The Potential of Information Systems Applications in Healthcare: Helping People Achieve Longevity

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Abstract

This paper introduces a concept for the application of Information Systems to assist people in achieving longevity. To emphasize the breadth and depth of issues affecting longevity, this paper summarizes the healthcare problems facing society. We discuss the role of information systems as offering possible solutions to these problems. Although many health care systems have been implemented, we propose an approach to make these systems accessible to the masses to use on a personal basis. The development of a suitable information system to resolve these issues would have a significant impact on society. Since this approach is not a component of the information systems curriculum, we suggest how this would impact information systems education.

Keywords: Information Systems applications, longevity, Information Systems education, health care issues, model curricula

1. Introduction

As a society we are currently facing a problem of immense proportions that is proceeding largely unchecked: Heart Attacks, Colorectal and Lung Cancer, and Diabetes KILL 82% OF THE POPULATION (NCHS 2005). There are a number of features common to each of these diseases (Bronn 2004; Rumberger 2004):

1. They probably result from poor lifestyle.
2. They develop for many years presymptomatically.
3. Pre-symptomatic detection is difficult.
4. The diseases get worse exponentially eventually becoming symptomatic.
5. Once symptomatic, the diseases are very difficult to reverse.
6. Once symptomatic, the diseases consume an enormous fraction of health care dollars.
7. Because of the aging collection of baby boomers the total health care expense is beginning to climb sharply over the next decade.

In combination these factors contribute to creating a population where almost 90% of the population suffer with some chronic dis-

ease that consume about 70% of a $1.9 trillion health care budget (CDC 2005)

Interestingly, it is thought that changes in each of the following life-style issues have the potential to reverse the above mentioned diseases:

1. *Attitude*—changes which focus on self-discipline and improvement.
2. *Diet*—adoption of a low glycemic, more Mediterranean approach.
3. *Exercise*—addition of appropriate exercise, e.g. walking.
4. *Supplements*—inclusion of specific natural substances difficult to obtain in ordinary diet, specific substances that will cause protection or reversal of the disease process, and age related substances necessary in aging/longevity.

However, as judged by the facts (NCHS 2005) that in 2002 859,619 people died of cardiovascular disease and stroke, and another 557.271 died from cancer, young adults are contracting diabetes at an alarming rate clearly due to dietary excess, and very few even know that osteoporosis is a significant problem, we, as a society need to figure this problem out while we still have time and resources. For example, in 2004 $800 billion (out of $1,300 billion total health care expense) was spent in attempting to undo the occurrence of heart disease; unfortunately this expense only benefited half of those with the disease—the other 50% died either immediately, or on the way to the hospital. Unfortunately, prevention remains difficult, and is rarely a goal in the 50% of the population who will face cardiovascular disease. Perhaps, in the moment of daily decisions, it is easy to ignore making better decisions, especially when the disease proceeds totally asymptomatically for perhaps as long as twenty years.

Yet, there are some reasons for hope. Paul Zane Pilzer (2003) has written prophetically about a developing trillion dollar wellness revolution. That is, people concerned about their health are spending new money in a quest for health and wellness. Perhaps, these people are unwilling to accept the same outcome experienced by the majority of society. It is unclear if there is any central focus to this movement. There are many new players and market forces: There is a booming supplement industry, there are many alternative health care practitioners, and many new organizations (Life Extension Foundation (LEF 2005), Academy for Anti-Aging Medicine (A4M 2005), Oasis Life Sciences (Oasis 2005) are several excellent examples) which collect, manufacture, distribute, and disseminate information, products and/or solutions about health, wellness, and anti-aging issues. Newsletters present alternative views on approaches to health attainment (Mercola 2005, Null 2005).

2. The Responsibility of Information Systems Education

Information Systems is a systems based discipline. Certainly, both IS'97 and IS2000 curriculum models for undergraduate programs of Information Systems focus on the responsibility to train new professionals in the strategies for development and deployment of these systems (Davis et al, 2002).

