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Adoption of Intelligent Transportation System: Hong Kong Bus Companies

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ABSTRACT

Bus is one of the significant segments in Hong Kong public transport. Since 1970s, Hong Kong bus companies have faced keen competition with other modes of transport. The purpose of this study is to identify the connection among Intelligent Transportation System (ITS), service quality and customer satisfaction for Hong Kong bus industry with respect to the 5 components of SERVQUAL by comprehensive literature review. The discussion reveals that ITS can enhance service quality of Hong Kong bus companies, as well as its customer satisfaction. Through ITS, Hong Kong bus companies could improve the performance and increase their competitive advantages to compete with Mass Transit Railway (MTR).

KEYWORDS: Bus, Hong Kong public transport, Intelligent transportation system, Service quality, SERVQUAL

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1 INTRODUCTION

In the past few years, Intelligent Transportation System (ITS) has grown rapidly over the world. The global ITS market is further expected to grow at a Compound Annual Growth Rate (CAGR) of 11.1% from 2013 to 2019 (PR Newswire Association, 2014). ITS has been applied to the section of transportation and logistics in many countries, such as Europe, Japan and America etc. (Kumar et al., 2005). ITS is a system which communicates processes and memorizes in transportation networks. Sussman (2008) defined ITS as systems that we can electronically link with different vehicles and infrastructure. It is an advanced technology which operates the transportation systems. According to Intelligent Transport Systems Hong Kong (2014), ITS can be widely applied in traffic control and surveillance, toll and fare collection, parking and access management, route selection and guidance, fleet management, position and tracking and signalling for guided vehicles. With these functions, ITS has been classified as Advanced Traffic Management System (ATMS), Advanced Traveller Information System (ATIS), Advanced Vehicle Control and Safety System (AVCSS), Advanced Public Transportation System (APTS), Commercial Vehicle Operation (CVO) (U.S. Department of Transportation Federal Highway Administration, 1997). In our paper, the following structure would be as the following details. After the introduction in Section 1, Section 2 would be the literature review. Research methodology and Intelligent Transportation System (ITS) would be discussed in Section 3 and 4 respectively. Research findings would be appeared in Section 5 and Section 6 would be conclusion.

This study is getting insights of the impact of ITS on service quality of bus industry in Hong Kong with respect to the 5 components of SERVQUAL by literature review. However, in 67 literature reviewed, there are only 10 journals about the ITS technology, while none of them is focused on bus industry. There has no literature review that discusses about ITS technology adopted in Hong Kong bus industry, thus a research gap is created. Therefore, it appropriates to carry out this initial study. This study will narrow the gap by research and further discussion on this particular topic about the Hong Kong bus companies in their future development and innovation. For the information of ITS, such data are mainly collected from the government documents, reports and news from all over the world in order to get more details of the system.

2 LITERATURE REVIEW

Service quality helps one company to differentiate itself and maintain competitive advantage, for instance, enlarge customer base and increase the market share. 7 service attributes, notably security, consistency, attitude, completeness, condition, availability and training which are believed can be represented service quality are listed out by Sasser et al. (1978). Parasuraman et al. (1985) developed SERVQUAL model to measure service quality. Service quality is one of the important ways for customer retention (Venetis and Ghauri, 2004). Bitner (1990), Bolton and Drew (1991), Boulding et al. (1993) and Cronin and Taylor (1994) discussed that service quality has a positive impact on retention, as well as creating positive word of mouth. Parasuraman et al. (1996) mentioned that service quality affects different customer intentions. They would be more willing to give recommendations and consume from the service providers. From the above definitions, service quality is one of the factors to attract and retain customers by making them satisfaction.

Enayati et al. (2013) described SERVQUAL is the most common model to measure service quality. SERQVUAL can be widely applied in different fields of determine customer satisfaction through the years, because of service quality is reported to have significant positive connection with customer satisfaction (Boltan and Drew, 1991; Sheather and Roberts, 2003; Boulding, et al. 1993, Burton) and customer retention (Reichheld and Sasser, 1990; Souca and Luiza, 2011). The model has also been developed to determine the key

criteria which lead to a selection of service and service satisfaction decisions (Fugate, 2008). The SERVQUAL first introduced by Parasuraman et al. (1985). They conducted in-depth study and formulated 10 components, including tangibles, reliability, responsiveness, competence, access, courtesy, communication, credibility, security and understanding. In 1988, these 10 components were summarized into 5 core components (Parasuraman et al., 1988) as followed.

