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PASSENGERS ACCEPTANCE OF CASHLESS PAYMENT SYSTEM IN PUBLIC BUS TRANSPORTATION: A CASE STUDY OF KIGALI AND SURABAYA

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ABSTRACT

Public transport is adopted to provide mobility to people without their cars or offer collective mobility. Nowadays, Cities are adopting public transportation for many reasons, such as providing collective mobility, handling traffic congestion problems, lowering air pollution, managing energy consumption, and increasing opportunities. To collect transport fare more efficient, cashless payments on public bus transportation are additionally adopted and progressively prevalent and offer new opportunities for a public transport company to collect those fares. This mode of payment is helping transport companies to increase the collection of payments, seeing a detailed analysis of passenger traffic, and reduce staff costs through a fare payment system without conductors and every budget that was supposed to be a budget of staffs. With the use of quantitative research methodology, we have tried to find out how do people perceive to the newly adopted system and we have organized a survey made up of 387 questionnaires which were comprised of 200 for Surabaya and 187 for Kigali. The model was made up of 9 variables and we have analyzed data separately. For both models, we have seen common insignificant variables (Insecurity) and other variables that they do not share.

Keywords: Cashless payment System, Public Bus Transportation, Kigali, Surabaya

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PENERIMAAN PENUMPANG SISTEM PEMBAYARAN TANPA UANG TUNAI DI TRANSPORTASI BIS UMUM: STUDI KASUS ANTARA KIGALI DAN SURABAYA

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ABSTRAK

Transportasi umum diadopsi untuk memberikan mobilitas kepada orang-orang tanpa mobil mereka atau menawarkan mobilitas kolektif. Saat ini, Kota mengadopsi transportasi umum karena berbagai alasan, seperti menyediakan mobilitas kolektif, menangani masalah kemacetan lalu lintas, menurunkan polusi udara, mengelola konsumsi energi, dan meningkatkan peluang. Untuk mengumpulkan tarif transportasi yang lebih efisien, pembayaran tanpa uang tunai untuk transportasi bus umum juga diadopsi dan semakin lazim dan menawarkan peluang baru bagi perusahaan angkutan umum untuk mengumpulkan tarif tersebut. Cara pembayaran ini membantu perusahaan transportasi untuk meningkatkan pengumpulan pembayaran, melihat analisis rinci lalu lintas penumpang, dan mengurangi biaya staf melalui sistem pembayaran ongkos tanpa konduktor dan setiap anggaran yang seharusnya menjadi anggaran staf. Dengan menggunakan metodologi penelitian kuantitatif, kami telah mencoba mencari tahu bagaimana orang memandang sistem yang baru diadopsi dan kami telah mengadakan survei yang terdiri dari 387 kuesioner yang terdiri dari 200 untuk Surabaya dan 187 untuk Kigali. Model ini terdiri dari 9 variabel dan kami telah menganalisis data secara terpisah. Untuk kedua model, kami telah melihat variabel umum yang tidak signifikan (Ketidakamanan) dan variabel lain yang tidak mereka bagi.

Kata Kunci: sistem pembayaran tanpa uang tunai, Sistem Transportasi Bus Umum, Kigali, Surabaya

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LIST OF ABBREVIATIONS

UK:	United Kingdom
US:	United States
CBN:	Central Bank of Nigeria
IT:	Information Technology
TRA:	Theory of Reasoned Action
TAM:	Technology Acceptance Model
PC:	Personal Computer
EOU:	Ease of Use
PEOU:	Perceived Ease of Use
PU:	Perceived Usefulness
NFC:	Near Field Communication
NISR:	National Institute of Statistics in Rwanda
DD:	Demand Draft
UPI:	Unified Payment Interface
RTGS:	Real-Time Gross Settlement
NEFT:	National Electronic Funds Transfer
IMPS:	Immediate Payment Service
USSD:	Unstructured Supplement Service Data
ECS:	Electronic Clearance Service
QR:	Quick Response
MMID:	Mobile Money Identifier
IMPS:	Immediate Payment Service
IFSC:	Indian Financial System Code
RFID:	Radio Frequency Identification
PIN:	Personal Identification Number
POS:	Point of Sale
ICT:	Information and Communication Technologies
UN:	United Nations
ITS:	Institute Teknologi Sepuluh Nopember
KNB:	Kemintraan Negara Berkambang

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CHAPTER 1
INTRODUCTION

1.1 Background

Cash is not always easy to get; also, very risks to carry it and by most estimation, it costs much the society. As for cashless payments, the introduction has shown a great significance to leverage the increase of economic and also the advancement financial inclusion[1]. The move by city public transport company, cashless payment has been adopted to cut off cost, promote road safety, and boost operator’s revenues.

However, this system has more advantages and disadvantages, especially for passengers' side, as they have criticized[2]. Cashless payment for public bus transport indeed helps to reduce the inconvenience of carrying cash, especially changes (in terms of coins) for the bus fare for the part of commuters.

