José C. Lacal
http://lacal.net
J.Lacal@UMiami.edu

1116 Rialto Drive
Boynton Beach, FL 33436
+1 (954) 553-1984 [Mobile]

Health Services Addendum: Activities 2001-2006.

Purpose: this document complements my Resume. Detailed herein are my activities in the Health Services arena.
This document is available at http://lacal.net/files/co/ra.pdf and my latest resume at http://lacal.net/files/co/resume.pdf

Table of Contents

Table of Figures

MOTOHEALTH

MOTOHEALTH is an integrated mobile monitoring solution that could potentially reduce healthcare costs and increase program compliance. Focusing on: chronic diseases, home care, and enhancing prescription drug compliance. MOTOHEALTH was designed as an end-to-end system that: gathers raw biometrical data; securely transmits it (wirelessly) to a central repository server; and allows service providers to make health care and wellness decisions based on such data.

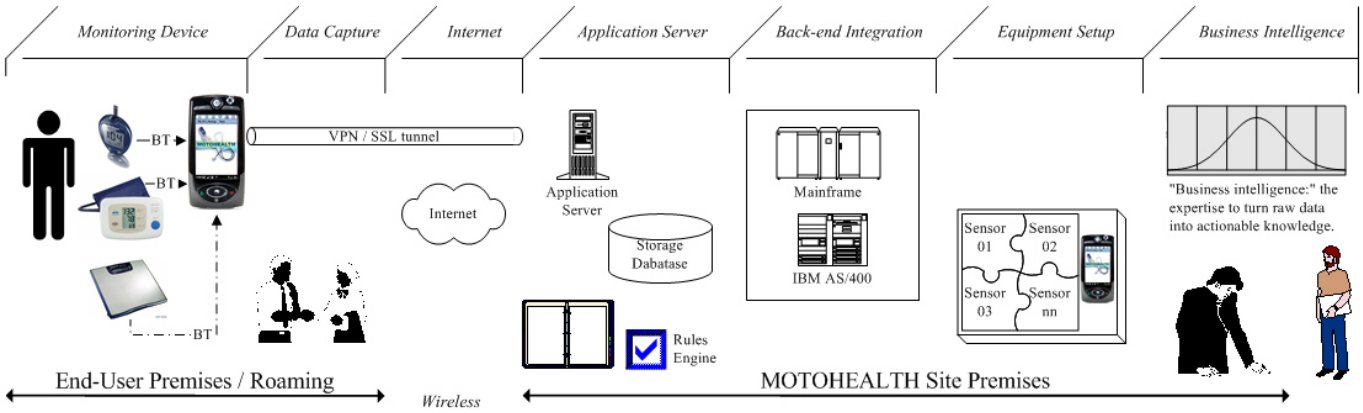

Figure 1: MOTOHEALTH System Overview.

I launched the MOTOHEALTH project in 2001 within Motorola, and led the team until July 2005. The software was developed from scratch under my guidance, based on a system architecture I articulated in a paper published in 2003 [please see item IEEE2003-01 below].

My business unit (iDEN) had developed an early technology prototype during 2000 that I took as the foundation for a new initiative devoted to leverage what I saw as the growing power and sophistication of Mobile Computing and Communication Devices (MCCDs).

Two subsequent papers I published in 2003 [please see item IEEE2003-02 below] and 2004 [please see item

IEEE2004 below] addressed some open issues in terms of legal, regulatory, and business model issues behind tele-health systems using mobile phones.

Under my leadership, my team launched the first clinical trials ever in Motorola's history:

Trial 01: Partners HealthCare / Harvard Medical School.

09/2004:
http://lacal.net/files/mt/Motorola_and_Partners_Telemedicine_092004.pdf
Developed relationship with one of the largest integrated healthcare systems in the nation, and with the premier medical school in the US. I secured their support to conduct a trial of the MOTOHEALTH platform. The Principal Investigator for the MOTOHEALTH trial, Dr. Joe Kvedar, is Corporate Director, Telemedicine, at Partners Healthcare and Vice Chair, Dermatology, at Harvard Medical School. Dr. Kvedar was also at the time the President of the American Telemedicine Association. This was the first clinical trial ever conducted by Motorola.

Trial 02: Clinic Hospital of Barcelona, Polytechnic University of Madrid, and amena.

02/2005:
http://lacal.net/files/mt/Motorola_amena_Hospital_Clinic_UPM.pdf
Developed relationship with top medical research institution in Barcelona, Spain; with the leading Telecommunication Engineering College in Spain; and with a 3G operator. Successfully negotiated the launch of a trial in Barcelona, Spain with the financial and technical support of amena, an existing Motorola customer. Leveraged relationships in Motorola Spain to provide local support for trial.

The MOTOHEALTH project received some media attention:

- Wall Street Journal
  http://lacal.net/files/mt/Wall_Street_Journal-MOTOHEALTH-12152004.pdf
- The Economist
  http://lacal.net/files/mt/Economist_Doctor_in_your_Pocket_09162005.pdf

Gaming for Health

While leading the MOTOHEALTH team at Motorola I initiated and directed the development of an MMORPG[1] 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 Mobile[2]
> 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.

