

Product Services Systems and Value Creation. Proceedings of the 6th CIRP Conference on Industrial Product-Service Systems

**Personal Wellness: Complex and Elusive Product and Distributed Self-Services**  
Farzaneh Salamati, Zbigniew J. Pasek\*

*University of Windsor, 401 Sunset Ave, Windsor, N9B 3P4, Canada*

\* Corresponding author. Tel.: +01-519-253-3000 EXT. 4738; E-mail address: [zjpasek@uwindsor.ca](mailto:zjpasek@uwindsor.ca)

---

**Abstract**

In many countries across the world a universal issue of growing concern is increasing demand for health services and corresponding escalating costs. While there are many reasons for these two trends, reasonable solutions are nowhere in sight and a subject of heated debates. One potential source of relief for the health care systems is to shift some (if not majority – but in long term) of responsibilities to patients themselves. To do so effectively, however, better definition of personal well-being is needed, supported by medical knowledge transfer to the consumer and creation of some personal health management tools. Service engineering concepts, such as service package, are useful in decoupling all elements needed to develop an infrastructure in support of wellness as a core product and addressed by variety of limited-focus services.

This paper reviews the emerging health care paradigms, in particular health care networks, consumer-personalized medicine and quantified self-tracking. With the Quantified Self movement on the rise for the past several years and a corresponding growth in offering of tools for variety of personal data collection (both hardware- and software-based), the obvious question arises how effective they are and what impact they actually have. The discussion also addresses the question whether it is possible to reframe the personal health issues by applying both design thinking and service engineering approaches aimed at individual's own well-being.

© 2014 Elsevier B.V. This is an open access article under the CC BY-NC-ND license

(<http://creativecommons.org/licenses/by-nc-nd/3.0/>).

Selection and peer-review under responsibility of the International Scientific Committee of “The 6th CIRP Conference on Industrial Product-Service Systems” in the person of the Conference Chair Professor Hoda ElMaraghy”

*Keywords:* Consumer-personalized medicine; Quantified self-tracking; Health social networks

---

**1. Introduction**

There is overwhelming rise in demand for improved healthcare services and facilities globally especially in developed nations in recent years [1]. It imposes enormous pressure on current government and insurance policies regarding healthcare in coping up with this surge in financial terms. Along with hike in cost other challenges like decentralized, uncoordinated competencies, low competition intensity, monolithic structures with low division of labor and inadequate quality management are plaguing this sector [2]. The present health care structure has in-built cost centers, which should be restructured by incorporating service engineering concepts and design thinking to reduce the avoidable burden. Thus there is need for paradigm shift in outlook towards envisaging healthcare as a service where patients collaborate with healthcare professionals in laying the foundation stone of healthy society. It can materialize by

utilizing technological advancement and making patients knowledgeable enough to share their part of healthcare responsibilities [3].

By integrating divergent disciplines like pharmacy, biotechnology, nanotechnology, IT, electronics, and service engineering; new tools and models can be developed which will enable healthcare services to be customized and packaged as per demand. Penetration of internet into every personal gadget provides opportunities to monitor and track biometric parameters which can be used to determine the health index at individual, regional or national level. Personalized, participatory, predictive and preventive approaches to tackle diseases can be formulated by analyzing human genome at personal level [4]. Online interaction among patients and physicians via healthcare networks can help in knowledge sharing and decision making regarding treatment beyond space and time constraints. These emerging trends can act as a

beacon for directing future research, government and insurance regulations and policies [5].

Different patient and technology driven healthcare models can be developed, based on enormous self-collected digital information and stored online by the patients and ongoing researches. The effectiveness and efficiency of these models can be verified by estimating the reduction in cost and increase in awareness and health of patients. But its implementation will have to overcome challenges related to privacy, security, regulations and capability to cope up with new emerging issues [6]. In this paper, main focus will be on the effectiveness of these models in restructuring the personal healthcare services by incorporating service engineering concepts for smooth transition of personal wellbeing responsibility on patients. Obesity is emerging as most prominent health issue responsible for over 60% deaths in developed nations. Obesity Predictive Model is personal health management tool which needs self-collected data to predict personal well-being status [1].

