การตรวจสอบความตั้งใจที่จะใช้ GOOGLE MAPS เพื่อการเดินทางของผู้ใช้งาน

INVESTIGATING INTENTIONS TO USE GOOGLE MAPS FOR TRAVELLING AMONG USERS

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งานวิจัยนี้ศึกษาการเชื่อมโยงระหว่างทฤษฎีรูปแบบการยอมรับ (TAM Model) และความตั้งใจใช้งาน Google Maps ในอนาคตในประเทศไทย ผ่านตัวกลางความพึงพอใจของผู้ใช้งาน ตัวกำหนดปัจจัยของแบบจำลอง TAM ได้แก่ การรับรู้ถึงความสะดวกในการใช้งาน (PEOU) และการรับรู้ถึงประโยชน์ (PUF) ระเบียบวิธีวิจัยใช้การวิจัยเชิงปริมาณ กรอบแนวคิดการวิจัยได้รับการตรวจสอบโดยใช้ข้อมูลจากผู้ใช้ Google Maps 423 รายในประเทศไทย กลุ่มตัวอย่างครั้งนี้ ใช้การสุ่มแบบความสะดวกทางออนไลน์ และใช้การวิเคราะห์ข้อมูลเชิงพรรณนาใช้ SPSS เวอร์ชัน 29 และทดสอบสมมติฐานโดยใช้แบบจำลองสมการโครงสร้าง (ADANCO 2.3.2; PLS-SEM) ที่ระดับนัยสำคัญทางสถิติ น้อยกว่า 0.001 เพื่อระบุความสัมพันธ์ระหว่างทฤษฎีรูปแบบการยอมรับ (TAM Model) และความตั้งใจในการใช้งาน Google Maps ในประเทศไทย โดยมีความพึงพอใจของผู้ใช้เป็นตัวกลางระหว่างตัวทำนายและผลลัพธ์ ผลวิจัยพบว่า ความพึงพอใจของผู้ใช้เป็นตัวกลางที่สำคัญในการเชื่อมโยงระหว่างทฤษฎีรูปแบบการยอมรับ (TAM Model) กับความตั้งใจในการใช้งาน Google Maps โดย การรับรู้ถึงความสะดวกในการใช้งาน (PEOU) และการรับรู้ถึงประโยชน์ (PUF) เป็นปัจจัยสำคัญในการทำนายความตั้งใจที่จะใช้ Google Maps โดยผ่านตัวกลางความพึงพอใจ แต่อย่างไรก็ตาม ความสะดวกในการใช้งาน (PEOU) เป็นเพียงปัจจัยเดียวที่มีอิทธิพลโดยตรงต่อความตั้งใจที่จะใช้ Google Maps แต่การรับรู้ถึงประโยชน์ (PUF) ไม่ได้มีผลโดยตรงต่อความตั้งใจที่จะใช้ Google Maps ข้อค้นพบจากการวิจัยนี้อาจช่วยนักวิชาการศึกษาปัจจัยอื่นเพิ่มเติม และยังจำเป็นสำหรับนักวางแผนเชิงกลยุทธ์อีกด้วย

คำสำคัญ: ความง่ายในการใช้งาน การรับรู้ถึงประโยชน์ แผนที่กูเกิ้ล ความตั้งใจในการใช้งาน ความพึงพอใจของผู้ใช้งาน การเดินทาง

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Abstract

This study investigated whether or not the level of satisfaction experienced by Google Maps users mediated the linkage between the theory of acceptance model and individuals' intentions regarding the future use of Google Maps in Thailand. The determinants of the TAM model were perceived ease of use and perceived usefulness. A quantitative method was used. The theoretical framework was validated using data from 423 Google Maps users in Thailand who participated in online convenience sampling. For the descriptive analysis of the data, SPSS Licensed Version 29 was employed, and the partial least squares structural equation modelling (ADANCO 2.3.2; PLS-SEM) was utilized to test the hypotheses at a significant level less than 0.001. The association between the TAM, intentions to use Google Maps in Thailand and adoption of user satisfaction as a mediator between the two predictors were identified. User satisfaction is an essential mediator in the linkage between the TAM model, which was identified as perceived ease of use and perceived usefulness to predict intentions to use Google Maps. The level of satisfaction can be used as a predictor of whether or not they will utilize Google Maps. However, perceived ease of use is the only factor substantially influencing intentions to use Google Maps. Perceived usefulness does not directly influence intentions to use Google Maps. The findings of this study may assist scholars by contributing additional perspective elements and are also essential for strategic planners.

Keywords: Perceived Ease of Use, Perceived Usefulness, Google Maps, Intentions to Use, User Satisfaction, Travelling

Introduction

These days, many corporations are engaged in a race to develop innovative software programs that would make people's day-to-day lives, including their time spent travelling and on vacation, easier to navigate. In the past, individuals had difficulties using traditional paper maps since the information inside them was not interactive and complicated (Marzuki et al., 2016). On February 8, 2005, it was first reported on Google Blog that what is now known as Google Maps was initially known as Google Local. On June 20, 2005, the geographical scope of the map was broadened to include all of the world instead of only the United States, the United Kingdom, and Canada. Google Maps is an online mapping service that is available all around the world. It offers many features, such as landmarks, area shapes, vector maps, path lines, satellite maps, and topographic maps. Google Maps, formerly known as Google Local, was first announced on the Google Blog on February 8, 2005. The map coverage was expanded from the United States, United Kingdom, and Canada to the entire world on June 20, 2005. Google Maps is a global online map service that includes landmarks, path lines, area shapes, vector maps, satellite maps, topographic maps, and other features (Yang & Hsu, 2016).

Since it was first introduced, Google Maps has revolutionized the process of mapping and positionality within a globalized digital economy. It has emerged as an essential socio-technical artefact, significantly contributing to reconfiguring the relationship between information systems' proliferation and rational behaviour theory's development. Users of Google Maps can see maps online and acquire useful trip information with just a few keystrokes thanks to the technology behind Google Maps. Google provides up-to-date, extensive digital maps for route planning and journeys by foot, automobile, bicycle, air, or public transit by combining satellite images, aerial photography, street maps, 360-degree panoramic views of streets, and GIS data. These maps can be accessed via the Internet. Street view, turn-by-turn instructions, and public transit schedules are just a few of the unique and helpful features found on Google Maps. In addition, Google Maps receives consistent updates that include new features and data, which helps to improve the app's usability and overall value. Even when the app is closed, or the screen is locked, users can still view real-time traffic information from surrounding locations thanks to a widget that Google recently added. Due to a wealth of helpful features, frequent updates, and large-scale adjustments, Google Maps is quickly becoming a requirement for modern-day travel for billions worldwide (Wallis, 2022).