There is no doubt that some government decisions are right, considering the way of implementation and how citizens are aware of the program is another issue. The citizen's unawareness can cause resistance to use the technology and should be a major failure because they are not aware.

The most particular known types of standardized money were coins printed in old Lydia. Other types of cash utilized the world over, yet it very well may be contended that they would not wholly relate to an excellent idea of money. This way, for the motivations behind this paper, we characterize money as institutionalized physical cash (or cash), usually appearing as state-gave banknotes and coins, and we can guarantee that it has been used for just about 3000 years.

Cash can be imagined as a token speaking to middle income and investment funds of an individual or substance, protected for conceded spending. Even though electronic cash, as of now, assumes a significant job in a few created nations, money is yet a fundamental empowering influence for the working of worldwide economies.

The utilization of money presents significant focal points over the direct trade of products. The utilization of money to perform Payments brought about: the comfort of transportation (rather than bargain things); high granularity (various groups make it suitable for both vast and little Payments); trust (permits prompt, last, repayment of the exchanges, and is generally hard to fake); unmistakable valuation standard (each grown-up in a general public knows about the average obtaining influence of the usual money units). To store money, likewise, presented noteworthy points of interest.

Those that can be detached include granularity (which enables the utilization of money to store any amount of cash effortlessly); smallness (high esteemed coins or enormous section banknotes permit smaller stockpiling of much cash); strength (money is stable, durable – mainly coin-based money); low putting away costs; accessibility (money can be put away near the proprietor, so it is promptly accessible when required). Other than evident focal points, for example, those recorded above, money likewise tackled progressively unobtrusive issues straddling capacity of significant worth and exchange settling. A model is the comfort of money to halfway complex, numerous gathering exchanges.

In the direct bargain, if a rancher represented considerable authority in creating apples needed to purchase a thing of attire, he would need to discover somebody selling that thing who might likewise acknowledge apples in return. Utilizing money to transitional, he can offer his apples to anybody keen on them, get money consequently, and after that, he can purchase the garments from any other individual in different money settled exchange[3].

Outside and inside the main market of the European Union, and even inside the single money market of the Euro, payment advancement is identified continuously with explicit foundations. It tends to the assorted variety of necessities and shortcomings of developed frameworks. Payments pioneers that can offer arrangements with a necessarily profitable profile will get an opportunity to win against the latency of since a long time ago settled payment propensities or potential payment strategies.

Be that as it may, numerous arrangements do not prevail with regards to arriving at a minimum number of clients – possibly except for monopolistic frameworks and administrations that can manage how individuals pay[4].

1.2 Problem statement

The public bus transportation system, especially in developing countries, faces challenges, amongst others, accountability in terms of fare collections. The management sometimes works hard to provide a solution, and some of them include the launching of a cashless payment system regardless of the users' view and considerations. From that point, sometimes users (passengers) will consider him/herself as vulnerable to the system adopted, and yet the resistance will arise.

A city is a multifunctional place where everyone is welcomed and should be able to go around in a different corner of that city. Most of the time, the person might be coming from another city, and at the same time, he is not aware of the changes in the domain of public bus transport payment where he will become a victim of the system.

In this research, we are going to take the journey and explore different perspectives of passengers in public bus transportation to look at how they accept the newly adopted system. They benefit from it, or maybe they can even see it as a threat for them. For this research, our concern will be based on a passenger's perception.

1.3 Research Questions

This study will be able to respond the following questions:

- How do passengers perceive the cashless payment system adopted for public bus transport fare collection?
- What is the state of the cashless payment system adopted in both cities?
- Comparison of cashless financial payment and cashless about bartering payment (plastic bottle waste collection) in Surabaya (acceptance or preference)

1.4 Contribution of Research

1.4.1 Contribution to the Knowledge

To develop literature knowledge that will be useful to academicians and other researchers. I mean to add to the hypothetical foundation by adjusting the consolidating two speculations (TRI and TAM) and attempting to approve an additional variable on TRI. More explicitly, I produce a more grounded prescient model with better outcomes in indicating the connections between the factors that impact the traveler's acknowledgment of cashless installment appropriation. I further broaden the model by presenting another free factor: Awareness. For traveler's information, this investigation coordinates TAM and TRI models and acquaints expectation with utilizing cashless installment framework selection as the reliant variable. Also, I look at the intervention impacts between factors to more likely comprehend the connections among factors. A couple of connections in both the models were halfway interceded, saw usability, and saw helpfulness factors. I likewise present new directing factors that may influence the traveler's acknowledgment of cashless installment framework reception factors. TRI, and TAM models by analyzing the variables that influence traveler's acknowledgment of the open transportation framework in the said instance of study city (Kigali and Surabaya)

1.4.2 Contribution to the Practical

Assist top management of transportation agencies in developing guidelines and standards to be considered when adopting and implementing a Cashless Payment System. The factors of this study can be used as a reference to determine the profile of transportation agencies such as what tends to be successful in implementing Cashless Payment System and as a list of priority resources that must be prepared by Transportation Company to succeed through all stages from adoption, implementation to the System Use.

