DECLARATION

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ABSTRACT

Ridesharing has been linked to a variety of social, environmental, and behavioral benefits including reducing fuels and energy consumption, greenhouse gas (GHG), traffic related emissions, traffic congestion, travel cost and also decreasing the need for parking. Ridesharing users may utilize it to fulfill their entire journey for example from origin to destination or to enhance public transit, with the goal of bringing public transportation more into the sustainable transportation by reducing automobile usage and increasing vehicle occupancy. Numerous research on ridesharing generally have been conducted, however there has been less emphasis on explaining demographic and perception of ridesharing in colleges and universities mainly in Universiti Malaysia Sabah (UMS). The main objectives of this study are to identify the influencing factors that influence respondents' decision to use ridesharing, to determine the problems that respondents experienced during ridesharing based on their perceptions and experiences and to identify respondents' ideas to improve or increase the ridesharing usage. The methodology used by the researcher is a quantitative questionnaire tool via google form with 377 respondents participating in this study. To analyze the quantitative data, the researcher employed several tests via SPSS and Microsoft Excel including descriptive statistics frequencies analysis, mean value comparison, Chi-Square test and Relative Index Important (RII). Based on the analysis, the researcher found that demographic characteristics have positive significant association with ridesharing utilization. The majority believed that ridesharing is faster, more comfortable, less expensive, safer, better for the environment, and provides convenient application. Respondents were most worried about a loss of privacy or independence during the ridesharing, a limitation of proper facilities, a lack of personal data security, and an unclear cost structure and timetable. These findings will be valuable to ridesharing service providers since they will be able to determine which factors have the least effect on customer experience.

ABSTRAK

Perkongsian tunggangan telah dikaitkan dengan pelbagai faedah sosial, alam sekitar dan tingkah laku termasuk mengurangkan penggunaan bahan api dan tenaga, gas rumah hijau (GHG), pelepasan berkaitan trafik, kesesakan lalu lintas, kos perjalanan dan juga mengurangkan keperluan untuk tempat letak kereta. Pengguna perkongsian tunggangan boleh menggunakannya untuk memenuhi keseluruhan perjalanan mereka contohnya dari asal ke destinasi atau untuk meningkatkan transit awam, dengan matlamat untuk membawa pengangkutan awam lebih banyak ke dalam pengangkutan mampan dengan mengurangkan penggunaan kereta dan meningkatkan penghunian kenderaan. Banyak kajian mengenai perkongsian tunggangan secara amnya telah dijalankan, namun kurang penekanan untuk menerangkan demografi dan persepsi perkongsian tunggangan di kolej dan universiti terutamanya di Universiti Malaysia Sabah (UMS). Objektif utama kajian ini adalah untuk mengenal pasti faktor-faktor yang mempengaruhi yang mempengaruhi keputusan responden untuk menggunakan perkongsian tunggangan, untuk menentukan masalah yang dialami oleh responden semasa ridesharing berdasarkan persepsi dan pengalaman mereka dan untuk mengenal pasti idea responden untuk menambah baik atau meningkatkan penggunaan perkongsian tunggangan. Metodologi yang digunakan oleh pengkaji adalah alat soal selidik kuantitatif melalui google form dengan 377 responden mengambil bahagian dalam kajian ini. Untuk menganalisis data kuantitatif, pengkaji menggunakan beberapa ujian melalui SPSS dan Microsoft Excel termasuk analisis frekuensi statistik deskriptif, perbandingan nilai min, ujian Chi-Square dan Relative Index Important (RII). Berdasarkan analisis, pengkaji mendapati ciri demografi mempunyai perkaitan signifikan yang positif dengan penggunaan perkongsian tunggangan. Majoriti percaya bahawa perkongsian tunggangan adalah lebih pantas, lebih selesa, lebih murah, lebih selamat, lebih baik untuk alam sekitar dan menyediakan aplikasi yang mudah. Responden paling bimbang tentang kehilangan privasi atau kebebasan semasa perkongsian tunggangan, had kemudahan yang sesuai, kekurangan keselamatan data peribadi dan struktur kos dan jadual waktu yang tidak jelas. Penemuan ini akan menjadi berharga kepada penyedia perkhidmatan perkongsian tunggangan kerana mereka akan dapat menentukan faktor mana yang mempunyai kesan paling sedikit terhadap pengalaman pelanggan.

