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RE: Proposal to build SoFLHealth, a South Florida Regional Health Improvement Platform.

"...students of medical economics have long realized that what consumers demand when they purchase medical services are not these services per se but rather **better health**."¹

This document outlines a vision for a care system that improves the health of all South Florida residents. The proposed platform will be based on consumer-owned IT tools (computers, mobile phones, etc.), a decentralized support infrastructure, and a close alignment of community resources with local families' needs.

There are lots of conversations around "improving the healthcare system." Unfortunately this industry is rife with mis-aligned incentives, starting with the root problem of a "fee-for-service" reimbursement model. Ill consumers are very profitable to healthcare providers, but not to consumers' employers, their families, their communities, much less themselves.

The traditional framing of the issue ("let's improve the healthcare system for all") misses a crucial point: what SoFL residents really want is **a care system that improves the health of all**. Ample research evidence demonstrates that **more healthcare does not automatically lead to better health**².

At the end of the day, where would you rather live? In a city with the best children's oncology hospital, or in a region where your children have the lowest possible odds of ever developing cancer?

How realistic is it to create a health-focused system? Quite realistic, as it turns out. This proposal is based on the reality that key SoFL stakeholders already have perfectly-aligned incentives to build a new health-enhancing delivery system:

- consumers are under ever-growing financial pressure to pay for healthcare expenses, while receiving less and less "good health" in the process
- payers are under tremendous pressure to contain their runaway healthcare costs, while requiring ever healthier workers to maintain the business' productivity
- educational institutions (school boards; colleges; universities) need healthy students ready and able to absorb the knowledge being imparted
- communities need healthier employees who spend more money in their local area, and waste a lower percentage of their disposable income on healthcare³
- economic development agencies realize that good individual, family, and community health are economic development issue: a healthy population makes for a healthy, vibrant economy.

Yes, we can make this transition, even in an industry as large as the healthcare industry currently is. Here is a historical perspective of how a huge industry in America was forced to transform its business model from "pay-when-it-fails" to a "pay-to-avoid-failure" model:

The US automotive industry went through a massive transformation starting in the late 70's. The industry was used to building large, chrome-loaded vehicles that were very inefficient and failure-prone. There was an entire industry (repair shops, auto clubs, body shops) built around repairing the prone-to-fail American-made cars of that generation. And along came imports (Japanese as well as German) with small, energy-efficient (for the time), and much more reliable vehicles. Imports were initially hampered by the fact that their dealer network (ie. repair shops) was not as widespread as the American manufacturers'. Until consumers realized that imports did not need to go to the repair shop as often as American-made cars. From that point on, American consumers demanded cars that **don't break down** and that provide **reliable transportation** for years. Automotive companies then delivered on that demand.

1 Grossman M, "The Human Capital Model." In Handbook of Health Economics. Volume 1A; Culyer, AJ; Newhouse, JP (Eds.). North-Holland - Elsevier Science, B.V. (2000).

2 See section below.

3 Ever-increasing healthcare costs tends to "Crowd out" other economic activities (see [http://en.wikipedia.org/wiki/Crowding_out_\(economics\)](http://en.wikipedia.org/wiki/Crowding_out_(economics)))

Thus, our vision:

SoFLHealth will build a consumer-centric, community-based, payer-driven, technology-enabled platform. This will help South Florida residents to maintain and improve their family's health. We'll develop new academic expertise and practical methodologies. And SoFLHealth will help to drive high-value economic activity in our region.

Consumer-centric:

The patient (or his caregiver) is usually responsible for the coordination of care across multiple settings (home care; out-patient; in-patient) and even multiple providers (primary care physician; specialist; hospital-based service providers; community-based services; etc.). SoFLHealth will empower the patient to take control of her health.

Community-based:

We're all in this together. A payer's employee is somebody else's customer and a local government's taxpayer. A healthy individual is a productive employee, a valuable consumer, and a reliable source of local taxes and fees.

Payer-driven:

In our market-driven system those with the "power of the purse" can effect change, and quickly. Payers need to use their healthcare dollars to push towards a health-enhancing system that produces healthier workers. Not just ever more expensive treatments for increasingly ill workers.

Technology-enabled:

Consumers already handle their financial, business, school and personal life digitally. Why not their health? SoFLHealth will help consumers to leverage their existing technology arsenal (millions of broadband-enabled homes with PCs, printers, scanners, mobile phones, etc.). Most homes in SoFL already have more IT and telecom tools in place than the majority of physicians' offices. SoFLHealth can build a "Health Improvement Network" from the edge (consumers) in (towards providers) at a faster pace than the current provider-centric Health IT approach.

Platform:

An IT-heavy, de-centralized, consumer-controlled system that allows consumers to collect and manage their own health information from across all the healthcare providers they deal with. Note: SoFLHealth is the exact opposite of a RHIO⁴: this is a consumer-centric, consumer-controlled model, and there will be no centralized storage of anything.

Help South Florida residents:

The proposed platform will have a regional approach, from Homestead to North Palm Beach. People in our region live, work, play and pray up and down the tri-county area.

Maintain and improve:

The current illness care system pays little attention to maintaining and improving an individual's health because providers are seldom compensated for avoiding illness. But consumers really want help to gain better health for themselves and their families.

Family's health:

The true unit of care in America is the family, not the individual. If a family member is ill the entire family suffers.

Develop new academic expertise:

SoFLHealth will purposefully seek to provide a test-bed for new academic research, from security protocols to industry standards. And to develop new academic disciplines such as Health Engineering.

Practical methodologies:

SoFLHealth proposes to look at the health improvement process as an Engineering challenge, and to develop "Evidence-Based Health" methodologies that leverage best-practices from other industries.

Drive high-value economic activity:

Several cities have built themselves up as "cities of healing," driving significant economic activity around their hospitals and centers of illness-care. Boston (Mass General⁵); Rochester, MN (Mayo Clinic⁶); and Pittsburgh (UPMC⁷) come to mind. SoFLHealth represents an opportunity for SoFL to become a "region of health," where we develop, implement, test, validate and then sell community-wide mechanisms that improve the local community's health.

I welcome your suggestions to improve this proposal. Please contact me directly at +1 (954) 553-1984. Regards.

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4 See http://en.wikipedia.org/wiki/Regional_Health_Information_Organization for details.

5 See <http://www.massgeneral.org>

6 See <http://www.mayoclinic.com>

7 See <http://www.upmc.com>

Executive Summary

The SoFLHealth proposal tackles the broken illness care system in Southeast Florida: Broward, Miami-Dade and Palm Beach counties. This proposal's main innovation is to re-frame the current discussion about improving the healthcare system.

SoFLHealth focuses on:

- * delivering better health (not better healthcare)
- * analyzing the community-level economic impact of poor individual health
- * stressing that good individual health is a pressing economic development issue
- * developing mechanisms to deliver care through family members and consumer's own IT tools
- * taking a regional approach to the problem
- * meeting the needs of both payers and consumers (those most affected by the inefficiencies of the current illness care system)

Our end goal is to build a breakthrough regional alliance of all key stakeholders with aligned incentives to achieve a common goal: better health for all residents in our region.

SoFLHealth's activities will include the implementation of several transformative ideas:

- * developing a consumer-centric Health IT platform
- * promoting consumer-owned and -controlled Personal Health Records
- * working with local academic institutions to develop Health Engineering as a new academic discipline
- * engage teenagers to take an active role in improving their own and their family's health through the use of teen-friendly technologies

SoFLHealth wants to drive systematic and radical change by re-defining:

- * the metrics: from "a better healthcare system for all" to "a care system that delivers better health for all"
- * the quality of care consumers receive: from "fixing you up" to "preventing illness"
- * the systems through which care is provided: from "houses of healing" (hospitals) to "every household a healthy house"

Society at large has tolerated the medicalization of health for far too long. It's time we re-define the rules of the game. See <http://en.wikipedia.org/wiki/Medicalization> and particularly Ivan Illich's "Limits to medicine: Medical nemesis, the expropriation of health" (1975).

SoFLHealth proposes to empower consumers to take control of their health, and we'll provide a technological and social platform to support consumers in that endeavor.

SoFLHealth's initial activities will include:

- * secure the support of at least 05 key stakeholders in the region
- * develop a concrete plan of action to launch a pilot project with key stakeholders as well as private industry suppliers (ie. technology)
- * secure support from at least 02 academic institutions to provide scientific and methodological support to the pilot

In the spirit of collaboration and scientific cooperation, SoFLHealth will:

- * develop and distribute all the software produced by this collaborative under a Free Software⁸ license for other parties to implement and improve upon
- * release all the methodologies under a Creative Commons⁹ license
- * make all published research papers available under an Open Access¹⁰ license

Jose is uniquely qualified to launch this initiative due to his varied background in high-tech¹¹, Public Health, software development, and health data mining¹². Jose brings an international perspective to the status quo, and he is bilingual (Spanish).