- Reliability - the ability of performing the promised service which should be safe, dependably and accurately in order to meet customer expectation;
- Assurance - the degree of knowledge and courtesy of the staff, their capacity to convey and inspire trust and confidence to customers towards the organisation. It can be regarded as warranty or guarantee;
- Tangible - the appearance state of physical facilities, equipment, personnel and communication materials which belongs to a quality of service;
- Responsiveness - the willingness to help customers and to provide prompt service;
- Empathy - the ability of giving individualized attention, caring to every customer and treating them based on their special features and characteristics (Gorgi et al., 2011).

3 DISCUSSION

3.1 Reliability

Turnquist and Blume (1980) proposed transit service reliability is the ability to comply with the schedule or maintain regular trips. Strathman et al. (1999) and Kimpel (2001) also believed that reliability is connected with schedule adherence. A lack of control due to the uncertainty of the vehicle arrival makes the service unreliable (Beirao and Sarsfield-Cabral, 2007). The length of waiting time is one of the main concerns of the passengers in reliability of public transportations (Abane, 1993). Unreliable service causes additional travel and waiting time for passengers (Wilson et al., 1992; Strathman et al., 2003). Kariuki (2006) found that punctuality and reliability of the vehicle are the significant factors for passenger satisfaction (Randheer et al., 2011).

According to Hong Kong's Information Services Department (2014), lost trip rate refers to the difference rate between actual bus trips and scheduled bus trips. In 2014, the overall average lost trip rates of franchised bus in Hong Kong were 2.6%. There were over 7,500 complaints about irregular bus service from the passengers, which is increased around 1,000 from the previous year. ITS can help bus companies to investigate the traffic and arrange the buses frequency in regard of the traffic congestion. This helps to maintain the punctuality of the bus services so as to reduce waiting time of passengers. In addition, ITS mobile app provides passengers for the estimated arrival time of the coming bus, as well as the current traffic conditions. Hence, passengers are able to adjust and plan their trip before they go to the bus stop. This will reduce the waiting time of the passengers. Therefore, the reliability gap can be narrowed.

3.2 Assurance

In Hong Kong bus industry, assurance is defined as the personal safety of passengers at bus stops and on buses (Cavana et al., 2007). Eboli and Mazzulla (2013) further explained assurance is the degree of safety from crime or incidents and the psychological factors. From 2009 to 2013, a number of accidents of Hong Kong bus have been increased from 1,916 to

2,344. The statistics made customers lose confidence of the service quality and safety of the Hong Kong bus companies (Transport Department, 2014). However, ITS mobile app only provides information about traffic and buses, which cannot give trust and confidence to passengers of their personal safety neither reducing accidents on the road. Therefore, the gap of assurance between customers and Hong Kong bus companies are failed to narrow by ITS mobile app.

3.3 Tangible

Cavana et al. (2007) defined tangible in Hong Kong bus industry as the clarity of information given it in timetables. According to Leung et al. (2011), they have found that MTR was appraised as the best performance in public transport among all the competitors and had a higher preference in transportation in Hong Kong resident mindset. It may attribute to its useful and timely information such as the arrival and departure time of train or the complete routine information provided by MTR. Hence, it made MTR to be successful and the most preferable public transport towards citizens in Hong Kong. However, the authors pointed out that buses and minibuses were the unfavorable choices in Hong Kong public transport sectors because of its incomplete or delayed information and the unpredictable situation in which service providers may create difficulties and bring customers inconvenience in result (Leung et al., 2011). In addition, from another literature, the findings shown that foreigners may encounter uncomfortable feelings or be overwhelmed because of the language barriers, ambiguous information and inexperienced system when they took Hong Kong public transport (Leung et al., 2013). As a result, Hong Kong bus service operators require improving their tangible service quality in order to compete in the rivalry and maintain a sustainable competitive advantage. In this case, ITS mobile app can close the tangible gap for Hong Kong bus companies by providing up-to-date and comprehensive information including bus routes, bus timetables, station locations, departure times etc. to the customers. Furthermore, different languages could be provided in the app to break the language barrier for customer to obtain information. In other words, the customers would feel comfortable to use the app about the Hong Kong bus service. Therefore, the tangible gap can be narrowed.