McNurlin and Sprague (1998) set the stage for our conceptual framework offered herein: the mission of information systems is to help people attain their goals through the application of information technology, wherein there is an increase in organizational productivity, yet the focus is on the people. In general it is assumed that people within an organization will align their focus on the mission of the organization. Therefore, in an empowered organization providing support to individuals to achieve their goals will optimize overall organizational productivity.

For Americans, the founding fathers summarized a great collection of desired achievements expressed in the simple guiding sentiments: "Life, Liberty, and the Pursuit of Happiness". Clearly the implication of "life" would imply seeking the best possible outcomes. It is probably not an overstatement that most people would desire to live longer or better or both. Clearly the fuel driving Pilzer's wellness revolution including the growth of a new trillion dollar industry underscores the certainty of this conviction. As a society, we would like to live longer and better! As individuals, we have a right and responsibility to pursue these goals.

3. Directions for IS Professionals

We would like to suggest that as Information Systems Professionals we take up the mission to provide a mechanism to help indi-

viduals achieve enhanced longevity through the application of information technology.

We propose that a single process may not achieve the desired result. Rather, we propose to investigate the use of the Capability Maturity Model Integrated (CMMI) approach as a solution (Carnegie Mellon; CMMI Product Team). The systems that we propose should enable individuals to attempt to take responsibility for their own outcomes. Yet, the best of medical knowledge, nutraceutical approaches, anti-aging strategies, private and public resources should be integrated giving people credible alternative strategies to enable their success. We propose to assemble a team of willing participants to take part in a reengineering effort designed to facilitate a family of strategies for success. The reengineering product would be cast in the following quality model:

Level	Description
Chaos	This is the level at which we are currently operating
Managed	Mechanisms for providing education, setting goals, measuring simple biometrics, and tracking progress are defined within the parameters of attitude, diet, exercise, and supplements. Also, key signs for medical intervention are identified.
Defined	Well characterized processes are identified and are very well defined; there may be several complete sets of processes to enable creative alternatives that may be more acceptable to individuals.
Quantified.	Metrics are defined to measure the effectiveness of the alternatives. Individually defined measures are utilized to ensure the effectiveness of individual actions and mechanisms
Optimizing	Study is made of the results of the metrics. Alternative mechanisms may be improved or discarded. New processes may be developed to insure individuals' success.

4. Proposal for Action

We propose to assemble a voluntary task force to study and explore the idea of developing and implementing an information system to addresses the issues of healthcare and longevity described above.

We will invite interested Information Systems faculty, medical professionals, alternative medicine experts, education delivery specialists, and others who have an interest in the objectives of this group. This task force will have as its ultimate goal to develop a simple, comprehensive, inexpensive, accessible information system that will:

1. Provide individuals with education and information concerning the factors that affect health and longevity.
2. Provide individuals with a mechanism to monitor these factors.
3. Provide direction and prescription for prevention, attention, and rehabilitation allowing the individual to sustain, maintain, or achieve longevity.
4. Network with international, national, state, and local health care and related organizations for feedback, education, and assistance.

We will utilize standard reengineering techniques to guide the behaviors of this task force. To focus the task force, we will utilize a combination of Delphi and SWOT techniques to sharpen our focus and establish our goals.

5. Impact on Information System Education

Projects in information systems development courses provide a forum for students to apply techniques, technologies, methodologies, and problem solving skills. Thus projects are certainly relevant and probably indispensable to students success as an IS professional. Cases provided in textbooks and literature lack the ingredient of real-world applications. The proposal in this paper has the potential to provide students and faculties in the IS discipline important comprehensive and relevant projects for the foreseeable future.

6. Summary

The evidence that we are facing a potential healthcare crisis abounds. The authors pro-

pose a possible solution as well as an approach to implementing this solution. The approach proposed in this paper is daunting and so comprehensive that we solicit participation to all IS professionals. We ask that you volunteer to be part of the task force, or you may suggest the names of others you feel should be involved.

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