/pub/a/p2p/2001/05/30/hailstorm.html?page=1

To extend this line of thinking even further, the person at the center may have many things other than health care activities and interests to contend with. A doctor's appointment is not an independent activity, for example. Other appointments must be checked, and the fact that an appointment has been made relates to other future appointments. Health care activities become only one aspect of a person's electronic records, radiating from their personal information spaces.

Technology allows these individuals may connect in new ways. This can lead to the emergence of new health benefits as each can reinforce the health activities of others.

2. Health and the Network Effect

One of the more powerful concepts emerging from the Internet is the "network effect." The value of a network to a given participant increases as the number of others on the network increases. For example, when fax machines were rare, each new fax machine increased the value of each existing fax machine. The more machines were available to communicate with, the more value the each became.

A critical perspective is, how do we use the dynamics of the network effect to improve veteran's health? What kinds of things can be done to create self-propelling, self-organizing activities which amplify health?

In order to employ the network effect, we need connectivity and scalability. The technology for connectivity is advancing rapidly. Our understanding of scalability, however, is sometimes lagging our ability to connect. We still often think of systems from a hierarchical, enterprise perspective rather than the individual customer perspective.

In order to evaluate activities for potential network effects, we need to take a fresh look at health care. One way is to look at a spectrum of activities at different scale.

A Spectrum of Health Activities

It is interesting to look at a broad range of activities relating to the VHA's mission to tend to the health of America's veterans. This spectrum ranges from very expensive, specialized operations to large scale public activities which affect the entire population. The following table is one way of looking at this spectrum, a kind of "Richter Scale" for health activities. For example,

Level	Description (approximate benefit/cost)	Sample Activity
1	Nationwide benefit	Replicates successful activity which grows to broad self-sustaining effectiveness assisting at national level (Viet Nam Veteran's outreach clinics, Mothers Against Drunk Driving, Alcoholics Anonymous, etc)
2	Community benefit	Volunteerism, building community for increased health capital
3	Small group benefit	Start/lead self-help group
4	Personal benefit	Participate in self-help group, volunteer in community activities
5	No Cost	Hope, optimism, family, strong social network, positive outlook, healthy lifestyle, exercise, spiritual/religious strengths.
6	$1 cost	Vitamins, over the counter medications
7	$10 cost	Medical office visit, health club visit
8	$100 cost	Minor office procedure, vacation to reduce stress
9	$1,000 cost	MRI, office procedures
10	$10,000 cost	Hospitalization, simple surgery
11	$100,000 cost	Major surgery, bone marrow transplant
12	$1,000,000 cost	Cronic disease care, trauma, drunk driving accidents, spinal cord injury
13	$billions+	Becoming first patient for a global epidemic, "patient zero" of HIV/AIDS

Figure 4 Spectrum of Health Activities

This spectrum provides a framework for looking at opportunities for applying Information and Communications Technologies to the VA. The focus of Information technologies within the VHA is typically at levels 6-12 on the above spectrum. Levels 1 through 5 typically lie outside typical operations in the VHA.

How Cost/Benefit Analysis can Override Human Values

A recent study by Arthur D. Little International sponsored by Phillip Morris concluded that smoking was beneficial to the country, because premature deaths caused by smoking saved the health care system $1227 each time a patient died prematurely.[5] Phillip Morris later apologized for publishing the study. Sr. Vice President Steven

[5] "Smoking Can Help Czech Economy, Philip Morris-Little Report Says - Cigarette Smokers' Frequent Early Deaths Offset Federal Medical Costs, Study Finds" Wall Street Journal, July 16, 2001

Parrish said that the funding of the study "exhibited terrible judgment as well as a complete and unacceptable disregard of basic human values."[6]

This study was particularly flagrant in its use of economic cost/benefit analysis to override "basic human values." However blatant this study was, its methodology was not that different from most economic analyses of health care activities.