The TAM theory asserts that behavioural intention is the primary determinant of system use. Intention to behave is determined both by attitude and how valuable something is thought to be. Perceived utility and perceived ease of use impact attitude, and perceived usefulness plays a role in both perceived ease of use and the influence of external circumstances. Therefore, perceived usefulness (PUF) and simplicity of use (perceived ease of use, PEOU) are essential elements in defining a user's behavioural intention, and both favourably affect a user's intention. These factors positively affect a user's behavioural intention (Woodeson, 2022). An individual's anticipation of how straightforward the target system will be to comprehend, master, and apply is referred to as their perceived ease of use. The intricacy of a single design will act as a barrier to the widespread implementation of an innovation. Users are more likely to have a favourable attitude towards their intentions and behaviours if a system's operation is as simple as possible (Akther & Nur, 2022). In a nutshell, a person's level of belief in the straightforward nature of a system is what constitutes their perceived ease of use of that system. The degree to which the system is used and the interaction between users and the design might contribute to the system's usability (Basuki et al., 2022). People's subjective evaluations of how a system would increase their ability to do their jobs make up what is known as perceived usefulness. The benefits one receives from anything are directly proportional to the degree to which one considers using it. Attitude can be predicted by perceived usefulness. Users can create a good attitude because of several benefits associated with participating in a specific behaviour (Akther & Nur, 2022).

Satisfaction was defined as an individual's sentiments of pleasure or disappointment comparing the apparent performance of a product or providing service to their expectations for that product or service. Satisfaction is essential to its continued prosperity. Businesses need to outperform their competitors by offering high-quality goods or services that meet or exceed the requirements of their clients to keep or expand their market share (Limna & Kraiwanit, 2022; Limna & Siripipatthanakul, 2022). In addition, there are three distinct degrees to which a customer's needs can be fulfilled and met. First, there will be dissatisfaction among customers if the product does not live up to their expectations. Second, the customer's needs will be met and satisfied if the product works as anticipated. Third, if the performance is better than expected, the customer's level of satisfaction will be extraordinarily high. Customer satisfaction is the consequence of an individual's assessment of a product or service after using it. Customers' expectations are being utilized as a variable in this analysis (Gunawan, 2022).

The TAM model was utilized in several studies to analyze the individuals' goals. For example, Zheng and Li (2020) proposed an extended TAM to investigate the students' intentions regarding using tablet computers. During the COVID-19 epidemic, Mailizar et al., (2021) used the TAM model to explore the elements influencing university students' behavioural intention to use e-learning. Saputra and Darma (2022) assessed the intention to utilize blockchain in Indonesia, specifically the My-T Wallet developed by Tokoin using the Extended TAM technique. However, few studies have established a connection between the TAM model, user satisfaction, and plans to continue using Google Maps in Thailand.

Using the Partial Least Squares Structural Equation Model (PLS-SEM), this research aims to establish whether there is a connection between the TAM model, user happiness, and intentions to use Google Maps. There are six major sections in the paper. The first section is an introduction to the study. The theoretical context for the study is provided in the second section. The third section presents the research methodology, and the results are shown in the fourth section. The fifth section offers the study's discussion. In the final section, conclusions, limitations, and recommendations are presented.

Significantly, this study identified the relationship between the TAM model (perceived ease of use and perceived usefulness) and users' behaviour regarding Google Maps. Therefore, this study could help more understand the impact of the TAM model (perceived ease of use and perceived usefulness) and user intentions regarding Google Maps through the mediating effect of Google Maps' user satisfaction due to the rare of this related research topic in Thailand. Therefore, the research question and objective could be identified as follows.

Research Question

What is the relationship between the TAM model (perceived ease of use and perceived usefulness), user satisfaction and intentions to use Google Maps in Thailand?

Research Objective

This study identified the relationship between the TAM model (perceived ease of use and perceived usefulness), user satisfaction and intentions to use Google Maps in Thailand.

Literature Review

The previous studies in the literature review explain the relationship between the TAM model (perceived ease of use and perceived usefulness), user satisfaction and intentions to use Google Maps in Thailand. The scholarly papers are based on valid sources like Google Scholar, Scopus Web of Science, etc. The conceptual model was created based on the following hypotheses.

Anuwichanont et al. (2023) found that 1) perceived ease of use and resource availability influenced the acceptance of online social media for tourism. 2) the acceptance of online social media for tourism influenced the intention to travel in the future. However, the perceived usefulness of online social media for tourism was not found to influence acceptance. These findings were used to construct online social media marketing communication to promote tourism in the eastern province.

Pozón-López et al. (2021) conducted a study investigating the relationship between perceived user satisfaction and intention to use massive open online courses (MOOCs). The findings of the analysis support the hypothesis that user contentment and intrinsic motivation are the most critical factors in determining whether or not a user would follow through with an action. The study demonstrates that one's level of perceived satisfaction is influenced not only by the programme's quality but also by the degree to which it is entertaining and helpful.

According to Martono et al. (2020), the dimensions of TAM had a favourable and significant influence on the employee's intention to use the Financial Information System. In addition, Vanduhe et al. (2020) found that attitudes and perceptions of usefulness play a significant role in ongoing plans to use gamified Moodle for training purposes. To and Trinh (2021) conducted research in Vietnam to determine the primary elements that influence individuals' behavioural intentions about using mobile wallets. The extended version of the TAM model, which includes perceived enjoyment and trust, served as the basis for this study's theoretical framework. TAM has been demonstrated to be a credible model for researching consumers' intentions towards new mobile payment applications.

