MyTransport.SG as a new communication platform in implementing smart mobility in Singapore

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Abstract. The development and innovation of information, communication, and technology (ICT) are the key in implementing smart mobility in Singapore to create smart and sustainable mobility. One product of them is MyTransport.SG which has website and mobile application display. This research aimed to analyze MyTransport.SG in supporting the implementation of smart mobility and to understand the role of The Government of Singapore in developing this product. This research used qualitative method and collected the data from transportation and geography journal, government publications, direct observation, and interview to LTA representative as creator and developer of MyTransport.SG. The results showed that MyTransport.SG which was launched in 2011 has provided public informations, data, and report by The Government of Singapore. MyTransport.SG website provides static and dynamic transport dataset. Another display named MyTransport.SG mobile application is developed with Global Navigation Satellite System (GNSS) using Global Positioning System (GPS). This product needs to improve data update and information delivery to create inclusive environment and smart mobility. Beside of a new communication platform, this innovation in MyTransport.SG has implemented smart mobility in Singapore by achieving informative, interactive, assistive, and green mobility variables. Also, MyTransport.SG is included to e-services application by The Government of Singapore to provide advanced, renewable, and sustainable transportation around Singapore.

1. Introduction

The development of information, communication, and technology (ICT) has become important role in implementing smart city program integrating components of government, environment, community, infrastructure, and economy to facilitate work while achieving its sustainability value in the future [1]. In addition, the existence of ICT also currently influences the way to improve livability, workability, and sustainability city level achieving matter in order to reach something smarter than before [2]. One program which emphasizes the important role of ICT in its implementation is smart mobility. The integration of ICT in smart mobility aims to achieve three goals for smart and sustainable mobility, namely travel efficiently, travel differently, and reducing travel [3]. Smart mobility innovations will help commuters to travel using minimal cost, energy and time easily while providing opportunities to increase productivity, comfort, safety, and inclusiveness by physical and digital facilities. This research takes location in Singapore which achieved first position of smart city in the world measured by the infrastructure and technology variables outlined in the indicators of health and safety, mobility, activities, opportunities and governance [4]. Population of Singapore has increased to 1.9 million in a
period of 14 years and accompanied by the number of motor vehicles reaching 970 thousand vehicles and it requires Singapore government to create innovations in order to create a sustainable and comfortable city [5]. The Singapore Government through Land Transport Authority (LTA) and Intelligent Transportation Society of Singapore (ITSS) then launched a smart mobility guide until 2050 in an Integrated Transportation System (ITS) form with a vision by creating connectivity and interactive land communities. In addition, Singapore Government also issued a policy to reduce private vehicles and promote public-shared mobility vehicles in issuing a policy of transportation integration [6]. One product of smart mobility in Singapore officially is MyTransport.SG which available on website and mobile application. Therefore, the purpose of this research is to analyze MyTransport.SG by breaking digital divide to provide real time and reliable whole transport informations in Singapore, including public and private transportation mode through analyze its particular hardware and features. Also, this research aimed to understand the role of The Government of Singapore in developing this product as a new communication platform for all transport users.

2. Literature review

2.1. Mobility and transportation
Mobility is defined to an ability to move from a job, social status, or place [7]. The existence of this movement includes people, goods, services, and ideas that are caused by the driving and pulling factors to move. In the macro regional context, the ability to move is strongly influenced by transferability, complementarity, and intervening opportunities that are formed by regional interactions [8]. Transferability is defined as the ability to make transfers that are calculated in terms of distance, time, and cost, while complementarity is a form of regional interaction based on meeting the needs in a regional comparative advantage. Intervening opportunity is defined as the ability of an area to intervene in mobility because of transferability factors that are superior to other regions so that the exchange of mobility occurs through the third region. Therefore, mobility is very closely related to the existence of transportation in an area that is expected to have cheap, fast, safe, and comfortable prices. Good transportation management in a region will affect the mobility experience which will affect mobility patterns and decisions by transport users in the future [9].

| Variables  | Purpose                                      | Details                                                                |
|------------|----------------------------------------------|------------------------------------------------------------------------|
| Informative| Increasing the quality of transportation    | • Adopt new transport data collection technologies                      |
|            | technology to meet various needs            | • Dynamic processing of big data and use of intelligent data analytics  |
|            |                                              | • Enhance delivery of relevant and quality transport information       |
| Interactive| Increasing travel experience through         | • Intelligent fleet management system                                    |
|            | smart interaction                           | • Enhance integration between public transport and road operations      |
|            |                                              | • Enhance spatial context for smart mobility                           |
| Assistive  | Increasing a safe and secure roadway        | • Enhance safety at traffic junctions                                   |
|            | environment                                  | • Promote connected vehicles and infrastructure                         |
|            |                                              | • Facilitate creation of in-vehicle ITS Telematics                     |
| Green      | Increasing a sustainable and environmentally| • Promote public transport                                              |
| Mobility   | friendly ITS                                 | • Promote green vehicles                                                |
|            |                                              | • Promote green infrastructure and alternative energy sources          |