If we want to optimize the system for lowest cost, we can simply cut expenditures to zero. "Everyone is going to die sooner or later anyway," is the cost-cutting extreme position. The extreme benefit position – trying to defeat death – would end up with the nation's GDP spent on life support for the elderly, maximizing national longevity. The discussion becomes one of "optimizing" some level of cost and benefits between these two polarities. It is as if there is a single line connecting the two options, and our decision is "what percentage of the GDP should we spend minimizing costs versus maximizing benefits."

Human values are not collected at the transaction processing level. Our information systems monetize interaction according to predefined categories, then aggregate them into ever larger accounts as they work their way up to decision makers. Non-economic values, if they are considered at all, are applied separately to the process.

Limits of Economic Analysis of Health Care

The currency by which we do economic analysis is usually the dollar or its equivalent. Interactions are monetized by attaching a dollar amount to them, then added up to create a total cost. Kindig[7] makes extensive use of this form of analysis. However, there are a wealth of spoken or unspoken assumptions underlying this form of analysis. Some of the assumptions made in this study are:

1. That health can be purchased
2. That financial incentives drive health care
3. Health care is a matter of a "system" doing things to a "patient."
4. That health care can be understood as the supply and demand of a scarce commodity.
5. That we are dealing with an "industry" in which producers "provide" health and people "consume" it.
6. That patients are only consumers of health, not also producers.
7. Decompositional analysis is a way of understanding the health care system
8. That the process of analysis does not change the system being understood.
9. That the system is linear
10. That inputs don't interact.
11. That it is possible to define health meaningfully across a whole population.
12. That this definition can be used to drive an aggregation of activities.

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[6] "Philip Morris Apologizes for Report, Touting Benefits of Smokers' Deaths," Wall St. Journal, July 26, 2001

[7] Munnecke, Tom, "Assumptions of the Transactional Health Model" http://www.munnecke.com/papers/D19.doc

13. That it is possible to maximize health through coordination, planning, and management.
14. That the patient's sense of self is not a factor in the efficacy of the intervention
15. That greater measurement with greater precision will converge on greater understanding of the phenomenon being studied.
16. Categorized transactions can be "rolled up"
17. That there is a specific scale and "yardstick" with which we can measure health care
18. That we can manage the system by understanding and defining its problems.
19. The placebo effect, mind-body interaction, racial, cultural and ethnic backgrounds, personal belief system, and family factors relating to a person's health process are outside of "normal" medicine.
20. That the system can look ahead and understand future consequences of today's activities.
21. That the "law of increasing return" is not evident in health

Costs are more easily quantified and aggregated, while benefits do not necessarily have specific monetized effects.

How Currency Shapes Analysis

At the core of these economic analyses is the notion of money – the currency by which the decisions and tradeoffs are made. Rather than comparing apples and oranges, everything is converted to money. Computers are able to process transactions, add them up, and store them in data bases. A fundamental model of information technology is transaction processing of transactions monetized in a specific currency.

Bertrand Lietear, one of the designers of the Euro, speaks of the impact of the type of currency used for exchange:

> "The type of currency used in a society encourages – or discourages – specific emotions and behavioral patterns. Our prevailing system [of world currencies] is an unconscious product of the modern Industrial Age world view, and it remains the most powerful and persistent designer and enforcer of the values and dominant emotions of that age…currencies were designed to foster competition among their users, rather than cooperation…money is a modern society's central information system, akin to the nervous system in our own bodies."[8]

The type of currency used in health care decisions, such as the Czech koruna (equivalent to dollars) used in the Phillip Morris study, has a dramatic influence in our ability to communicate human values in our decisions. The numbers say one thing, and our decision makers must apply values from another perspective. This creates a built in conflict between our information processing systems and our value systems. The gap between "what the numbers say" and values is an ongoing problem. In particular, today's

[8] Lietaer, Bernard, **The Future of Money**, A new way to create wealth, work, and a wiser world, Century, London, 2001, p. 4, 19 Available from Amazon.com UK (not US) at http://www.amazon.co.uk/exec/obidos/ASIN/0712683992/janhauser-20/202-1265299-7193425

currencies are designed from the perspective of scarcity – money is a scarce resource. However, health can be viewed according to the economics of plentitude – everyone can get healthier, and, in so doing, make everyone else a little healthier. What would a currency which dealt with Veteran's Health look like?

