Defining Design Opportunities of Healthcare in the Perspective of Digital Social Innovation

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Abstract. Digital Social Innovation is a relative new term, which describes new IT-enabled solutions that simultaneously meet a social need and enhance capacity to act. It includes the challenge of giving a clear identity to the digital essence that assist our way of knowing, and living. It is an emergent stream of social innovation research and a response to growing social, environmental and demographic challenges. There is great potential to exploit digital network effects both in social innovation activity and in new services and approaches that generate social value. By the development of the internet, especially the popular of social media, such as face book, twitter, Wechat, QQ and so on, the way of people interact is changed a lot. And this kind of platform is a new way of social innovation in healthcare field, but we still need to do more research on this field to make it more reasonable. In order to explore and define design opportunities related to healthcare field, an interdisciplinary course "Smart Healthcare" and workshops which combined the smart technology with social innovation were carried out. The sub-topic of the workshops related to the aged community, medical system. The paper addresses the result of the course and workshops by analyzing the case studies and defining design opportunities in the healthcare field. This could be a very preliminary step to understand how the social problems can be unbarred by digital social innovation approach.

Keywords: Digital social innovation · Healthcare · Service design · Social media

1 Introduction

Along with the rapidly developing of internet, the world we are living is changed remarkably. And the capacity of internet for generating societal and economic value is relatively well understood, and a number of innovative services are developed. Consequently, Digital Social Innovation (DSI) is an emerging field of study, with little existing knowledge on who the digital social innovators are, which organizations and activities support them and how they use digital tools to change the world to be better.

Digital social innovations (DSI) in this study refers to "a type of social and collaborative innovation in which innovators, users and communities collaborate using digital technologies to co-create knowledge and solutions for a wide range of social

needs and at a scale that was unimaginable before the rise of the Internet". This definition is derived from DSI interim report by Bria (2014) [1].

With the high diffusion in practice there has been a similar increase in ways of understanding social innovation enabled by collaborative digital technologies. However, definitions are certainly controversial and cannot capture the entire dimensions of the observed phenomena which are complicated and diverse. Social innovation is here considered in relation to the initiatives that are based on "meaningful discontinuities" in the way involved participants behave and interact collaboratively leveraging the power of collective intelligence through open digital technologies. This means that changes can be seen as a step towards social and environmental sustainability, for which the implementation and outcome would depend significantly on people's behavioral change and interactive effect. And where the "involved participants" are both the "user/co-producers" and all the other participants to the initiative, taking into account the transformation of the role of the consumer into active users as co-creators and their motivations to participate in the innovation process.

The paper describes the result of the course and workshops by analyzing the case studies and defining design opportunities in the healthcare field. This could be a very preliminary step to understand how the social problems can be unbarred by digital social innovation approach.

2 Smart Healthcare in the Context of Digital Social Innovation

Design challenges are inherently complex – and every client has their own particular knots to untie, especially in the complicated healthcare system. In recent years, service-oriented solutions are emerging as a response to the complicated aspects referring to environmental and social crisis, such as healthcare system. In order to improve the patient experience, create smooth dialogue between patient and doctors, ease the job burden of hospital staff, many new innovative methods were used. This collaborative mindset generates a mutually-shared sense of dedication to discovering solutions, and an optimism about making them work. This is exhilarating to experience, of course, but more importantly, it creates tangible results [2].

By the development of the internet, especially the popular of social media, such as Facebook, twitter, Wechat, QQ and so on, the way of people interact is changed a lot. It is so easy for people to share different kinds of information. Beside this, there are many special platform and smart phone APP for patients and doctors to communicate with each other. These kinds of networks provide a free patient platform where people can connect with each other to better understand their diseases, share condition and treatment information, and get support from peers to improve their health condition. It is also a research platform. As patients report on their disease experiences, they provide real-world insight into diseases and long term conditions. Those insights are shared with companies, government organizations and others who use them to continuously develop more effective products, pharmaceuticals, services and care. This kind of platform is a new way of social innovation in healthcare field, but we still need to do more research on this field to make it more reasonable. Moreover, aging

population, the stiff relationship between patients and doctors are typical national social problems in China, even in the world. We believe that some serve social problems can be eased down by design.

