Advanced Queue System for Polyclinics

Singapore's Healthcare

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The Problem in Healthcare

Addressing Current Healthcare Problems

Long Queues in Polyclinic

Long Waiting Times

The Problem in Healthcare

Analyzing Causes of the Problem

DEMAND

Increase in ageing population

More senior citizens opt for polyclinics due to lower and heavily subsidized medical fees

Working adults opt to obtain medical certification from polyclinics

Shortage of doctors poses inconvenience of meeting huge number of patients in a limited amount of time

SUPPLY

The Problem in Healthcare

Analyzing Causes of the Problem

High demand for inexpensive, basic care at polyclinics by needy citizens
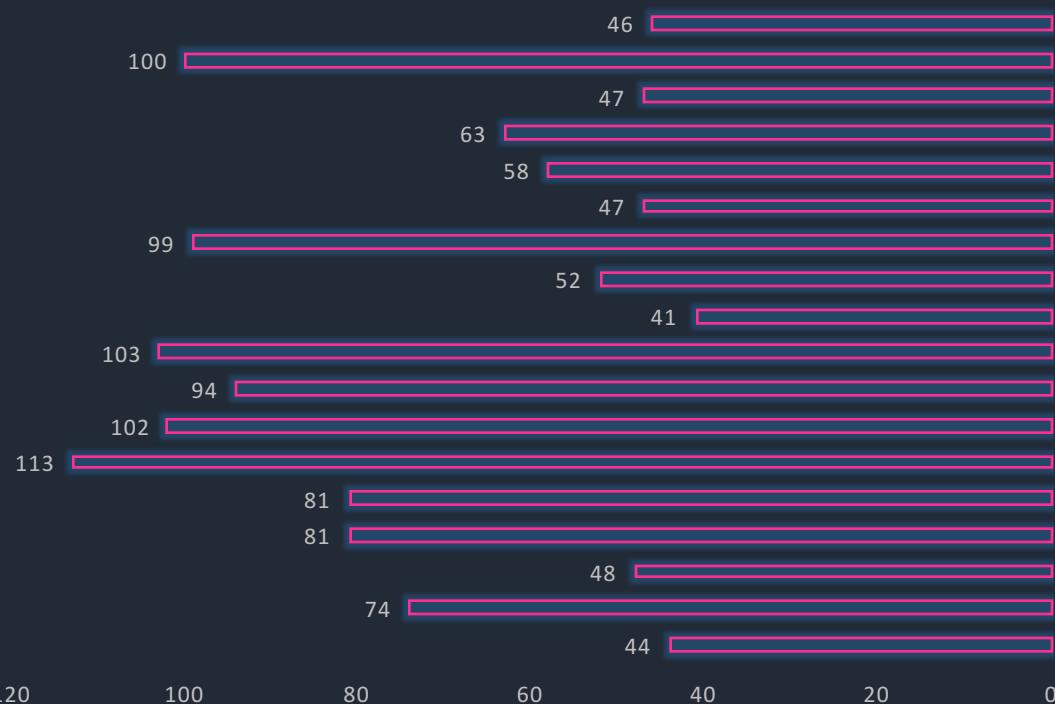
| Year	Total No. of Attendances ('000)
2010	4,314.5
2011	4,502.0
2012	4,614.0
2013	4,623.6
2014	4,648.4
2015	4,872.7

The Problem in Healthcare
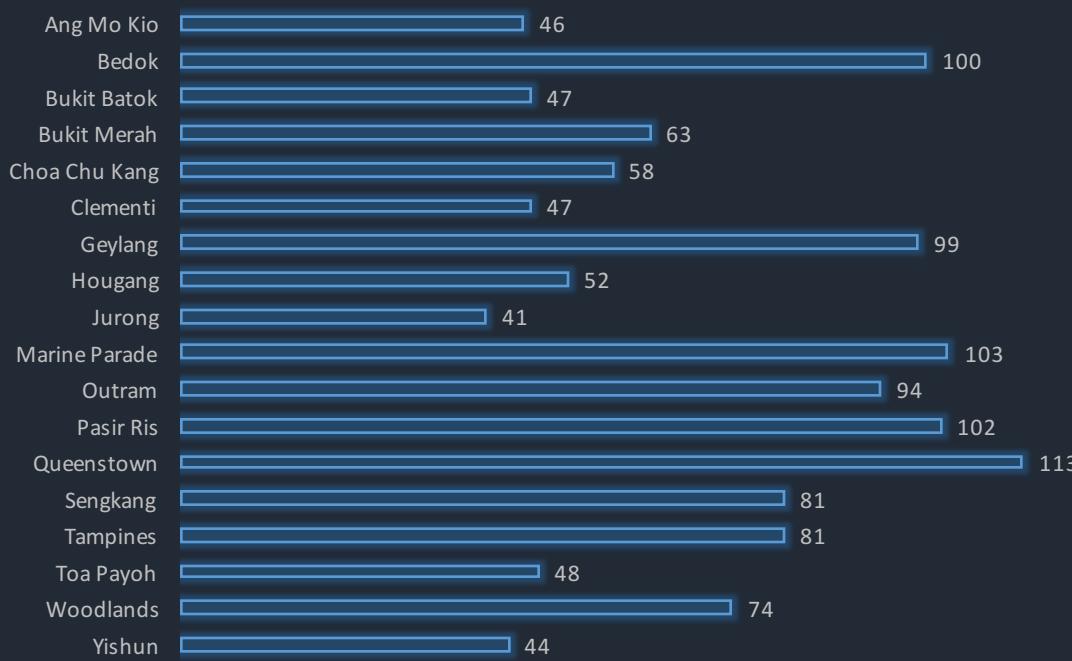
Analyzing Causes of the Problem

