Wellness Informatics: Towards a Definition and Grand Challenges

Abstract
The last decade has seen a large explosion of health-related human centered computing research and practice focused on wellness (e.g., good nutrition and exercise promotion) with the intention of helping people avoid needing medical care. And while Health Informatics may appear to be the obvious home for these activities, it is a discipline that has focused on the design, development, and evaluation of systems to process healthcare data and through that aid in patient treatment. Given the ubiquity of wellness systems we think its time to create a Wellness Informatics community. The goal of the workshop is to identify the themes and grand challenges for designing and evaluating Information and Communications Technologies (ICTs) that help people stay well.

Keywords
Wellness Informatics, Health Informatics

ACM Classification Keywords
H5.m. Information interfaces and presentation: Miscellaneous.

General Terms
Design, Human Factors
**Introduction: Why Wellness Informatics?**

Health Informatics has seen substantial growth in the last two decades, leading to distinct sub-disciplines. For example, Bioinformatics focuses on computational innovations in molecular biology, such as the mapping and analysis of DNA and protein sequences. By contrast, Biomedical Informatics is described as "the discipline of dealing with the systematic processing of data, information and knowledge in medical and health care" [3] and as a result spans healthcare and everyday environments (e.g., the office, home and gym). Electronic Health Records (EHRs) are one key focus area in this field, posited not just as supporting the collection of data from multiple sources (e.g., doctor, hospital departments) about a single patient, but supporting the aggregation and analysis of information about multiple people (e.g., for clinical trials) [10].

Despite this plurality of specializations, some common themes exist within health informatics:

1. Patients are viewed as a source of data input into ICTs: whether it is tracking patients, or combining health and financial data to understand healthcare costs, or in public health informatics, using patient data to track and monitor disease spread trends—patients frequently appear as systems inputs.

2. The healthcare establishment is the primary user of information: healthcare professionals (e.g., nurses, doctors, clinicians, hospital managers, public health officials) are often the targets of system design.

3. The population is often the appropriate level of data granularity: disease tracking is emblematic of this focus, but it appears as a foci in systems which classify data by disease for diagnosis and treatment purposes, and in systems for clinical trials.

Of course exceptions exist. The field of Consumer Health Informatics (CHI) advocates a patient-centered approach to some health ICTs [1]. But a substantial focus area within CHI is to reverse themes 1&2, making the healthcare establishment the provider of data that can be used by patients [4]. This same reversal can be seen in Translational Informatics, through the translation of laboratory results to end-users, often through local centers. Behavioral Informatics is another sub-discipline that also prioritizes the patient, but has tended to focus on individually oriented health behavior outcomes. Those outcomes are important to Wellness Informatics, but we see other interactions and outcomes as also being part of system evaluation [9].

While these research foci are essential for continuing to innovative in the health ICT space, we propose a complement: Wellness Informatics. Wellness Informatics focuses on helping people stay well, and potentially involves very little if any direct interaction with the health and medical establishment. It contrasts with health informatics because it is both human-centered and wellness-focused. For example, it has tended to prioritize individuals as both sources and users of data (e.g., collecting data to support personal reflection [8,11]), and highlighted other collaborations beyond the patient and the healthcare establishment (e.g., people competing in physical exercise [5] or sharing their own health knowledge [2]). Undercutting all of these examples is the centrality of individuals and groups as the level of data analysis.
Purpose of the Workshop
The primary goal of this workshop is to bring the human-centered health ICTs research community together to identify common themes and grand challenges in Wellness Informatics.

We propose five common themes/challenges for discussion, and invite contributions from a variety of disciplines and perspectives that can contribute empirical and systems experiences. We are open to other themes/challenges for discussion.

1. Numerous sources of data input into ICTs: The process of maintaining health focuses on the individual, who in turn relies on a vast array of data in the process. Applications may collect data from the patient (e.g., the number of steps taken), and the medical/health communities (e.g., the amount of exercise appropriate for a particular person, at what intensity). They also frequently collect other, behavioral, measures of health outcomes such as how long an individual stays engaged with an activity (e.g., does exercise continue beyond the first few weeks). Other sources of data come from the socio-economic and cultural nature of wellness. A challenge for Wellness Informatics is to understand and integrate these sources into solutions.

2. The end-user is the primary user of the information, consuming as well as producing data. This presents a challenge, since the information is processed in context. For example, socio-economic status and culture affect wellness technologies. A nutrition system needs to account for (1) how easy it is to find inexpensive and healthy food in a particular area and (2) whether the food recommendations make sense, that is, the extent to which they fit the food preparation and consumption practices of the person being advised [2,6]. It is not enough to pull information from multiple sources, rather it has to be presented in a way that is meaningful to the end-user.

3. The individual, group, and community are all emphasized as the appropriate levels of data granularity: Wellness is personal. And yet, it is also clear that a person relies on a network of family and friends, and so systems are also collaborative. This collaboration can take place both remotely (e.g. via online communities) and locally [5,7]. Wellness Informatics systems then face the many challenges associated with CSCW technologies.

4. The healthcare establishment may or may not be directly involved: Wellness decisions can be triggered by the healthcare establishment (e.g., a doctor’s visit), but it does not have to be so. Healthcare resources (e.g., websites) may be the only interaction. The challenge for wellness informatics is to understand these networks that may be involved in staying healthy, and the quality of the information exchanged through them.

5. Temporality of systems engagement: Ideally, wellness activities are sustained over time. It is not just a matter of adopting a new practice, but also sustaining it. Overtime this may change, as a novice runner becomes an expert, and as physical and environmental changes may require adaption of practice. The long-term trajectory of Wellness
Informatics systems is potentially a substantial portion of a human lifetime.

**Topics of Interest**
We invite contributions from a variety of areas and with a range of perspectives about the distinctive contributions of Wellness Informatics including (but not limited to) empirical field studies of wellness behaviors of individuals and groups, studies of virtual wellness communities and systems development and evaluation experiences as they relate to the challenges. We also invite participants from closely related fields including behavioral informatics, consumer health informatics and translational informatics as part of discussing and elaborating the themes and grand challenges for Wellness Informatics.

**References**