3. Complementary Currencies for Health

Dee Hock, founding CEO of Visa International, spoke of how credit cards have changed the concept of money. "Money has evolved from shells to green paper to the artful arrangement of binary digits."[9] Lietear presents a way to more closely relate our values and our currency – the use of "complementary currencies" to supplement or replace traditional money. For example, Frequent flier miles as a form of complementary currency, creating value and customer loyalty. There is also a wealth of other complementary currencies active today, some of which are used directly for health purposes:[10]

- **Japanese Healthcare Currency**. An application of a specialized "healthcare currency" operating at the national level in Japan provides an innovative way to improve the quality of healthcare at no costs to the government. In this system, the hours that a volunteer spends helping older or handicapped persons in their daily routines is credited to that volunteer's "time account." This is managed like a savings account, except that the unit of account is hours of service instead of yen. The type of service provided is preferred by the elderly themselves, because the caring quality of the service turns out to be higher than the yen-paid service workers. One of the names of this currency Hureai Kippu ("caring relationship ticket") spells out agenda.
- **Time Dollars** Time Dollars are a tax-exempt kind of money that empowers people to convert their personal time into purchasing power by helping others and by rebuilding family, neighborhood and community. An hour helping another earns One Time Dollar. Time Dollars express four core values: 1) everyone has strengths and assets; 2) raising children and building community is valuable work; 3) mutual support is more powerful and empowering than one-way helping; and 4) trust is the basis for community.[11]
- **Elderplan Care Bank.** Participants at this Brooklyn insurance company can contribute up to 25% of its premiums for its senior health programs in Time Dollars. They have started a home repair service by which potential problems are fixed before they become a medical problem. Their motto is, "A broken towel rail is a broken hip waiting to happen." The insurance company took these steps when they noticed that participants in the Time Dollar program were experiencing fewer health problems.[12]

The values of the community using the currency are embedded in the currency itself. In Japan, it is "caring relationship"; in Time Dollars, they are personal strengths, building

[9] Dee Hock was quoted in **Bankers, The Next Generation**, Truman Talley Books, New York, 1997, p. 129
[10] Lietaer, p. 201
[11] http://www.timedollar.org/101/x1Question_one.htm
[12] Lietaer, p. 191

community, mutual support, trust, and community. In the Care Bank, it is health directly. As the currency is used to encourage and monitor activity, decision makers do not have to look at the numbers from one perspective and values from another. Values are integral to the currency.

Currency	**Values**
Time Dollars	Personal strengths, building community, mutual support, trust
Care Bank	Health
Japanese	Caring relationship

Trust is integral to currencies. People who exchange goods and services for a dollar, for example, trust that they will be able to exchange the dollar with someone else. If this trust erodes, then the currency becomes worthless. There is nothing underlying the piece of paper which has value. A dollar bill says, "This note is legal tender for all debts, public and private" but that is all. If there were not a sufficiently large community of people who trusted that the dollar had value, the value of the dollar would plummet. On the other hand, this trust is subject to the law of increasing returns: the more people trust the currency, the more trustworthy it becomes for others to trust.

A complementary currency is based on the same principle: There must be a community of people who trust the currency. The more people trust it, the more attractive it becomes to others, which in turn creates additional trust.