2.1 The Value of Social Media in Healthcare

The role of the Internet in communication and information management has been becoming increasingly important for the last few years not only in medicine and healthcare, but it has been changing how we do shopping, interact with friends or organize events. The use of the Internet to search for health-related information has even become a common practice worldwide. Almost everyone online is doing search queries, but actually 80 % of Internet users have looked specifically for information about health topics such as diagnosis or treatment [3].

However, before social media became popular, hospitals approached communicating and marketing traditionally through one-way messages, for example by the broadcast. And the patients and community were forced to accept the messages passively [4]. This approach wasn't natural. Health is personal, something in which each of us is individually invested. We patients were scared of our health statuses, unprepared for hospital experiences, and lost in the confusion of healthcare, grasping at the information healthcare marketers pushed at us. Traditional marketing doesn't fit in healthcare. Fortunately, social media has leveled the playing field. Social media often can help bring people together. This is evident in the use of social media by both patients and healthcare providers. People will talk about anything on Facebook - even their surgery or their doctor. Patients are also most likely to share information about their health through social media with doctors and hospitals more than other groups or people. Now patients can communicate about health at any time. They can share fears about diagnoses with distant friends and families. They can connect with people across the world who struggle with similar health conditions, finding support and companionship. They can question whether the doctor gave the right diagnosis or express displeasure with a recent emergency room visit.

With the introduction of social media within hospitals, new networks and channels are opened up for the hospital. Anyone who has permissions to post to the social media can push out messages through a downward channel; in turn, patients can begin a dialog with a physician, recruiter, or event planner and deliver upward communication. The network that begins with this simple form of communication allows patients and those outside of the organization to communicate the needs of the surrounding communities. The introduction of social networking and social media for a hospital or healthcare facility plays an integral role in strengthening the communication between the provider and consumer. Social media is an important issue for hospitals and organizational communication alike because is it expanding on the backbones of interpersonal communication and new technologies in the work place [5].

Several studies explored the impacts of social media on healthcare organizations, clinicians, and patients. These studies found that healthcare organizations, clinicians and patients can benefit from the use of social media. For healthcare organizations, social media can be used primarily for community engagement activities such as

fundraising, customer service and support, the provision of news and information, patient education, and advertising new services. These studies also found that the most widely used social media venues for physicians were online communities where physicians can read news articles, listen to experts, research new medical developments, network, and communicate with colleagues regarding patient issues. Patients can benefit from the use of social media through education, obtaining information, networking, performing research, receiving support, goal setting, and tracking personal progress. Future research should further examine other financial, technological, informational, ethical, legal, and privacy issues surrounding the use of social media in healthcare [6–8].

2.2   Review of Social Media and Digital Platform for Healthcare

Some of the most popular social media outlets include blogs for patients and personal blogs, healthcare-specific blogs (WebMD, New York Times' Well blog), social networking sites (Facebook, MySpace and LinkedIn), healthcare-specific websites (PatientsLikeMe and Organized Wisdom), social sharing websites such as YouTube, forums (Google Health Groups and Revolution Health Groups), and online networking groups. There are hundreds of websites to access social media but the main competitors include blogs, Facebook, LinkedIn, Twitter and YouTube. Each social site has a different look and feel and consumers go to each website looking for a different message. There are many concerns when beginning a new social media campaign for a hospital or social media websites, what information should be pushed out to audiences, and how to avoid violating patient privacy laws. The top social media websites chosen for hospital practice will include: blogs, Facebook, LinkedIn, Twitter and YouTube.

When people think of social media, they automatically think of Facebook. With over 600 million people logged into Facebook, hospitals can post timely videos, educate patients and reduce embarrassment around sensitive subject matters [6, 9]. With so many people already tuned into Facebook, many hospitals and healthcare organizations should strive to participate on Facebook. Hospital Facebook profile pages should be updated at least once a week to show that the organization is actively participating.

Twitter is a great resource to push out links and short messages to patients. Users can follow trusted colleagues, health organizations or journals to stay up to date with information without having to crowd an e-mail inbox. This form of social media has been used by hospitals and clinics to publicize health screening, fairs, and to acknowledge information from other health organizations.