3.4 Responsiveness

The responsiveness of Hong Kong bus service can be defined as the cost-effectiveness and the quick response time. Cost-effectiveness is time related constructs, for example, the high availability of Hong Kong bus information (Megha, Ashish, Ajith and Sneha, 2013). There are various types of measurement to evaluate the transportation system performance, some are schematic while others are more specific (Eboli and Mazzulla, 2012). To measure the performance of a service operator, we can set as input, output, or outcome as the considerations (Dalton et al., 2000). Input measurement focus on the resource allocation while the output measurement concentrated on the impact of result on the final goals. Outcome measurement is more significance, since it directly rates the result such as time consumed in the service process. The measurement also relates to the strategic goals of service provider (Eboli and Mazzulla, 2012). However, many researches addressed that there is a gap in responsiveness due to expectation scores are larger than perceived scores of the passengers in the measurement (Randheer et al., 2011; Kumar, 2012; Eboli and Mazzulla, 2012; Megha et al., 2013). Meanwhile, some studies discussed that the prompt service is the lowest score. ITS mobile app can narrow the gap by providing real-time tracking and instant information to passengers. With the real-time tracking function, estimated arrival time of the Hong Kong bus can be obtained from the app. The instant information allows users know about the current traffic. Therefore, waiting time could be reduced as passengers can plan their routings before they wait at the bus stops. Since the time used in the whole journey of transport is reduced, the service would be more cost-effective. Therefore, the gap of responsiveness could be narrowed.

3.5 Empathy

Empathy is defined as the ability to give individualized attention and take care to every customer so as to provide specialised services to each customer. In public transportation, the operation hours are convenience to the customers would be count as empathy (Badri et al., 2005). According to Edvardsson (1998), customers concern about how much the Hong Kong bus company and its staff knows what they need. Friendliness, helpfulness behaviour and professional knowledge of the bus drivers lead to comfort the customers by answering their enquiries and satisfy their needs (Disney, 1998). The bus driver is the main personnel to interact with the customers. However, it is difficult for the bus drivers to answer the enquiries when they are driving. The ITS mobile app provides alight reminder to remind the customers that they have arrived their destination and prepared to get off at the right bus stop. This function allows customer to set their own destination and provides personalised service to them. Besides, the app will provide service in 24 hours 7 days. Customer could use the service and browse the information via their mobile phones without restriction. ITS provides humanity, convenience and personalised service to them, and hence, ITS narrow the empathy gap between Hong Kong bus companies and its customers.

4 CONCLUSION

The finding of this study indicated that ITS influences significantly the service quality of Hong Kong bus companies. ITS can narrow the gap of SERVQUAL components, including reliability, responsiveness, empathy and tangible. However, the gap of assurance is failed to be narrowed. To a large extent, ITS enhance the service quality of Hong Kong bus companies. From this study, service quality determines customer satisfaction level.

BIOGRAPHICAL NOTE

Ms. Ng Wei Lok Camellia graduated from School of Professional Education & Executive Development, The Hong Kong Polytechnic University and received Bachelor of Arts (Honours) in Marketing and Public Relations. She is now working at Muse Group Limited. Her research interest is corporate marketing.

Mr Lau Yui Yip has published over 60 research papers in international journals and professional magazines, and contributed book chapters and presented numerous papers in international conferences. He collaborates with scholars from more than 20 countries and regions spreading over five continents on research projects. In addition, he has participated in different consultancy projects with various (inter-)governmental organisations, academic institutions and industrial associations, e.g. Trade and Industry Department, China Communications & Transport Association (CCTA), The Chartered Institute of Logistics and Transport (CILT), the Institute of Seatransport, Hong Kong Sea Transport and Logistics Association (HKSTLA), and The Hong Kong Polytechnic University. His research interests are Transport History, Maritime Transport, Air Transport, Port Planning, Supply Chain Management, Green Transport, Maritime Law, Public Transport, Maritime Education and Human Geography.

Mr Lau has been active in scholarly activities. For example, he is an editorial board member of *Seaview*, a reviewer of *Journal of Shipping and Ocean Engineering, Management Studies, Journal of Business and Economics* and leading international conferences. Recently, he has been awarded Certificate of Appreciate in recognition of Outstanding Performance on research (Institute of Seatransport) and Best Paper Award in international leading conference.

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