Complementary currencies can be used in a variety of ways. For example,

1. Complementary currencies make possible transactions and exchanges that otherwise would not occur…in one survey, more than half the people [using a complementary currency] started to provide services as a direct result of the availability of the complementary currencies in their community.
2. This additional work and wealth is being generated where it is most needed without the need for taxes, government bureaucracy, and without creating the risk of inflation in the mainstream economy. Note that this is *additional* wealth, not the redistribution of existing wealth. Therefore complementary currencies are *not* a new form of welfare. Welfare is a compulsory transfer of resources from the rich to the poor via taxes. In contrast, the use of complementary currencies is voluntary for everyone; it creates new wealth, and – once started – becomes a completely self-funding mechanism to address many social problems without requiring permanent subsidies or taxes.
3. Complementary currencies make not only social sense, but also business sense. They enable locally owned businesses to compete better against large chain distribution systems… in this sense, complementary currencies can also contribute to make the local economy more self-reliant, a modest but healthy counterweight to the relentless globalization of the economy.

The establishment of a complementary currency for the VA could create additional health and wealth in the Veterans community. It would do so in proportion to the

increased trust and size of the community. This is a powerful way to exploit the network effect to improve Veterans health.

The Internet is a perfect technology for creating complementary currencies:

> "It happens that some characteristics of the Net make it an ideal space where community-supporting currencies could happily thrive next to traditional national currencies, enabling a new symbiosis between the two approaches. Because Internet offers unlimited "space" and transcends natural and cultural boundaries, the electronic marketplace need not be limited to one exclusive currency system. New synergies between virtual communities and local communities would become possible, improving quality of life of the participating Netizens."[13]

The health activities level 1-5 on figure 5 are all subject to the use of a VHA specific complementary currency. Because they are based on scalable benefits, rather than costs, their benefits would grow much faster than their costs. A complementary currency could be used to fuel this process.

VHA Health Bucks: A Scenario for a VA Complementary Currency

Imagine that the VA becomes the "central bank" for a new currency – "VA Health Bucks," similar in concept to the Japanese health currency, Time Dollars, or the Care Bank. Initially, it is organized around volunteer efforts, with particular support from the Veteran's Service Organizations. As its trustworthiness grows and the community using it grows, Veterans (and others) can earn them by volunteering their time in support of VA activities, and spend them on an increasing array of goods and services.

Over time, Veterans develop loyalty and trust in VA Health Bucks in much the same way that frequent fliers develop loyalty and trust in their mileage programs. As the currency and its community grow more trustworthy and more currency circulates, it plays an even stronger role. VA exchanges VA Health Bucks for discounts at the canteen, barber, or pharmacy. Veterans Service Organizations (VSOs) become part of the community, helping veterans as well as earning VA Health Bucks themselves.

Earning VA Health Bucks

Veterans might be able to earn VA Health Bucks in a variety of ways:

1. Volunteering for service at a hospital
2. Serving as a health buddy
3. Organizing or supporting a physical or online support group
4. Participating in research studies or questionnaires
5. Adopting a healthier lifestyle, such as controlling weight, stopping smoking, abstaining from substance abuse.
6. Donations and in-kind gifts
7. Veterans Service Organizations support activities
8. Donating Blood

[13] Lietaer, p. 210

9. Complying with treatment programs
10. As "bonuses" from clinicians as special patient motivators

Spending VA Health Bucks

Veterans would be able to use VA Health Bucks in a variety of ways:

1. Discounts or free food at the Canteen
2. Free services at the barber shop
3. Discounted co-payments on prescriptions
4. Free transportation services
5. They could donate them to others
6. Local merchants could redeem them, for example, free coffee at a coffee shop, recreation or dining discounts
7. They could be saved for future needs, such as long term care or other unforeseen emergencies
8. They could be used for recognition awards and "premier" volunteer status

Health Buddies

One example of how the currency could work might be to support "Health Buddies," in which one patient mentors another going through a similar operation. For example, John Smith has a hip replacement surgery. He volunteers to become a "health buddy" for Bill James who is undergoing the same operation. The two get to know each other; their interaction is mutually reinforcing:

1. Jim's role as a mentor reinforces his post operative recovery process.
2. Bill sees a positive role model. "If Jim did it and is happy with the results, then so can I."
3. Since Jim is seeing the operation for the second time, he knows what to expect, and may be able to make suggestions to the staff about how to improve the process for future patients.
4. Jim builds up VA dollars for use in the future, perhaps to assist in co-payments for prescriptions, or services or goods from the canteen.
5. The interaction builds community within the VA.
6. The interaction builds trust in the VA and in the Veteran population.
7. The interaction is scalable and low cost. There is little or no cost to the program; it can itself be run by volunteers earning VA Health Bucks.
8. The interaction improves the health of both Jim and Bill.

