Project Title

Doctor COVID: Enhance Operations and Care with Smart Multi-Lingual Chatbot for COVID-19 patients at Community Care Facilities

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Organisation(s) Involved

Singapore Health Services, Singapore General Hospital, Singapore National Eye Centre, National Cancer Centre Singapore, Institute of High Performance Computing, A*STAR

Project Period

Deployed on 9 May 2020

Aims

Facilitate effective communication and active engagement with patients through broadcasting of medical and social content. Assist in closely monitoring and understanding patients' health and mental well-being through self-reporting functions

Background

See poster appended / below

Methods

See poster appended / below

Results

See poster appended / below

Conclusion

See poster appended / below

Additional Information

Singapore Healthcare Management (SHM) Conference 2021 – 1st Prize (Operations Category)

Project Category

Automation, IT & Robotics Innovation

Keywords

Automation, IT & Robotics Innovation, Technology, Mobile Health, Chatbots, Digital Health, Mental Health, Community Health, Safe Care, Healthcare Administration, Singapore Health Services, Singapore General Hospital, Singapore National Eye Centre, National Cancer Centre Singapore, Institute of High Performance Computing, A*STAR, Operations, COVID-19, Doctor Covid, Multi-lingual Chatbot, Broadcasting System

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Doctor COVID:

Enhance Operations and Care with Smart Multi-Lingual Chatbot for COVID-19 patients at Community Care Facilities

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Introduction

The huge increase in the number of COVID-19 positive cases, especially amongst the migrant workers in Singapore, and the corresponding increase in their admissions to the Community Care Facilities (CCFs) had presented a challenge to the understaffed CCFs to better manage the clinical as well as psychosocial needs of patients, while minimising healthcare worker's time spent working within the "Red Zone" to decrease the risk of infection. The diversity of patients had presented further challenges of differences in language, culture, literacy and mental well being at the time of their admission to the respective CCFs. Hence there was a need to develop a solution that would enable the team to swiftly and effectively communicate critical information to while taking the above challenges into consideration.

Aims

Facilitate effective communication and active engagement with patients through broadcasting of medical and social content

Assist in closely monitoring and understanding patients' health and mental well-being through self-reporting functions

With the evolving COVID-19 situation and tight timeline involved, the multidisciplinary team utilised the **Agile Methodology** to design and develop Doctor COVID - a multi-lingual Chatbot to improve health surveillance and care for a large number of migrant workers in the CCF.

Methodology

Define
project goals and deliverables

Explore & Design
possible solutions to meet requirements

Develop & Iterate
desired product according to requirements

Deploy & Refine
Ensure product meets specifications

Implementation

Formation of project team: Representatives from various domains such as medical, communications, operations, nursing, information technology, and innovation, together with external agency A*STAR, with the strong support of IHiS, came together to form the Doctor Covid multi-disciplinary project team.

Goals and Deliverables

Phase 1
Broadcasting system

Phase 2
Surveillance system for mental well-being

Phase 3
Surveillance system for clinical wellness

Requirements Gathering: Feedback was obtained from various domains to gather and prioritise needs and requirements.

Specifications: The needs were then translated into technical specifications and features to be enabled for an effective and efficient solution.

Key Requirements

- Provision of multiple languages
- Broadcasting of information and reminders
- Sharing of social content such as videos, web-links, etc.

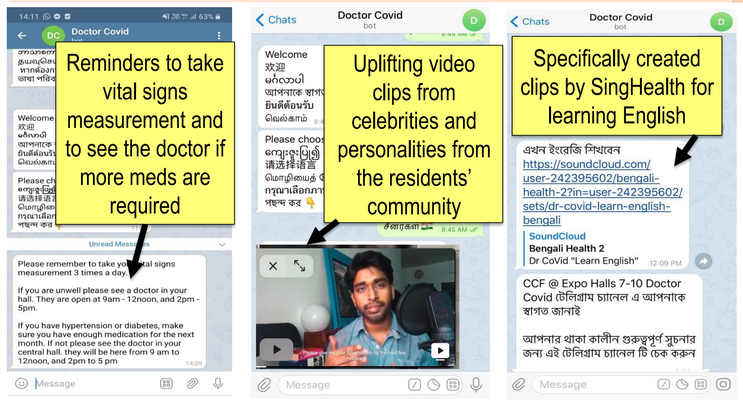
Exploration and evaluation: Multiple communication tools and platforms such as SMS, FormSG, Telegram, WhatsApp, Public Address system were explored and evaluated based on a list of identified evaluation criteria. These criteria included ease of use, cost, security, and scalability.

Telegram was selected as it possesses a suite of functionalities which met the identified evaluation criteria.

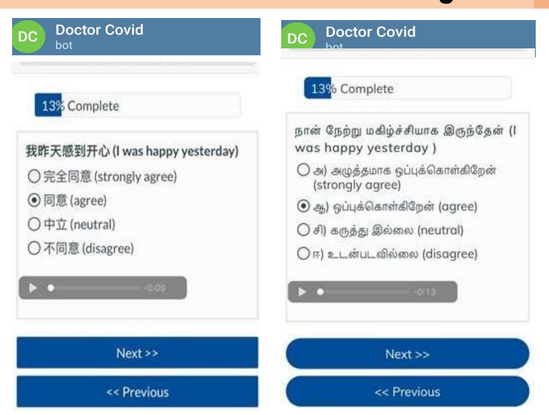
Develop: Development of a operationally-ready prototype was done swiftly within 3 weeks together with the A*STAR team with strong support from IHiS.