Moreover, Na et al. (2022) investigate the factors that influence end-user intentions and acceptance of AI-based technology in construction organizations using the technology adoption model (TAM) and the technology-organization-environment (TOE) frameworks. The usefulness of AI-based technology and its perceived ease of use were positively influenced by technological characteristics, external circumstances, and an individual's personality. Yeo et al. (2022) analyze elementary teachers' approval of a digital mathematics game and the reasons influencing their decision to employ it in the classroom. In particular, the research

investigates the factors that primary school teachers regard to be fundamental when making this choice. The extension of TAM that is hypothesized takes into account redefined elements in the context of game use during mathematics instruction (perceived ease of use, perceived usefulness, and attitude towards game use for mathematical learning), a social factor known as environmental support, as well as specified outcome factors based on orientations known as game-driven intention and mathematics-driven intention. The findings lend validity to the model's linkages, including direct links between attitudes and environmental support and intentions to play the digital game, as well as indirect links from perceived ease of use and perceived utility. The model also includes direct links between attitudes and environmental support, and intentions to play the digital game.

Conceptual Framework

(PEOU = Perceived ease of use; PUF= Perceived usefulness)

Perceived ease of use impacted user satisfaction with mobile websites (Amin et al., 2014). Perceived ease of use positively affected customer satisfaction (Lee et al., 2015). The first hypothesized could be identified as follows;

H01: PEOU does not significantly impacts Google Maps user satisfaction

Ha1: PEOU significantly impacts Google Maps user satisfaction.

Electronic-human resource management supported the finding that perceived ease of use was positively related to intentions to use among hotel users (Rawashdeh et al., 2021). Perceived ease of use directly influenced the intention to use E-wallets (Olivia & Marchyta, 2022). Perceived ease of use positively affected behavioural intention among service users (Lee et al., 2015). Perceived ease of use significantly affects consumers' intention to repurchase (Keni, 2020). The second hypothesized could be identified as follows;

H02: PEOU does significantly impact intentions to use Google Maps among users.

Ha2: PEOU significantly impacts intentions to use Google Maps among users.

Perceived usefulness impacted user satisfaction with mobile websites (Amin et al., 2014). Perceived usefulness determines end-user satisfaction (Calisir & Calisir, 2004). Perceived usefulness positively affected customer satisfaction among service users (Lee et al., 2015). The third hypothesized could be identified as follows;

H03: PUF does not significantly impacts Google Maps user satisfaction.

Ha3: PUF significantly impacts Google Maps user satisfaction.

Perceived usefulness significantly affects intentions to use the e-learning system (Alkhawaja et al., 2022). Perceived usefulness positively affected behavioural intention among service users (Lee et al., 2015). Perceived usefulness significantly affects consumers' intention to repurchase (Keni, 2020). The fourth hypothesized could be identified as follows;

H04: PUF does not significantly impacts intentions to use Google Maps among users.

Ha4: PUF significantly impacts intentions to use Google Maps among users.

TikTok user satisfaction influences continuous intention to use TikTok in Jordan (Sharabati et al., 2022). Customer satisfaction positively affected behavioural intention among service users (Lee et al., 2015). User-perceived satisfaction is the strongest predictor of use intention related to the increasingly popular massive open online courses (Pozón-López et al., 2021). The fifth hypothesized could be identified as follows;

H05: User satisfaction does not significantly affect intentions to use Google Maps among users.

Ha5: User satisfaction significantly affects intentions to use Google Maps among users.

TAM comprises perceived ease of use, usefulness, and ease of use. Moreover, customer satisfaction and behavioural intention to use a service have a positive relationship. Customer satisfaction positively mediated between perceived ease of use, perceived usefulness and behavioural intention among service users (Lee et al., 2015). The sixth hypothesized could be identified as follows;

H06: User satisfaction does not significantly mediate between the TAM model and intentions to use Google Maps.

Ha6: User satisfaction significantly mediates between the TAM model and intentions to use Google Maps.

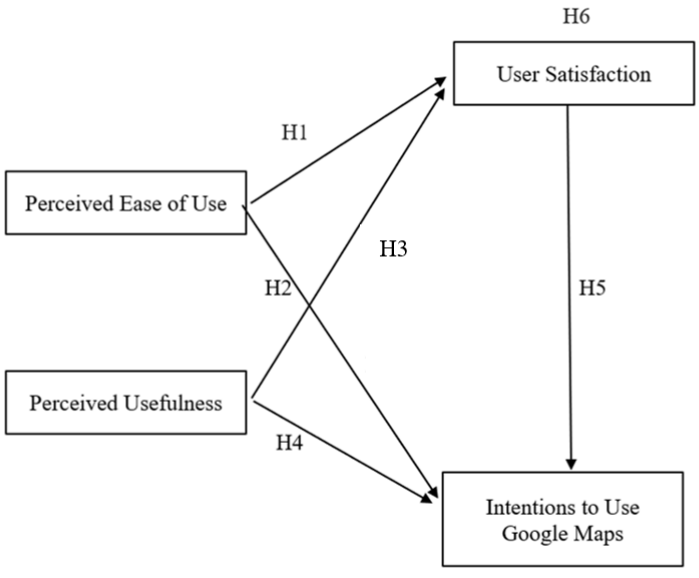

Figure 1 The hypothetical model of this research

Research Methodology

Research Design

The data was collected through an online survey with a closed-ended questionnaire designed using the Likert's Rating Scale. According to the recommendations made by Jangjarat et al. (2023) and Satranarakun and Kraiwanit (2023), a questionnaire was given to thirty individuals as a preliminary test to assess its reliability. Because of the testing that was carried out, it was possible to determine the reliability and accuracy of the measuring tools. According to Jaipong et al. (2012), the degree to which a measurement accurately measures the conceptual framework or hypothesis of the researcher determines whether or not the measurement may be considered valid. The major variables in this inquiry were rated using a Likert scale with five points, ranging from 5 (strongly concur) to 1 (strongly disagree), with 5 reflecting the highest level of agreement and 1 representing the lowest level of agreement. The findings of the study that was carried out by Sitthipon et al. (2022) were used to make inferences about the demographics of the individuals who responded to the survey questions. The instruments of the research that were based on the study of Limna et al. (2022) and Siripipatthanakul et al. (2022) served as the foundation for the questionnaire items that addressed user satisfaction, perceived usefulness, perceived ease of use, and intentions to use the technology, Google Maps.

Sample and Sampling Techniques

According to Obilor (2023), convenience sampling is a method in which a sample is drawn from a conveniently available population, close at hand, or convenient to the person conducting the sampling. Researchers collected data from a pool of respondents who are freely accessible and readily available by employing a technique known as convenience sampling, which is a form of non-probability sampling. This study did not specify who its target population was supposed to be. Users of Google Maps who were 18 years old or older constituted the sample. The degree of confidence for a standard survey is 95%. Accordingly, the sample size should be over 385 instances at $p = 0.5$, and it must be gathered using convenience sampling with a sample error of 5% and a precision level of 95% (Limna et al., 2023). As suggested by Kraiwanit et al. (2021), Withupassakan et al. (2022), and Shaengchart et al. (2023), the total number of participants in the study was four hundred and twenty-three (423). These individuals were selected using convenience sampling that was over 385.

