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Agile Open Innovation Platform: Managing Value Cocreation to Face Health Challenges in the Post-pandemic Era

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Abstract

BACKGROUND: Most of proportion of global disease burden and premature death could actually be prevented through enabling healthy lifestyle. However, many previous initiatives failed to address this challenge, because they tend to solve it in isolation and ignore the system complexity that tend to be complex, asymmetric, vague, and erratic. It is a necessary to shift our thinking from traditional way using reductionist to systemic approach.

AIM: In this paper, we propose a novel approach Agile Open Innovation platform based on collaborative, adaptive, visionary, and experiential (CAVE) principles in the cocreation of innovation initiatives to manage the public health challenges.

METHODS: This platform explores and exploits ideas from internal and external sources. It encourages ideas to come from anywhere not just from health professionals. At present, public or people who are not working in health sector have difficulties to contribute and apply innovative ideas into the system. Consequently, many ideas that be developed fail to fit the user priorities. Hence, we design a system to facilitate multi-sided collaboration in health innovation initiatives.

RESULTS: As the result of this research, we have developed a prototype of platform, as part of Innovation-Driven Excellence in Eco- Adaptive System living laboratory, to accommodate health innovative solutions be developed in the agile manner with continuous improvement and iteration from involved users. As illustrative case, we create health challenge and health forum in this platform with the topic "How can technology be enabler for people to be physically active with ease and fun in the (post) pandemic period" to promote active and healthy behavior lifestyle.

CONCLUSION: One of the examples developed solution, it has successfully opened prospective ideas in the form of augmented reality application as a way to promote and educate physical activity in the current and post-pandemic era.

Introduction

Public health has to face two sides of the same coin with the rising of digitalization and globalization, they are the challenges and the opportunities. The current practice of public health has not exploited the opportunities to overcome the challenges. Our global health is still in the status of "Triple Burden" disease, where we strive to overcome the old and new infectious disease, in the other hand, we have to deal with preventable of non-communicable diseases [1]. We also still face pandemic spread of COVID-19 which affected daily live, disrupted health systems, and economics. Furthermore, most of proportion of global disease burden and premature death related to health risk behaviors [2], [3]. It implies that current diseases and complication could actually be prevented through enabling healthy lifestyle. Based on the WHO, health is not only the absence of disease but also living a healthy lifestyle [4]. This orientation must embrace many healthy lifestyle elements such as physical activity, balanced nutrition, safe behaviors, and many initiatives have to focus on improve the health of every people and consider people as subject of health not passive object.

However, many previous initiatives failed to address this challenge they tend to solve it in isolation and ignore the system complexity that tend to be complex, asymmetric, vague, and erratic. First, health system is complex because involve multiple thing that connected to each other. People have difficulties when confronted with complex problems that have multiple connections [5]. It is not easy to detect connections between seemingly unconnected objects and anticipate especially nonlinear behaviors [5]. Second, health system tends to be asymmetry related to information and resources. Most of the system have structure, and moreover, this structure is asymmetrical. For asymmetric information, it exist when one of the two or more parties have irrelevant information such as choosing not to share or fail to understand information [6]. Most of the current health system fail to address this asymmetric of information and resources. Third, vagueness in health system. We define vague as unclear, multiple meaning, and undefinable situation [7]. [8]. In the public health, there are many situations that undefinable, so it gives difficulties for the parties to take proper steps. The last, erratic which means unpredictable, or deviate from the

standard. The complexity in the system tends to make the system and often, we cannot predict what will be happened in the future [5], [9], [10].

It is necessary to shift our thinking from traditional way using reductionist to systemic approach. We need to think in innovative ways through multisectors collaboration [10]. Although many researches have focused on collaborative community health partnership [11], [12], [13], [14], we still need to bring it into the innovative ways. We can exploit the big opportunities of digitalization and globalization with better utilization in interconnectedness. We can explore interconnected of innovative ideas through cross-border of countries, people, and institutions with technology [15].

