

A Conceptual Model for Virtual Queuing System to Support Social Distancing

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Abstract— In the early December 2019, Coronavirus Disease 2019 (COVID-19) epidemic outbreak emerged from Wuhan City, Hubei Province, China and spread rapidly to the rest of the world. Globally, IT Professionals were forced to adapt and innovate rapidly in response to the pandemic and have devised a variety of IT solutions to ease peoples' transitions into the new normal. There are 4 major categories of IT-based COVID-19 solutions, namely contact tracing, quarantine management, symptom monitoring and information provision. However, most of these applications only focus on contact tracing as opposed to preventing the spread of the virus through the enforcement of social distancing. This paper presents a conceptual model for virtual queuing system, MyQueue which allows its users to enter virtual queues by scanning unique QR codes of various premises. It introduces proper process flows and approaches to eliminate waiting in a crowded queue and help support social distancing efforts to reduce the spread of COVID-19.

Keywords—virtual queue, COVID-19, COVID-19 application, QR Code

I. INTRODUCTION

Coronavirus Disease 2019 (COVID-19) epidemic outbreak emerged from Wuhan City, Hubei Province, China in early December 2019 and spread rapidly to the rest of the world. The virus continued to spread globally and would subsequently cause a pandemic that had social and economic impacts that are still felt today.

Globally, most countries had to undergo lockdowns and enforce strict social distancing protocols to prevent the spread of COVID-19 due to the unknown nature of the virus during the initial outbreak. In an effort to respond to the pandemic, professionals in the field of Information Technology (IT) have innovated and devised a variety of solutions to aid in the prevention of the spread of the virus.

In a review conducted by Singh, Couch and Yap [1] categorized IT solutions regarding the management of COVID-19 into 4 major categories namely contact tracing, quarantine management, symptom monitoring and information provision with contact tracing applications making up the majority of applications currently being released into the market. The main issue found within the release of these IT-based COVID-19 solutions is that most applications only focus on contact tracing as opposed to preventing the spread of the virus through the enforcement of social distancing.

In Malaysia, the government responded to the virus by implementing the Movement Control Order (MCO) with strict social distancing through physical distancing and crowd control. However, the solutions implemented to supplement said efforts such as MySejahtera, Qmunity, Selangkah,

Mytrace etc. are not suitable as they are mostly for contact tracing purposes only while not explicitly supporting actual social distancing between users. Therefore, the virtual queuing system, MyQueue was designed and implemented which allows its users to enter virtual queues by scanning unique QR codes of various premises. It aims to introduce the process flows and approaches to eliminate the need to be physically present in a crowded queue and help support social distancing efforts to reduce the spread of COVID-19. Fig. 1 shows a general overview of the usage of MyQueue. Through MyQueue, premise managers will be able to register a premise and obtain a unique QR code. Then, they will be able to set up counters and services and manage their staff. Customers enter a premise's queues by creating a virtual ticket when they scan a premise's unique QR Code. They will later be alerted when their turn is up via an SMS generated by the system.

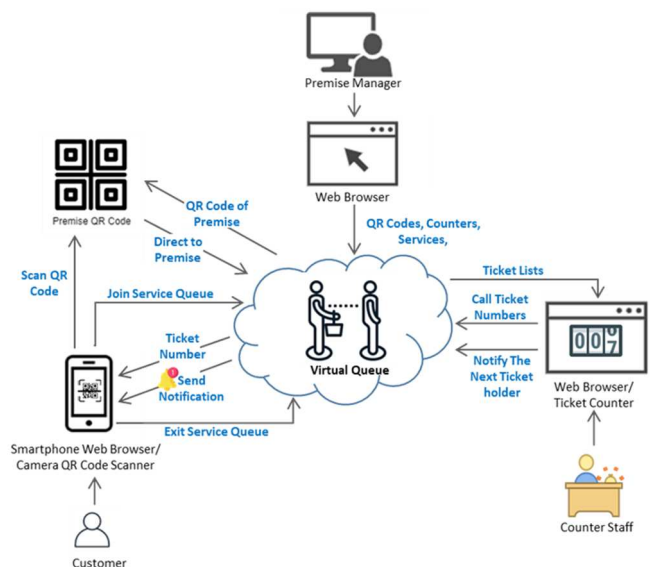


Fig. 1. The overview of MyQueue process flows

II. METHODOLOGY

This study has adopted the refined Waterfall methodology by Royce [2] to systematically plan, manage, and control the process of project development due to its clear structure and well-defined deliverables and artifacts at each phase that met the milestones and timelines requirement of the project. Pressman & Maxim [3] described the Waterfall processes as workflows as a systematic and sequential approach of workflows that starts from customer specification of requirements and progresses through planning, modelling, construction, and deployment. The major phases and activities of the Waterfall methodology in the context of this project are illustrated in Fig. 2. In the requirements analysis phase, online research will be conducted to study existing