Data Collection

The researchers collected the data through the use of online survey questionnaires. The sample decisions were made at the researchers' discretion, and they refer to the Central Region and the Outside of Central Region in Thailand. Participants in this study were required to be at least 18 years old and have a Thai residence to be included in the sample for this research. Before sending out online questionnaires, the researchers informed respondents of the purpose of the study and solicited their participation by giving them

background information about the investigation. In addition, they thanked respondents for their time and consideration. The data was collected through a self-administered online survey throughout January and March 2023.

Data Analysis

SPSS Licence Version 29 and Partial Least Squares Structural Equation Modelling (PLS-SEM, ADANCO, 2.3.2) were used to analyze the data. Descriptive statistics, including frequency and percentage, were utilized to study the respondent's demographic profile. The mean and standard deviation were used to analyze each questionnaire variable and item. Cronbach's Alpha is a reliability coefficient used to analyze the data and evaluate their consistency and reliability. Factor loadings were computed. The hypotheses were evaluated using PLS-SEM (ADANCO 2.3.2; an inferential statistic) to assess the instrument's reliability.

Research Findings

Descriptive Analysis

Table 1 Respondents' Demographic Information (n=423)

Demographics		Frequency	Percentage
Gender	Male	179	42.3
	Female	244	57.7
Age	31 years old or below	74	17.5
	36-40 years old	84	19.9
	41-45 years old	92	21.7
	46 years old or over	173	40.9
Status	Single	251	59.2
	Married	172	40.8
Education	Bachelor's degree or below	178	42.1
	Master's degree or higher	245	57.9
Salary	THB 20,000 or below	89	21.1
	THB 20,001- 40,000	152	35.9
	THB 40,001 or over	182	43.0
Region of Thailand	Central	253	59.8
	Out of Central	170	40.2
Total		423	100

According to Table 1, among Google Maps users in Thailand who were older than 18 years old. A total of 423 respondents completed online surveys, which were subsequently coded and examined. According to the data, the majority of respondents were women (57.7%), were unmarried (59.2%), had a master's degree or higher (57.9%), and earned an income that was more than 20,001 Thai Baht (78.9%). The Central Region of Thailand was the residence of most respondents (59.8%).

Table 2 Items, Factor Loadings, Cronbach's Alpha and Average Variance Extracted (n=423)

Items	Factor Loadings	Cronbach's Alpha	Average Variance Extracted (AVE)
Perceived Ease of Use (PEOU)		0.8969	0.7640
1. Google Maps is easy to use for me. (Mean=4.24, SD.=0.820)	0.8934		
2. I have skills using Google Maps. (Mean=4.19, SD.=0.867)	0.8950		
3. I am good at travelling after using Google Maps (Mean=4.00, SD.=0.875)	0.8537		
4. Google Maps is a convenient tool to use. (Mean=4.30, SD.=0.775)	0.8532		
Perceived Usefulness (PUF)		0.7844	0.6988
1. Using Google Maps makes me interested in travelling to different places. (Mean=4.30**,** SD.= 0.885)	0.8162		
2. Using Google Maps saves me time when travelling. (Mean=4.30, SD.= 0.876)	0.8634		
3. Using Google Maps is useful in my daily life. (Mean=4.26, SD.=0.917)	0.8276		
User Satisfaction (US)		0.8943	0.8254
1. I think Google Maps is a very powerful tool. (Mean=4.10, SD. =0.850)	0.9147		
2. Google Maps is a tool that helps make good travel decisions. (Mean=4.18, SD.=0.841)	0.9064		
3. I like it every time I use Google Maps. (Mean=4.02, SD.= 0.841)	0.9045		
Intentions to Use (IU)		0.8980	0.8305
1. I intend to use Google Maps for constant travel. (Mean=4.22, SD.=0.851)	0.9090		
2. I intend to use Google Maps every time to save travel time. (Mean=4.13, SD.=0.911)	0.9263		
3. I plan to use Google Maps whenever I travel. (Mean=4.12, SD.=0.941)	0.8984		

According to Table 2, the Cronbach Alphas fall somewhere in the range of 0.7844 to 0.8980 (above 0.7). The AVEs range from 0.6988 to 0.8305, both greater than 0.5. The factor loadings fall between 0.8162 and 0.9263 and are greater than 0.7. The range of means is

between 4.02 and 4.30. The standard deviations are all smaller than one, ranging from 0.775 to 0.941. Thus, there is a high degree of consensus regarding the interpretations. All values are acceptable.

Table 3 R-Squared (n=423)

Construct	Coefficient of Determination (R^2)	Adjusted R^2
User Satisfaction (US)	0.7051	0.7037
Intentions to Use (IU)	0.6948	0.6926

According to Table 3, the coefficient of determination (R2) to accurately predict user satisfaction is 0.7051, which indicates that 70.51% of the predictors can account for it. The coefficient of determination (R2) to forecast intentions to use Google Maps is 0.6948, which indicates that around 69.48% of predictors can adequately describe it. The adjusted R-square value to explain user satisfaction is 0.7037, and the adjusted R-square value to explain intentions to use among Google Maps users in Thailand is 0.6948.

Table 4 Effect Overview (n=423)

Effect	Beta	Indirect Effect	Total Effect	Cohen's f^2
PEOU ⟶US	0.2750		0.2750	0.1253
PEOU ⟶IU	0.2927	0.1343	0.4270	0.1219
PUF ⟶ US	0.6208		0.2558	0.0013
PUF⟶ IU	0.1230	0.3033	0.4263	0.0148
US ⟶ IU	0.4886	0.4886	0.2306	

PEOU=Perceived Ease of Use, PUF=Perceived Usefulness, US=User Satisfaction, IU=Intentions to Use (***significant level at p<0.001)

According to Table 4, the effect overview consists of the following components: effects, Beta, indirect effect, total effect, and Cohen's f^2. The high beta values indicate that there is a stronger capacity for prediction.