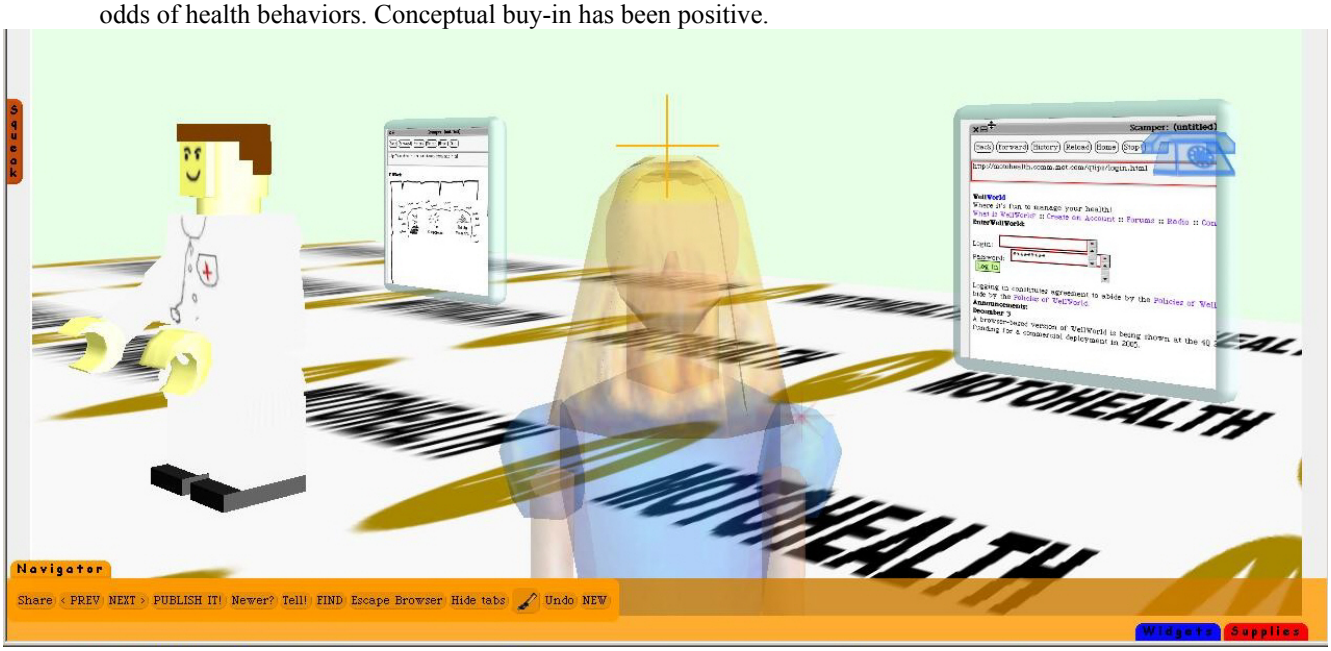

Figure 2: Early WellWorld Prototype.

[1] MMORPG = Massively Multiplayer Online Role-Playing Game.

[2] Source: http://www.gamasutra.com/features/20050927/bogost_01.shtml

Seamless Health Center of Excellence

In October 2005 I created the Seamless Health Center of Excellence at Motorola's Plantation, FL facility. The Center's focuses on developing solutions in the health space that leverage Information and Communication Technologies ("ICTs") as a tool to enhance the population's health. This ties with my personal commitment to leverage ICTs to improve people's health: health leads to wealth.

"Seamless Health" is defined as a person-centric framework of products and services (based on open standards) that bring health services to people, when needed, in a personal manner, seamlessly and unobtrusively: "Wherever you go, health services follow." Seamless Health services are envisioned to:

- go with the consumer, physically (a consumer's health data is his)
- go with the consumer, across providers
- go with the consumer, across employers / payers
- go with the consumer, across time and distance
- emphasize prevention
- focus on the family as the unit of care

In other words …."Wherever I Go, My Health Services Are There"

The projects currently under the Seamless Health Center of Excellence are:

Personalized Health Informatics ("PHI")

This is a proposed family of IEEE standards (IEEE2407) that will facilitate the development and usage of a comprehensive set of Internet-based tools that place the individual (and his/her dependents) at the center of an encompassing architecture of services that promote and enhance health. IEEE2407 is geared towards optimizing an individual's health, mostly outside of the scope of a healthcare provider. This standard is not about personal health records (that is being address already by many other organizations). This proposal is to create a "family health dashboard" where all relevant information (nutrition, environmental issues, published research, etc.) are brought together in an easy-to-use tool to enhance a family's health. Please visit the website at http://www.ieee2407.org

Continuity of Care Record ("CCR")

Developing the client and server components to allow Motorola mobile phones to securely download, store, display, and transmit a subset of an individual's health record by implementing an existing industry standard, the ASTM Continuity of Care Record (CCR) standard.

Health Relationship Management ("HRM")

Developing a commercial-grade, family-centered, portable, personalized, prevention-oriented Seamless Health platform of services to maintain, enhance, and restore an individual's health. Leveraging the growing power and sophistication of mobile computing and communication devices and the expanding capabilities of wireless networks.

Global Schools of Health ("GSH")

This project fulfills a human and social need on a global scale. It would distribute health information to people with cell phones and keep them updated and alerted to issues that could impact their such as: emergency warnings, nutrition information; sanitation; Public Health interventions; etc.

Personal Health Informatics (IEEEP2407 standard)

I developed the concept of Personalized Health Informatics ("PHI" thereafter) starting in 2004 as a "Family-centered, portable, personalized, prevention-oriented Seamless Health Record platform of services to maintain, enhance, and restore an individual's health. Leveraging the growing power and sophistication of mobile computing and communication devices and the expanding capabilities of wireless networks."

This concept was first presented publicly in December 2005 during a Personal Health Records conference hosted by Claremont Graduate University.[3]

In early 2006 the IEEE-SA (Standards Association) chartered a Study Group to ascertain if there were gaps in the current health IT standards landscape where the IEEE could bring its resources to address. Given my interest in this topic, I was asked to co-chair the study group together with Linda Weaver (Chief Technology Officer at Ontario, Canada's Smart Systems for Health Agency).

(Please see http://standards.ieee.org/ and http://0-standards.ieee.org.csulib.ctstateu.edu/sa-mem/sa-view.html for more info on IEEE-SA).

The Study Group's initial meeting took place in mid-March 2006 week in Ottawa, Canada. See http://standards.ieee.org/announcements/pr_healthitssg.html

A summary of my proposal for person-centric, family-oriented Personalized Health Informatics standard is available here: http://grouper.ieee.org/groups/hit/Ottawa-29-30March/Lacal%20Proposal%20IEEE-SA%20Health%20IT%20Standards%20Study%20Group%20032006%20Scope%2002.ppt

All the files presented during this meeting are available at http://grouper.ieee.org/groups/hit/Ottawa-29-30March/

In June 2006 I submitted a PAR (P2407 - Architecture and Framework Reference Model for Personalized Health informatics (PHI)) to NesCom, with myself as the Working Group Chair.