Source: LTA (2014)

2.2. Smart mobility in Singapore

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The existence of ICT in smart mobility will affect the efficiency of mobility because it will shorten the distance of physical services in the formation of digital services which may be accessed from homes/offices [10]. Therefore, smart mobility has 4 main components to support its implementation, namely technology, transportation systems, data, and services [3]. The implementation of smart mobility in Singapore is based on Intelligent Transport System (ITS) concept. ITS aims to connect and integrate people with transportation systems through innovative, smart, and real time information “on the move” technology while providing an efficient, safe, and inclusive travel experience [5]. The Government of Singapore has established 4 variables in implementing smart mobility which are described in table 1.

Smart mobility is planned to achieve by 2030. Therefore, The Government of Singapore has created several products to achieve the goals. Specifically for digital innovation, The Government of Singapore has created MyTransport.SG website as a platform to help users access transportation data and estimation their trip around Singapore efficiently.

3. Research methodology
The research method used in this study was qualitative. Data collected were carried out through indepth interview with Winnie Wong (Assistant Manager of Quality Division) as representative of Land Transport Authority (LTA) as creator of MyTransport.SG to understand the purpose of MyTransport.SG development and its utilization in achieving Smart Mobility. In addition, data collected was also achieved by direct observation to website and mobile apps of MyTransport.SG. This research also used literature study to explore smart mobility policies in Singapore by local government as well as explore history, role, and plan of developing MyTransport.SG going forward also to triangulate with results of indepth interview and direct observation. Literature study was completed through analyzing government publications and transportation journals. Data processed then was carried out qualitatively by data reduction, data presentation, and drawing conclusions described in a qualitative descriptive.

4. Results
MyTransport.SG launched in 2011 by Land Transport Authority aims to empower commuters, motorists and cyclists in Singapore to get information and predict their trips accurately [11]. This explanation could be reached possibly due to MyTransport.SG is designed for public and private transport users in Singapore to access transportation information real time as mentioned by the informant as follows:

“Commuters can make use of LTA’s Mytransport.sg app to access real-time traffic information such as bus arrival time, bus services, traffic news, parking availability, etc.”- (Winnie Wong-Assistant Manager of Quality Division, LTA)

Figure 1 shows MyTransport.SG along with other transportation products which has been downloaded 3.5 million times in 2018. The informations contained in MyTransportation are easily to share and updated by The Government to meet all transport users needs efficiently. As a transportation
platform, MyTransport.SG is a digital facility available in website and mobile app. Figure 2 shows the appearance of MyTransport.SG in website display called “data mall”. The availability of data provided on data mall is divided into two types, namely static datasets and dynamic datasets. Static dataset contains numerical/total data, i.e. geospatial data and facts. While dynamic data contains temporal data based on field conditions, namely data on public transportation, traffic, mobility, and geospatial data, for example time range of bus arrivals data at a bus stop and ERP for all private vehicles using road throughout Singapore based on certain times regularly. Specifically for geospatial data, data format is provided in .SHP, .XML, or .JSON which could be directly entered into ArcGIS or other mapping software. But on the other hand based on direct observation by the authors, transportation data provided on Data Mall does not match with other data released by other institutions in Singapore then it could cause data to overlap, especially for planning purpose. Also, most available data provided on data mall website is still not renewable data.

![Home display of MyTransport.SG mobile app. Drive users displays in the right side and Bus/MRT in the left side.](image)

**Figure 3.** Home display of MyTransport.SG mobile app. Drive users displays in the right side and Bus/MRT in the left side.

MyTransport.SG mobile app could be downloaded via android or iOS system based on Global Navigation Satellite System (GNSS) using Global Positioning System (GPS) on each telephone device as particular component. Therefore this application is location-based and smart features of frequently trips, notification of traffic conditions, and a trip planner with several modes of transportation based on telephon site accurately. Figure 3 displays the difference in information display based on the choice of transportation mode to be used by application users with Bus/MRT mode or driving by private vehicle. The informations contained are useful for users to estimate their cost and travel time then users may decide their route efficiently and arrive at their destination in accordance with a predetermined time accurately. Instead of those good advantages of MyTransport.SG, based on direct observation this application must improve information delivery regarding the condition of disability-friendly transport fleet to achieve inclusive travel and smart mobility. Until now information on this matter could be accessed directly at bus stops / MRT stations / ITHs. The features MyTransport.SG mobile application are explained in table 2.