Table 5 Total Effects Inference (n=423)

Effect	Original Coefficient	Standard Bootstrap Results					Percentile Bootstrap Quantiles		
		Mean Value	Standard Error	T-Value	P-Value (2-Sided)	P-Value (1-Sided)	2.5%	97.5%	99.5%
PEOU⟶US	0.2750	0.2797	0.0502	5.4752	0.0000	0.0000	0.1833	0.3812	0.4061
PEOU⟶ IU	0.2927	0.2992	0.0615	4.7590	0.0000	0.0000	0.1848	0.4298	0.4638
PUF ⟶ US	0.6208	0.6161	0.0486	12.7744	0.0000	0.0000	0.5160	0.7065	0.7374
PUF⟶ IU	0.1230	0.1259	0.0755	1.6296	0.1035	0.0518	0.0209	0.2783	0.3081
US ⟶ IU	0.4886	0.4790	0.0829	5.8962	0.0000	0.0000	0.3202	0.6386	0.6772

PEOU=Perceived Ease of Use, PUF=Perceived Usefulness, US=User Satisfaction,
IU=Intentions to Use (***significant level at p<0.001)

Table 5 presents the overall effect and its effects. The relationship between the causes and the effects is demonstrated in this table. When the mean of the original coefficients is larger, the predictive powers are also more considerable. The standard bootstrap findings comprise the mean, standard error, T-value, two-tailed p-value, and one-tailed p-value at 2.5 per cent, 97.5 per cent, and 99.5 per cent are the respective Bootstrap percentile quartiles. When the p-value is lower than 0.05, a significance level equal to 95% is acknowledged. In addition, a significance level of 99% can be determined when the p-value is less than 0.01. With a p-value of less than 0.001, a significance level of 99.9% is considered acceptable.

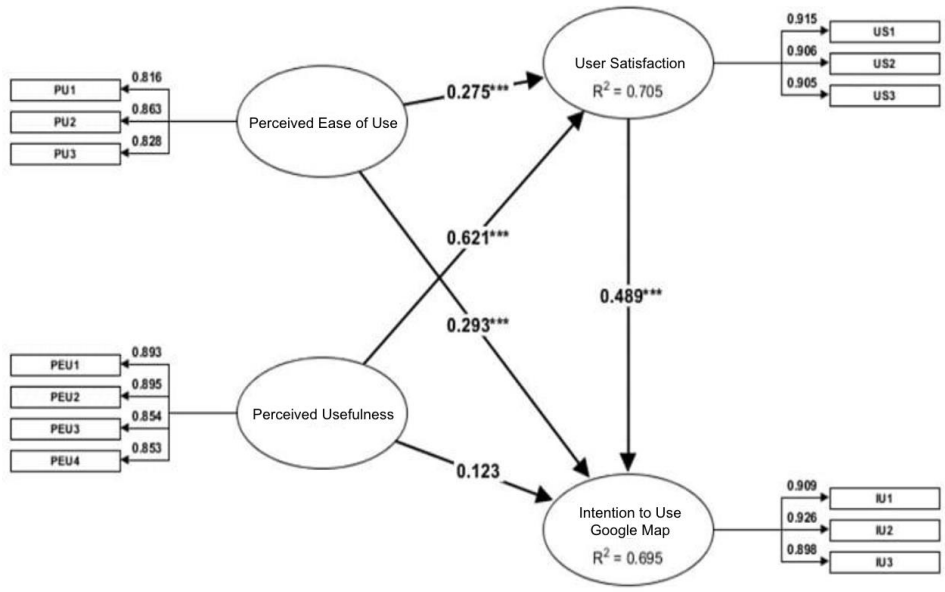

Figure 2 PLS-Structural Equation Model of the Study (SRMR = 0.055)
(***significant level at p<0.001)

According to Figure 2 (which can be found above), the PLS-SEM model used in the research shows an SRMR of 0.055, which is less than 0.08. It shows that this model's SRMR is within acceptable parameters. In general, the level of satisfaction experienced by users acts as a mediator in this model, explaining 70.5% (R^2= 0.705). However, among Google Maps users in Thailand, 69.5% of the variance in intentions to use Google Maps could be explained (R^2= 0.695).

Table 6 Summary of Hypothesis Testing
Overall intentions to use Google Maps can be explained by about 69.5% (R^2 = 0.695)

Hypotheses	Results	Actions
H1: Perceived ease of use ⟶ User Satisfaction	β=0.275 at p-value < 0.001	Rejected Ho1
H2: Perceived ease of use⟶ Intentions to Use	β=0.293 at p-value < 0.001	Rejected Ho2
H3: Perceived usefulness ⟶ User Satisfaction	β=0.621 at p-value < 0.001	Rejected Ho3
H4: Perceived usefulness ⟶ Intentions to Use	β= 0.123 at p-value > 0.05	Accepted Ho4
H5: User Satisfaction ⟶ Intentions to Use	β=0.489 at p-value < 0.001	Rejected Ho5
H6: User Satisfaction mediates between the TAM model and Intentions to Use	R^2 = 0.705	Rejected Ho6

(***significant level at p<0.001)

According to Table 6, the results of testing the hypotheses are outlined as follows. User satisfaction may be predicted with β= 0.275, at a significance level of 0.001 when perceived ease of use is used. As a result, hypothesis Ho1 was rejected.

With β=0.293 and a significance level of p<0.001, perceived ease of use is able to predict intentions to use Google Maps. As a result, Ho2 was rejected.

With β=0.621 and a significance level of 0.001, perceived usefulness can predict user satisfaction. Consequently, the H03 was rejected.

Predicting intentions to use Google Maps based on perceived usefulness is possible, with β=0.123 and p>0.05. Therefore, Ho4 was accepted.

Using β=0.489 and a significance level of 0.001 determines whether a user intends to utilize Google Maps. Therefore, answer Ho5 was rejected.

It has been found that user satisfaction plays a significant role as a mediator between the TAM model (perceived ease of use and perceived usefulness) and intentions to use Google Maps by around 70.5% (R^2 = 0.705). Because of this, hypothesis H06 was rejected.

About 69.5% of the variance in intentions to use Google Maps can be accounted for by considering all contributing factors (R^2 = 0.695). Moreover, user satisfaction could be the mediator between the TAM model (perceived ease of use and perceived usefulness) and intentions to use Google Maps by about 70.5% (R^2 = 0.705).

