

THE HEALTH PERSPECTIVE IN USING DIGITAL MEDIA FOR HEALTH AND WELLNESS

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ABSTRACT

While most health systems serve the majority of their citizens well, each has its challenges and gaps that lead to inadvertent marginalization of certain populations. The engagement of traditional stakeholders in health – policy makers, patients, health professionals, health administrators – to address these issues are necessary but insufficient if unconventional solutions are to be discovered. Use of modern technologies to enable innovative approaches will require meaningful engagement of professional disciplines with technological expertise such as engineering, computer science, and health information science. Their involvement contributes unique and important perspectives in order to generate novel solutions to address health service quality, access, cost effectiveness, and innovation. This paper discusses the principles behind ideal collaboration between health professionals, engineers, computer scientists, and health informaticians to co-create health solutions, and cite literature based examples and case studies in British Columbia, Canada to illustrate the opportunities and challenges inherent in animating this collaboration between health professionals and technology experts. This paper will conclude with recommendations to stimulate and nurture interprofessional synergy towards success.

Index Terms— Health and Wellness, Digital Media

1. INTRODUCTION

In support of global human development, and the right for access of quality health care, modern information and communication technologies (ICT) hold great promise to improve both global and local access and quality of health care delivery. [1] Achieving equitable health for all depends on our ability to identify effective ways to improve health care access and quality. [2] Using digital media – such as smart phones, computers and mobile digital devices for health – represents the integration of health and information technology to create strategic value to improve access, quality and cost effectiveness for nations and their citizens. [2] This approach innovatively facilitates collaboration amongst health professionals and technology experts towards creating patient-centred care pathways, effective healthcare services and self-management tools, thereby

animating technology enabled knowledge translation for effective health and wellness. [3]

In order that we introduce innovations into the health and wellness of individuals and health systems in an applied fashion that matches the need of end-users, engineers, computer scientists, health informaticians, health professionals, and health researchers need to work together and bring their respective expertise to the table. This synergy of disciplines towards successful co-creation of useful digital media will require not only willingness and time, but also joint commitment to advance together in sequential stages to build mutual understanding towards meaningful collaboration. This paper discusses a framework towards building sustainable and productive synergy amongst these professions.

2. MODEL OF GROUP DEVELOPMENT

In 1965, Tuckman articulated a conceptual framework for the visualization of stages of group development to guide the advancement of groups towards sound productivity. [4] This paper will apply this framework with its four stages: forming, storming, norming, performing – as it applies to different disciplines working together in digital media for health and wellness.

Forming: Mutual Knowledge Exchange

Health professionals and health researchers have a deep understanding of the health system – its many opportunities to serve the population and its challenges. While some of these challenges can be addressed within the healthcare system, many other gaps require unconventional and innovative solutions. For example, improving access of healthcare to rural and remote locations, or assisting patients to understand their own physiologies to optimize their wellness and self-management of chronic diseases had their limitations, but the use of digital media to deliver health services remotely (telehealth) [1, 2] and use of sensors to quantify individuals' physiologic states dynamically [5] are innovative technological solutions that have only been popularized over the last decade. These are tools that cannot be invented by health professionals and health researchers by themselves, but need the involvement of technology experts

such as engineers, computer scientists, and health informaticians. Meanwhile, technology experts have the know-how in technology oriented construction of solutions, but would benefit greatly from health professionals and health researchers to pinpoint the clear needs in the patients and the health system in order to invent necessary technological solutions. Otherwise, these inventions risk missing the mark in addressing the key issues, remaining esoteric, and get left on the shelf without being adopted for use. Therefore, establishing a common ground between experts in health and technology so as to gain a mutual understanding of each others' perspectives and expertise would be a great foundational start. Based on this knowledge exchange, important technological insights to address real world health problems will start to emerge.

Storming: Ideas for Invention

Through dialogues and deep sharing, experts from health and technology disciplines can start to spark ideas to generate innovative technological solutions towards addressing health and wellness issues. Recent growth of social and academic movements like hacking health are good examples. [6] These events bring together health professionals, technology experts, hackers and designers together to discover health problems and rapidly construct ideas and solutions towards addressing them. Other less formal yet important ways for this storming phase to occur include the embedment of engineers or computer scientists in hospital environments or research teams, thereby getting deep understanding of health issues and offering technological insights to solve them. There are now increasing opportunities for health professionals or researchers to participate in technology expert groups, such as biomedical engineering programs. Yet another approach is to attract these different disciplines to learn together such as the Singularity University model in "solving humanity's grand challenges". [7]

Norming: Testing and Adoption

Consolidation of ideas from the storming phase will be necessary to come up with testable innovative technology solutions. This is where technology experts work interdependently with health professionals and researchers: the former group needs to come up with the designs and the technologies, while the latter group create health research opportunities to do the real live testing. Opportunities are available now both through public sources (such as the European Vision 2020 Horizon Network or the Canadian eHealth Innovation Partnership Program), or through private investments to stimulate such collaboration. Leveraging these prospects can be very exciting and further fuel the growth and maturation of these interdisciplinary teams. Proving that technologies work and generating research quality evidence can further accelerate these innovative solutions to get to the health market.

Performing: Scaling Up and Spread

Taking an invention to become a widely used product so as to prove its sustainable performance has its own science. Often referred in health literature variably as "Knowledge translation" [8], "scaling up and spread" [9], or implementation science [10]. All these different models and framework starts with the generation of evidence, in our case through collaboration between different disciplines. The next step is the engagement of the wider stakeholders and end users, including but not limited to the public, patients, policy makers and health administrators in the arena of health system adoption. Also, in the case of digital media innovations, commercialization is also a vital step towards wide scale uptake and usage. Often capacity building so as to train health professionals and technology experts to work interdependently is also a part of wider health system readiness and introduction for change. While this seems to be the final stage, in fact the reality is that the teams need to continue to evolve through re-norming or even re-storming to continue its productive journey forward.

3. EXAMPLE IN B.C.: HOME MONITORING FOR PATIENTS WITH HEART FAILURE

A recent example to illustrate the power of interdisciplinary engagement is the innovative use of home health monitoring for heart failure patients in B.C. A collaboration between health professionals (emergency medicine, cardiology, family medicine, acute care and community nursing) technology experts (UBC engineering, TELUS, Sention) and health policy makers (Ministry of Health, Vancouver Coastal Health) led to the successful bid for a 4 year Canadian Institutes of Health Research grant to look at discharging patients with heart failure – a health condition when patients' lungs accumulate fluids to literally lead to drowning due to poor heart functioning – home for monitoring. While we will be starting off with the current generation of tethered sensors including scale, oxygen saturation, blood pressure and heart rate monitoring, we will be evolving over the four years to include future untethered, touchless sensors with predictive analytics. This project is in cooperation with another major grant funding that UBC Engineering has obtained on People & Planet Friendly home for smart home monitoring of its occupants. This health-technology collaboration will accelerate the linkage of home and hospital settings through sensing technologies to enable the seamless transition of individuals between the two environments with health monitoring to ensure safety. Our presentation will provide more details in terms of areas of collaboration on an individual, building, and infrastructure levels.

5. CONCLUSION

Digital media carries great promises in improving health and wellness of individuals. How they will be deployed to do so is limited only by imagination and collaboration between health professionals and technology experts, and

translating this vision into reality through methodical, stepwise, and sensible synergy.

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