On 28 July 2006 the IEEE-SA Standards Board approved the P2407 project until 31 December 2010. This is going to be IEEE's first ever standard in the health informatics space.

The purpose of this family of standards is '..to facilitate the development and usage of a comprehensive set of Internet-based tools that places the individual (and his/her dependents) at the center of an encompassing architecture of services that promote and enhance health. This standard is geared towards optimizing an individual's health, mostly outside of the scope of a healthcare provider. This standard is not about personal health records (that is being addressed already by many other organizations). This proposal is to create a "family health dashboard" where all relevant information (nutrition, environmental issues, published research, etc.) are brought together in an easy-to-use tool to enhance a family's health.'

[3] Available at http://lacal.net/files/hs/Lacal_CGU_122005_07.pdf

I designed and manage the website for the IEEE2407 working group, available at http://www.ieee2407.org

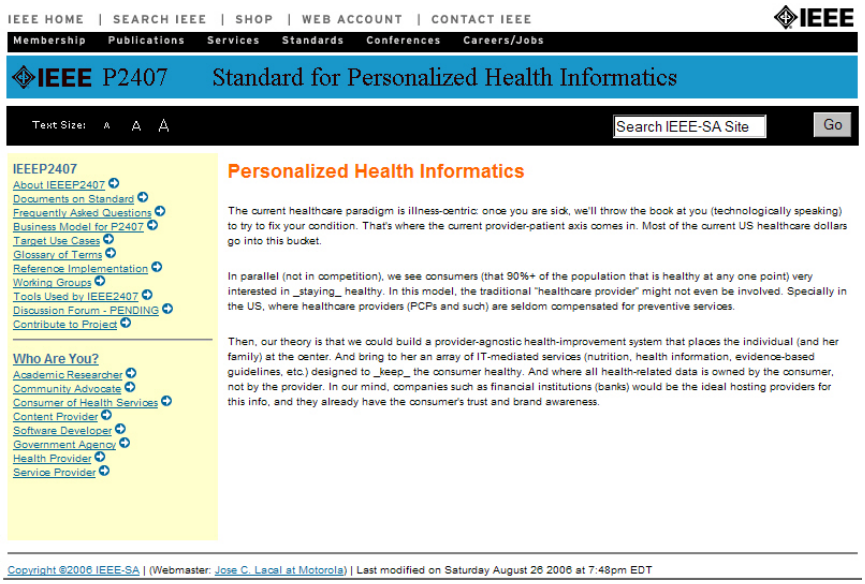

Figure 3: IEEE2407 Website.

Continuity of Care Record (CCR)[4]

The ASTM Continuity of Care Record (CCR) 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 CHiT's guiding principles).

My team has 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 is 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.

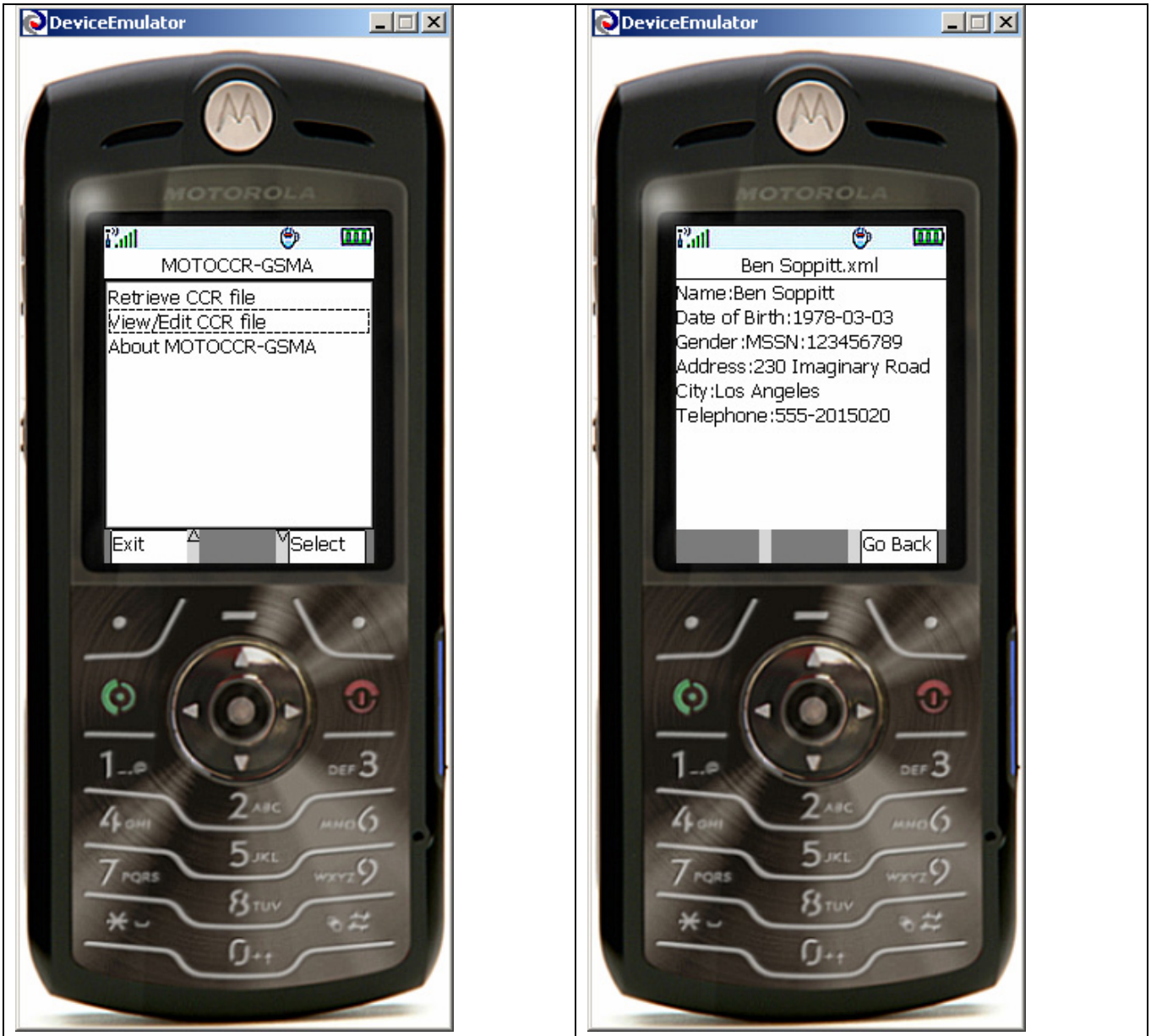

Figure 4: CCR Application in Mobile Phone.