Discussions

According to Wallis (2022), Google Maps enables consumers to access useful trip information and see maps online. Google provides comprehensive and up-to-date digital maps for route planning and travel by foot, automobile, bicycle, aeroplane, or public transportation. These maps are created by combining satellite images, aerial photography, street maps, 360-degree panoramic views of streets, and GIS data. The turn-by-turn directions, street views, and public transportation timetables available on Google Maps are just a few of the unique and helpful features the app offers. In addition, Google Maps receives continuous updates that include new features and data to enhance the app's usability and practicality. For instance, Google has recently released a widget that shows nearby real-time traffic statistics even when the app is closed or the screen is locked. This feature is available on Android and iOS devices. Because of its plethora of helpful features, consistent updates, and substantial customizations, Google Maps is quickly becoming an indispensable tool for travelling for billions of people worldwide.

The results confirmed Tiwari et al. (2023) that perceived usefulness and ease of use substantially impact intentions to use travelling applications. Nevertheless, intention does not necessarily depend on perceived ease of use and usefulness. It investigated the factors influencing the intention to use travel applications, utilizing the Technology Acceptance Model (TAM) and the Diffusion of Innovation (DOI) theory, while employing both sufficiency and necessity logic.

The findings were consistent with those reported in research conducted by Legi and Saerang (2020), who discovered that perceived utility and perceived risk did not significantly influence the intention to utilize electronic currency. Meanwhile, the desire to use e-money was strongly and favourably influenced by perceptions of how easy and trustworthy the system was. In addition, Hossain et al. (2020) found that the perceived ease of use affected the intention to use and continue to use online banking services.

The findings support Ismiyati et al.'s (2021) finding that perceived ease of use and perceived usefulness greatly affected the customers' intentions to use mobile learning, and these data complement those findings. The influence between the TAM model and intent to utilize mobile applications was successfully increased through user satisfaction as the

mediating variable. In addition, the results confirmed the study of Akel and Armanan (2021) that the TAM and the expectation confirmation model (ECM) ensure whether or not customers continue to utilize mobile applications. In addition, Siripipatthanakul and Vui (2021) demonstrated that the effect of customer satisfaction serves as a mediator between the many variables and the customers' behavioural intentions in the services industry. According to the findings, user happiness strongly mediates the relationship between the factors that make up the TAM model and the intention to continue using the program.

The findings may be described as follows: user satisfaction and intentions to use Google Maps directly are influenced by the user's perception of how easy it is to use Google Maps. However, the perceived utility of Google Maps among users in Thailand did not immediately alter their choices to use Google Maps. In addition, the level of user satisfaction was found to be a strong mediator between the TAM model and intentions to use Google Maps, which indicates that it plays an essential role in shaping user behaviour. These findings show the relevance of perceived ease of use and perceived usefulness in driving user contentment and intentions to use Google Maps, as well as the essential role of user satisfaction as a mediator between these characteristics. In addition, these findings indicate the value of user satisfaction as a driver of these parameters. In general, the results of this study offer scholars and practitioners working in the field of information technology essential insights into the factors that drive the adoption and use of Google Maps in Thailand.

This study aimed to investigate the effect of user satisfaction as a mediator on the connection between the TAM and users' intentions to continue using Google Maps among Thai users. The results support the studies of Pozón-López et al. (2021), Siripipatthanakul et al. (2022), Rutherford and Campbell (2022), Zheng and Li (2020), Mailizar et al., (2021) and Saputra & Darma (2022) that the TAM model mainly of perceived of use and perceived usefulness are determinants of user satisfaction and intentions to use technological applications. Moreover, the relationships between the TAM model (perceived ease of use and perceived usefulness), user satisfaction and intentions to use Google Maps supported the previous studies of Amin, Lee et al. (2015), Rawashdeh et al. (2021), Olivia and Marchyta (2022), Keni (2020), Calisir & Calisir (2004), Pozón-López et al., 2021).

Conclusion

The findings of this research have significant repercussions for the progression and dissemination of technology, particularly regarding the application of Google Maps in Thailand. The result that user satisfaction and intentions to use Google Maps could be predicted based on perceived ease of use underscores the significance of user experience in the technology adoption process. It is more probable that users will be satisfied with a mobile technological application and will continue to use it in the future if they find it easy to utilize. Furthermore, the result is that user satisfaction is predicted by perceived ease of use rather than perceived

usefulness. Moreover, perceived ease of use positively affects the intention to use Google Maps but does not directly affect perceived usefulness. It also shows that consumers are more likely to be content with technology if they consider it helpful, regardless of whether or not they initially intended to use it. It can be inferred that individuals are more likely to be satisfied with Google Maps when perceived usefulness is correlated with user satisfaction. These findings underline the significance of marketing and explain the technology's utility to prospective users. The examination of mediation also found that user satisfaction is a substantial mediator between the TAM model and use intentions regarding Google Maps. In addition, strategic planners can improve user satisfaction and intentions to use Google Maps by focusing on the perceived value of utilizing Google Maps in the users' day-to-day lives. If it paid attention to how well consumers knew how to use Google Maps, it could improve the appearance of its ease of use.

The discovery may imply that user pleasure is critical to the relationship between the TAM model and adopting new technologies. Increasing user satisfaction can result in more people adopting new technologies. Overall, these findings show that to encourage the adoption and use of technology like Google Maps, software developers and marketers should place a higher priority on the user experience, focus on improving user satisfaction, and explain the utility of the technology. This study contributes to the current body of research on the relationship between the TAM and intentions to use Google Maps by examining how the mediating effect of user happiness influences that relationship. As a result, this study's findings might assist researchers in widening their research by integrating additional potential factors. The measurements can potentially direct future studies on the relationship between the TAM and intentions to use Google Maps through the mediating influence of user happiness.

Limitations and Directions of Future Research

The limitation of this study is that the researchers collected data from two locations in Thailand (Central and Outside Central) using questionnaires and convenience sampling. Participants in further research should be randomly selected from among Thai residents who use Google Maps. Because of this, it is suggested that the sample be carried out in different countries. It is advised that future research investigate other elements that may lead to a better understanding, such as the unified theory of acceptance and use of technology (UTAUT). In addition, a qualitative method, such as conducting interviews or participating in focus group discussions, might help shed light on future research.

References

Alkhawaja, M. I., Halim, M. S. A., Abumandil, M. S., & Al-Adwan, A. S. (2022). System Quality and Student's Acceptance of the E-Learning System: The Serial Mediation of Perceived Usefulness and Intention to Use. *Contemporary Educational Technology*, *14*(2), 1-15.