YouTube is one social media where the user does not have to be a member to watch the videos posted. With over 48 h of video uploaded every minute, YouTube is a growing social media and getting the company's videos viewed by the proper patient involves selecting the correct keywords [10]. To add content to the hospitals official YouTube page start by repurposing videos that have already been made [11]. YouTube is the perfect outlet to place patient testimonials, education materials or recaps from past events.

PatientsLikeMe launched its first online community for amyotrophic lateral sclerosis patients in 2006. From there, the company began adding communities for other

life-changing conditions, including multiple scleroses, Parkinson's disease, fibromy-algia, HIV, and many others. By October 2009, the number of registered users had grown to more than 45,000. In April 2011, the company expanded its scope and opened its doors to any patient with any condition. By June 2011, PatientsLikeMe had hit a new milestone of 100,000 members. The primary service provided by PatientsLikeMe is a social network for people living with a long term health condition. Once they have created a profile, PatientsLikeMe allows members to input real-world data on their conditions, treatment history, side effects, hospitalizations, symptoms, disease-specific functional scores, weight, mood, quality of life and more on an ongoing basis. The result is a detailed longitudinal record – organized into charts and graphs – that allows patients to gain insight and identify patterns. Answers come in the form of shared longitudinal data from other patients with the same condition(s), thus allowing members to place their experiences in context and see what treatments have helped other patients like them [1].

In China, there are also many kinds of social media, such as RenRen,TencentQQ, Wechat and so on. And these social media are using for healthcare related communication. Besides that, there are also special App and digital platform for healthcare, such as good doctor online, Ding xiang yuan, Chunyu doctor and so on. For instance, Chunyu Doctor seeks to rebuild the relationship between patients and doctors, by improving the process of health inquiry online with recording tools for daily activities related to people's physical condition.

The role of social media and social networks in healthcare can be classified into five categories based on interactions: patient-patient, clinician-patient, public health-health consumer, researcher-patient, and corporate/hospital-patient interactions [12].

3   Case Study

In order to explore and define design opportunities related to healthcare field, an interdisciplinary course "Smart Healthcare" and workshops which combined the smart technology with social innovation were carried out. The sub-topic of the workshops related to the self-management of chronic disease, community for the new pregnant woman (Baby Plan), self-management for preserve one's health, dealing with sub-health for college student, and service design for elderly. The paper addresses the result of the course and workshops by analyzing two case studies and defining design opportunities in the healthcare field. This could be a very preliminary step to understand how the social problems can be unbarred by digital social innovation approach.

3.1   Case Study 1- Service Design for Elderly

This case study was designed to motivate elderly do more outdoor activities.

Figure 1 shows the daily routine of most elderly people in China. Most of them have different kinds of chronic disease; reasonable amount of sports is good for their health. Although they do daily sports, such as square dance, tai chis, jogging and so on, most of them have no proper guidance and measurement for their amount of sports. Moreover, most of the elderly have no motivation to do outdoor activities.
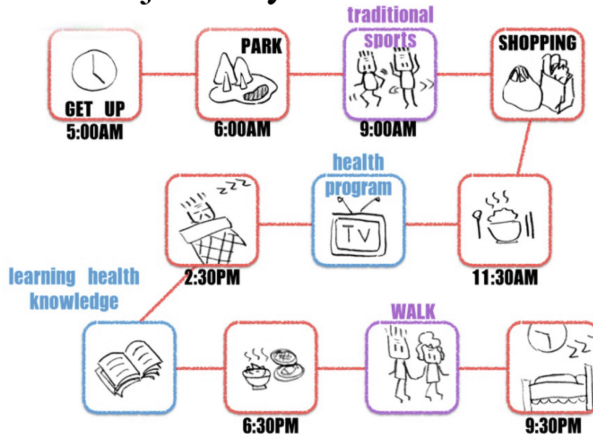
Old user journery

Fig. 1. Daily routine of elderly

Based on user research, we interviewed several elderly communities and elderly home; we think we can solve several problems by service design approach. Aging population is facing by all over the world; the government also put a lot of effort to tackle this problem.