[4] http://www.centerforhit.org/x201.xml

Health Relationship Management (HRM) system

Imagine an Internet-based system where a parent, caregiver, or community health advocate could have secure access to a health dashboard with the health status of an entire family, minor children as well as elderly parents. This "health dashboard" would present the user with:

- Summaries from all published research worldwide on specific diseases that afflict a family member;
- Centralized storage of all medical records for the entire family ("Family PHR") where all physicians that have ever attended to any family member are expected to deposit all relevant information about each family member (this data belongs to the individual or legally responsible adult);
- Access to the latest Evidence-Based Medicine ("EBM") guidelines, as published by respected agencies (such as the US, Canadian and British governments), that are relevant to each of the family members. That is, the dashboard user will be able to review the latest EBM guideline for each disease prior to a visit to a physician, to ensure that the family member receives the best possible treatment;
- The health information is available to the user via a mobile phone; PDA; office PC; home computer.
- Help the family to manage the enormous amount of paperwork and bills generated when an individual goes through a healthcare system with multiple providers.

Everything above is technologically possible today. Why isn't it currently available? The lack of open standards is a key stumbling block to realizing the above scenario.

The HRM concept is an extension of the traditional Customer Relationship Management (CRM) systems already widely deployed in industry: a CRM system is used by companies and institutions to manage all their interactions with their consumers or members.

HRM turns the CRM concept on its head: HRM is designed to allow a family to manage all its interactions with health providers. HRM uses CRM's capabilities to help families improve the health of their members.

This is how a hosting company could provide a hosted service for consumers to manage their families' health data.

> In the US, President Bush has outlined a plan to ensure that most Americans have electronic health records within the next 10 years.[5] Think of Personal Health Records ("PHRs") as "virtual health safe deposit boxes." Hosting companies could safely host the patient's data, encrypted with a 02-key mechanism: the customer has a set of keys, the hosting company holds the second. The privacy and security issues posed by PHRs can certainly be solved by leveraging the combined brainpower of the IT and banking experts.
>
> A hosting company offering such hosting of a family's PHR would be akin to a consumer renting a safe deposit box for US$99 / year. A consumer will pay an initial "set-up fee" to digitize all paper-based records (immunization records; x-rays; etc.). This "digitalization" would be done at a physical location, such as one of the many retail pharmacies in the US, or even in bank branches. The pharmacy (and /or the bank branch) can earn money by digitizing the consumer's records; the hosting company would earn an annual fee to host this "digital health records safe deposit box."
>
> My wife (much to my surprise) loved the idea, and she said she'd love to go to a pharmacy to set-up her PHR account (for an initial set-up fee of up to US$200). Thereafter, she'd be willing to pay an annual fee similar to what she now pays for a safe deposit box (US$100). I can imagine that those setting up their PHR accounts at pharmacies would also increase their purchases at those pharmacies. My wife is a techno-phobic person, yet she herself imagined the time-saving and empowerment that this PHR system could bring to her.

Value of PHRs to Consumers

Please refer to these documents for a very detailed answer to what is the value of consumer-controlled health systems:

- http://grouper.ieee.org/groups/hit/PHI/IEEE_Study_Group_Health_IT_3.04.pdf
- http://grouper.ieee.org/groups/hit/PHI/IEEE_SA_PHI_Use_Cases_05.pdf
- http://grouper.ieee.org/groups/hit/PHI/IEEE_SA_PHI_FAQ_10.pdf

[5] http://www.whitehouse.gov/infocus/technology/economic_policy200404/chap3.html