**Table 2.** MyTransport.SG mobile app features.

| Features          | Function                                                                 |
|-------------------|---------------------------------------------------------------------------|
| Bus Arrival Time  | Information on estimated bus arrivals is based on the bus stop or bus number |
| Bus Services      | Information on bus capability based on bus stop or bus number              |
| MRT/LRT           | Information on MRT capabilities and rates based on station or time          |
| Traffic News      | Latest news about traffic conditions, such as road closure accidents, and others |
| ERP               | Information about ERP and rates based on location and time                  |
| COE               | Information regarding permitted registration of private vehicles           |
| Snap and Send     | Reporting road infrastructure conditions, also accidents                   |
| Exam Centres      | Information on centers for conducting educational exams during the examination period |

Source: Field Observation (2020)
The existence of MyTransport.SG has achieved four variables of smart mobility in Singapore namely informative, interactive, assistive, and green mobility by analyzing its features and utilization directly. As informative variable, MyTransport.SG has used GNSS technology and camera infrastructure along with transportation infrastructure in Singapore. In addition, MyTransport.SG has high-quality and relevant transportation information transparency by delivering travel information and modes of transportation through the website (data mall) and mobile application regularly. As interactive variable, MyTransport.SG has integrated public transportation to road use by traffic cameras and news features, ERP, and public transportation modes in mobile application. MyTransport.SG also has adopted spatial context by providing geospatial data with dynamic and static datasets format. Assistive variable has also been fulfilled by increasing high quality features to promote vehicle connectivity and infrastructure as well as to achieve green mobility variable. These smart features will help transportation users to find out and plan their trip easily.

The Government of Singapore has important role in developing MyTransport.SG. Local government has transformed the country to world class information technology since 1981 with “the Civil Service Computerization Program (CSCP)” then followed by other master plans by E-Government Action Plan I (2000-2003), E-Government Action Plan II (2003-2006), iGov 2010, and eGov 2015 (2011-2015) which involved all of strategies to prepare and realize ICT integration to all part of government and communities [12]. MyTransport.SG finally was launched in 2011 and entered into M-Government Portal under mGov@SGInitiative along with 150 other applications aimed to facilitate individual and businesses in searching and accessing mobile services provided by government, such as traffic conditions and transportation infrastructure then it could be accessed through a mobile portal or application [13]. This product is included in e-services application formed directly by The Government of Singapore in providing advanced, renewable, and sustainable transportation services using the website and mobile app platforms. The Government of Singapore as facilitator has been developing MyTransport.SG as a smart communication platform comprehensively. This purpose could be understood through innovation of these features, such as snap and send feature which is a 24-hour reporting facility. In addition, MyTransport.SG provides latest information about transportation conditions and registration status of their vehicles automatically, such as One Motoring Digital Services, and COE. Also, MyTransport.SG becomes a container to channel transportation data online and 24 hours which was previously only accessible offline accessed.

5. Conclusion
This research was conducted during COVID-19. Therefore, there is limitation to do direct interview on-site which only interviewed one person as representative. In addition, the existence of smart mobility master plan in 2040 also needs to be linked in order to find out about the MyTransport.SG development future plan. The results of this research showed that MyTransport.SG is a new communication platform by government of Singapore (LTA) to support the implementation of smart Mobility in Singapore. This product is available in a website and mobile application display offered to provide information on public and private transportation in Singapore, then it could be used to accurately predict trips efficiently and effectively. This product has smart features to plan trips easily and provides all of transportation data on its website or data mall, but most data available on data mall website is not renewable data and does not match with other data released by other institutions in Singapore. Also, MyTransport.SG need to improve the delivery of information regarding disability-friendly fleet facilities. Related to smart mobility variables, MyTransport.SG has also fulfilled informative, interactive, assistive, and green mobility variables stated by The Government of Singapore. In realizing this product, The Government of Singapore has transformed and planned the integration of ICT since 1981. MyTransport.SG finally was launched in 2011 and entered to e-services application to provide advanced, renewable, and sustainable transportation services. MyTransport.SG features has also been developed regulary to meet public needs and solve digital divide and physical facilities problems.
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