Akel, G., & Armağan, E. (2021). Hedonic and Utilitarian Benefits as Determinants of the Application Continuance Intention in Location-Based Applications: The Mediating Role of Satisfaction. *Multimedia Tools and Applications, 80*(5), 7103-7124. https://doi.org/10.1007/s11042-020-10094-2

Akther, T., & Nur, T. (2022). A Model of Factors Influencing COVID-19 Vaccine Acceptance: A Synthesis of the Theory of Reasoned Action, Conspiracy Theory Belief, Awareness, Perceived Usefulness, and Perceived Ease of Use. *PLoS One*, *17*(1), e0261869. https://doi.org/10.1371/journal.pone.0261869

Anuwichanont, J., Mechinda, P., & Kanraweekultana, N. (2023). Role of Technology Acceptance Model (TAM) towards the Tourism of Eastern Province Group. *RMUTT Global Business and Economics Review, 18*(1), p. 39–56.

Amin, M., Rezaei, S., & Abolghasemi, M. (2014). User satisfaction with mobile websites: the impact of perceived usefulness (PU), perceived ease of use (PEOU) and trust. *Nankai Business Review International*.

Basuki, R., Tarigan, Z., Siagian, H., Limanta, L., Setiawan, D., & Mochtar, J. (2022). The Effects of Perceived Ease of Use, Usefulness, Enjoyment and Intention to Use Online Platforms on Behavioral Intention in Online Movie Watching during the Pandemic Era. *International Journal of Data and Network Science*, *6*(1), 253-262.

Calisir, F., & Calisir, F. (2004). The relation of interface usability characteristics, perceived usefulness, and perceived ease of use to end-user satisfaction with enterprise resource planning (ERP) systems. *Computers in human behavior*, *20*(4), 505-515.

Gunawan, I. (2022). Customer Loyalty: The Effect Customer Satisfaction, Experiential Marketing and Product Quality. *KINERJA: Jurnal Manajemen Organisasi Dan Industri, 1*(1), 35-50. https://jurnalpustek.org/index.php/kjmb/article/view/6

Hossain, S. A., Bao, Y., Hasan, N., & Islam, M. F. (2020). Perception and Prediction of Intention to Use Online Banking Systems: An Empirical Study Using Extended TAM. *International Journal of Research in Business and Social Science (2147-4478), 9*(1), 112-126. https://doi.org/10.20525/ijrbs.v9i1.591

Ismiyati, I., Kartowagiran, B., Muhyadi, M., Sholikah, M. A., Suparno, S., & Tusyanah, T. (2021). Understanding Students' Intention to Use Mobile Learning at Universitas Negeri Semarang: An Alternative Learning from Home during COVID-19 Pandemic. *Journal of Educational, Cultural and Psychological Studies, (23*), 181-199.

Jaipong, P., Siripipatthanakul, S., Sitthipon, T., Kaewpuang, P., & Sriboonruang, P. (2022). An Association Between Brand Trust, Brand Affection and Brand Loyalty: The Case of a Coffee Brand in Bangkok Thailand. *Advance Knowledge for Executives*, *1*(1), 1-14.

Jangjarat, K., Kraiwanit, T., Satityapong, N., Sonsuphap, R., & Phaksipaeng, I. (2023). The Social Economy in the Digital Era: A Perspective on Community Enterprises in a Developing Economy. *Journal of Social Economics Research, 10*(1), 13-21. https://doi.org/10.18488/35.v10i1.3317

Keni, K. (2020). How perceived usefulness and perceived ease of use affecting intent to repurchase?. *Jurnal Manajemen*, *24*(3), 481-496.

Kraiwanit, T. (2021). A Multiplier of E-Consumption: The Study of the Developing Economy. *Journal of Governance and Regulation, 10*(3), 85-92. https://doi.org/10.22495/jgrv10i3art7

Lee, S., Park, E., Kwon, S. J., & Del Pobil, A. P. (2015). Antecedents of behavioral intention to use mobile telecommunication services: Effects of corporate social responsibility and technology acceptance. *Sustainability*, *7*(8), 11345-11359.

Legi, D., & Saerang, R. T. (2020). The Analysis of Technology Acceptance Model (TAM) on Intention to Use of E-Money in Manado (Study on: Gopay, Ovo, Dana). *Jurnal EMBA: Jurnal Riset Ekonomi, Manajemen, Bisnis dan Akuntansi, 8*(4), 624-632. https://doi.org/10.35794/emba.8.4.2020.30951

Limna, P., & Kraiwanit, T. (2022). Service Quality and Its Effect on Customer Satisfaction and Customer Loyalty: A Qualitative Study of Muang Thai Insurance Company in Krabi, Thailand. *Journal for Strategy and Enterprise Competitiveness, 1*(2), 1-16.

Limna, P., Kraiwanit, T., & Siripipattanakul, S. (2023). The Relationship between Cyber Security Knowledge, Awareness and Behavioural Choice Protection among Mobile Banking Users in Thailand. *International Journal of Computing Sciences Research, 7*, 1133-1151. https://stepacademic.net/ijcsr/article/view/378

Limna, P., & Siripipatthanakul, S. (2022). A Conceptual Review of the Role of Student Satisfaction between Educational Relationship Management (4Cs) and Decision to be Online Degree Students (pp. 1-13). *Available at SSRN, 3993915*. http://dx.doi.org/10.2139/ssrn.3993915

Limna, P., Siripipatthanakul, S., Siripipattanakul, S., Woodeson, K., & Auttawechasakoon, P. (2022). Applying the UTAUT to Explain Factors Affecting English Learning Intention Via Netflix (English Subtitle) Among Thai People. Asia-Pacific Review of Research in Education, 1(1), 1-19.

Mailizar, M., Burg, D., & Maulina, S. (2021). Examining University Students' Behavioural Intention to Use e-Learning during the COVID-19 Pandemic: An Extended TAM Model. *Education and Information Technologies, 26*(6), 7057-7077. https://doi.org/10.1007/s10639-021-10557-5

Martono, S., Nurkhin, A., Mukhibad, H., Anisykurlillah, I., & Wolor, C. W. (2020). Understanding the Employee's Intention to Use Information System: Technology Acceptance Model and Information System Success Model Approach. *The Journal of Asian Finance, Economics and Business, 7*(10), 1007-1013. https://doi.org/10.13106/jafeb.2020.vol7.no10.1007

Marzuki, M. I. I., Rosly, A. N., Roslan, N. S., Abdullah, D., Kamal, S. B. M., & Azmi, A. (2016). The Role of Perceived Interactivity, Perceived Ease of Use, Perceived Usefulness, and Perceived Enjoyment Toward Intention to Use Online Mapping Service Applications. *International Academic Research Journal of Business and Technology*, *2*(2), 135-139.