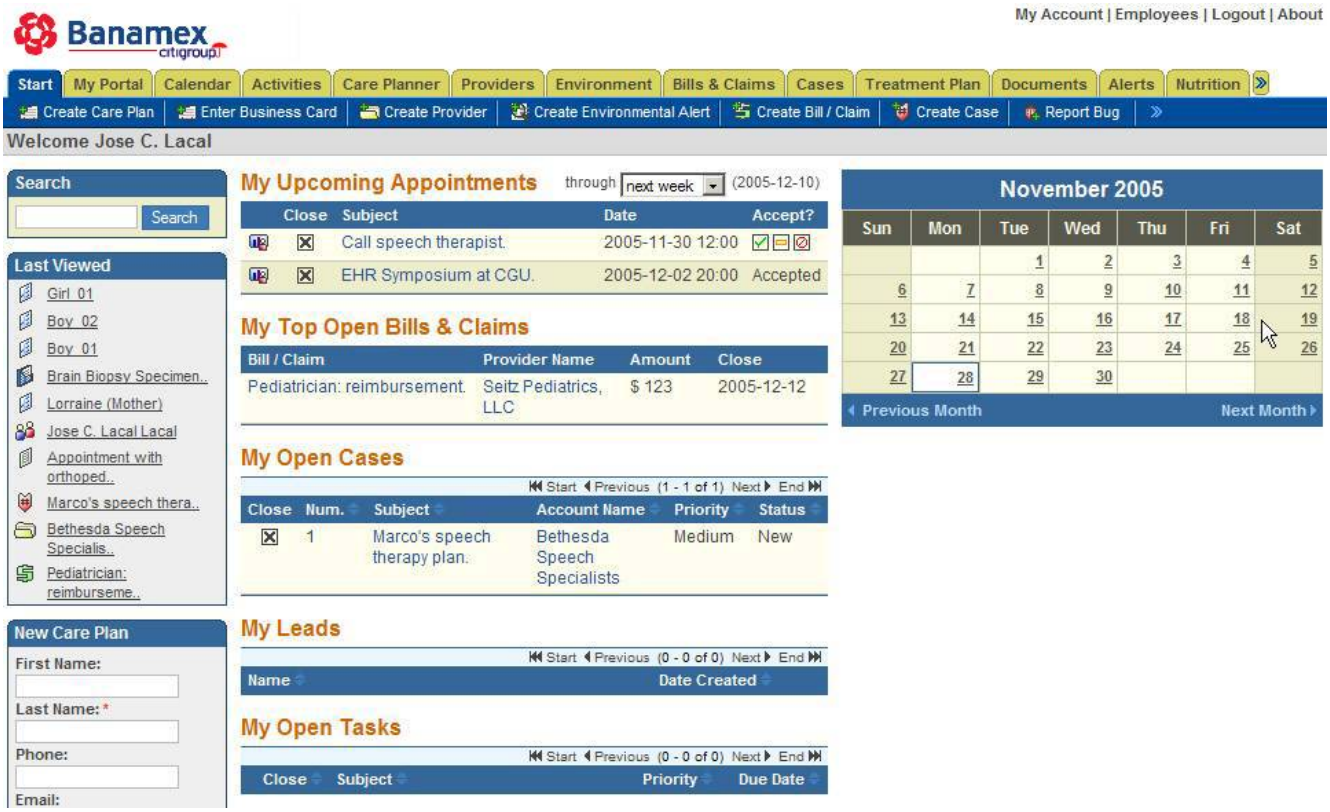

Figure 5: Prototype Health Relationship Management System.

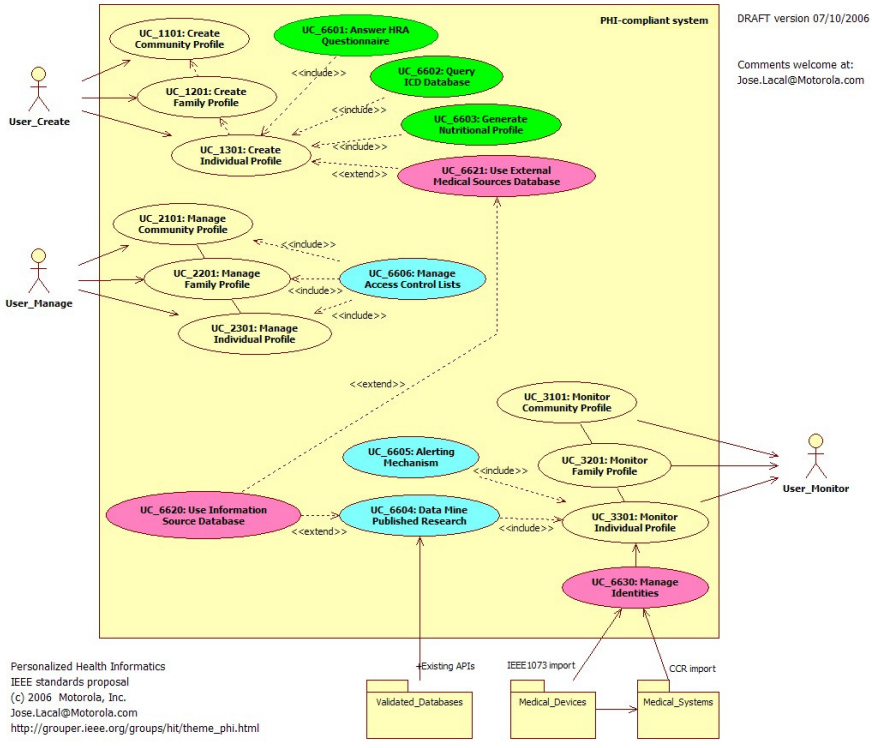

Figure 6: UML Representation of HRM System.

Independent Research

These are some of the papers I have developed on my own initiative.

HealthCoach Proposal

Available at http://lacal.net/files/hs/HealthSmart_M.pdf

Abstract:

This paper proposes the development of HealthSmart, a subscription-based service that will offer upper middle class families and individuals a long-term, personalized, on-site, on-going health improvement and management coach centered on the family as the unit of care.

The front-line worker in the HealthSmart program will be a HealthCoach that will work with member families to guide them towards the maintenance and improvement of each family member's highest level of achievable personal health.

Health Index Through the Life Cycle

Available at http://lacal.net/files/hs/Seamless_Health_Health_Through_Life_Cycle_G.pdf

Abstract:

Concept of Health Index

Outlined in Phelps, C.E. “Health Economics,” 3rd edition.

A person is alive as long as her Health Index (“HI”) is above the minimum level (“HImin”) at which death occurs. The HImin value is not fixed across time. Rather, social and technological advances have consistently lowered the HImin “floor” since 1900. The HI value changes as a person suffers from an illness or an accident, dropping her HI level until a recovery takes place. Also, the HI decreases naturally as a person ages. Healthcare systems today are designed to help patients recover from a drop in their HI caused by illness or accident.

Publications

This section lists all my published books and papers to date.

Books

- Kemper S, Lacal JC. Addressing the Communication Needs of an Aging Society. In Pew RW, Van Hemel SB, eds. Steering Committee for the Workshop on Technology for Adaptive Aging. *Adaptive Aging Workshop, National Research Council.* Washington, DC; January 2003.
  http://books.nap.edu/catalog/10857.html
  The chapter I contributed to: http://books.nap.edu/books/0309091160/html/131.html#pagetop
  The section I wrote starts here: http://books.nap.edu/books/0309091160/html/142.html#pagetop right at the "Technology to Empower Older Adults" heading.

Published Papers

These are several papers I have published on the topic of mobile tele-health. These papers outline my vision for leveraging consumer-grade IT.

IEEE2003-01

Lacal 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://lacal.net/files/mt/Seamless_Health_Paper_Healthcom_2003.pdf
Abstract:

> The growing power and sophistication of cellular phones and Personal Digital Assistants (PDAs) make those devices increasingly feasible platforms for mobile tele-health applications, including telemedicine. These mobile telemedicine solutions can offer remote monitoring services to patients on the go, increasing their independence with potentially better outcomes. A proposal for a cellphone-based mobile telemedicine system is outlined herein, as well as specific recommendations to accelerate the wide deployment of mobile telemedicine solutions.