8 See http://en.wikipedia.org/wiki/Free_and_open_source_software

9 See <http://creativecommons.org/>

10 See http://www.openphi.com/about_open_access.html

11 See <http://www.openphi.com>

12 See <http://www.healthlibrarian.net/search>

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Give us Better Health, not just Better Healthcare.

Our "healthcare system" is actually a hodgepodge of "illness care" providers. We devote 17% of GDP to healthcare, but very little of that goes towards prevention and improving health. By all international standards, Americans are less healthy than residents of other countries that spend much less than we do.

What you and I demand when we purchase medical services are not these services per se but rather better health for ourselves and our families. Most people want to live long and prosper, and then check out quickly. Thus, we need to reframe the discussion from "Let's improve the healthcare system for all" towards the real goal of "Building a care system that improves the health of all."

Lets use the automotive industry as a frame of reference. How would the healthcare industry design cars? There would be massive social investments to develop car repair tools and techniques (medical procedures, drugs). But very little investment in building roads and improve driver education (public health campaigns). Body shops would be reimbursed even if they didn't fix the car's problems. Or even if the car gets damaged while in the shop (hospital-borne infections). And all drivers would pay the same insurance rates regardless of driving record.

But we know that cars are designed to prevent accidents and to provide many years of trouble-free service. If an accident is imminent the car protects the passengers (ABS, air-bags, sidebeams, etc.). And there are large investments in a good traffic-management infrastructure (highways, traffic signals). This is the equivalent to the "Social Determinants of Health:" where people live, what they eat, and their social context are as important to their health as if the roads have potholes, or the highways are poorly-designed and that leads to more car accidents and traffic congestion.

At the end of the day, do you want to buy a car that has the largest network of repair shops in your city? Or would you rather buy a car that does not need to go to the shop at all for repairs? "The best children's cancer hospital in town" is a repair shop-type statement. "We keep your children cancer-free" would be a more desirable goal for a hospital. It's time we demand more social resources be devoted to improving our "health highways" and to prevent the cars (our bodies) from breaking down in the first place.¹³

Please refer to http://www.openphi.com/files/IFTF_Mobile_Health_Informatics.pdf for more background information.

¹³ Taken from http://www.openphi.com/files/OpenPHI_EDC_Paper_0408.pdf

Health Care Spending, Quality, and Outcomes

More Isn't Always Better¹⁴

A Dartmouth Atlas Project Topic Brief

February 27, 2009

Elliott Fisher, MD, MPH; David Goodman, MD, MS; Jonathan Skinner, PhD; Kristen Bronner, MA

...Studies that have looked carefully at the additional services provided in high-spending regions have shown that the higher volume of care does not produce better outcomes for patients.[5] Medicare beneficiaries in high-spending regions do not receive more "effective care" (services shown by randomized trials to result in better health outcomes, such as making sure that heart attack patients get proper medication). Nor do they receive more "preference-sensitive care" -elective surgical procedures which have both benefits and risks- where patients' preferences should determine the final choice of treatment. Rather, the additional services provided to Medicare beneficiaries in higher-spending regions all fall into the category of "supply-sensitive care": discretionary care that is provided more frequently when a population has a greater per capita supply of medical resources. Higher-spending regions have more hospital beds (especially intensive care unit beds), more physicians overall, and more specialists per capita. Patients in high-spending regions are hospitalized more frequently, spend more time in the ICU, see physicians more frequently, and get more diagnostic tests than identical patients in lower-spending regions. In other words, in regions where there are more hospital beds per capita, patients will be more likely to be admitted to the hospital -and Medicare will spend more on hospital care. In regions where there are more intensive care unit beds, more patients will be cared for in the ICU -and Medicare will spend more on ICU care. And the more CT scanners are available, the more CT scans patients will receive. Conversely, in regions where there are relatively fewer medical resources, patients get less care -and Medicare spends less. So geography becomes destiny for Medicare patients.

What are the consequences for patients? Worse access, lower quality.

Using more resources and spending more money would not be controversial if it produced better health care or better outcomes. So the critical question underlying the variations in practice and spending is: What is the relationship between quantity and quality? Over the past ten years, a number of studies have explored the relationship between higher spending and the quality and outcomes of care (see Table 1). The findings are remarkably consistent: higher spending does not result in better quality of care, whether one looks at the technical quality and reliability of hospital or ambulatory care, [5-7] or survival following such serious conditions as a heart attack or hip fracture.[8] This finding holds even when we consider changes over time; regions experiencing the greatest increase in health care spending for heart attack patients did not exhibit the most rapid improvements in health outcomes.[9] Higher spending also did not result in improved patient perceptions of the accessibility or quality of medical care and their experiences in the hospital.[5,10,11] Remarkably, in regions where the numbers of hospital beds and specialists are greater, physicians are more likely to have difficulty getting their patients into the hospital or getting a specialist referral.[12] Access is worse where there are more medical resources: a "paradox of plenty."

...Perhaps the most counter-intuitive finding is that higher spending does not necessarily lead to better access to health care (see box), or better quality of care. Patient outcomes can actually suffer, because having more physicians involved increases the likelihood of mistakes (too many cooks spoil the soup), and because hospitals are dangerous places to be if you do not absolutely need to be there.[16]

..The problem is not how many physicians we have; it is how we pay them and how care is organized. I have asked physician audiences what proportion of the patients they saw in their office that day needed to be seen; many will say that only a minority of their patients needed to be seen. ***They are seeing the others because they need to keep their offices full to pay the rent, and because they are not paid to provide care in any other way, such as through telephone calls or email.***

That last sentence is one of the core elements of the SoFLHealth proposal: to jointly develop new mechanisms to deliver (and reimburse for) care that both enhances consumers' health and keeps them away from providers' facilities as much as possible.

14 Available at http://www.dartmouthatlas.org/atlas/Spending_Brief_022709.pdf

Proposed Lines of Action

These are a few concrete ideas for consideration.

Tackle Chronic Diseases

First of all, we must tackle the epidemic of chronic diseases. We need new approaches, with a lower emphasis on treatment at the point of care for acute events (the current paradigm). And with more focus on long-term behavior modification. There are proven methods to address this type of life-long diseases. One of those is the Chronic Care Model. See Appendix A: The Chronic Care Model ("CCM") below for more details.

SoFLHealth can build a technology-rich, community-wide application of the CCM by using the most ubiquitous of IT devices: consumers' own mobile phones. See Appendix E: Mobile Chronic Care Model Platform below for more details.

Consumer-based Health IT Platform

Several high-level efforts are under way to encourage the deployment of Health Information Technology ("HIT") systems from a provider perspective. Those attempts, and initiatives such as RHIOs, have yet to demonstrate that healthcare providers, fierce competitors in a geographical area for the same limited customer base, will be willing to share patient data. Furthermore, RHIOs have yet to be proven financially sustainable. What is missing is an equivalent effort from a consumer-centric perspective.

Consumers already have a significant arsenal of both IT and telecommunication tools deployed and in daily use. Almost 50% of American homes have broadband Internet access; 22.5 million households are deemed "networked homes" (02 or more PCs interconnected); and over 55% of US inhabitants own at least one mobile phone. Add to that the huge number of digital cameras, GPS units, scanners, fax machines, wireless access points, and satellite dishes already in consumers' houses. And it is then unquestionable that the typical American household has much more, and more up-to-date, IT and telecom equipment deployed and in use than many physician's offices.

Lost in all the pronouncements concerning HIT is a discussion on how to leverage the widely deployed and very capable IT and telecom arsenal already owned and used by consumers. Such arsenal can lead to the development of a Personalized Health Informatics ("PHI") infrastructure. A proposed series of tools and a standards-based framework to allow consumers to bring their current IT and telecom arsenal to the management of their personal and family's health. PHI is proposed as an alternative to waiting for the healthcare industry to sort out its competitive, ROI, and inter-operability issues impairing the wider deployment of provider-centric HIT.

In the final analysis, the proposed consumer-centered HIT system could end up building the vaunted Health Information Network from the outer edge (consumers) in (towards the providers) at a faster pace and with lower social costs. See Appendix B: Consumer-owned Health Data Ecosystem below for more details.