Na, S., Heo, S., Han, S., Shin, Y., & Roh, Y. (2022). Acceptance Model of Artificial Intelligence (AI)-Based Technologies in Construction Firms: Applying the Technology Acceptance Model (TAM) in Combination with the Technology–Organization–Environment (TOE) Framework. *Buildings*, *12*(2), 90. https://doi.org/10.3390/buildings12020090

Olivia, M., & Marchyta, N. K. (2022). The influence of perceived ease of use and perceived usefulness on E-wallet continuance intention: intervening role of customer satisfaction. *Jurnal Teknik Industri*, *24*(1).

Pozón-López, I., Higueras-Castillo, E., Muñoz-Leiva, F., & Liébana-Cabanillas, F. J. (2021). Perceived user satisfaction and intention to use massive open online courses (MOOCs). *Journal of Computing in Higher Education, 33*, 85-120. https://doi.org/10.1007/s12528-020-09257-9

Rawashdeh, A. M., Elayan, M. B., Alhyasat, W., & Shamout, M. D. (2021). Electronic human resources management perceived usefulness, perceived ease of use and continuance usage intention: the mediating role of user satisfaction in Jordanian hotels sector. *International Journal for Quality Research*, *15*(2), 679.

Saputra, U. W. E., & Darma, G. S. (2022). The intention to use blockchain in Indonesia using extended approach technology acceptance model (TAM). *CommIT (Communication and Information Technology) Journal, 16*(1), 27-35. https://doi.org/10.21512/commit.v16i1.7609

Satranarakun, A., & Kraiwanit, T. (2023). Rules and Regulations for Enhancing Metro Rail Accessibility in a Developing Country. *Corporate Law & Governance Review, 5*(1), 111-121. https://doi.org/10.22495/clgrv5i1p10

Shaengchart, Y., Kraiwanit, T., Virunhaphol, S., Chutipat, V., & Chaisiripaibool, S. (2023). Users' Opinions on Telecom Mergers and Acquisitions in a Developing Country. *Corporate & Business Strategy Review, 4*(1), 50-56. https://doi.org/10.22495/cbsrv4i1art5

Sharabati, A. A. A., Al-Haddad, S., Al-Khasawneh, M., Nababteh, N., Mohammad, M., & Ghoush, Q. A. (2022). The Impact of TikTok User Satisfaction on Continuous Intention to Use the Application. *Journal of Open Innovation: Technology, Market, and Complexity*, *8*(3), 125.

Siripipatthanakul, S., Limna, P., Kraiwanit, T., & Siripipattanakul, S. (2022). Predicting Intention to Use Smart Education Technology during the COVID-19 Pandemic: The Case of Higher Education Students in Thailand. In International Conference On Research And Development (ICORAD) (Vol. 1, No. 2, pp. 8-22). https://doi.org/10.47841/icorad.v1i2.46.

Siripipatthanakul, S., & Vui, C. N. (2021). A Conceptual Review on the Mediating Effect of Patient Satisfaction Towards Patient Loyalty in the Dental Practice in Thailand. *International Journal of Behavioral Analytics, 1*(2), 1-16.

Sitthipon, T., Limna, P., Jaipong, P., Siripipattanakul, S., & Auttawechasakoon, P. (2022). Gamification Predicting Customers' Repurchase Intention Via E-Commerce Platforms Through Mediating Effect of Customer Satisfaction in Thailand. *Review of Advanced Multidisciplinary Sciences, Engineering & Innovation, 1*(1), 1-14.

Tiwari, P., Kaurav, R. P. S., & Koay, K. Y. (2023). Understanding travel apps usage intention: findings from PLS and NCA. *Journal of Marketing Analytics*, 1-17. https://link.springer.com/article/10.1057/s41270-023-00258-y

To, A. T., & Trinh, T. H. M. (2021). Understanding Behavioral Intention to Use Mobile Wallets in Vietnam: Extending the TAM Model with Trust and Enjoyment. *Cogent Business & Management*, *8*(1), 1891661. https://doi.org/10.1080/23311975.2021.1891661

Vanduhe, V. Z., Nat, M., & Hasan, H. F. (2020). Continuance Intentions to Use Gamification for Training in Higher Education: Integrating the Technology Acceptance Model (TAM), Social Motivation, and Task Technology fit (TTF). *IEEE Access, 8*, 21473-21484. https://doi.org/10.1109/ACCESS.2020.2966179

Wallis, J. (2022). *How Does Google Maps Work? – The Tech Behind Series.* Webo Digital. https://webo.digital/blog/the-tech-behind-google-maps/

Withupassakan, T., Kraiwanit, T., Shaengchart, Y., Jangjarat, K., & Virunhaphol, S. (2022). Civil Economy of Digital Citizens [Special Issue]. *Corporate & Business Strategy Review, 3*(2), 211–220. https://doi.org/10.22495/cbsrv3i2siart2

Woodeson, K. (2022). The Role of Student Satisfaction between TAM and Intentions to Use English Online Dictionary: A Conceptual Review. *Advance Knowledge for Executives 1*(2), 1-9.

Yang, S. Y., & Hsu, C. L. (2016). A Location-Based Services and Google Maps-Based Information Master System for Tour Guiding. *Computers & Electrical Engineering*, *54*, 87-105. https://doi.org/10.1016/j.compeleceng.2015.11.020

Yeo, S., Rutherford, T., & Campbell, T. (2022). Understanding Elementary Mathematics Teachers' Intention to Use a Digital Game through the Technology Acceptance Model. *Education and Information Technologies*, *27*(8), 11515-11536. https://doi.org/10.1007/s10639-022-11073-w

Zheng, J., & Li, S. (2020). What Drives Students' Intention to Use Tablet Computers: An Extended Technology Acceptance Model. *International Journal of Educational Research, 102*, 101612. https://doi.org/10.1016/j.ijer.2020.101612