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LIST OF ABBREVIATIONS

GPS	-	Global Positioning System
SEA	-	South East Asia
USD	-	United States Dollar
UMS	-	Universiti Malaysia Sabah
GHG	-	Greenhouse Gas
ICT	-	Information Communication Technology
US	-	United States
SPSS	-	Statistical Package for the Social Sciences
RII	-	Relative Important Index

LIST OF SYMBOLS

%	-	Percentage
$\sum$	-	Summation
w	-	Weight
A	-	Highest Weight
N	-	Number of Respondent

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CHAPTER 1

INTRODUCTION

1.1 Background of Study

A well-functioning transportation system is critical to a city's economic and social growth. In acknowledgement of this crucial significance, transportation networks have been referred to as the "lifeblood" of cities (Miller et al., 2016). Expanded transportation networks aided urban growth in the twentieth century, but they also posed a number of issues in terms of ensuring sustainability. A sustainable transportation system should be dependable, efficient, and safe while also having a low environmental effect (Gołda *et al.*, 2017). Because the transportation industry has such a large influence on society in terms of the environment, social issues, and economics, it is critical that it adopt the notion of sustainable development. Lack of accessibility and capacity to employ analytical approaches in the creation of transportation network plans need the development of simplified models for specific modes of transportation (Gołda *et al.*, 2017).

The landscape of vehicle services has rapidly changed since the emergence of ridesharing services early in 2014, while the world has received its own facelift thanks to advancements in mobile phones, innovative internet connections, and a interactive technique framework that associates drivers and passengers (Mittendorf, 2016;Teubner and Flath, 2019). This system is called ridesharing system, and they combine the advantages of a private car such as door-to-door service and flexibility with the advantages of public transit.Commuters request a trip from a personal driver car operated by a typically unlicensed driver using a smartphone program actual demand, integrating GPS and billing customers depending on distance charge (Davis, 2015).

Ridesharing has grown in popularity as a way to reduce automobile usage, promote multimodal transportation, and reduce greenhouse gas emissions and other emissions. In the normal given situation, their vehicle is parked for 95 percent of the period (Morency *et al.*, 2015). In Malaysia, ridesharing services have been known as Uber and Grab since their launch in 2012. Grab, on the other hand, acquired Uber Southeast Asia (SEA) operations in March 2018, thus uniting the two ride-hailing behemoths. The e-hailing service has expanded outside Malaysia's capital to include places such as Johor Bahru, Penang, Ipoh, Kinabalu and Kuching (Land Public Transport Commission, 2015). This has sparked renewed desire among Malaysians to participate in the shifting scene.

Furthermore, GrabTaxi's mobile platforms have 170,000 registered drivers from Malaysia, Singapore, Thailand, Vietnam, Indonesia, and Philippines which operate MyTeksi and Grab Car, encompassing taxis, personal automobiles, and motorcycle taxis (Omar *et al.*, 2019) The research aims to look into the characteristics that influence ridesharing usage in the Universiti Malaysia Sabah (UMS) campus in Malaysia, and then explore some of the implications for sustainable transportation.

In South East Asia, ridesharing is a prominent kind of transportation. The ridesharing industry in Southeast Asia has grown dramatically in a very short period of time, thanks to growing use of mobile applications and rising demand for mobility. Uber began in Southeast Asia in 2013, and was quickly followed by Grab, which extended beyond taxi hailing by launching a competitor service named GrabCar. Using an application, commuters may access automobiles for point-to-point mobility. When a potential rider wants a trip, the platform displays a set or projected fee that the user may approve or refuse. Drivers are alerted after it has been accepted, and they may then approve or decline the trip. When the driver agrees, the passenger is picked up and transported to the location (Lee, 2017).

Having 40 million active users, ridesharing has grown to be a key component of the SEA industry, with a value surpassing 13 USD billion in 2019 (Davis *et al.*, 2019). A combination among rider demand and driver supply is required to construct a fully efficient system that provides the least costly

transportation to passengers and the corporation (Scheiber, 2017). The workforce availability on this system is not managed by the corporation, but rather by a large number of independent individuals (Redfearn III, 2016).

As ridesharing has become more prevalent in daily life, SEA have attempted to address the concerns associated with it. Because of these characteristics, ridesharing is fast expanding in many nations and cities throughout the world. Furthermore, previous research has revealed the existence of several, distinct ridesharing market segments such as locals, students, visitors, clients taking short-term or out-of-town vacations where each category has distinct demand characteristics (Danielis *et al.*, 2016). This study will focus on the sector of university students. Several research on ridesharing in general have been conducted, however there has been less emphasis on ridesharing on university campuses.

This paper suggested a methodology for estimating prospective demand for carsharing, with a focus on UMS students. The methodology is based on a survey which is a questionnaire to be delivered to as broad a sample of students as feasible to obtain data and information regarding the ridesharing among the students. The acquired data is utilized to estimate the ridesharing demand according to the student's skill and understanding of the ridesharing utilization. This study is to assist engineers in making decisions regarding this topic, as well as offering information and direction to new engineers who lack expertise in performing future studies. Other than that, this study can promote and raise public awareness about the convenience of the transportation system as well as the importance of ensuring sustainable transportation.