95th Percentile Patient Waiting Times at Registration Counter and for Consultation at Polyclinics, November 2016

Registration

Consultation

| Location	Registration	Consultation
Ang Mo Kio	46	46
Bedok	100	100
Bukit Batok	47	47
Bukit Merah	63	63
Choa Chu Kang	58	58
Clementi	47	47
Geylang	99	99
Hougang	52	52
Jurong	41	41
Marine Parade	103	103
Outram	94	94
Pasir Ris	102	102
Queenstown	113	113
Sengkang	81	81
Tampines	81	81
Toa Payoh	48	48
Woodlands	74	74
Yishun	44	44
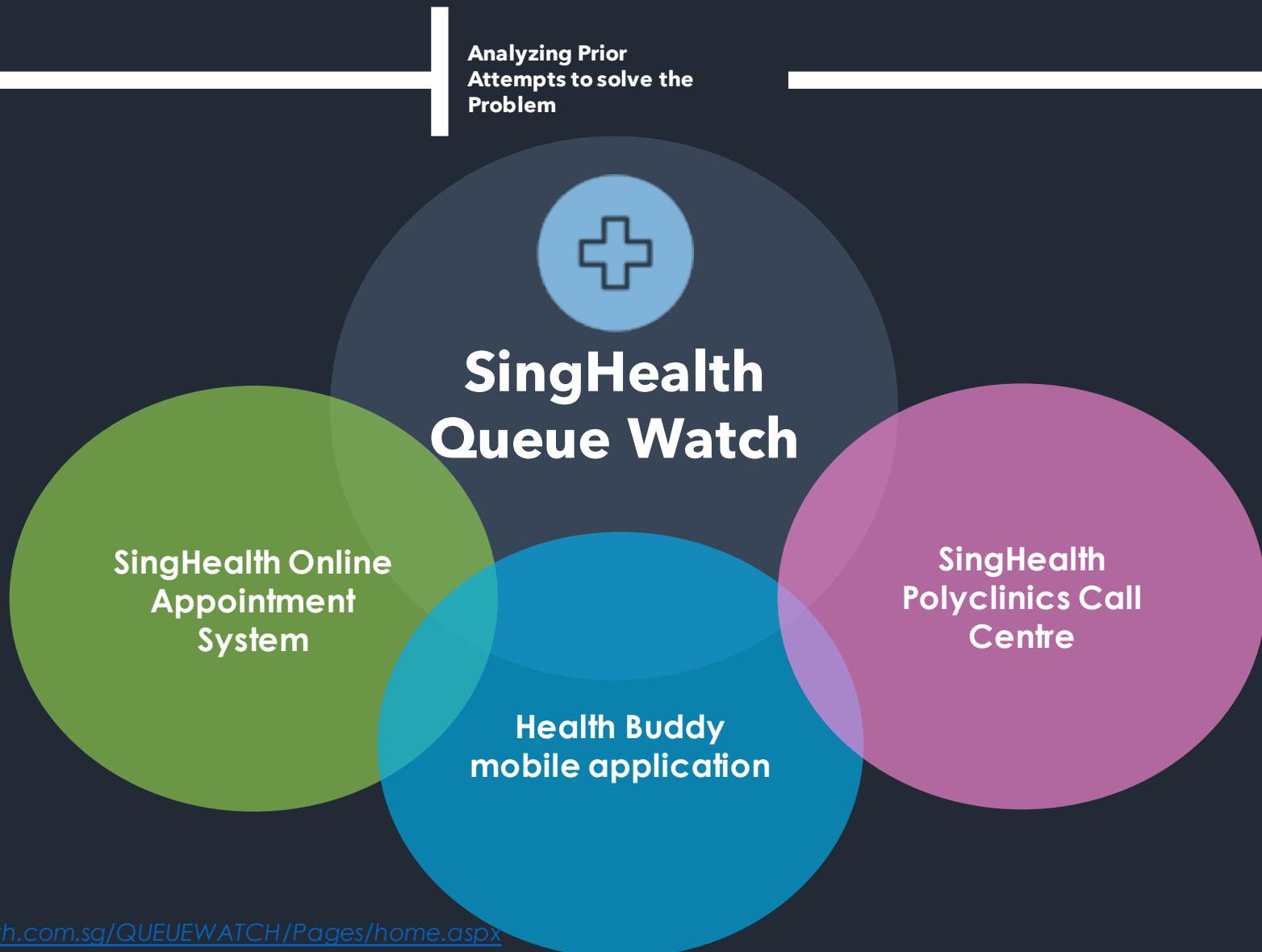
The Problem in Healthcare