Figure 2 shows a system map of the service system, the stakeholders are including hospitals, health center, government, dealers, and elderly people. The health center is located in every community, which can provide facilities, healthcare knowledge and advices for the elderly people, and they also provide the service of recording body data for free. Later they can share these body data to the hospital or to the elder's family member. The government can give the health center some finance support. Then the health center can cooperate with supermarket dealers by distribute the supermarket coupons to the elderly who took the activities in the health center. The more activities elderly took part in the health center, the more supermarket coupon they can get. So the coupon could be a motivation for elderly to take part in more exercise and activities.

Based on the system map, we came out of the new user journey as shown in Fig. 3.

3.2   Case Study 2-Baby Plan

Recently, Chinese government loosens the only one child policy, and more and more couple wants to have their second child. In the near future, China will have another baby booming. Pregnant women are a very important group, who deserved more attention, and they need more care during pregnancy. Pregnant women during pregnancy tend to be very focused on the status of the fetus to timely to check. How to connect the family, hospital, and the community effectively to improve the pregnant experience? What kind of form can reduce the unpleasant mood, and thus to add more pleasurable experience during pregnancy?
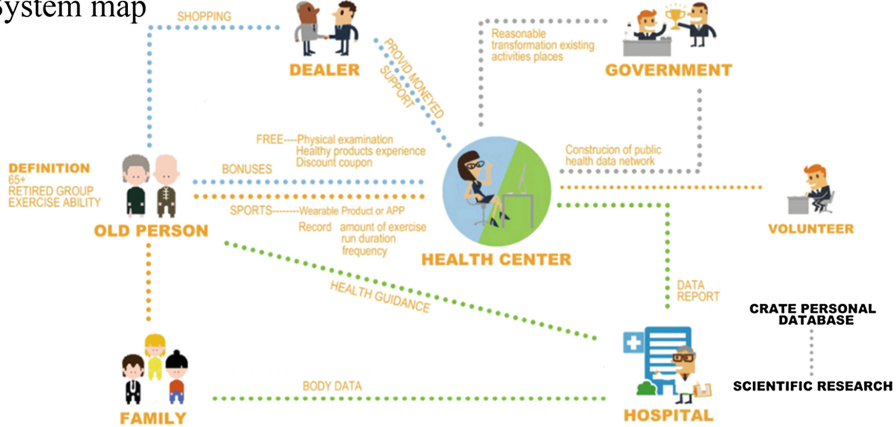
System map