1.2 Problem statement

Some writers discovered a larger interest in vehicle pooling among people whose travel times do not rely as much on personal automobile use (Hinkeldein *et al.*, 2015). An identical relationship is demonstrated when individuals who are more happy with public transportation are considered (Wang *et al.*, 2017; Mugion *et al.*,

2018). In previous research, those living in urban areas, males, and younger generations showed a strong desire in vehicle sharing possibilities (Prieto *et al.*, 2017; Carteni *et al.*, 2016). Given that the population of ride sharing individuals varies from town to town, the demographic features of carpooling individuals are an essential issue to explore in this perspective (Efthymiou and Antoniou, 2016).

Therefore, literature review of ridesharing, the variety of ridesharing members' usage factors and experience, as well as the need to investigate the impact of the utilization toward sustainable transport, keeps research knowledge in this topic strong. Numerous research on carpooling generally have been conducted, however there has been less emphasis on commuting on colleges and universities especially in UMS. The current rideshare research has primarily focused on examining and analyzing the technical elements of shared travels rather than aiming to explain demographic, perception, and experiential variables. This research adds to the existing information and makes a contribution in this topic by suggesting a strategy for investigating university students' opinions and measuring their likelihood to join vehicle sharing based on several variables.

One significant downside of these operations is that they contribute automobiles to the street and enhance traffic congestion in already congested locations, severely impacting the environment and renewable energy targets. Ridesharing is recognised as an efficient method of alleviating road traffic congestion (Wang *et al.*, 2018; Wang *et al.*, 2020; Zhang *et al.*, 2018). Ridesharing has been demonstrated to increase road system performance, shortened trip times and cheaper transport expenses without needing significant additional spending on infrastructure (Liu *et al.,* 2018; Cleophas *et al.*, 2019). According to the United Nations Sustainable Development Goals, sustainable transportation is one of the elements of ecological sustainability. The necessity for sustainable transportation is also a prominent subject in green infrastructure, with the demand for such technologies regarded as a way to mitigate the negative consequences of urbanization (Gopalakrishnan *et al.*, 2015).

Transport systems frequently rely on advancement to deliver convenient services to the community (Tan & Taeihagh, 2020), and commuting is one method for achieving an efficient and sustainable town. Ridesharing has the potential to assist the ecosystem. It has the potential to alter consumer behavior by decreasing customer desire for personal vehicles, resulting in reducing emissions from the acquisition of additional automobiles or the usage of existing vehicles (Yu *et al.*, 217). Because of this, it is becoming extremely essential to understand carpooling management and the techniques used by multiple jurisdictions in the supervision of technological advances toward transportation sustainability. Despite numerous substantial research studies on travel behavior modification, possible approaches for effectively changing people's choices particularly university students' transportation modes towards sustainability remain unexplored.

1.3 Objectives

The purpose of this study is to look into the usage of ridesharing in UMS, as well as the factors that influence it and its impact on sustainable transportation. The following objectives will be used to achieve this aim.

a) To identify the influencing factors that influence respondents' decision to use ridesharing.
b) To determine the problems that respondents experienced during ridesharing based on their perceptions and experiences.
c) To identify respondents' ideas to improve or increase the ridesharing usage.

1.4 Scope of Study

The main focus of this research was to study the ridesharing utilization in UMS, the influencing factors and impacts towards sustainable transportation. This study gave the primary intention of an infamous and important university located in the city of Kota Kinabalu. The chosen location was due to the potential of the university located in the urban town with the broad connection of the transit hubs to the

different route areas. In addition, the preferred location was also crucial for future research performed by another researcher since there was still a lack of studies made on ridesharing among university students in Sabah. This study was conducted based on questionnaires for data collection from various respondents.

The focus respondents for this survey primarily comprised the people who have adopted or experienced ridesharing. The questionnaire surveys were carried out via online survey method as a primary tool for collecting data in regards to the ridesharing utilization including influencing factors and impact towards sustainable transportation in UMS. The number of data samples collected from the questionnaire surveys were conducted. The establishment of the questionnaire survey was using structured questions for more in-depth information regarding ridesharing utilization among university students, experiences and perceptions, and level of satisfaction on ridesharing, along with the challenges encountered by students while adopting the ridesharing habits or services and also ideas to improve the ridesharing services.

1.5 Significance of Study

This study will be able to grasp the engagement of students or staff in ridesharing in the selected university. It will become a big help to the organization or individuals who run or make the ridesharing business or services to take the necessary steps in order to meet the new standard practices in flattening the curve while at the same time coordinating a conducive and reliable transportation system for future preparation. The assembled data will be useful for future use in the research related to sustainable transportation.

Thus, it is essential to perform this case study. This probe is indeed substantial to evaluate the individuals' reaction on the use of ridesharing which is to be said to have pros and cons as the carpooling improvement arises. The users' response and feedback are crucial as a benchmark in enhancing transportation services that meet the passenger's expectation, help to present the challenges and efficient ways to improve transportation towards sustainability. It is a challenging

task for the management or higher authority to abruptly change the ridesharing system or process since there will be a loss and risk that has to be faced. Therefore, this research will be a big help for future preferences.