The Health Bucks concept exploits the network effect. The more people use them, the more valuable they become. As they are tied to healthy behavior and activities, they are self-regulating. Over time, the system could become a completely self-funding mechanism to improve the health of veterans.

VHA Voluntary Program

The VA's voluntary timekeeping software (see Appendix B) could be used as a foundation for the a complementary VHA health care currency. In a sense, it is already acting as a special purpose currency, exchanging volunteer hours for meal tickets and awards.

A more generalized approach would extend the concept to work off a common currency, such as the Health Bucks, which would be earned by specific activities, such as volunteering, making donations, etc. Instead of printing specific meal tickets for specific times, however, the Health Bucks would be given to the person to be used when and where they wished.

The concept of a health currency is a significant departure from the perspective currently encoded within the Voluntary system. The current system, for example, lists codes to define volunteer participation in the National Veterans Games. One section of this code (this is just a sample from 8 pages) is listed below:

604		Hospitality Volunteer (Hotel)
	604A	Morning shift (6:oo am - 12 Noon)
	604P	Afternoon shift (12 Noon - 6:00 pm)
	604E	Evening shift (6:00 pm - 12 midnight)
	604M	Night shift (12 Midnight - 6:00 am)
605		Alternative Activities Volunteer
	605A	Morning shift (6:oo am - 12 Noon)
	605P	Afternoon shift (12 Noon - 6:00 pm)
	605E	Evening shift (6:00 pm - 12 midnight)
	605M	Night shift (12 Midnight - 6:00 am)
606		Souvenir Volunteer
	606A	Morning shift (6:oo am - 12 Noon)
	606P	Afternoon shift (12 Noon - 6:00 pm)
	606E	Evening shift (6:00 pm - 12 midnight)
	606M	Night shift (12 Midnight - 6:00 am)
607		Memorabilia Volunteer
	607A	Morning shift (6:oo am - 12 Noon)
	607P	Afternoon shift (12 Noon - 6:00 pm)
	607E	Evening shift (6:00 pm - 12 midnight)
	607M	Night shift (12 Midnight - 6:00 am)

The specificity of the coding system creates as many questions as it solves. What happens when someone works between two shifts, for example from 9 AM to 2 PM? What if someone volunteers for an activity which is not one of the 73 defined categories? Using a single currency to track all of these issues makes the system simpler and more flexible.

An alternative currency would be able to track volunteer hours and convert them to a single VA Health Bucks currency, which could then be used for a variety of applications. Rather than having a separate set of programs designed to specifically print meal coupons for the canteen, the currency could be used by the volunteers as they

needed. This would simplify the accounting, add flexibility, reduce staff accounting time, and create a larger community within which the currency was available.

Conclusion

Advances in information and communications technologies over the next decade will introduce dramatic changes beyond simple improvements in speeds and capacities. They will fundamentally change the way we think about our systems and the relationship between the enterprise and the customer. VHA should factor this into its long range planning:

1. VHA should study the possibility of using of Microsoft's Hailstorm and/or its future competitors. The person-centric nature of the model, coupled with its service architecture, is attractive vehicle for many of the VHA's information needs. However, HailStorm also introduces many issues relating to openness, competition, privacy, and security
2. VHA should consider creating a complementary currency for Veterans health. This would position the VHA as the "central banker" for a new currency, which would be used for improving veterans' health, encouraging volunteerism, greater involvement of Veteran's Service Organizations, growing the Veteran community, improving trust, and engaging local merchants and organizations.