Health Engineering

Once an individual falls ill, or a disease manifests itself, the best treatment plan is definitively a highly personalized intervention. On the other hand, preventive health measures and those that promote health (such as physical activity, living conditions, nutrition, etc.) can be generic and very broadly applied across large groups of people. Those measures are highly predictive of health outcomes, and lend themselves to an engineering approach on a large scale, population-wide.

Can we prevent illness or death? Most definitively not. But we can certainly look at the immense amount of data already available to try to "engineer health" by testing, publishing, and promoting "best practices" for the maintenance and enhancement of every individual's health.

Lets apply the same Engineering tools and methodologies that build complex, reliable systems to maintaining our bodies in top operating capability. Academic institutions in South Florida can become global leaders in developing methodologies and process to tackle health management as an Engineering challenge.

See Appendix F: Certified Health Engineers below for more details.

Adolescents as "Health Engineers" for their Families

South Florida is a region with a large percentage of young population.

SoFLHealth proposals for action is to engage with adolescents (those aged 13-20) in our region to bring their ICT¹⁵ expertise and energy to the challenge of improving their own and their family's health.

ICTs and Health

It is crucial to understand the proper context that ICTs occupy in the adolescent's mental and social landscape:

- This is the post-Internet generation. For most current adolescents (those born between 1987 and 1997), it is absolutely incomprehensible how people ever operated (personally as well as professionally) without e-mail, Internet searches, mobile phones, and text messages.
- ICTs are an enabler to create, maintain, and expand communities of affinity around the adolescent. ICTs per se are only relevant to adolescents as magical tools and conduits to reach out and touch somebody, anybody, many somebodies, anytime and anywhere. How the magic happens (from a technical perspective) is utterly irrelevant to many adolescents.
- IM¹⁶ are us. For many adolescents of this generation, nothing happens without consulting one's network first. From what to wear to school tomorrow to where to go to who's seeing whom, this generation is hyper-networked and network-reachable 24 by 7.

Slicing the Cohort

The 10 - 20 cohort can be further defined as follows:

- 10-13: still close to their parents; technology used mainly as a toy, for entertainment purposes.
- 14-16: breaking away, with a major milestone being the ability to drive (16 as the minimum driving age in most states)
- 17-20: the pre-adult years, going away to college, making a life by herself. Technology use has a direct, measurable connection with productive activities (school, work).

	Broward		Miami-Dade		Palm Beach			Summary
	Count	% Total	Count	% Total	Count	% Total		
Population:								
10 to 14 years	109,132	6.7%	160,754	7.1%	70,155	6.2%		340,041
15 to 19 years	95,161	5.9%	154,989	6.9%	61,738	5.5%		311,888
							Total >	651,929
HOUSEHOLDS BY TYPE								
Total households	654,445		776,774		474,175			
Family households (families)	411,403	62.9%	548,493	70.6%	303,772	64.1%		
With own children under 18 year	191,804	29.3%	262,752	33.8%	118,085	24.9%		572,641

Table 1: Census 2000: Selected Population Data for South Florida.

Sources:

Broward: [http://factfinder.census.gov/servlet/QTable?](http://factfinder.census.gov/servlet/QTable?_bm=n&_lang=en&qr_name=DEC_2000_SF1_U_DP1&ds_name=DEC_2000_SF1_U&geo_id=05000US12011)

Miami-Dade: [http://factfinder.census.gov/servlet/QTable?](http://factfinder.census.gov/servlet/QTable?_bm=n&_lang=en&qr_name=DEC_2000_SF1_U_DP1&ds_name=DEC_2000_SF1_U&geo_id=05000US12086)

Palm Beach: [http://factfinder.census.gov/servlet/QTable?](http://factfinder.census.gov/servlet/QTable?_bm=n&_lang=en&qr_name=DEC_2000_SF1_U_DP1&ds_name=DEC_2000_SF1_U&geo_id=05000US12099)

15 Information and Communication Technologies, see

http://en.wikipedia.org/wiki/Information_and_communication_technologies

16 Instant Messaging.

Creating a "Sub-culture of Health"

One of the most powerful impacts that ICTs have had in adolescent life is allowing adolescents to find and develop social support networks for every personal inclination: from Goths to cheerleaders. The Internet has facilitated the development of many sub-cultures within the "mainstream" culture (if there is such thing as mainstream anymore).

What is missing is a "subculture of health" where taking care of oneself, and assisting others to improve their health, is seen as "cool" and worthy. Mass media's main messages towards adolescents can only be described as destructive and mostly promoting behaviors that lead to ill-health.

Just as eco-awareness and an organic lifestyle were fringe a couple of decades ago, now both have solidly entered the mainstream. A sub-culture of health will most likely start as a fringe movement, and with the proper support could become part of a mainstream adolescent's mindset.

Tools at Hand

It is important to realize that many adolescents already have an enormous arsenal of ICT tools at their disposal. Many households in the US and other developed countries have more ICTs already in use than most physicians' offices.¹⁷ Further, millions of adolescents already have developed the required technological skills necessary to use those ICT tools. From personal blogs to Facebook postings of last week's party.

In the European Union, three out of four of the 9-10 year old, and nine out of ten of the 12-14 year old have a mobile phone.¹⁸ The percentage of mobile phone ownership among adolescents is close to 100%.

Based on the above, there is a tremendous opportunity to leverage ICTs to improve adolescents' health status, as detailed below.

ICTs can be leveraged to improve adolescents' health by enhancing the adolescent's health self-efficacy through several direct as well as indirect mechanisms:

- * Improve own self-efficacy through mastery of health-enhancing behaviors
- * Improve peers' self-efficacy as a peer educator or as a network support peer (either live or ICT-mediated)
- * Improve family members' self-efficacy when an adolescent is entrusted (and empowered) to take responsibility for other family members' well-being
- * Improve a community's health self-efficacy through adolescents' engaging in designing healthier communities, schools, and neighborhoods

It is crucial to realize that adolescents themselves must be made the drivers of the changes we want to implement to enhance their health.

Opportunities to have an Impact

- Provide the proper tools for the Internet generation to "hack their bodies" as much as they hack YouTube,
- "Gaming for health" as the next frontier in online role-playing games (see Appendix D: Online Game Server for Health below).
- Create an "eBay of health data" where adolescents could "trade" relevant portions of their health data just as they trade their details of their social life through social networking sites.

From "Social Networking" to "Health Networking"

There is a significant opportunity available now to leverage all the tools of the so-called "social networking" universe towards a new paradigm of adolescent "health networking." That is, to use the proven methodologies and underlying technologies of social networking towards a subculture of health. For example: peer support; peer education; knowledge sharing; and social networking as tools to increase adolescents' health self-efficacy.

¹⁷ <http://lcal.net/files/hs/BYOHIT05.ppt> (Accessed on 08 August, 2007).

¹⁸ Eurobarometer; "Eurobarometer on Safer Internet for Children: qualitative study 2007." Available at http://ec.europa.eu/information_society/activities/sip/eurobarometer/index_en.htm

Can Teenagers do This?

If you have or know teenagers, you know that their abilities with computers, mobile phones and using the Internet far surpass what most healthcare providers can do in their own offices.

And the academic load on most teenagers clearly demonstrates that their ability to grasp and handle complex issues is already well developed.

Adolescents and Their Human Networks

We can not look at an adolescent as a single entity in isolation. Rather, to best address their health issues, adolescents must be conceptualized as members of an evolving coterie of “human networks,” as illustrated below:

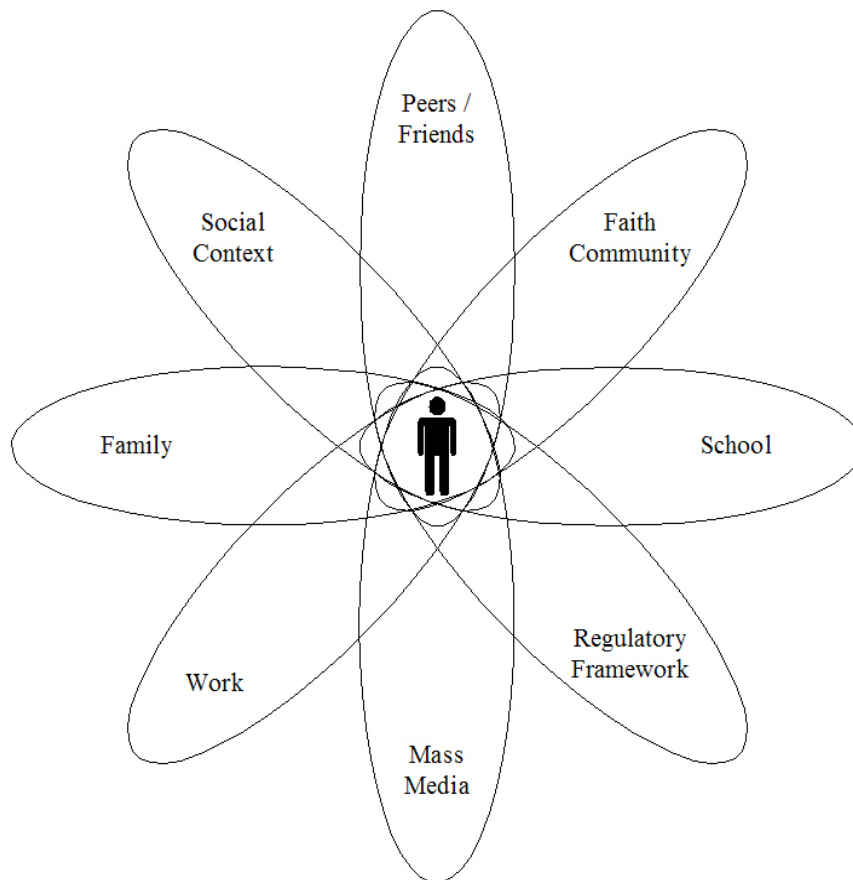


Illustration 1: Adolescents and their Human Networks.

Definitions of Human Networks

Network	Definition
Family	The voluntary or blood-related affiliation of individuals under one roof.
Social Context	From neighborhoods to local communities, this refers to the physical and human environment that surrounds an individual throughout his life.
Peers / Friends	These are individuals other than family members whom a particular adolescent spends time with and values opinions from.
Faith Community	Many individuals choose and then frequent a particular house of worship. And such individuals then agree to follow the guidance provided by the leaders of such community.
School	From pre-K playgrounds to college halls, individuals are subject to and indoctrinated with very formal rules of engagement in preparation for their integration into society at large.
Regulatory Framework	The legal, regulatory, and common law parameters that control, contain, and define individuals' permissible vs. punishable actions in a clearly defined geographical context (state, city, nation).
Mass Media	The conglomerate of public and private entities that utilize massive communication

Network	Definition
	mechanisms (from print to electronic) to convey non-individualized messages and political / social agendas to large numbers of individuals.
Work	The places where individuals perform activities in exchange for remuneration. As well as the operational and regulatory limits such places impose on individuals as conditions for employment.

As each adolescent ages, the degree of influence each particular network exerts over the adolescent changes over time. While parents’ influence decreases as the adolescent gets older, the influence of peers and mass media generally tends to increase.

Adolescents need to be served by a “community of health:” defined as the goods and services delivered as needed, when needed, transparently, through each interface between the adolescent and her human networks, that allows each adolescent to remain and improve her health.

ICTs from mobile phones to MMORPGs¹⁹ can be leveraged as enablers to deliver health education and health improvement messages to adolescents via channels adolescents are already using and comfortable with.

Adolescents are highly refractory to health-oriented messages. Like all previous generations of adolescents, today's adolescents are very cynical towards and question all authority figures. Unlike previous generations, today's adolescents are globally linked at the speed of e-mail and IM, and able to cross-reference and validate any health-oriented message they receive locally with their peers on a local, national, and even global scale.

This hyper-connectiveness demands that any and all health-oriented strategies targeting adolescents must be multi-modal (print, electronic, web, social network), multi-network (family, at work, at school), and even global (syncing messages with WHO, as well as across national barriers with like-minded institutions in other countries). The desirable outcome is a globally coordinated message that “Staying healthy is cool, and the key to your own future. Your mates count on you.”

A further point to consider is that instead of considering the individual adolescent as the point of intervention / care, we must look at networks as the most adequate and effective point of care and intervention.

¹⁹ Massively Multiplayer Online Role Playing Games.

Alignment of Local Stakeholders' Incentives

To bring SoFLHealth into reality will require the active cooperation and support of several key regional stakeholders. These are the individuals and institutions that suffer the most from the current state of the healthcare system, and the ones with the most interest in helping to build a truly health-enhancing system instead.

Payers

From a payer's perspective, their healthcare dollars are intended to deliver better employee health. It is impossible to find any other industry where the payers spend more money every year on a particular type of supplier (i.e. healthcare providers) and yet payers receive less and less value from those expenditures.

Payers today are very receptive to any and all concrete plans that could tackle one of their largest, and the fastest growing expenditure: healthcare costs for their retirees, their current employees, and their employees' dependents. See South Florida's Largest Employers below for an incomplete summary of the largest employers in South Florida.

Plan of Action: SoFLHealth needs to secure the financial and institutional support from at least 05 of these organizations.

Consumers

Consumers want better health, not necessarily better healthcare. Using that metric, the current healthcare system fails to meet consumers' needs. As a point of comparison, consumers are willing to pay for non-failure in every area of their life: cars that don't break down; appliances that lasts for years; houses that withstand hurricanes; etc. Are consumers ready and willing to pay for a system of care that delivers better health? Most likely.

Plan of Action: SoFLHealth needs to identify new financing and delivery mechanisms for a consumer-centric model that focuses on enhancing a family's health. Models of "concierge health" are a good starting point for this analysis: could such a model be scaled up to cover a large population within a regional footprint?

Communities and Local Agencies

Cities and counties play a crucial dual role in the healthcare debate:

- as significant employers themselves with a huge financial burden caused for expanding healthcare costs;
- and as organizations dependent on the financial health of the residents in their jurisdiction: poor residents make for a challenging taxpayer base

It is beyond discussion that greater health leads both individuals and regions to greater wealth. Individuals who suffer from poor health are not going to be active economic agents in their community. Therefore, communities and local agencies have a double interest in building a health-enhancing regional system: lowering their healthcare costs while improving their residents' health.

This paper explains how the current under-investment in Public Health programs and infrastructure is creating entire generations of future consumers and taxpayers that might not be able to sustain today's economic model based on consumption. The pauperization of future consumers will hit the private sector where it hurts: both in its bottom line (consumers with a diminished earning potential) as well as in the quality and availability of its labor force. This paper proposes a funding mechanism similar to the existing commodities futures market, an economic framework to bring new actors to fund existing Public Health infrastructure. The proposed concept of Public Health Futures is designed to empower new actors with an interest in the future earning and purchasing power of today's youth to actively fund public health activities that have a high probability of delivering healthy, productive citizens in the future.²⁰

Plan of Action: SoFLHealth needs to quantify the impact poor individual health has at the community level. And to rally support for addressing individuals' and communities' health as an economic development issue.

²⁰ The presentation is available at http://www.OpenPHI.com/files/apha2006_phf.pdf

Colleges and Universities

Local colleges and universities see the impact of the current healthcare crisis from 04 closely-related perspectives:

- as large employers, these institutions are also some of the largest healthcare payers in the region
- their students' ability to study and learn is directly tied to the students' individual health and well-being
- the local job market where their graduates are going to go looking for jobs upon graduation
- opportunities to conduct research in new and emerging areas of medicine, bio-tech, Public Health, and other health-related fields

Plan of Action: SoFLHealth needs to secure the support of at least 02 local colleges or universities, both from their healthcare dollar perspective ("payers") but also from a research perspective to conduct innovative, impactful research and development.

School Boards

South Florida is home to 03 very large public school boards, and they are also major employers in the region. Just like colleges and universities (above), school boards play multiple roles in the current healthcare ecosystem: from payers to beneficiaries of a healthy local population.

Plan of Action: SoFLHealth needs the explicit support of the local school boards to create a culture of health in school children.

Foundations and Non-profits

Local foundations and non-profit organizations have ample experience tackling issues of health and economic disparity in our community. Many of the foundations' grants are focused on improving health and fostering community development. Some foundations specifically focus on prevention, education and treatment. And some take holistic approaches to health and development programs.

Community Empowerment: GFF supports programs that provide continuing education opportunities for adults and teens. Focus areas include access to technology, computer literacy and social advocacy. supports efforts that strengthen communities through participation, education and activism.

The SoFLHealth proposal could fit within the goals of the "Transformational Grantmaking"²¹ methodology.

Plan of Action: SoFLHealth needs to secure the feedback and guidance of established foundations and non-profits with a track record of investing in health-related issues.

Private Industry

There is a significant number of companies (both large and small) in the tri-county area that have products, services, and technologies applicable to the vision SoFLHealth articulates here. From wireless technology (Motorola, RIM, General Dynamics) to health IT to bio-technology, many of these companies will likely be interested in contributing to building the SoFLHealth platform.