Hence, in this paper, we propose open innovation approach as a concept to manage the complexity in the public health with the focus on the value cocreation in the agile manners. Open innovation model open ideas from internal and external sources, including the technology which can enter the innovation process in the different phases [16], [17]. This model is alternative to closed innovation model, which most of knowledge is generated inside the institution, enter and exit the market in one way, so there is limited option for the previous model. Open innovation is widely recognized as a driver of innovation. The cocreation of value is increasingly based on the capacity of all parties participating. Open innovation more commonly be used in the large firms to develop new products [17]. Companies such as P&G use this approach to reduce the lead time of its production process [18]. General electric and Google use it to form collaboration with startup and research institutions to develop new product [19], [20].

Using this concept, there will be many alternatives for solution to create value for users in market whether it is social or commercial. It urges institution to develop partnership with several stakeholders such as government, industry, academic university, and also society such as citizens and users [20]. We encourage ideas to come from anywhere not just from health professionals. Mostly, in the health areas, the ideas have been dominated by health professionals, while public or people who are not working in health sector have difficulties to contribute and apply innovative ideas into the system. Consequently, many ideas that be developed fail to fit the users priorities. Hence, we need inside-out solution exploitation and outside-in exploration which can create value for organizations involved.

This paper explore how open innovation be developed in a platform as part of Innovation-Driven Excellence in Eco-Adaptive System (ID(E)EAS) living laboratory. We develop web-based platform to crowdsource prospective innovative solutions to be developed in agile manners, including health forum mechanism to discuss specific ideas related to the health issues.

Methods

In the methodology, we adapt several approaches such as human centered design [21], [22], [23], [24], [25], information system method especially action design research [26], [27], [28], [29], [30], [31], [32], [33], and agile [34], [35], [36]. We design an open innovation framework to stimulate innovation capabilities and prospective solutions-related health challenges in the agile manners. It uses several phases in the framework of ID(E)EAS development [24], [25], identification, design, and execution phase. In the identification phase, we identify and map the current system, process, products, platform, stakeholders, critical requirements/specification, and basic features. We map the stakeholders using adapted version of quadruple helix model [37], [38]. We develop Government, Industry, Academic/University, Non-government-Society (GIANtS) collaboration involving a wide variety of actors to contribute in generating and sharing innovative ideas. This platform can open participation from various actors to contribute related to the open innovation with the each potential roles (Figure 1).

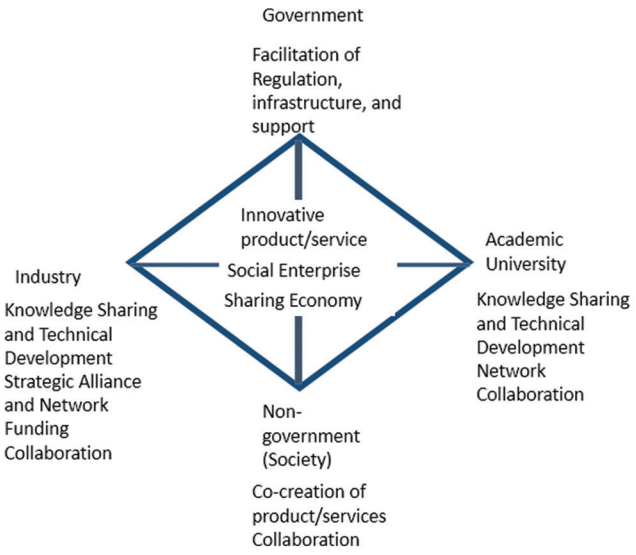

Figure 1: GIANtS helix model

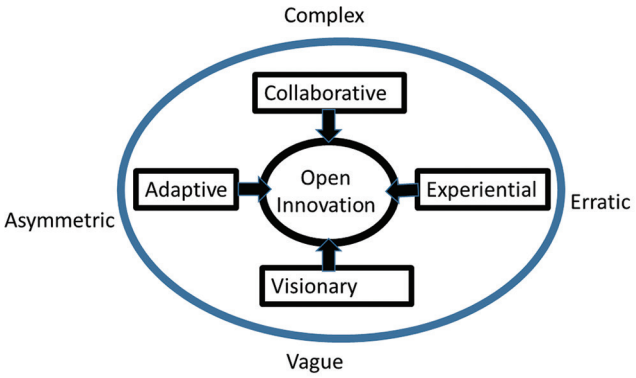

Figure 2: Collaborative, adaptive, visonary, and experiential

In the design and execution phase, we combine the four principles collaborative, adaptive, visionary, and experiential [20], [24], [25] (from the Figure 2) into the features. Hence, from the technical perspective, we design the web-based prototype based on the following features:

- Challenge prizes
- Solution-seeker
- Online communities
- Solution development partnership.