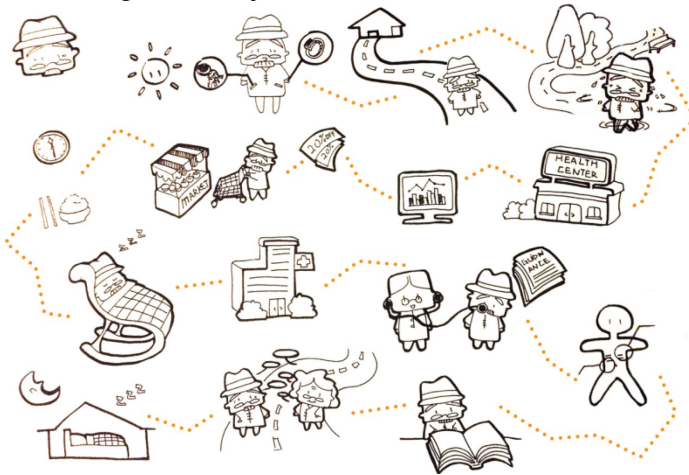**Fig. 2.** System map

New user journey

Fig. 3. New user journey

Several pregnant women were interviewed, and several hospitals were investigated. Based on the user research, the daily routine of pregnant woman was formulated as Fig. 4. The daily routine listed some difficult problems, such as can not bend over, travel issues, keep balance diet, movement, sleep difficulties, and emotion issues. From the interview and user research, we found that pregnant woman is easy to feel lonely and helpless, and they really need to share their feelings with family members or friends. Also they need more information and experience from others to relief their fear. Then the concept "Baby plan" came out. The system map of "Baby plan" is showed in Fig. 5.
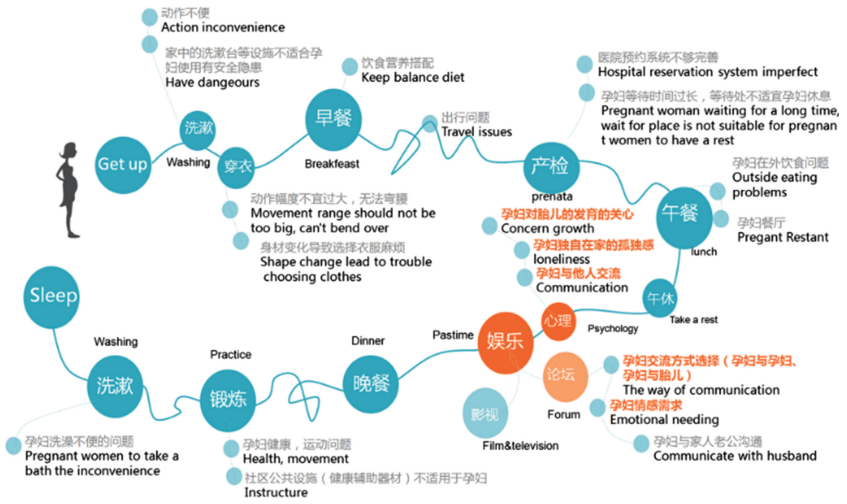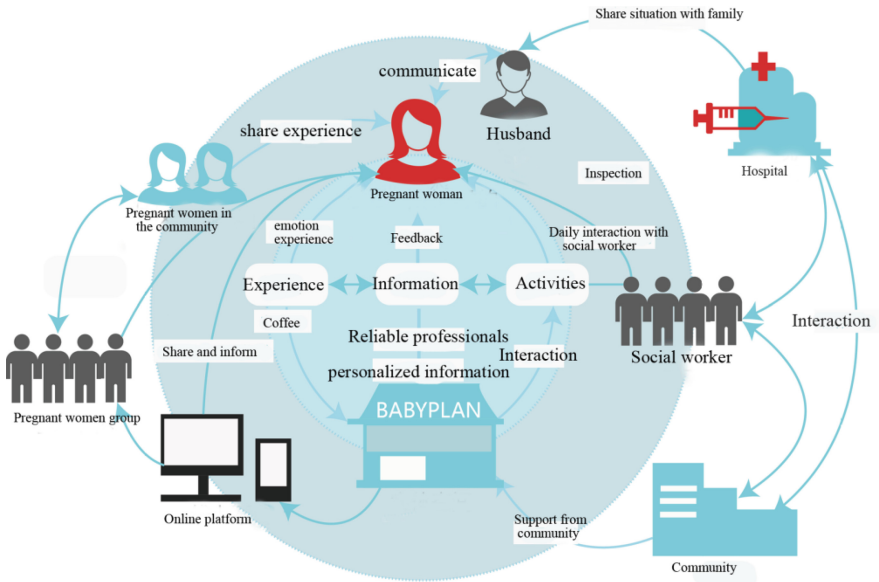
Fig. 4. Daily routine of pregnant woman

Fig. 5. System map of baby plan

Baby plan is a service proposal based on an online platform and a solid place in the community, defined as "an supporting network for pregnant women to deliver a healthy baby", whose purpose is to engage new mothers, the pregnant women their family member, social worker and the hospital into a collaborative community, where the

pregnant women can share information, communicate with each other. The online platform can provide any pregnant related information. The solid place can provide a special location for the pregnant woman and new mothers to communicate face to face. And the new mothers are endowed with a new role: the adviser or assistant of the pregnant with their personal experience and knowledge. And as the pregnant women turn out to be new mothers, it's natural for them to switch the role.

Baby plan provide a better access to the personal knowledge for young pregnant women especially who have no such experience before and normally get themselves supported through internet or directly going to hospital. It also helps to relieve their fear and anxiety when communicating with the ones who have just went through it. And the "Baby plan" is supported by the residential community and hospital.

4   Conclusion

The communication capabilities of social media and social networks have the potential to improve healthcare. This kind of platform is a new way of social innovation in healthcare field. As technology grows and more consumers are comfortably using the new technology, the healthcare industry can be improved and changed remarkably by using of social media. It is an emergent stream of social innovation research and a response to growing social, environmental and demographic challenges. There is great potential to exploit digital network effects both in social innovation activity and in new services and approaches that generate social value.

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