SoFLHealth can, in turn, offer those companies a large-scale, geographically-constrained "test-bed" with real users for new tools, technologies and methodologies in the health space. That alone will be a tremendous inducement for private industry participants in this project.

Plan of Action: SoFLHealth to work through existing organizations to recruit the support and active participation of private industry players.

21 "Unlocking the Promise: A Guide for Funders Interested in Transformational Grantmaking." The Funders' Network for Smart Growth and Livable Communities (TFN). Available at http://www.fundersnetwork.org/usr_doc/UNLOCKING_THE_PROMISE.pdf

South Florida's Largest Employers

The table below provides an incomplete summary of the largest employers in the tri-county area. ²²

<i>County</i>	<i>Type</i>	<i>Organization</i>	<i># Employees</i>	<i># Retirees</i>	<i>Multiplier ratio</i>	<i>Total Covered Lives</i>
Broward	School Board	Broward Public Schools	39,000		1.5	58,500
Broward	Municipality	City of Fort Lauderdale		1,200	1.5	1,800
Broward	Municipality	Broward County				0
Broward	Municipality	City of Plantation				0
Broward	University	Broward Community College				0
Broward	University	Nova University				0
Broward	Hospital	Memorial Health	10,000		1.3	13,000
Broward	Hospital	North Broward Hospital District	7,000		1.3	9,100
Broward	Hospital	Tenet	10,000		1.3	13,000
Broward	Industry	Motorola	1,500		1.5	2,250
Miami-Dade	School Board	Miami-Dade County Public Schools	54,000		1.5	81,000
Miami-Dade	Municipality	City of Miami	4,000		1.5	6,000
Miami-Dade	Municipality	Miami-Dade County	30,000		1.5	45,000
Miami-Dade	Municipality	City of Hialeah	1,600	1,000	1.5	3,900
Miami-Dade	Hospital	Palmetto General Hospital	1,600		1.3	2,080
Miami-Dade	Industry	UPS (Hialeah)	1,200		1.5	1,800
Miami-Dade	Hospital	Hialeah Hospital	1,000		1.3	1,300
Miami-Dade	University	University of Miami	12,000		1.5	18,000
Miami-Dade	University	FIU	3,000		1.5	4,500
Miami-Dade	University	Miami-Dade College	2,000		1.5	3,000
Miami-Dade	Hospital	Baptist Hospital	12,000		1.3	15,600
Miami-Dade	Hospital	Jackson Memorial	11,000		1.3	14,300
Palm Beach	School Board	Palm Beach Board	22,000		1.5	33,000
Palm Beach	University	FAU	2,000		1.5	3,000
Palm Beach	University	PBCC	2,400		1.5	3,600
Palm Beach	Industry	The Breakers	2,300		1.5	3,450
Palm Beach	Industry	Office Depot	2,000		1.5	3,000
Palm Beach	Industry	US Sugar	1,500		1.5	2,250
Palm Beach	Industry	Boca Raton Resort	1,400		1.5	2,100
					TOTAL	344,530

Table 2: Covered Lives by Large Employers in South Florida.

Notes:

- "Multiplier ratio" is an attempt to identify how many dependents each covered employee may have under the employer's plan.
- "Total Covered Lives" is the estimated total number of individuals covered under each employer's health plan.

This table shows that adding the number of direct employees, plus the number of dependents as well as retirees under each employer's plan gives us a very large number of covered lives concentrated in a few large employers.

²² The Excel spreadsheet is available at http://www.openphi.com/files/SoFLHealth_01.xls

This table fails to account for several large employers: I could not find definitive numbers for the size of their local (tri-county) workforce:

- Publix
- Winn Dixie Stores
- FPL
- BellSouth / ATT
- Precision Response Corporation
- American Airlines

Appendix A: The Chronic Care Model ("CCM")

The CCM²³ identifies the essential elements of a health care system that encourage high-quality chronic disease care.²⁴ These elements are the community, the health system, self-management support, delivery system design, decision support and clinical information systems. Evidence-based change concepts under each element, in combination, foster productive interactions between informed patients who take an active part in their care and providers with resources and expertise.

The Model can be applied to a variety of chronic illnesses, health care settings and target populations. The bottom line is healthier patients, more satisfied providers, and cost savings.

Development of the Chronic Care Model

The staff at the MacColl Institute for Healthcare Innovation developed the CCM by drawing on available literature about promising strategies for chronic illness management, and organizing that literature in a new more accessible way. The Model was further refined during a nine-month planning project supported by The Robert Wood Johnson Foundation, and revised based on input from a large panel of national experts. It was then used to collect data and analyze innovative programs recommended by experts. RWJF funded the MacColl Institute to test the Model nationally across varied health care settings, creating the national program, "Improving Chronic Illness Care" (ICIC).

Refinements to the Chronic Care Model

In 2003, ICIC and a small group of experts updated the CCM to reflect advances in the field of chronic care both from the research literature and from the scores of health care systems that implemented the Model in their improvement efforts. We list more specific concepts under each of the six elements. Based on more recent evidence, five new themes were incorporated into the CCM:

- Patient Safety (in Health System);
- Cultural competency (in Delivery System Design);
- Care coordination (in Health System and Clinical Information Systems)
- Community policies (in Community Resources and Policies); and
- Case management (in Delivery System Design).

The Model element pages have been redesigned to reflect these updates. Each page describes the overall strategy for each element, and the health system change concepts necessary to achieve improvement in that component. The refinements have been emphasized in bold typeface for ready identification.

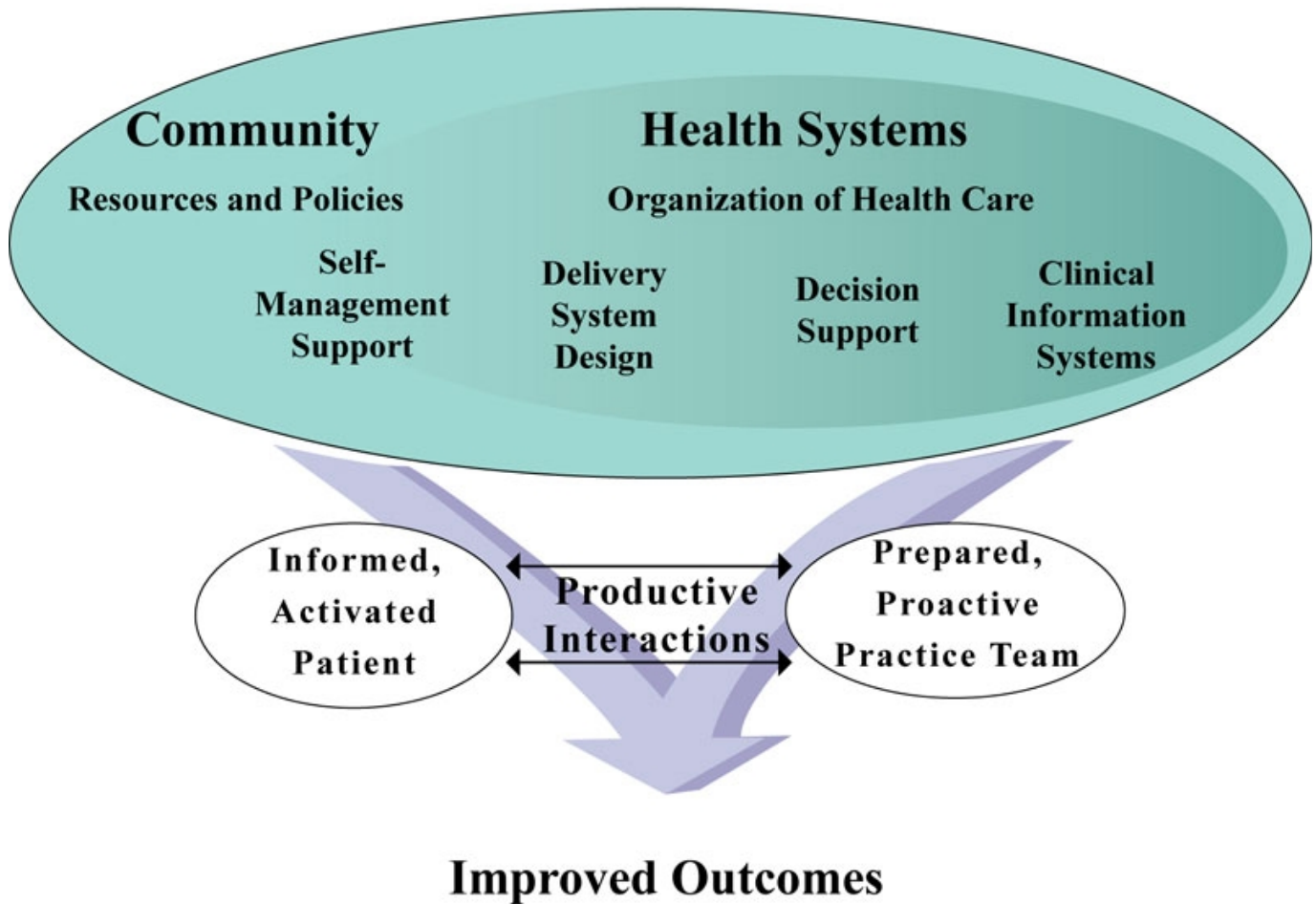
The diagram below²⁵ shows the elements of the CCM:

23 Available at http://www.improvingchroniccare.org/index.php?p=The_Chronic_Care_Model&s=2

24 Wagner EH, Glasgow RE, Davis C, Bonomi AE, Provost L, McCulloch D, Carver P, Sixta C. Quality Improvement in Chronic Illness Care. A Collaborative Approach. *J Quality Improvement* 2001;27(2):63-80.