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Appendix A: Microsoft HailStorm Architecture

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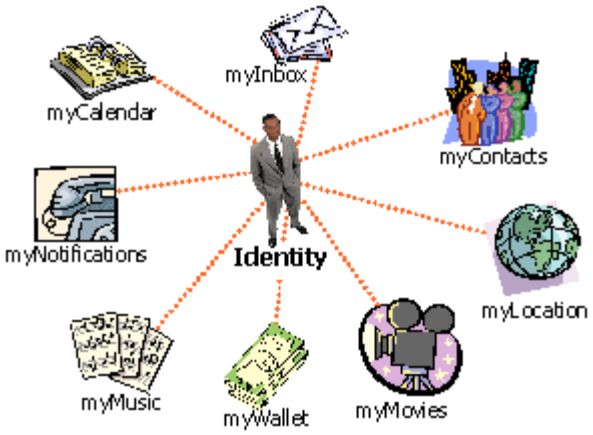
Key points:

- HailStorm is the user-centric set of XML Web services being built by Microsoft.
- It will allow users to have access to their data regardless of device, platform or application.
- It is the first set of XML Web services that Microsoft will be building.

HailStorm

Microsoft is developing a user-centric set of core XML Web services, codenamed "HailStorm", which will be needed by many applications. HailStorm services are oriented around people, instead of around a specific device, application, service, or network. They put users in control of their own data and information and allow you to access it at anytime from any device. They also protect personal information by allowing the user to control who can have access to their information and providing a new level of ease of use and personalization. HailStorm services are just the first set of the XML Web services being built by Microsoft.



XML Web Services

XML Web services, through the use of XML and SOAP, allow applications to talk regardless of operating system or programming language via the Internet. With XML Web services, not only can applications share data, but they can also invoke capabilities from other applications without regard to how other applications were build. Sharing data through XML allows them to be independent of each other while simultaneously giving them the ability to loosely link themselves into a collaborating group that performs a particular task.

Working with your consent

The HailStorm services make user consent the basis for who can access user information, what they can do with it, and how long they have permission. In mid-March at the HailStorm Design Preview, the first set of these XML Web services were showcased. Passport is the first such service, giving developers the option to outsource their user authentication services.

Passport to the future

Based on the Passport user authentication system, HailStorm permits applications and services to cooperate for the user's benefit, as well as allowing users, groups, and organizations to share and collaborate. For instance, with HailStorm services, booking a flight using an online travel reservation service becomes much simpler because with the user's consent, the travel service automatically access the user's preferences and payment. If you're traveling on business, and your company has travel policies you need to adhere to, your individual affiliation with your company's HailStorm group identity will make it possible for the travel service to automatically show you only the choices that meet both your preferences and your company's requirements.

[14] http://www.microsoft.com/presspass/features/2001/mar01/03-19hailstorm.asp

Once you've chosen your flight, the travel service can use HailStorm, with your explicit permission, to figure out which calendaring service you use and automatically schedule the itinerary onto your calendar, automatically updating that itinerary and notifying you if your flight will be late. And through HailStorm, you can share that live flight itinerary with whomever you're going to visit so that they will also know when and where to expect you. The information in your HailStorm-enabled calendar can then be accessed through your PC, someone else's PC, a smart phone, a PDA, or any other smart connected device.