Analyzing Effects of the Problem

Long queues deprive patients of the time to recuperate rest and lower the efficiency of the polyclinics in attending to patients who require treatment urgently. Needy & sickly citizens might not be able to access fast treatments or prescribed medication from the doctors due to such long queues.

Current Measures

SingHealth Queue Watch

SingHealth Online Appointment System

SingHealth Polyclinics Call Centre

Health Buddy mobile application

SingHealth Online Appointment System

1. View, Change or Cancel Appointment Online

2. Make a New Appointment

3. Contact Call Centre

BENEFITS

Allows Singaporeans to plan their visits to the clinics in advance

Can track profiles and appointments for user & next-of-kin

User Guide available

## DRAWBACKS
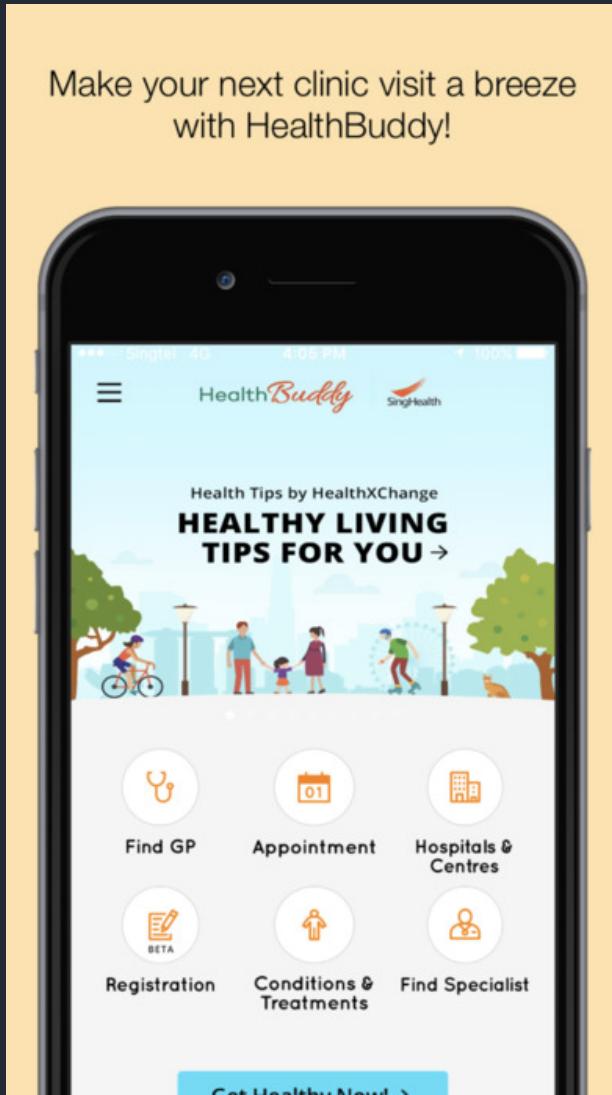
Only viable for advance appointment bookings

Only manages existing appointments & unable to add new appointments

Does not solve long queues from walk-in or last minute appointments by patients

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Health Buddy Mobile Application

Make your next clinic visit a breeze with HealthBuddy!

