

# Wellness 2.0 — Sharing Personal Health Experiences

**Jochen Meyer**  
OFFIS – Institute for  
Information Technology  
Oldenburg, Germany  
meyer@offis.de

**Benjamin Poppinga**  
OFFIS – Institute for  
Information Technology  
Oldenburg, Germany  
poppinga@offis.de

**Susanne Boll**  
University of Oldenburg  
Oldenburg, Germany  
susanne.boll@uni-  
oldenburg.de

## ABSTRACT

Wellness is more than just a spa where we go twice a week to relax and enjoy nice treatments. In future, we will more and more take care of our well-being in all activities of our daily life, wherever we go, whatever we do. We can observe a recent shift from monitoring patients with a concrete disease to the mobile monitoring of our daily lives' activities, contributing to our motivation to eat well, do sports, staying healthy. One of the next really big steps will be to actually reveal and communicate these "personal health experiences", as we call it, with others. The idea of the social web will be applied to share our health experiences to foster unseen services and applications. The wisdom of the crowd will be an enormous asset to share and benefit from the personal health experiences of others.

## Author Keywords

mobile health monitoring, sharing of personal health data

## ACM Classification Keywords

H.1.2 Information Systems: Models and Principles—*User / Machine Systems*

## INTRODUCTION

Wellness is strongly related to our personal health: according to the World Health Organization's (WHO) definition of health "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." [1]. Consequently, health care must take a holistic view on an individual person, including the person's physical status ("medical health"), feelings ("happyness") and social interaction ("communication").

## THE EVOLUTION OF HEALTH MONITORING

Tremendous advances in micro system technology in the past few year have provided a wealth of body-worn sensors that potentially allow a detailed long-term monitoring of the personal health status and the individual activities. Such sensors range from heart rate monitoring belts, step sensors, GPS receivers to mobile ECGs and skin resistance sensors.

These technological advances go along with an evolution of (mobile) monitoring applications. From research and industry it is obvious that personal health state and activity monitoring will be one of the next waves.

While early monitoring applications concentrated merely on the *acquisition* of health data, today's applications allow a storage and evaluation of the personal health data. In health care a 24h ECG is a common example, while there also exist more complex approaches that monitor a variety of sensors, allowing direct on line interaction between patient and medical supervisor [4]. For sports applications the adidas miCoach<sup>1</sup> is a nice example: The system allows for the creation of individualized training plans for runners, based on the personal state (weight, fitness level) and intention (become fit, burn fat, train for a marathon etc) that are stored on a mobile device. During the workout, the current heart rate and running pace are measured with a chest belt and a step sensor accordingly, while the system provides feedback like "now increase speed until your heart rate is within the energy zone".

## FROM MONITORING TO SHARING

An upcoming trend of those mobile monitoring applications is the *sharing* of personal data. As opposed to the traditional online health communities approach which focus on exchange of information and *knowledge* in blogs, fora etc, this new sharing model is based on the exchange of *data* that has been acquired by sensors. The probably most popular is the Nike+<sup>2</sup> system. Based on a step sensor, the system acquires the running speed and distance during a work-out. The acquired data is then uploaded to a central database, where the personal data can be viewed and evaluated. The most prominent feature is that parts of the data can also be shared with friends and with the community. Based on this, competitions among friends ("I ran faster than you today") and among communities ("men vs. women - who is running more?") are made possible. Moreover, running routes may be created on Google Maps and shared on the portal, thus allowing to exchange experiences and suggestions. Although most of these applications so far focus on sports and training, there are also approaches to adopt the principle to prevention and rehabilitation, e.g. to motivate obese adolescent to physical activities [2]. We believe that the sharing of health data has a very high potential that is merely scratched by today's applications. We suggest to further develop this

<sup>1</sup><http://www.micoach.com/>

<sup>2</sup><http://www.nikeplus.com/>

idea of sharing health related data, coming to the idea of a "Personal Health Experience".

### PERSONAL HEALTH EXPERIENCES

A typical example when talking about a personal health status is something like: "An asthmatic walking through Chicago might experience difficulties to breathe, whereas the same person walking through rural DeMotte might feel better. On the other hand, if he suffered from birch pollen allergy, he might feel sick in DeMotte during spring time." In this simple example, we find three relevant aspects of personal health: behaviour (walking, staying), context (Chicago, DeMotte) and disease (asthma, birch pollen allergy).

We introduce the term *Personal Health Experience* to describe the combination of three aspects of healthy living: **Behaviour, Context, Disease**. This definition can be used to describe what contributes to a person's view on its health situation, from a Wellness Informatics point of view. *Behaviour* are the person's physical activities, but it also includes other aspects such as food intake, drug consumption, the mental behaviour etc. Whereas for physical activities there are quite good sensor-based monitor solutions available, the food intake monitoring is still pretty much a matter of ongoing research [3]. *Context* describes the status of the person's surroundings. This includes the user's geographic position, the temperature, light, loudness volume, but also less obvious aspects such as air quality or concentration of allergens. *Disease* is the health state of the person, e.g. given chronic or acute sicknesses or the fact that the person is totally healthy. It also includes the general health status that can be monitored, e.g. weight, blood pressure or heart rate. In a broader sense, disease also contains the *potential* sicknesses that are given by family histories.

### SHARING PERSONAL HEALTH EXPERIENCES

Monitoring the health status is undoubtedly of high value for various target groups. Patients suffering from cardiovascular diseases benefit from a continuous observation of their heart activity; healthy persons are encouraged to keep a good lifestyle and stick to personal fitness routines etc. Personal Health Experiences now provide a point of view that eases the identification of particular information needs of the persons by using the three dimensions behaviour, context and disease for clustering. A meteo-sensitive (disease) person is interested in the weather conditions (context) of the location that he will go to in the next days; a healthy person wants to know how certain fitness activities (behaviour) may have a positive influence on the cardio-vascular system (disease) etc.

Such information can be provided by the community, containing both raw data and personal experiences. However, one of the major challenges of sharing is to identify which individuals could specifically profit from this approach. Personal Health Experiences can again provide a helpful point of view: People might suffer from the same disease, share a common context or show the same behaviour. Now, the greater the similarities of the personal health experience, the higher is their potential interest to share their health data.

The great success of micro blogging and Web2.0 social communities such as Twitter or Facebook shows that the "low-effort sharing" of tidbits of information is highly attractive to people. Therefore we believe that sharing personal health experiences on a suitable Web2.0 wellness community should be attractive to people as well. From the trans-theoretical model of health behaviour [5] point of view, sharing might thus support the ongoing maintenance of a disease – like in the example about the meteo-sensitive person – as well as the contemplation of an individual, creating awareness for specific diseases and their consequences – the example of the healthy person interested in fitness activities.

### OUTLOOK

Today, sharing personal health information is only starting to show its potential. It may unveil new applications and shape the way people are dealing with health data, much like Web 2.0 has shaped the way people are communicating. Our notion of a *Personal Health Experience* aims to address some of the important aspects needed for such health information sharing. Based on the sharing of personal health experiences, new types of applications are possible, including context based access to external health data, e.g. medical databases, or totally new types of epidemiological analyses based on data input directly from the user. On the other hand, a lot of the currently discussed applications toward mobile and ubiquitous computing or ambient assisted living are also developing in a direction that, from an information and communication centered view, go along the same line of thinking.

The monitoring and sharing of personal health experiences in our view paves an important way for the future development of informatics in personal health and wellness.

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