Initial Set of HailStorm services

The initial set of HailStorm services will include:

myAddress - electronic and geographic address for an identity

myProfile - name, nickname, special dates, picture

myContacts - electronic relationships/address book

myLocation - electronic and geographical location and rendez-vous

myNotifications - notification subscription, management and routing

myInbox - inbox items like e-mail and voice mail, including existing mail systems

myCalendar - time and task management

myDocuments - raw document storage

myApplicationSettings - application settings

myFavoriteWebSites - favorite URLs and other Web identifiers

myWallet - receipts, payment instruments, coupons and other transaction records

myDevices - device settings, capabilities

Appendix B: VHA Voluntary Timekeeping Software System

Overview

The Voluntary Timekeeping module automates the process of recording volunteer time at a medical facility. Volunteer hours can be recorded by the volunteers themselves which lightens workload on staff. This software allows volunteers to log themselves into the system in a language selected by the volunteer and then keeps track of their hours worked. The program can produce statistical reports detailing volunteer activities for a given time period or provide lists of any data stored in a master file, such as a meal list for Canteen Service. This software transmits time information to the Austin Automation Center (AAC).

Features

- Provides multi-lingual interaction with volunteers during log-in.
- Supports multiple division facilities.
- Electronically updates the AAC's master file.
- Eliminates use of Generic Code Sheets module and/or FALCON for changes to AAC's master file data.
- Displays or prints entire master record for a single volunteer.
- Provides local printing of address labels and telephone lists.
- Provides expanded field sizes for names and addresses.
- Reduces workload required to input mass award code changes.
- When using Auto Log-in, provides the ability to view list of volunteers currently on station.
- Enhances security for multiple division facilities.
- Automatically updates hours, years, and award information on a monthly basis from the AAC into a master file.
- Prints an individual meal ticket for the volunteer (using a small receipt printer) after Auto Log-in.

Appendix C: A Peer to Peer Health Care System

A HEALTHIER CHIN[15]

Imagine going to an M.D. or clinic for the first time, and during the examination, the doctor pulls up your entire health care history—even though she had nothing to do with your previous treatment—all on a PC. She can see that you visited a clinic across town two years ago for a severe flu (and that the clinic ran some tests to rule out infections); you went to an emergency room for a badly twisted ankle; and you picked up a few extra pounds in the past year, which seems to be making your blood pressure tilt higher.

Unless you carry around such detailed records, you might forget an illness or a pattern of visits critical to a diagnosis. The thought of putting such complete patient information at doctors' fingertips is why several Santa Barbara County, California, health care facilities began talking about building a CHIN (community health information network) about eight years ago.

CHINs are far from ubiquitous, but the ones that exist are usually built on a central data warehouse. All health care providers in one county or geographic region that contribute patient information can electronically access the entire range of data. It's a good idea, but in Santa Barbara it initially stalled. "These things (CHINS] are just too expensive to implement," says Tom Colbert, CIO at Sansum-Santa Barbara Medical Foundation Clinic. "Issues such as who would pay for it and who would maintain and administer it always bogged down discussions."

Enter P2P. With it, the group could avoid building and maintaining a pricey, complicated centralized database. With $10 million in funding Santa Barbara County received through a grant from the California HealthCare Foundation, plus matching funds of $10 million from the group and $5 million from Care-Science, it is setting up a system that lets health care practitioners at 15 facilities grab patients' files directly from each other's databases and computers via the Internet.

Four institutions are already online, and the rest are expected to follow by year's end. "Let's face it, in the U.S. we don't have a coherently organized health care system, so anything we can do to improve access to information for better patient care will be significant," says Dr. David Brailer, CEO of CareScience, the builder of Santa Barbara County's system. Like Napster, the CareScience system maintains central components to administer the shared records.

For example, a central index server aggregates and tracks the various ways in which a patient's name is listed by participating institutions. For example, if a doctor types in J.G. Smith, the server will search all of its computers and pull up John G. Smith and John Smith. The doctor then can choose the correct records. Considering the critical nature of the data, Santa Barbara County is trying to create an extremely secure system. Passwords are required, and biometric log-on solutions are in the works. In addition, the system uses public-key/private-key encryption to authenticate users before data is shared.

Peer groups are nothing new for doctors, although the contact is usually face-to-face. Yet it perhaps explains why the new peer-to-peer arrangement for exchanging vital patient information seems to be just what the doctor ordered.—SLRW

[15] PC Magazine June 26, 2001 Vol.20 No.12 edition