BENEFITS

View or Change Appointments on-the-go

Offers various Health Tips, Videos & Promotions, Health Events & News for Singaporeans

Comprehensive list of GP clinics in Singapore with locations & contact information to call to make an appointment

Wide range of medical Conditions & Symptoms available for reference

DRAWBACKS

Non tech-savvy elderly would not be familiar with the usage of the Mobile App

Only manages existing appointments & unable to add new appointments within the Mobile App

Inconvenient to have to call to make an appointment

Does not solve long queues from walk-in or last minute appointments by patients

SingHealth Polyclinics Call Centre

Analyzing Prior Attempts to solve the Problem

BENEFITS

Allows Singaporeans to book an appointment through the respective Polyclinic Call Centres

DRAWBACKS

Call Centres hotline may be busy or unreachable during peak hours

Inconvenient to have to call to make an appointment

Patients are required to search for the correct Polyclinic Call Centre hotline themselves

Only viable for advance appointment bookings

Does not solve long queues from walk-in or last minute appointments by patients

The Solution

Advanced Queue System (AQS)

Target Audience: Patients at Polyclinics or Hospitals

AQS aims to manage the flow of incoming patients at medical institutions. Through this system, patients may obtain their queue numbers prior their walk-in visit at the medical institutions via the Online Website or through the Mobile App. This allows sickly patients to spend more time resting at home instead of waiting in long queues for their turn. A personalized message would be sent 30 minutes prior to their turns to notify the patients in line of the queue.

REDUCE QUEUE TIMES

SERVE MORE PATIENTS

GREATER CONVENIENCE

How It Works

Advanced Queue System (AQS)

**1** PATIENTS OBTAIN A QUEUE NUMBER THROUGH THE FOLLOWING CHANNELS
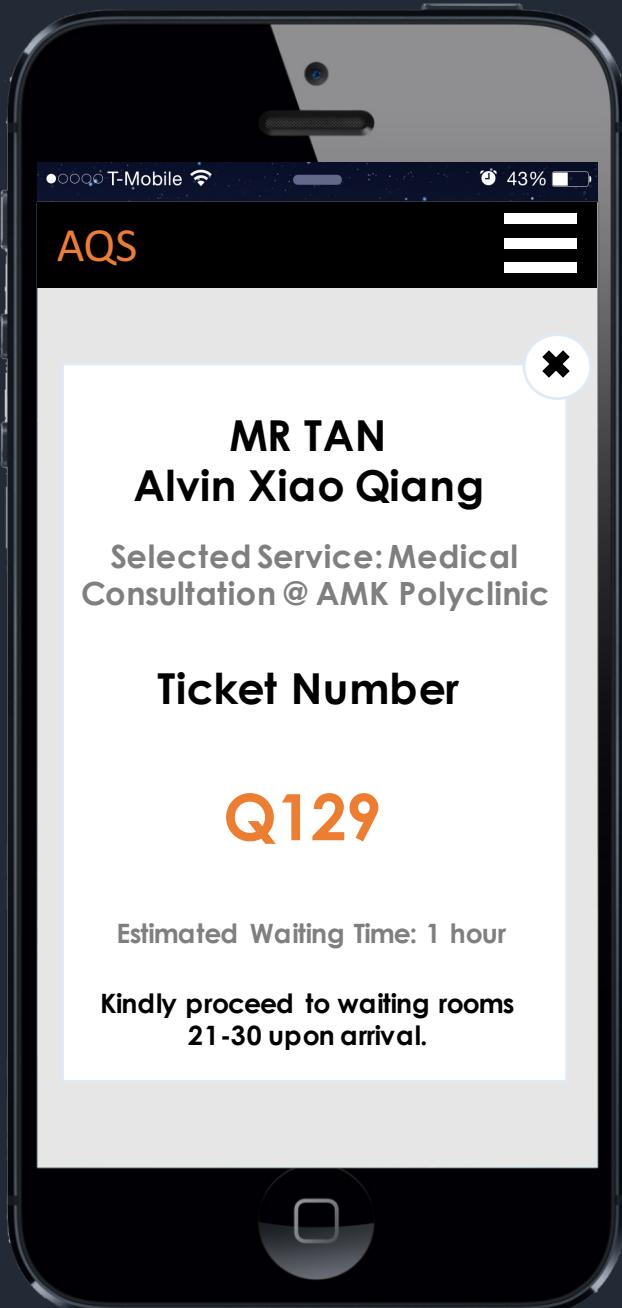
ONLINE AQS WEBSITE

MOBILE AQS APP

AQS WEBSITE

AQS MOBILE APP

How It Works

Advanced Queue System (AQS)

2 **PATIENTS ARE ALERTED VIA TEXT MESSAGING 30 MINUTES PRIOR TO THEIR TURNS**

Allowance of 5 minutes late tolerance before patient shows up

Optional in-App notifications would also be made available

How It Works

Advanced Queue System (AQS)

3   PATIENTS FEEDBACKS ARE COLLECTED

Garner user experience feedbacks to generate further improvements in managing the service

What could be improved?