25 Available at <http://www.improvingchroniccare.org/index.php?p=Chronic+Care+Model&s=124>

The Chronic Care Model



Developed by The MacColl Institute
® ACP-ASIM Journals and Books

Illustration □: Overview of CCM Components.

Mobile Chronic Care Model ("mCCM")

Mobile phones have significantly increased in power and sophistication, truly becoming an ideal platform to deliver remote care and patient support very cost-effectively.²⁶ Mobile phones are widely available and used across the world, and at all income levels and social strata, particularly in low resource countries like Latin America and the Caribbean.

Just like mobile phone technology allowed developing countries to leap-frog their telecommunications infrastructure, it's OpenPHI's contention that mobile phones and mCCM can help to build a Health IT infrastructure very quickly, and at very low cost. And the return on investment of delivering care through mobile phones is potentially higher than through traditional mechanisms.²⁷

26 Lacial JC. "Cell Phones and Tele-Medicine." Proceedings of the IEEE Fifth International Workshop on Enterprise Networking and Computing in Healthcare Industry. Santa Clara, CA; June 2003. Available at http://lacial.net/files/mt/Seamless_Health_Paper_Healthcom_2003.pdf

27 Lacial JC. Proposed Framework to Measure the ROI of Mobile Tele-Health Solutions in the Management of Chronic Diseases. Proceedings of the 26th International Conference of the IEEE Engineering in Medicine and Biology Society; San Francisco, September 2004. Available at http://lacial.net/files/mt/Seamless_Health_Paper_IEEE_SFO_2004.pdf

mCCM is envisioned as a patient-centric tool to provide self-management support, and to deliver personalized “health coach” services through the integration of relevant, personalized information from HealthLibrarian²⁸, a semantic search engine for health data.

The intended goal for mCCM is to have an informed, activated patient. And to facilitate high-quality interactions between patient and providers / system of care.

The hypothesis OpenPHI wants to test with mCCM is whether mobile phones are an effective mechanism to extend the CCM model beyond the traditional healthcare facilities (clinics, hospitals). And to empower patients through the use of a technology platform (mobile phones) they are intimately familiar with and comfortable using on a daily basis.

²⁸ Available at <http://www.HealthLibrarian.net/search>

Appendix B: Consumer-owned Health Data Ecosystem

OpenPHI has been working since 2005 to develop a platform for a consumer-owned health data ecosystem.

Consumer-Owned Health Data Ecosystem

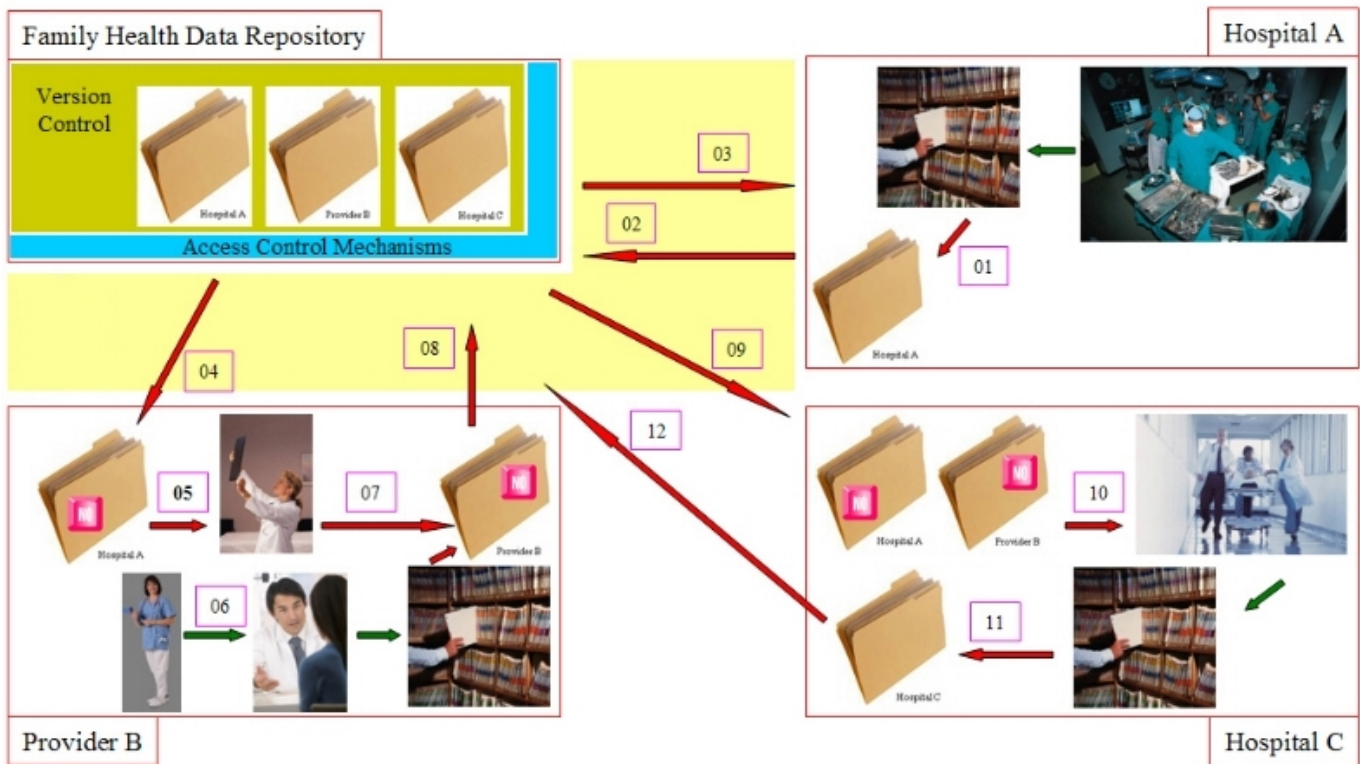


Illustration 3: Consumer-owned Health Data Ecosystem.

Why Personal Health Records (PHRs)?

Consumers want control over health data: social and economic pressure

- less trust in providers
- need to improve healthcare's delivery systems, methods
- consumer-driven healthcare (HSAs)
- high-deductible plans
- care coordination for life-long chronic diseases

Consumers pushed to "own" their health data:

- few EMR deployments
- privacy of outsourced health data processing
- health data floating around (RHIOs) with no Consumer control

Need to migrate from a provider-centric model towards a Consumer-controlled model of health improvement.