IEEE2003-02

Istepanian RSH, Lacal JC. Emerging Mobile Communication Technologies for Health: Some Imperative notes on m-health. *Proceedings of the 25th Silver Anniversary International Conference of the IEEE Engineering in Medicine and Biology Society*; Cancun, Mexico September 2003.
Available at http://lacal.net/files/mt/Seamless_Health_Paper_IEEE_Cancun_2003.pdf
Abstract

> The next generation of "wireless e-health technologies" is a new and evolving topic in the areas of telemedical and telecare systems. These technologies involve the exploitation of mobile telecommunication and multimedia technologies to provide better access to healthcare personnel on the move, by removing the key disadvantage of trailing wires in current systems. These technologies provide equal access to medical information and expert care by overcoming the boundaries of separation that exist today between different users of such medical information. A great benefit to all users will be a more efficient use of resources and far greater location independence. In this paper we will address some notes and future trends in these emerging areas and their applications for m-health systems. We will also discuss current as well as future strategies for implementing these system within important healthcare sectors as well as critical medical environments.
> Index Terms— m-health, telemedicine, wireless telemedicine, wireless communications, UMTS, GPRS, e-health

IEEE2004

Lacal 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://lacal.net/files/mt/Seamless_Health_Paper_IEEE_SFO_2004.pdf
Abstract

Significant changes in the distribution of healthcare costs (away from critical care and towards chronic diseases) pose major challenges to existing healthcare systems. Caring for a patient with a chronic disease lasts as long as a person is alive, and medical expenses accumulate unrelentingly. Therefore, new approaches to disease management of chronic diseases are urgently needed, especially in terms of increasing the (currently low) rate of adherence to the patient's prescribed treatment plan. A proposal is advanced to use Mobile Tele-Health systems to enhance the effectiveness of Disease Management programs. A framework to measure the ROI (Return On Investment) of these systems is also proposed.
Index Terms— Social ROI, Mobile Tele-Health, Chronic Disease, Mobile Disease Management, Medicare, Health Economics, Mobile Computing and Communication Devices.

Pending Publications

These are some of the papers I am currently working on. The latest draft of each paper is available upon request.

Bring your own Health IT: Building a Consumer-centric Health IT Infrastructure.

Abstract:

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.

This paper was presented on 11/03/06 in Washington, DC during the Medical Automation International Conference.
http://medicalautomation.org/conferences/index.php?confid=1
The presentation is available at http://lacal.net//files/hs/BYOHIT05.ppt

The Case for Health Engineering

Abstract:

This paper proposes the development of a Health Engineering program that provides 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 Medicine ("EBM") is very popular these days to treat ill individuals. Alternatively, we need to develop Evidence-Based Health ("EBH") methodologies, including 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.

.. 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.

This paper was presented on 10/19/06 in Washington, DC during the "Summit, A National Summit: Moving Toward Interoperability— Technologies for Accessible, Affordable Healthcare." This event was sponsored by NIST, The Technology Administration in the Department of Commerce and the Center for Aging Services Technologies (CAST).
http://www.itl.nist.gov/Healthcare%20Summit/program.htm

The presentation is available at http://www.ieee2407.org/files//Case_For_Health_Engineering_06.ppt

Health Care as a Social Privilege

Abstract:

Personal Responsibility is the missing link in healthcare reform. Access to healthcare services should not be treated as a "right" but rather as a "social privilege" akin to driving a car. Today there is little connection between an individual's behavior and his / her health insurance premium and access to services. This helps to explain the growing number of people with lifestyle-related chronic diseases (such as diabetes, obesity, smoking-related) that lack any incentive to control their disease by changing their lifestyle given that society will "fix" them at any cost. This paper proposes the car insurance market as a model for health care access. In the car insurance model, there is a direct, measurable and immediate correlation between "driving behavior" and insurance premiums. Drivers that do not follow traffic laws can cause huge externalities to other drivers: drunk driving, speeding. Likewise, an obese, diabetic person can cause huge externalities to the rest of society by consuming excessive healthcare resources that could be best used to treat other individuals, including the uninsured.

The Pauperization of Future Consumers

Abstract:

Significantly all developed countries today are built on the basis of a consumption-oriented economy. That is, large numbers of consumers with significant (and increasing over their lifetime) purchasing power drive the economic engine through their expenditure patterns. But for young people today to become viable consumers tomorrow they must be provided with the necessary social resources (education, health, supportive homes) to empower them to earn enough future income to have a purchasing power equivalent of that of today's consumer. Unfortunately, current governmental and business policies on a global basis that benefit today's older generations have a clear and catastrophic effect in effectively pauperizing young generations by siphoning resources away from the young. Therefore lowering the future purchasing power of today's young people, and greatly reducing the future consumer base for all businesses. Given a society's limited resources, lavishing resources on the current elderly generation deprives today's young and future generations of the necessary resources to nourish their full potential. This paper summarizes hard evidence of the on-going "generational robbery" that threatens the future viability of today's economic models.

Public Health Focus

I am pursuing a Master's in Public Health (MPH) at the University of Miami's Miller School of Medicine.

These are some of the papers I have written as part of my MPH classes.

Public Health Futures.

Abstract:

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.

This paper was presented on 11/08/06 in Boston, MA as an oral presentation during the 2006 convention of the American Public Health Association.
http://apha.confex.com/apha/134am/techprogram/paper_130490.htm
The presentation is available at http://lacal.net/files/ph/apha2006_phf.ppt

Maternal Mortgage: An Analysis of Inter-generational Health Consequences

Abstract:

Economic, social, physical, as well as emotional factors across a woman's lifespan have a direct impact on her offspring's health and quality of life. By the time an infant is born, he already inherited an assortment of physical and emotional burdens directly related to the way his mother lived her life, and those burdens are transferred across generations ("Maternal Mortgage"). This paper outlines a trans-generational predictive model to measure the impact that maternal mortgages bring on children, and the social consequences of burdening children with such cross-generational inherited health burden loads.