How It Works

Advanced Queue System (AQS)

4 **MANAGERS MAY ACCESS REAL TIME DASHBOARDS THROUGH THE DATABASE**

PERFORM ANALYSIS ON:

PATIENTS' DEMOGRAPHICS

SERVICE QUALITY LEVELS

BRANCH & REGION PERFORMANCE

The Advanced Queue System (AQS)

INNOVATION

The AQS is a completely new service which makes use of a reactive database to manage or track new and virtual queues entered by patients. Patients may access their queues information as the system stores into the database while reflecting personalized, real-time information to them. As existing solutions currently do not encompass walk-in consultations, the AQS aims to target this particular group of patients to improve waiting time.
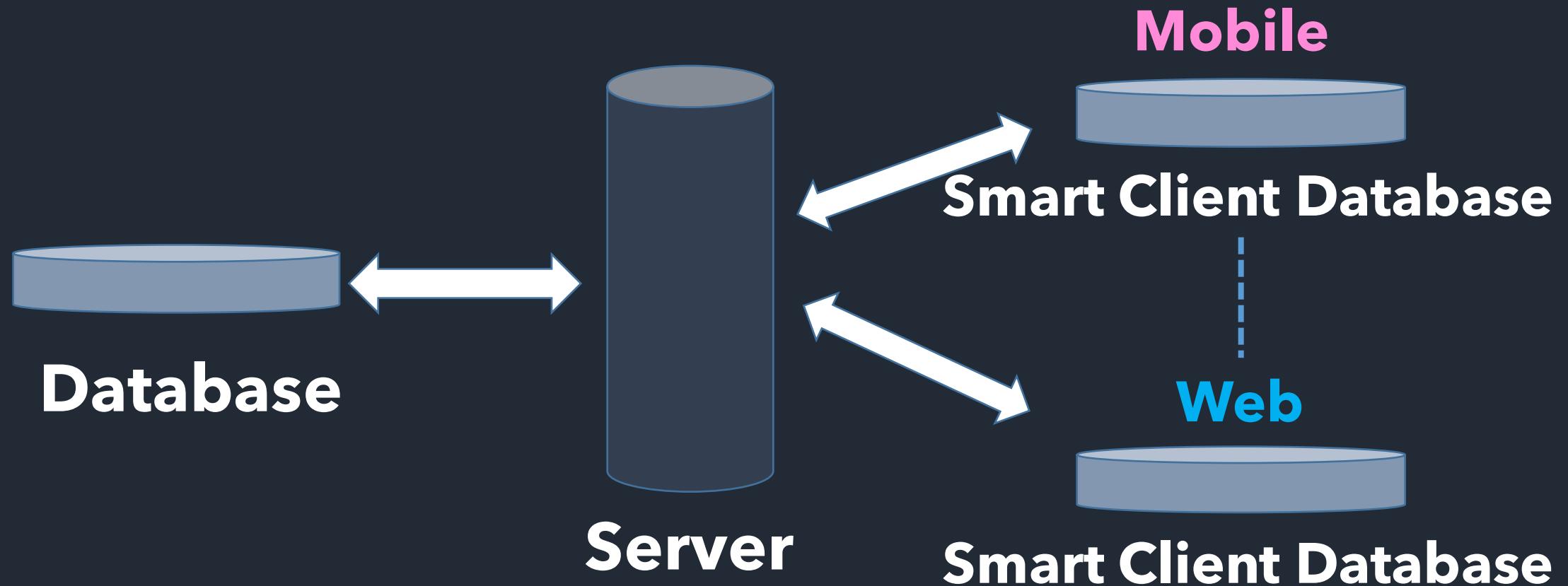
VALUE PROPOSITION

The AQS would be beneficial to polyclinics and hospitals in resolving long physical queues, as well as patients who require extra rest. Medical institutions can better manage the crowd especially during peak periods. Patients may also experience greater convenience by benefitting from the extra time to rest during their waiting times. This would ultimately improve efficiencies within medical institutions.