## 2. Paradigm shift in health care sector towards self-service

In 2013, U.S. expenditure on healthcare surpassed \$ 2.8 trillion; raised serious issues demanding transformation in current health care structure [7]. Several social, structural and behavioral reforms focused on shifting some of the responsibilities towards consumer have already begun. Health Care Kiosks installed at hospitals assist patients in self-check-in, information retrieval, scheduling appointments, way finding, self-checkout at reduced waiting time, lower paper and labor costs, less information entering errors with enhanced patient satisfaction and accuracy [7]. According to survey conducted by Accenture [8], “90% patients want to self-manage their healthcare leveraging technologies such as accessing medical information, refilling prescriptions and booking appointments online”.

Service engineering concepts and design thinking can be applied for health care restructuring targeted at patient’s wellness. Individual units and operations should be detected and decoupled based on their potential to enhance self-service. As health care sector is a complex system, its holistic behavior cannot be determined by having knowledge of individual components’ behavior located at various levels. These components are heterogeneous, mutually dependent and inter-related non-linearly with feedback loops across different levels [9].

Self-service oriented healthcare restructuring requires multilevel, adaptive, continuously evolving and dynamically changing modeling of complex system. Decision making should be decentralized at multi-levels i.e. at individual, physician, institutional, government and insurance policy makers’ level [10,11]. As conventional, centralized, top-down approaches doesn’t work in complex decision making. Agent based Computational Modeling, System Dynamics Approach, Dynamic Micro-Simulation and Markov Model are the prominent modeling techniques being implemented in this sector [9]. System Dynamic Approach for modeling complex

obesity problem has been most widely implemented targeting self-monitoring and tracking [1].

## 3. New patient-driven and technology-enabled models

Advancement of technology and increasing health related awareness of patients are boosting the development of new personal wellness models. Implementation of these models requires self-gathered data using personal gadgets and know-how to interpret the results [3]. The three main currently emerging approaches are discussed below:

- Health Social Networks
- Consumer Personalized Medicine
- Quantified Self-tracking

### 3.1 Health social networks

Social networks have emerged more than just platform for sharing personal beliefs and ideas into more structured knowledge sharing, research and business clusters which have the potential of recognizing trends and patterns and guide decision making. In healthcare sector various networking platforms like PatientsLikeMe, CureTogether, DailyStrength, MedHelp, HealthChapter, MDJunction and OrgannizedWisdom have emerged recently which provide services at four different levels i.e. emotional support and information sharing, physician question and answer, quantified self-tracking and clinical trial access [3]. Patients interact with other patients with similar conditions as well as with physicians and exchange knowledge to become more aware of their situation. They upload their biometric data collected through self-monitoring on various available tools on these websites to evaluate their health status and consult appropriate remedy as well. This online counseling eradicates space and time barriers [5]. It also transcends translational medicine by bridging patients and researchers and enabling real time feed-back for analyzing research needed and research conducted. It provides a common platform for interaction among patients, physicians, employers, regulators, policy-makers and insurance agencies to gain insight into health status and confronting challenges from individual level to community as a whole [12, 3].

### 3.2 Personalized medicine

Personalized medicine is an emerging multi-disciplinary therapeutic approach based on personal and genetic variation whose market is estimated to grow up to \$452 billion by 2015 [13]. This dream is becoming a reality due to development of high throughput genetic technologies that enabled human gene sequencing, detection and manipulation possible at affordable price [14,15,16]. With the completion of Personal Genome Project, new arena of genetic based predictive and preventive targeted drug formulation therapies have opened up [17,15]. Direct-to-consumer physician mediated genetic

Download English Version:

<https://daneshyari.com/en/article/1700734>

Download Persian Version:

<https://daneshyari.com/article/1700734>

[Daneshyari.com](https://daneshyari.com)