Results and Discussion

We have developed a web-based prototype, with the innovative campaign to stimulate users participating in prospective solutions partnership in the agile manners. It is a platform where users from any institution can register (Figure 3). One of the examples, it opens health challenge and health forum with topic “How can technology be enabler for people to be physically active with ease and fun in the current and post-pandemic period” to promote active behavior for people. It crowdsources innovative ideas such as example in the Figure 4, where a user creates augmented reality application to promote and educate physical activity. The other users can contribute to this prospective ideas by joining partnership with the initiator such as in involving user research, testing, and continuous improvement as it facilitates solution development in the agile mechanism. The features in this platform can also facilitate the knowledge sharing and discussion using health forum (Figure 5). Basically, it is an open platform where anywhere can share ideas, feedback, and partner with other users.

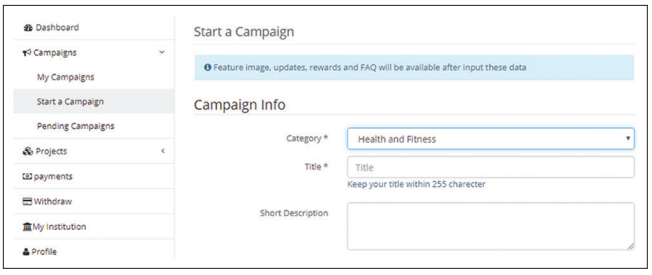

Figure 3: Dashboard of multi-sided platform

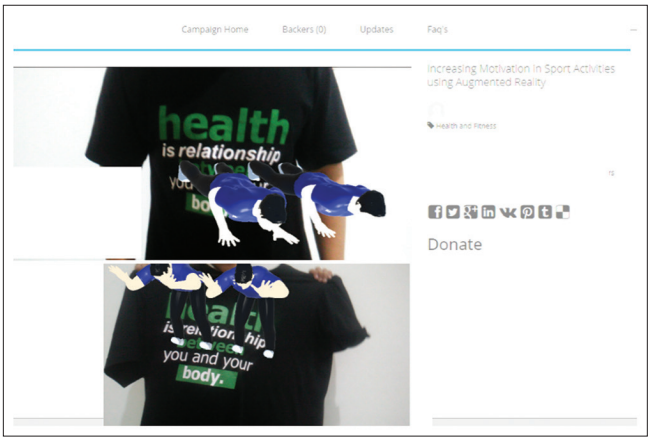

Figure 4: Augmented reality application

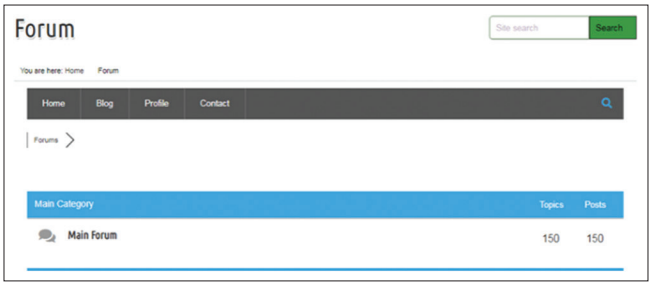

Figure 5: Health forum

Using this platform, we try to shift the paradigm in the innovative solutions related to the health issues, which is commonly using top-down to bottom-up approach in the agile manners. Every citizens can be innovation agent to join and spread innovative ideas. However, there is a need to integrate push and pull mechanism of ideas here. The institutions participate in the platform, not only contribute in the early phase of value creation, but also in the development phase through dedicated partnership [16], [17], [20].

Conclusion

During the challenges of triple burden and pandemic COVID-19, which have complex, asymmetric, vague, and erratic characteristics, we need to shift our thinking to a new mindset based on the collaborative, adaptive, visionary, and experiential innovation. As the result, we have developed a prototype of platform which can be used for collaborative creation, user needs adaptation, and facilitating experiential learning using solution development partnership. However, we need to test and scale up this platform to accommodate more users in order to validate its robustness.

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