Shortcomings in the availability and quality of Maternal and Child Health services can be used as proxies to predict the health and social well-being of the next generation. The odds that a US resident female will become pregnant at least once in her lifetime are over 100%, given an estimated Total Fertility Rate of 2.03 for 2003i. Thus, given that pre-conceptional health care can improve outcomes, that the early phases of conception are crucial for the fetus's development, that any delay in ascertaining pregnancy status could lead to a late start in taking nutritional measures, and that over 50% of pregnancies are unexpected, it is proposed that all females (regardless of age) must be offered pre-conceptional services from birth in order to minimize negative health impacts on their children and future generations. Not only for the mother's well-being, but for that of society as a whole.

This paper was presented on 11/08/06 in Boston, MA as an oral presentation during the 2006 convention of the American Public Health Association.
http://apha.confex.com/apha/134am/techprogram/paper_133405.htm
The presentation is available at http://lacal.net/files/ph/apha2006_mm.ppt

Patents

There is 01 patent application pending where I am one of the co-inventors.

United States Patent Application Publication NO.: US 2006/0045281 A1
Korneluk et al.
Pub. Date: Mar. 2,2006
Title: PARAMETER ADJUSTMENT IN AUDIO DEVICES

Inventors:
Jose E. Korneluk, Boynton Beach, FL
Marc A. Boillot, Plantation, FL
Jose C. Lacal, Boynton Beach, FL (US)
John G. Harris, Gainesville, FL (US)

Assignee: MOTOROLA, INC.
Filed: Aug. 27,2004

ABSTRACT
A method (400, 600) and apparatus (500,800) allow adjusting parameters associated with an audio signal output from a device. Tones are output according to a first interactive test profile presented on a user interface during a first test period. A first interaction forms a first adjustment profile with adjustment levels. The audio signal is output with parameters adjusted according to the first adjustment profile. The audio signal is output from the device in accordance with the first adjustment profile and a second interactive test profile. An interaction with the user interface forms a second adjustment profile having second adjustment levels and the audio signal is then adjusted in accordance with the second adjustment levels. The second interactive test profile includes a speech sample and an intelligibility parameter including a spectral tilt for the device and a formant sharpening profile.

Presentations, Fora Participation

This is a list of presentations I have made, as well as my participation in different events.

2002

- Hosted a Motorola-wide "Healthcare Summit" to explore opportunities for Motorola to enter this market.

2003

- IEEE Healthcom 2003; 5th International Workshop on Enterprise Networking and Computing in Healthcare Industry
  June 06-07.
  Santa Monica, CA US.
  Delivered keynote session on "Cell Phones and Tele-Medicine."
  https://lists.cs.columbia.edu/pipermail/tccc/2003-May/000992.html

- 25th Silver Anniversary International Conference of the IEEE Engineering in Medicine and Biology Society
  September
  Cancun, Mexico.
  Presented paper I co-authored, titled "Emerging Mobile Communication Technologies for Health: Some Imperative notes on m-health."

- Hosted a Motorola-wide "Seniors Summit" to identify areas of opportunity for Motorola to deliver products and services to the elderly, both at home ("aging in place") and in institutional settings.

2004

- 26th International Conference of the IEEE Engineering in Medicine and Biology Society
  September 2004.
  San Francisco, CA US.
  Submitted paper for presentation, titled "Proposed Framework to Measure the ROI of Mobile Tele-Health Solutions in the Management of Chronic Diseases."

2005

- 29th Annual International Computer Software and Applications Conference (COMPSAC 2005)
  July 25-28
  Edinburgh, Scotland, UK.
  Hosted a panel titled "High-Assurance Software for Mobile Tele-Health Systems."
  http://www.informatik.uni-trier.de/~ley/db/conf/compsac/compsac2005-1.html

- 2nd CGU-QTC Health Symposium at Claremont Graduate University.
  December 02-03.
  Claremont, CA US.
  Presentation titled "Seamless Health Record"
  http://www.cgu.edu/pages/3789.asp#lacal
  ➔ Download from http://lacal.net/files/hs/Lacal_CGU_122005_07.pdf

2006

- "The Summit, A National Summit: Moving Toward Interoperability— Technologies for Accessible, Affordable Healthcare." Sponsored by NIST, The Technology Administration in the Department of Commerce and the Center for Aging Services Technologies (CAST).
  October 18-19.
  Washington, DC.
  http://www.itl.nist.gov/Healthcare%20Summit/program.htm

- Medical Automation International Conference.[6]
  November 01-03.
  Washington, DC US.
  http://www.medicalautomation.org/conferences/bio.php?confid=1&speaker=23

- 134th Annual Meeting and Exposition of the American Public Health Association
  November 04-08.
  Boston, MA US.
  02 of my student papers were accepted for oral presentations:
  http://apha.confex.com/apha/134am/techprogram/paper_130490.htm
  http://apha.confex.com/apha/134am/techprogram/paper_133405.htm

[6] http://medicalautomation.org/conferences/index.php?confid=1

Software Development and Methodologies

Although an Economist by training, and a Public Health advocate by heart, I take great pride in constantly sharpening my skills in the use of state-of-the-art Free and Open Source ("F/OSS") software tools and methodologies.

Software Tools

These are some of the software tools I am comfortable with.