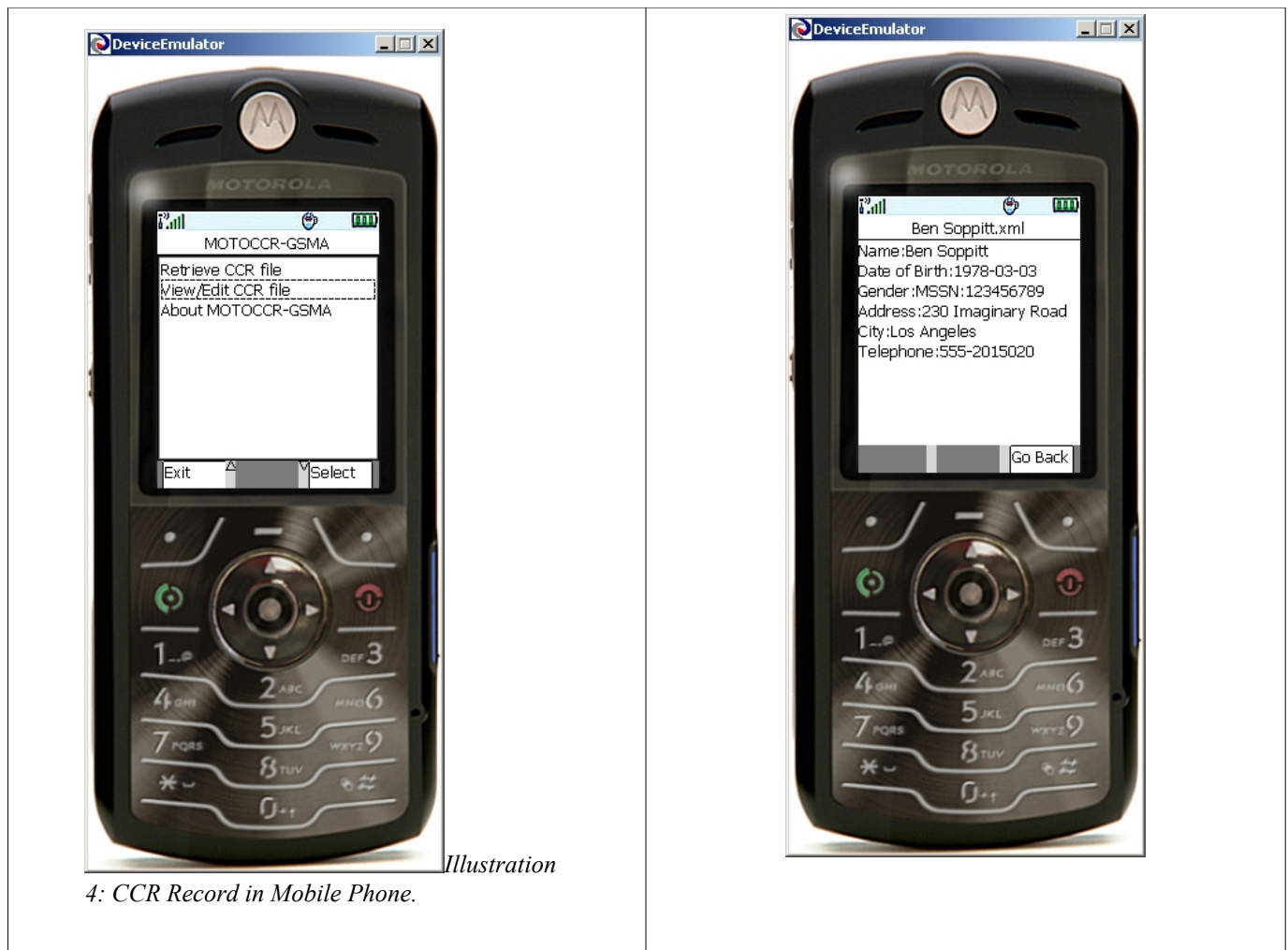
For several years OpenPHI has been working on the concept of a consumer-controlled PHR. With a particular focus on the consumer owning her own health data.²⁹

²⁹ See http://www.openphi.com/files/Lacal_CGU_122005_07.pdf for context.

Appendix C: Portable Personal Health Record

The ASTM Continuity of Care Record (CCR)³⁰ was developed in response to the need to organize and make transportable a set of basic information about a patient's health care that is accessible to clinicians and patients. It is intended to foster and improve continuity of care, reduce medical errors, and ensure a minimum standard of secure health information transportability. Adoption of the CCR by the medical community and IT vendors will be a great step toward achieving interoperability of medical records (one of CCHIT's guiding principles).

While at Motorola, Jose C. Lecal's team developed a Java (MIDlet) application running on a couple of Motorola mobile phones that implement 100% of the CCR standard defined by ASTM and the American Academy of Family Physicians. This MIDlet displays the full CCR file (with all of a patient's medical history). This was a proof of concept to allow consumers to have access to their Personal Health Records (in CCR format) available with them at all times on their mobile phones.



30 <http://www.centerforhit.org/online/chit/home/project-ctr/astm.html>

Appendix D: Online Game Server for Health

While leading the MOTOHEALTH team at Motorola, Jose initiated and directed the development of an MMORPG³¹ designed to enhance patient compliance with their chronic disease treatment plans. Further, this game connects with and extracts data from the mobile tele-health system my team developed.

The concept behind this game is that patients respond better to positive reinforcement than to the “nagging spouse” profile of most disease management programs. Further, this gaming concept leverages the documented forces of peer pressure and competitive spirit in online games.

..Taking Games for Health Mobile³²

Charles P. Schultz of Motorola presented this session, whose premise was that games can provide players with a sense of mastery over their condition. Schultz used the example of YuGiOh as evidence that kids can learn large bodies of information about arcane topics, and this can be applied to health instead of fantasy. Motorola tried to realize this by extending existing internal products and initiatives. At the same time, the company wanted to avoid using mobile technology as a nag, said Schultz.

WellWorld is an internal MMORPG built on Torque, started in October 2004, and funded through 2005. The goal of the game is to help players manage an acute lifestyle health condition like diabetes or heart disease. In the game, the player receives token rewards for the acting in ways that support his or her health condition. The purpose is to help kids (or adults) understand and feel more confident managing their own conditions.

Motorola has a project called “seamless mobility,” which involves the ability to access what you want, when you want it, wherever you are. The new iTunes phone is an example of this initiative. Other kinds of mobility are content, experience, brands, information, social experience, device independence, and demographics. So, specific content can be transmitted based on the purposes of the game. Specific content from different domains could then be delivered to the game world. These additional materials could be pushed to a phone. The game world could also move between devices (PC to mobile), and demographically, the parent and child should both be able to engage the experience. So far WellWorld has incorporated branded content from LifeScan and the American Heart Association. Motorola sees this as a viable method for distribution and funding. The videos in the game are accessible through the game or on a phone. In terms of demographics, parents want age-appropriate themes and Motorola wants a “happy, shiny look.” With respect to device mobility, the phone clients are possible, but may have limited features.

The justification for an MMORPG was based on research that showed social support helps people engage in positive health behaviors, said Schultz. Higher values of the social contract index are associated with increased odds of health behaviors. Conceptual buy-in has been positive.

31 MMORPG = Massively Multiplayer Online Role-Playing Game.

32 Source: http://www.gamasutra.com/features/20050927/bogost_01.shtml

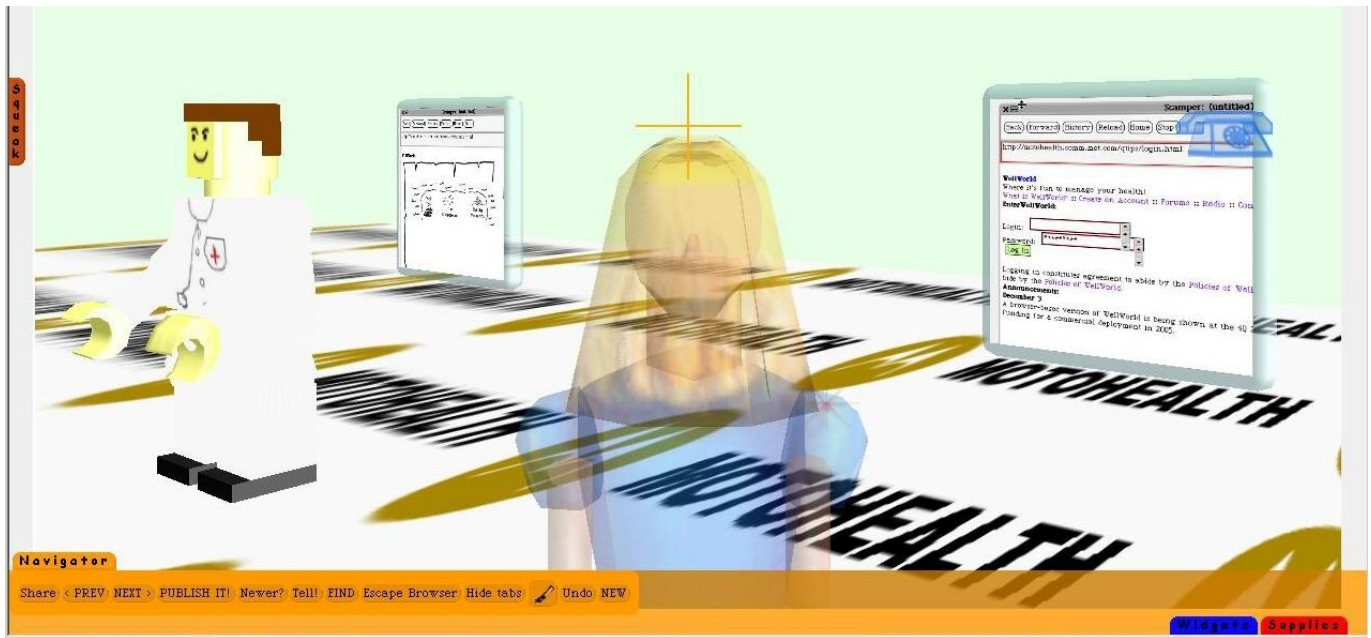


Illustration 5: Early WellWorld Prototype.