Iterate: Usability testing was performed based on multiple scenarios to ensure an effective experience for the residents at the CCF@Expo with over 20 iterations in the span of 1 month as the team continued to improve on the solution .

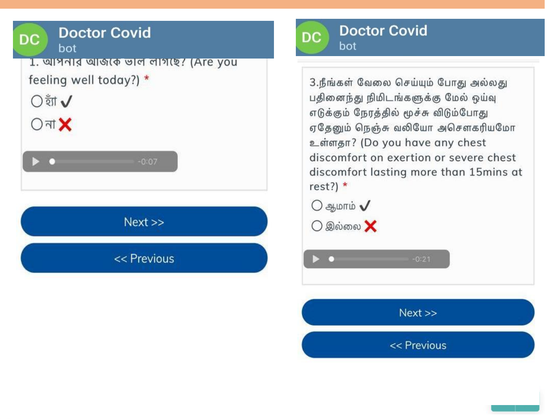
Phase 1 – Broadcasting system



Phase 2 – Mental Well-being



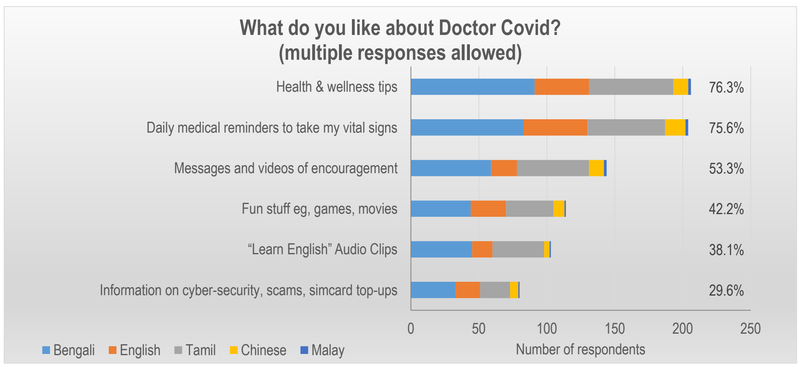
Phase 3 – Clinical Wellness

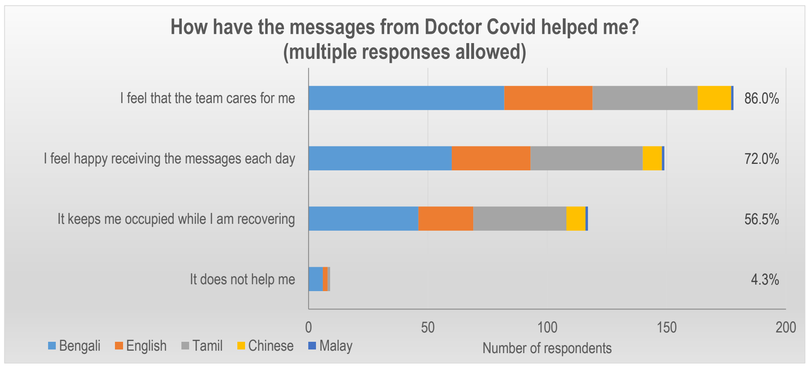


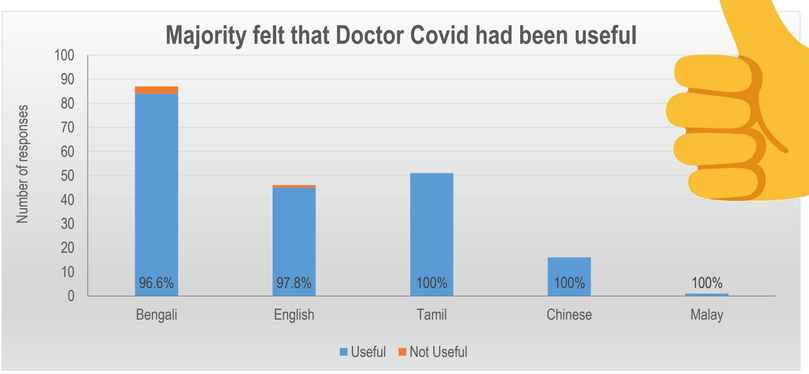
Deployment: Doctor Covid was deployed on 9 May 2020 where critical information and reminders were broadcasted to residents who had subscribed to the Chatbot.

Refinement: There were refinements of existing features and roll-out of subsequent phases such as the clinical and psychosocial surveillance where CCF@Expo residents use Doctor COVID to respond to questions that assess their clinical risk factors and mental well-being.

Product & Impact







- **More than 4,000 patients** from the CCF@Expo, D' Resort and Bright Vision Hospital (BVH) subscribed to Doctor Covid and **over 887,000 messages were sent out to patients**.
- Of >200 patients surveyed, **98% were satisfied with the Chatbot.** 75.6% found the daily medical reminders useful and 76.3% appreciated the health and wellness tips.
- **86% of the respondents** also indicated that they felt cared for because of Doctor Covid.

" very useful, especially for health monitoring, health messages. Feels safe and in good health."

Mr Ramaswamy (former CCF resident)

Conclusion

The Doctor COVID project leveraged an emerging communication channel to better reach out, engage and care for the migrant worker population, while allowing healthcare professionals to gain insights into how each patient is doing in their recovery. This initiative had helped to **enhance operations and allowed healthcare professionals to operate efficiently and safely**. The survey results had indicated that the **new communication channel has satisfied the majority needs of patients and their expectations**.