- Apache
  The Apache HTTP Server Project is an effort to develop and maintain an open-source HTTP server for modern operating systems including UNIX and Windows NT. The goal of this project is to provide a secure, efficient and extensible server that provides HTTP services in sync with the current HTTP standards.[7]

- Eclipse
  Eclipse is an open source community whose projects are focused on providing a vendor-neutral open development platform and application frameworks for building software.[8]

- Moodle
  Moodle is a course management system (CMS) - a free, Open Source software package designed using sound pedagogical principles, to help educators create effective online learning communities.[9]

- MySQL
- OpenBSD 3.9
  The OpenBSD project produces a FREE, multi-platform 4.4BSD-based UNIX-like operating system. Our efforts emphasize portability, standardization, correctness, proactive security and integrated cryptography. OpenBSD supports binary emulation of most programs from SVR4 (Solaris), FreeBSD, Linux, BSD/OS, SunOS and HP-UX.[10]

- Protégé
  Protégé is a free, open source ontology editor and knowledge-base framework.[11]

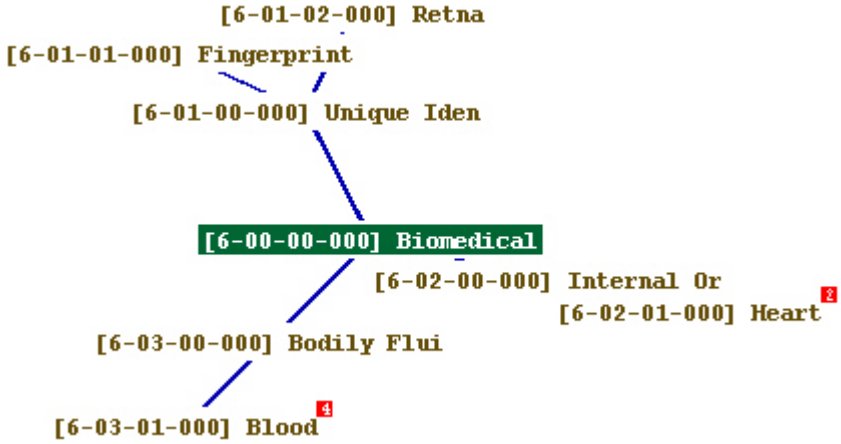

Figure 7: Segment of Customized Ontology Developed with Protégé.

- SugarCRM
  SugarCRM is a Customer Relationship Management ("CRM") application natively built on the pure Open Source LAMPS (also WAMPS) platform: Linux or Windows, Apache or IIS, MySQL, and PHP.[12]

[7] http://httpd.apache.org/
[8] http://www.eclipse.org/
[9] http://moodle.org/
[10] http://www.openbsd.org/
[11] http://protege.stanford.edu/
[12] www.sugarforge.org

Methodologies

These are some of the development methodologies I currently use in my projects.

- Test-Driven Development
  TDD is a computer programming technique that involves repeatedly first writing a test case and then implementing only the code necessary to pass the test. Test-driven development gives rapid feedback. The technique began to receive publicity in the early 2000s as an aspect of Extreme Programming, but more recently is creating more general interest in its own right.[13]

- Unified Modeling Language
  In software engineering, the Unified Modeling Language (UML) is a non-proprietary specification language for object modeling. UML is a general-purpose modeling language that includes a standardized graphical notation used to create an abstract model of a system, referred to as a UML model. UML is extendable as it offers a profile mechanism for customization. If a concept you need is not present, you may introduce it by defining a stereotype. The semantics of extension by profiles has been improved with the UML 2.0 major revision.[14]

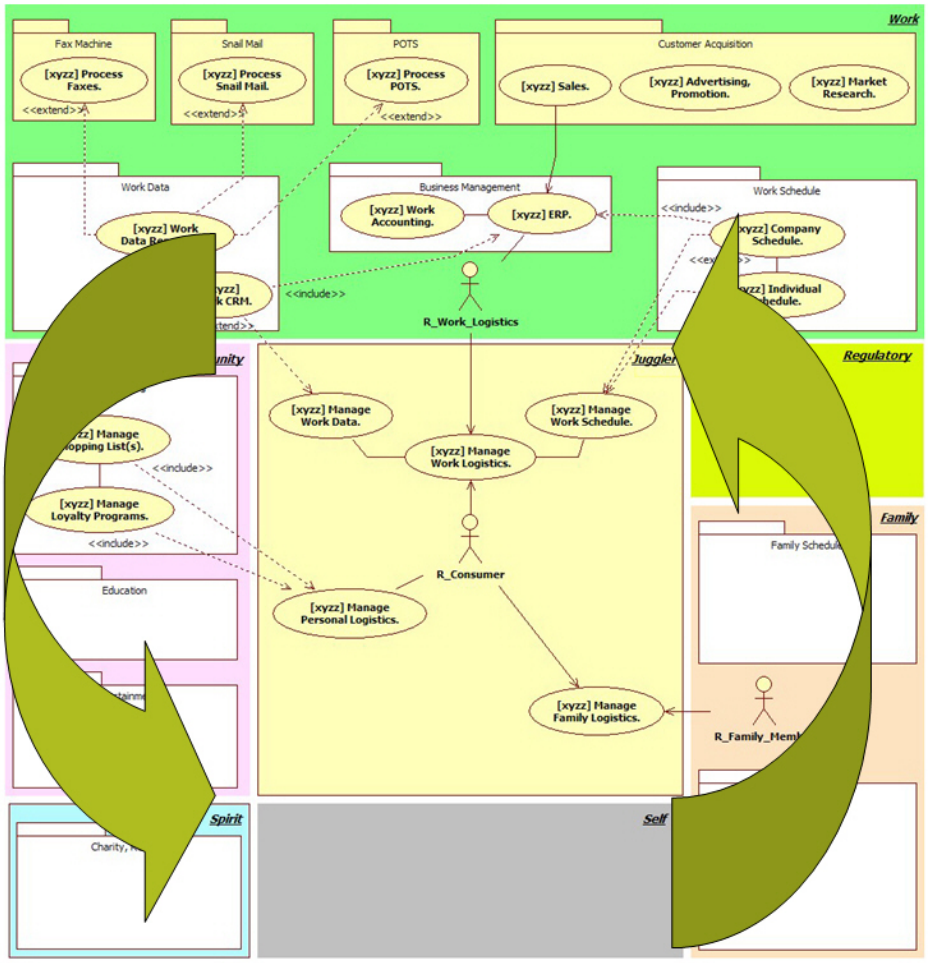

Figure 8: UML Representation of a Person's Life Cycle.

[13] http://en.wikipedia.org/wiki/Test_driven_development
[14] http://en.wikipedia.org/wiki/Unified_Modeling_Language