Appendix E: Mobile Chronic Care Model Platform

OpenPHI proposes to develop an end-to-end system that integrates an Application Server with mobile devices performing the role of a communication hub with the patient's body, home, and broader environment.

This is the proposed system architecture:³³

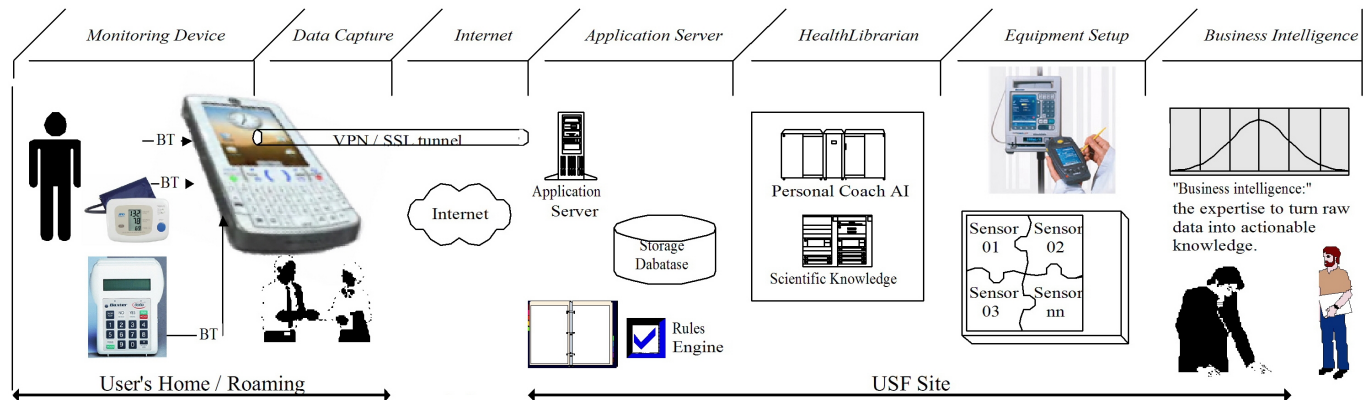


Illustration E: Proposed System Architecture

These are the core elements of the proposed architecture:

Monitoring Device

These are any and all devices that capture some sort of bio-medical information. These devices can communicate with the mobile phone via a series of open standards: BlueTooth; ZigBee; WiFi; and even via a tethered connection as a last resort. These monitoring devices may need to be FDA cleared in most cases.

The target devices for this project are:

- Insulin pump
- Heart rate monitor
- Blood pressure monitor³⁴
- Body mass index monitor / scale³⁵

Data Capture

Mobile device will perform the functions of a communication and data-gathering hub that consumer carries at all times. The mobile device will host an application that will control and communicate with the selected Monitoring Devices.

It is important to note that the selected mobile device(s) need to provide detailed documentation on the available APIs. One of the required features on the mobile phone is the ability to run processes in the background that alert the user at pre-determined times / dates.

Internet

The wireless network will provide consumers (and their mobile devices) with constant, pervasive access to the Internet.

It is important to note that the selected wireless operator needs to be an active participant in this engagement to address any technical and wireless security issues that may present.

Application Server

³³ See http://www.openphi.com/files/OpenPHI_Mobile_Chronic_Care_Model.pdf for the full proposal.

³⁴ See for example http://www.aandd.jp/products/medical/bluetooth/ua_767pbt.html

³⁵ See for example: http://www.aandd.jp/products/medical/bluetooth/uc_321pbt.html

OpenPHI will develop a server that performs the following functions:

- communicate with and collect the information collected by the mobile phone applications
- device management
- patient management
- consumer profile management: what alerts to transmit at what time for what devices
- secure data storage
- dashboard functionality for care managers, physicians

HealthLibrarian

The Application Server will query the HealthLibrarian server on a regular basis to extract the most relevant scientific information of interest to the patient.

Equipment Setup

One of the often overlooked requirements for a mobile tele-health system is the ability to manage the pieces of hardware that consumers will have access to. For example, the system must provide the ability to:

- assign specific Monitoring Devices to each mobile phone
- track and manage the repair, replacement, and retrieval of devices
- ensure the security of the communication channel: the right device transmitting the right information about the right consumer to the right mobile phone to the right provider in the back

Business Intelligence

This section is where the raw data collected by the mobile tele-health system is turned into actionable information for providers to affect the treatment plan for the consumer.

Appendix F: Certified Health Engineers

The current healthcare system is not geared towards optimizing a person's health:

- there are few incentives to improve, maintain patients' health
- mostly focused on repairing bodily damage
- very dis-organized and not coordinated across providers

Alternatively, it is possible to look at the process of managing an individual's health as an engineering challenge. Think of a human body as a finely-tuned machine, with different core elements (representing each of the human biological systems):

- Respiratory System
- Digestive System
- Vascular System
- Skin
- Lymphatic System
- Nervous System

Hundreds of years of biological and medical knowledge have led to the creation of fairly good (and scientifically valid) models of how different pieces of each system interact with each other, and how systems play together to create, maintain, and recover an individual's health.

How realistic is this? There is a concept in medicine that is very popular these days: Evidence-Based Medicine ("EBM"). EBM is the compilation of best practices on how to treat sick patients. It is proposed that we focus on the development of Evidence-Based Health ("EBH"): the compilation and dissemination of best-practices to keep people healthy and prevent illness.

Therefore, there is a tremendous need in the consumer marketplace for tools, processes, goods and services that help consumers to maintain and improve their health, based on solid engineering principles that leverage the vast amounts of health-related knowledge already available.

Therefore, local academic institutions can bring to bear their enormous engineering processes and mindsets to the development of engineering-centric processes and procedures to maintain a person's health. The Health Engineering academic program will provide interested individuals on a global basis with the tools, knowledge, and sources of support to enhance their own health and that of their communities. Evidence-Based Health ("EBH") methodologies will include the compilation and dissemination of best-practices to keep people healthy and prevent illness. Cisco and Microsoft, among other IT vendors, have extensive Certified Professionals programs. It's time for a Health Engineer certification program.³⁶

IT firms have been widely successful developing and maintaining an ecosystem of {Cisco / Microsoft / Novell} Certified professionals. IT firms have provided these professionals with a clear-cut, replicable and demonstrable model for financial and professional success.

OpenPHI proposes to develop an equivalent certification program for health professionals. This is geared towards enabling technology-savvy users to become health engineers by providing them with the proper "package" of tools, knowledge, and support services to allow those users to become health change agents in their communities.

We can talk about the need (and the opportunity as well) to qualify those already inclined towards health knowledge and to turn them into recognized professionals. With academic institutions providing both the technical and educational training, but also the enabling IT-centric tools to perform their duties in a professional and standardized way.

Does the world need more health professionals? According to the World Health Organization, the answer is a resounding yes. The shortage of health workers with the right expertise and experience has reached crisis levels in Less-Developed Countries. The ability of health services to deliver care depends on the knowledge, skills and motivation of health workers. Without enough skilled staff in the right place at the right time health systems cannot function effectively and populations are left without needed treatment, support.

In parallel, more consumers on a global basis are expected to take care of themselves, when healthcare providers are not readily

36 See http://www.ieee2407.org/files/Case_For_Health_Engineering_06.ppt for more details.

available. Certified Health Engineers can help fill in this social need.

There are 02 distinct areas of opportunity for Health Engineers:

- Certified Personal Health Engineer
- Certified Community Health Engineer

Certified Personal Health Engineer

The CPHE will be a person devoted to working with individuals and their families to help them attain and maintain the highest possible level of health and well-being.

Certified Community Health Engineer

The CCHE professional will focus on community-level issues (epidemiologic studies; support for immunization and sanitation campaigns; etc.) where there are not enough suitable Master's in Public

Health professionals available. In the past 50 years global life expectancy rose 30 years, 28 of them due to prevention and public health interventions. Yet, although there are over 700 medical schools in the world, there are only 71 schools of Public Health.