



Solve Your Enterprise Learning Challenges

10TH INNOVPLUS CHALLENGE

CHALLENGE STATEMENT #07

1. Challenge Owner Index and Pseudonym

#07 – Population Health

2. Challenge Statement

We are a hospital of Singapore's Public Healthcare System seeking a learning solution to increase awareness and understanding of active aging amongst community and employees. We envisage the solution to be highly personalised, predictive and engaging.

3. About the Challenge Owner Organisation

As a pioneering hospital with strong roots in the community, we serve part of a resident population of 1.4 Million living in Singapore. Together, with our community partners, it brings care beyond the hospital into the community as an integrated care organisation.

4. Define the Challenge

Singapore's population is rapidly ageing and at a faster pace than a decade ago. In 1970, 1 in 31 Singaporean was aged 65 years and above. This increased to 1 in 8 in 2015, and it is projected that by 2030, the proportion will increase to 1 in 4¹. As Singapore's population ages, an increase in healthcare services is required to cater to the population's complex medical needs. Resultantly, Singapore is predicted to at least triple its healthcare expenditure from SGD 4 billion in 2011 to SGD 13 billion by 2021². Currently, the bulk of our healthcare expenditure, similar to the global trends, is largely spent on operating acute hospitals and specialist clinics; 85.5% of Ministry of Health (MOH) budget in FY2019 accounted for operational cost of the healthcare system³

In a bid to ease the burden on acute hospitals and specialist clinics in Singapore, the Ministry of Health has emphasised the importance of step-down care to ensure that patients remain in their communities or at home. In January 2017, there was a call to reorganise the six regional health systems into three integrated clusters to better meet Singapore's future healthcare needs. Under one of the integrated clusters, YYY has expanded its mission as an integrated care organisation, to integrate and provide healthcare for its population, as well as to engage the community partners to

¹ Older Singaporeans to double by 2030. Population SG. Accessed 22nd Aug 2016. Accessed 15th Apr 2020. Available at: <https://www.population.sg/articles/older-singaporeans-to-double-by-2030>.

² Govt spending on healthcare to rise sharply in next 3-5 years: Heng Swee Keat. Straits Times [online]. Accessed 9th Feb 2020. Available at: <https://www.straitstimes.com/singapore/health/govt-spending-on-healthcare-to-rise-sharply-in-next-3-5-years-heng-swee-keat>

³ FY2019 Budget Ministry of Health. Accessed 9th Feb 2020. Available at: https://www.singaporebudget.gov.sg/docs/default-source/budget_2019/download/pdf/35-MOH-2019.pdf 3 Low LL, Tay WY, Ng MJ, Tan SY, Liu N, Lee KH. Frequent hospital admissions in Singapore: clinical risk factors and impact of socioeconomic status. Singapore Med J. 2018;59(1):39-43. doi:10.11622/smedj.2016110



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develop a population health system that shifts care beyond the hospital into the community and beyond healthcare to health.

In order to integrate and provide healthcare for the population, the current model of care delivery has to evolve. It is currently characterised by care that is very episodic and fragmented, which causes a lack of care continuity across settings (acute hospital and community providers).

The relationship between the acute hospitals and the community providers has been largely transactional in nature, with patients being referred to them for post-discharge follow-up care in the community after their acute health issues have been resolved. Staff in the acute hospitals also have limited understanding of the complex community landscape, which hinders them from visualising the connections between acute hospitals and community providers at a system level. This greatly impacts the acute hospitals' ability to effectively and meaningfully collaborate with community providers to shift care into the community.

The complex community healthcare landscape also makes it challenging for the residents to navigate and seek care in the community. Strikingly, there is a lack of a consolidated platform/directory of programmes and services available in the community. Though efforts have been made to set-up directories, they only offer snippets of programme/services provided by a few community providers who also did not have a comprehensive overview of available resources. These directories are also largely informative rather than interactive (i.e. they did not encourage participation nor subscription to the programmes).

Therefore, there is unrealised potential we can actualise through developing a platform that addresses the following considerations:

1. How can we help residents to:
 - a. Better understand their health status; and
 - b. Guide them to a suitable programme/services in their community so that they can better manage their health and learn about resources available in the community?
2. How can we educate staff on:
 - a. The importance of collaboration and shifting care into the community;
 - b. Their roles in relation to the larger healthcare system; and
 - c. The key providers and services available in the community?

5. Requirements

To develop a mobile optimised platform that consists of the following 2 portals:

Portal 1: Learning Management System (For Residents)

1. To develop a series of self-assessment tools for residents to learn more about their health status i.e. psychosocial health, function and nutritional status. These comprise of questionnaires that will help them reflect on and evaluate their lifestyle, mood and social, Clinical Frailty Score and



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risk of falls, as well as nutritional awareness. The final assessment should also be made available to the residents.

2. To create an algorithm and a classification system to segment the residents based on their health status, then recommend suitable community programmes/services. This helps to educate and guide residents to appropriate resource(s) in the community that would help them better manage their health.
3. To incorporate quizzes that would help evaluate learning outcomes i.e. residents' level of understanding on their health status and the community resources.
4. To consolidate and organise existing community programme/services resources (LifeSG, Health Promotion Board Health Hub, ActiveSG, Agency for Integrated Care Silver Pages, Ministry of Social and Family development and National Silver Academy) into user friendly bite-sized modules so as to enhance residents' understanding on the resources available in the community.
5. To include helplines, list of care providers, relevant announcement (e.g. screening events) and articles and a chat-bot function to facilitate information finding. Residents should also be able to identify and register for relevant programmes/services nearest to their home address.