The Advanced Queue System (AQS)

The AQS Distributed Application Platform

Mobile

Smart Client Database

Database

Server

Web

Smart Client Database

The Advanced Queue System (AQS)

MARKET POTENTIAL

To ensure quality and complete functionality, the testing phase would be conducted at various selected polyclinics before deploying to the other branches and hospitals. This allows the AQS to be further enhanced and developed towards consumer satisfaction in order to encourage consumer retention and greater commercial sustainability.

COMPETITIVE ADVANTAGE
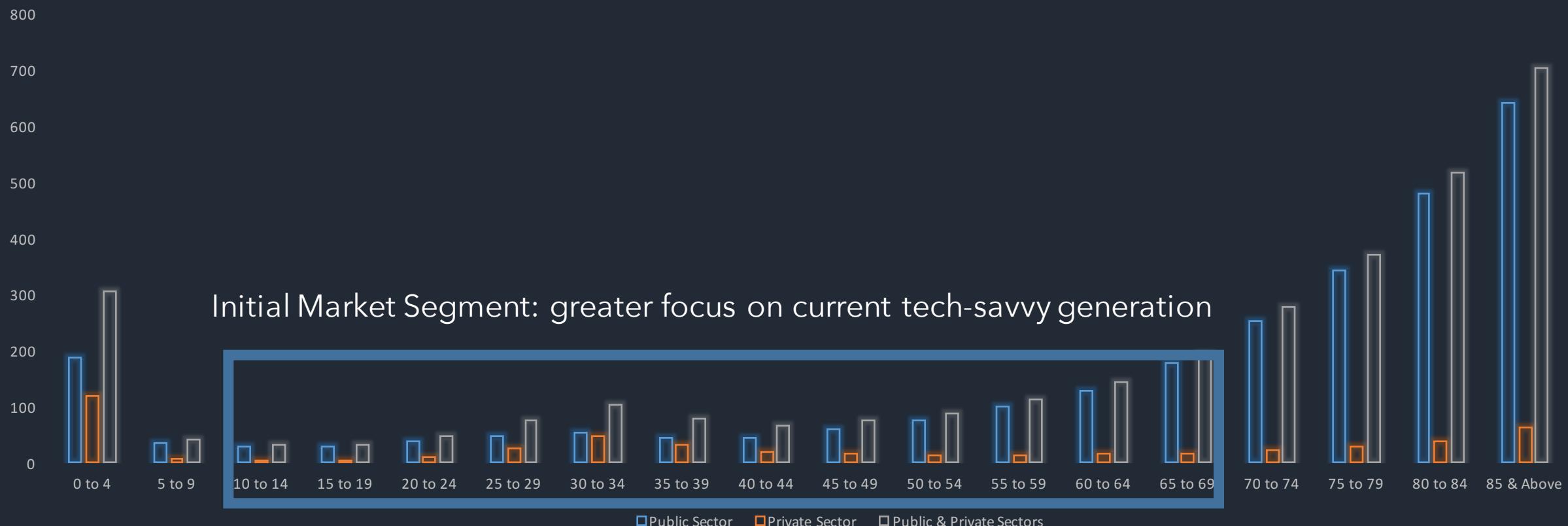
The healthcare market currently does not make use of any advanced virtual queueing systems. However, there are businesses which provide similar Queue Management System, such as *QLess*. While ideas are similar, the AQS is differentiates from its competitors in that it is integrated with patients' medical profiles while offering a more personalized and localized touch to customer experience.

The Advanced Queue System (AQS)

Analysis of the AQS

Healthcare Market Trends

Hospital Admission Rates* by Age 2015p (Rate Per 1,000 Resident Population)

