Technologies for Wellbeing and Healthy Living: Perspectives and Challenges

Jochen Meyer, OFFIS Institute for Information Technology, Oldenburg, Germany

ABSTRACT

It is a strange paradox that the public is talking about health technology but cares more about disease technology: people address chronic diseases, people want to change unhealthy behaviors, people aim to help carers and nurses - but people hardly ever look at those who are and want to remain healthy. This is even stranger, as times of health outnumber periods of disease in most persons' lifetimes. Somewhat surprisingly, technology available today is not yet optimally suited to help staying healthy. The authors discuss challenges with respect to the adaption of health behavior models, long-term interaction, quality of data, design of devices, primary use of data, and life-long data. And the authors suggest understanding technical systems for wellbeing as navigational systems, guiding a person through life on a healthy path.

Keywords: Data Analysis, Design, Human-Computer Interaction, Lifelong Health, Pervasive Health, Wellbeing

INTRODUCTION

The last years and decades have seen massive changes in the way we understand, live and pay for health. The public health systems, also in high-income countries, are under constant financial pressure and in the need for restructuring and change (WHO Health Systems in Transition, 2013). Since the initial release of the Ottawa Charta (WHO, 1986), it is more and more understood now that everybody is required to take over much more responsibility for one’s own health. The gap in the population’s health state has continued to grow wider. More and more people live unhealthy, leading to a massive increase in behavior-related, non-communicable diseases such as cardiovascular diseases, cancers, diabetes and chronic lung diseases (WHO Global status report on non-communicable diseases, 2010). On the other hand, we also see a massive boom in the fitness movement with people focusing on sports and fitness, going to gyms, jogging, cycling, or regularly performing other sports activities. It is now more and more appreciated that prevention of diseases is a necessity both from a personal and a societal point of view, and that it pays off in terms of money and in quality of life (WHO Gaining Health, 2006).

DOI: 10.4018/ijhcr.2014010103
New technologies have moved to the mass market, enabling personal monitoring of health parameters in a quality that was previously available in a doctor’s office or hospital only. Products for monitoring e.g. blood pressure, blood sugar, physical activity, heart rate or sleep are now available which are affordable to the average person in developed countries and which are easy to use. Devices such as GPS-enabled heart rate watches or pedometers offer support on fitness and activity to the healthy average person.

One might think that these new technologies are perfect tools to promote wellbeing and help the individual to live and stay healthy throughout his entire life. Somewhat surprisingly, this is not fully true. Today’s eHealth-systems focus much more on diseases than on health. They aim to correct or manage a status of poor health or a chronic disease such as diabetes or asthma or try to induce a change in an unhealthy behavior or risk factor such as lack of activity or obesity. Wellbeing and healthy living in contrast requires promoting and maintaining a good health in everyday life. Fitness, as supported by various systems, clearly is one relevant aspect but there are many more that need to be taken into account.

While we don’t want to introduce a precise definition, we will use the term “wellbeing” to describe a personal state and lifestyle that supports a positive health now and in the future. This is fairly close to the original WHO definition of health as “a state of total physical, mental and social well-being” (WHO Preamble to the Constitution, 1946) although with its coverage of social aspects the latter is even broader. Wellbeing as we understand it is different from wellness which is frequently understood as relaxation and cosmetic and esthetic treatment in a spa. Wellbeing particularly also includes primary prevention of behavior related diseases.

Healthy living is more complex than just not being sick or just being fit. We will subsequently outline why today’s technology is not yet optimally suited for wellbeing, prevention and life-long support of healthy living. After briefly presenting the current state of personal health technology from a wellbeing point of view, we will outline six challenges to the design of systems for wellbeing. Summarizing these challenges, we will suggest a different view on wellbeing systems. We are going to end with a short conclusion.

**PERSONAL HEALTH TECHNOLOGY TODAY**

From the advent of personal computers and later the internet, ICT-based systems have been used to assist healthy living. (Chatterjee & Price, 2009) describe four generations of such technologies: The first generation are “prescriptive” systems in the late 1960s that mainly support the one-on-one persuasion between a health care provider and the patient. Second generation: “descriptive” systems, starting in the mid 1980s, are web based systems aiming to provide information and content to the patient. The third and current generation are “environmental” systems from around year 2000 which integrate sensing and information exchange to infer a user’s present state and impact change. The authors envision a fourth generation of “automated” systems in which human intervention is minimal and which are able to provide recommendations to the user in a fully automated and highly personalized way.

Particularly the possibility to sense a user’s behavior and health outcomes using mobile or ambient sensors – Chatterjee’s “third generation” systems –, has given a boost to personal assistive health applications. Previous systems put a direct and actionable link between monitored data on the one hand and envisaged behavior or outcome on the other. Physical activity as a frequent example is measured using pedometers to count the number of steps, and the envisaged behavior is to achieve a minimum number of steps each day. Fish’n Steps (Lin, Mamykina, Lindtner, Delajox & Strub, 2006) or Chick Clique (Toscos & Faber, 2006) are examples which combine a playful interface with elements of competition. The UbiFitGarden system (Consolvo, Klasnja, McDonald, Avrahami, Froehlich et al., 2008) has shown to induce an envisaged health behavior even over
Customer Journey Maps for Demographic Online Customer Profiles
www.igi-global.com/chapter/customer-journey-maps-for-demographic-online-customer-profiles/183336?camid=4v1a

Distributed Video Coding for Video Communication on Mobile Devices and Sensors
www.igi-global.com/chapter/distributed-video-coding-video-communication/41643?camid=4v1a