Portal 2: Games module (For Residents and Staff)

1. To create game modules to (a) heighten staff's understanding on importance of collaboration and shifting care into the community and (b) enhance residents' competencies on the administration of self-assessment tools.
2. To address (a), there could be an overarching story- and choice-driven role playing game which focuses on elements of collaborations, joining up care, and the challenges faced by residents and providers. Key providers and services from Portal 1 should also be featured in the game to help players better draw relation to the real world.
3. To address (b), there could be a series of time pressure mini games which incorporate components from the assessment tools for residents to complete in order to assess their various health and social conditions. This could either be incorporated as part of (a) or exist as an independent module. The mini games should serve as an additional avenue to evaluate resident's functional and cognitive ability e.g. Chair rise, walking speed, cognitive games etc. The scores from the games also serve as additional data points to assist the recommendation of programme in Portal 1. Interesting 'Did you know' messages should also be provided to educate the importance of maintaining a good state of functional and cognitive health.
4. The game modules should be easy to play and stop/pause, with simple controls and short tutorials. It should have outstanding presentation such as hand-drawn illustrations, minimalist graphics and a stylish user interface.
5. The game modules should illustrate strong synergy with Portal 1.

General

1. This platform should be easily accessible to the public with minimal viewing restrictions.



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2. To kick-start the pilot, the programme resources could target a specific geographical boundary (i.e. Ang Mo Kio) before expanding to the other parts of Singapore.
3. There should also be a (a) backend system to store user data (i.e. demographic profile, scores from assessments and quizzes) with the aim to generate a profile of the neighbourhood and recommend programmes, and (b) backend analytics function to facilitate the generation of utilisation reports and accuracy of algorithm for continual improvement (details in section 7).
4. The platform should be maintained on a routine basis by the Solutionist in terms of fixing of bugs, ensuring compatibility with new software updates, monitoring of performance through loading times and responsiveness as well as updating of new features and user interfaces. On a related note, updates to content will be maintained by the Challenge Owner.
5. A suitable data architecture and security which minimally covers the aforementioned data storage.
6. A feedback channel that comprises a composite of rating scales and open-ended fields to measure the following:
 - a. Interest in application
 - b. Usefulness of application in achieving the outcomes
 - c. Ease of use
 - d. Recommendation to others
 - e. Areas for improvement

6. Targeted Learners / Users

With the aforementioned 2 portals, the project aims to target 2 key groups of learners.

1. Residents

Residents should be the primary learner for the Portal 1 and Portal 2. The former helps to build awareness on their health status and programmes/services around their vicinity whereas the latter will equip them with competencies to self-administer the assessment tools. Through the constant exposure of the aforementioned, we hope that residents could proactively take charge of their health without much 'handholding' from the provider, and lead an active and healthy lifestyle so that they can age well in their homes and communities.

2. Staff

Staff should be the primary learner for Portal 2. Through an interactive and engaging manner, Portal 2 serves to enhance the importance of collaboration and shifting care into the community; it should also familiarise them with the assessment tools. Staff should also be the secondary learner for Portal 1 as they will be able to appreciate the suite of programmes available in the community which aids to further reinforce their understanding of the community landscape.

Beyond the InnovPLUS Project, there will be opportunities to scale the prototype to other healthcare institutes, community partners and even volunteers, which they can similarly use to (i) gather buy-in



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on the importance of community and preventive care, (ii) gain a better understanding of the community landscape and (iii) leverage on for programmes/services recommendation(s) for their own clients.

The estimated number of users would be further determined in line with the development of the platform.

7. Measures of Success

The aforementioned solution will be evaluated based on the following success measures:

S/N	Category	Indicator	Details
1	Overall	Outreach	<ul style="list-style-type: none"> Number of hit rates Number of unique visits Average time spent on each portal Number of unique resident who attempt the assessment. <p><i>Target: 5% increase year on year for the first 2 years.</i></p>
		User Feedback	<ul style="list-style-type: none"> At least 50% of user's rated at least 7 out of 10 for interest in application, usefulness of application, ease of use and recommendation to others
2	Learning Management System	Learning Effectiveness	<ul style="list-style-type: none"> 70% of completed assessments upon attempt. At least 50% of correct answers through quizzes
		Effectiveness of algorithm and Shifting Care into Community	<ul style="list-style-type: none"> At least 50% of the residents who completed the assessment, signs up for the recommended programme At least 70% of the residents who signed-up, attends the recommended programmes At least 70% of the residents who attended, completes the recommended programme
3	Game module	Learning Effectiveness	<ul style="list-style-type: none"> High scores / leaders board At least 50% of correct answers through gamified quizzes

Solutionist should ideally be selected based on the ability to fulfil the requirements listed for the 2 portals.

8. Deliverables

Deliverables will be based on the fulfilment of the aforementioned requirements listed in two portals.



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9. Vision

- A network of health and social care providers coming together to deliver integrated and comprehensive care to the community and improve population health outcomes.
- Happier and healthier communities where residents are activated and supported to live and age well in their communities.
- A reduced rate of avoidable admission due to inadequate community care and poor lifestyle habits.