Initial Market Segment: greater focus on current tech-savvy generation

■ Public Sector   ■ Private Sector   □ Public & Private Sectors

The Advanced Queue System (AQS)
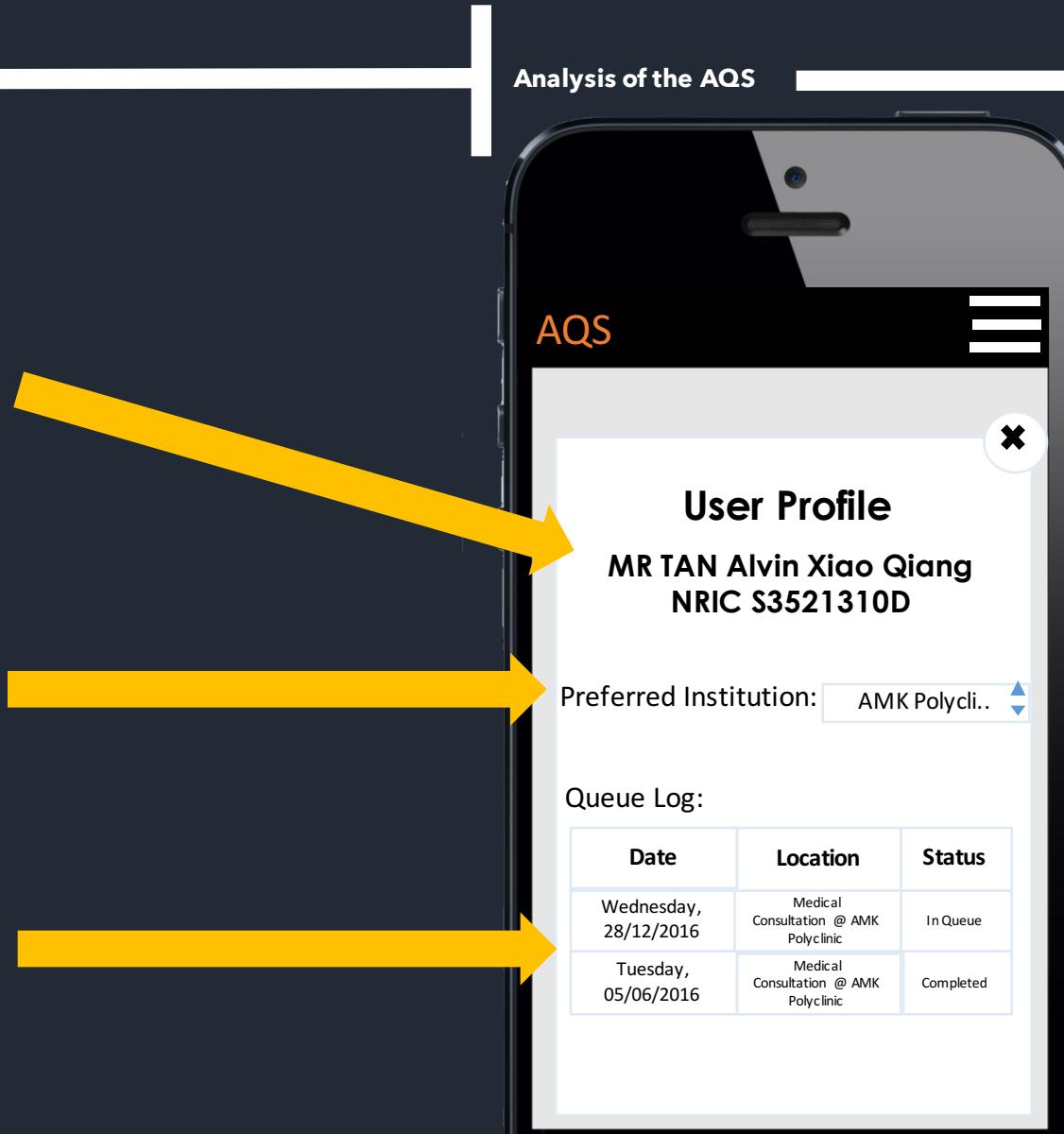
Personalized Touch

Under User Profile, the user can view his current personal information including his full name and NRIC. This information uniquely identifies each user in the AQS.

The user may indicate his preferred medical institution from the list of institutions available on the drop-down list. This is to facilitate a more hassle-free queueing without the need to indicate the medical institution each time the user queues via the AQS.

A queue long is available for each user to track down the history of his visits to the medical institutions.

AQS

User Profile

MR TAN Alvin Xiao Qiang
NRIC S3521310D

Preferred Institution: AMK Polycli..

Queue Log:

Date	Location	Status
Wednesday, 28/12/2016	Medical Consultation @ AMK Polyclinic	In Queue
Tuesday, 05/06/2016	Medical Consultation @ AMK Polyclinic	Completed

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The Advanced Queue System (AQS)

POTENTIAL MARKET SIZE

The estimated potential market size would be around 1,400,000 once the AQS is fully deployed to all regional healthcare centres. This figure is estimated based on the healthcare market trends. An estimate of about 1,800,000 patients may not be technological-savvy due to ageing population in Singapore.

OTHER AREAS OF APPLICATIONS

Small and large businesses alike may also take advantage of the AQS in serving their customers. For instance, restaurants may offer customers the option to book a table through the AQS web or mobile app instead of waiting at the long queues during peak hours. Customers may have more time to carry on with their own activities before being notified when their tables are ready.

The Advanced Queue System (AQS)
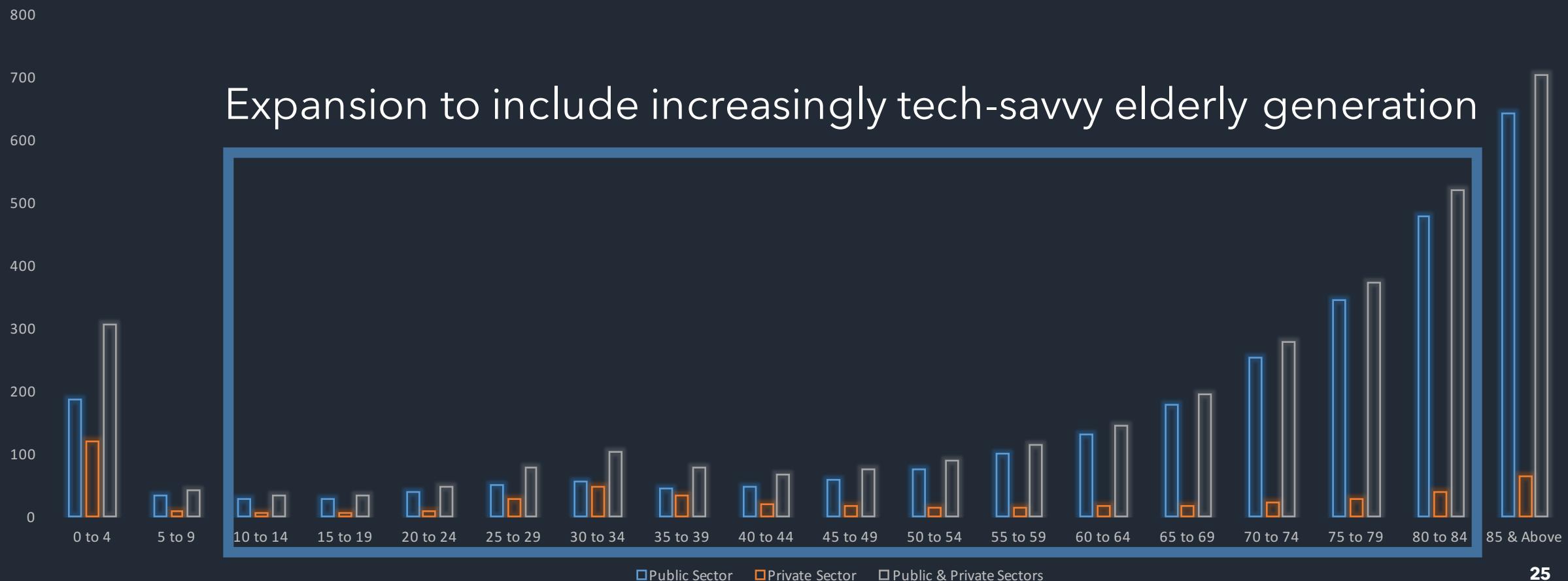
CHALLENGES

1 A foreseeable challenge while implementing the AQS is the **rapidly ageing population**. There will definitely be a substantial number of elderly who may not be technological-savvy enough to adopt the solution. However, this would not be a cause of concern because the next generation of elderly population would most likely own at least a smartphone.

2 Another challenge would be the **lack of publicity and awareness** of the AQS put in place. Without adequate marketing and publicity, the AQS would not be as effective in solving long queues at healthcare centres. There is a need to build a group of consumer database. A way to overcome this challenge is to alert all Singaporeans through email marketing to inform them of the availability of the AQS system. Alternatively, SingHealth and Health Promotion Board could also engage in viral marketing on social media such as Facebook and Twitter to inform the public.

The Advanced Queue System (AQS)

Potential Expansion

Future Market Potential

Hospital Admission Rates* by Age 2015p (Rate Per 1,000 Resident Population)

Expansion to include increasingly tech-savvy elderly generation

Public Sector   Private Sector   Public & Private Sectors

Ending Note

From my personal experience at the polyclinics, I have come to realize that the issue of long queues and waiting time has been pervasive and it poses a significant amount of inconvenience to some people, especially to the sick and needy patients. Sometimes the queues could drag up to 2 hours during peak periods, which deprives essential rest time for those who had already fallen ill. These patients require quality rest at home.

I hope my proposed solution – the Advanced Queueing System (AQS) could alleviate some of the long queues in Singapore's healthcare institutions by reducing the queueing time for patients. At the same time, the AQS would be able to ensure greater efficiency within the medical institutions and allow polyclinics and hospitals to serve more patients.

Finally, I hope that the AQS could revolutionize the queueing systems in not only medical institutions, but also be applied in small and large businesses alike. Thank you!

Selina Wong