1.5 Significant of the Study

This research aims to evaluate the passenger's perception on the cashless payment system acceptance after the adoption for public bus transport by revealing the passenger's consideration 'role. This study will primarily contribute to the improvement of passenger's concern when a public transportation company adopts a new system, not in the company but also users' consideration. I believe that this study will strengthen the business owners to be considered to this newly adopted method a passenger-consideration's approach – and to adapt as an effective assimilation strategy that will benefit both the company and customers. The outcomes to be considered consist of the following: the improvement of passengers' abilities in all components of the newly cashless payment system adopted; development of a positive attitude towards the system; enhancing passengers' independence, creative thinking; and the level of interaction and cooperation that will be engendered between passengers and transport company's owner.

1.6 Objectives

The objective of this study is to find a better model for measuring the relationship of contextual dimensions to multi-stage acceptance of cashless Payment System for public bus transportation by literature and qualitative research (interview and open-ended questionnaire). By consolidating Technology Readiness Index (TRI) and Technology Acceptance Model (TAM) and by revealing other possible factors by Qualitative research to amend the on the existing TRI, will come up with the new model that will be used to measure the acceptance of cashless payment system for public bus transportation.

- Develop and validate a conceptual model for passengers' acceptance on the public bus transport system based on literature review and qualitative (interview)
- To examine passengers' understanding and acceptance of the cashless payment for public bus transport in the city of KIGALI AND SURABAYA.

- To determine factors that would have been considered before adopting a new system to ensure users (Passengers) participation.
- To compare the newly adopted system compared with the existing one.

CHAPTER 2
LITERATURE REVIEW

2.1 Study area Description

2.1.1 Background of Study Area

2.1.1.1 Kigali

The City of Kigali, which began in 1907, is one of the generally secure and most amiable of African capitals. It is regarded with a moderate high-stature environment that gives a bogus portrayal of its tropical region and is deliberately put inside three hours' drive of the standard vacationer regions. The Rwandan capital city offers both a pleasing and welcoming preamble to this spot where there are a thousand slants and an ideal springboard from which to research this blessed country. The City of Kigali is composed of three areas Gasabo, Kicukiro, and Nyarugenge. It is by and occupied by roughly 1.2 million occupants. Kigali is 70% with a population that is dominated by youths, which make up about 60%, and ladies make marginally more the half.

In the year 2008, the Kigali city was granted the UN-Habitat Scroll of Honor Award [5] for its numerous developments in structure model, the current city symbolized by zero resistance for plastics, improved trash gathering, and a significant decrease in wrongdoing. The award is the most distinguished honor given by the United Nations in acknowledgment of work completed in the field of human settlement improvement. The honor plans to respect people and establishments that have been instrumental in improving the living conditions in urban bases on the world[6].

2.1.1.2 Surabaya

The story of the history of the city of Surabaya is thick with heroic values. Since its inception, the city has a long history related to the values of heroism. The term

Surabaya consists of the words sura (brave) and baya (danger), which are then literally interpreted as brave to face the threat that comes. One of the values of heroism was manifested in the battle between Raden Wijaya and the Mongol army led by Kubilai Khan in 1293. It was so historical that the struggle, until the date was blessed, was the date of the founding of Surabaya to date, May 31. The heroism of the people of Surabaya is best illustrated in the battle of November 10, 1945. Arek-arek Suroboyo, the term for the people of Surabaya, armed with spiky bamboo brave against allied forces who have sophisticated weapons. Tens of thousands of people died defending the homeland. This heroic event was enshrined as a memorial to Heroes' Day. So that makes Surabaya labeled as City of Heroes.

Surabaya's history is also related to trading activities. Geographically Surabaya was indeed created as a trading city and a port. Surabaya is the main port of the kingdom of Majapahit. Its location on the north coast of Java made it develop into an important port in the Majapahit era in the 14th century. Continuing in the colonial period, it's very strategic geographical location made the Dutch Colonial Government in the 19th century, positioning it as the main port that served as collecting centers from the last series of plantation production collection activities at the East end of Java, which is in the interior to be exported to Europe[7].

2.2 Related Work

This area will audit of the past works identified with the subject of research by looking over books, quick articles, and some different sources appropriate to a particular issue, an area of study and by doing, it gives a delineation, abstract, and fundamental appraisal of these works in association with these investigation issues being inspected. Composing reviews are expected to give a chart of sources you have examined while investigating a subject and to display to the scrutinizes of how research fits inside a gigantic field of study.

2.2.1 Cashless Payment System

In his study paper, "The cashless society," Worthington[8] portrays the cashless society, where ungainly and expensive to manage coins and notes are superseded by sufficient cashless Payments began by various types of plastic cards is an alluring prospect for this modern century.

A portion of the invested individuals remains to acquire than others if the cashless society turns into a reality. The paper plots the method of reasoning of the individuals who are quick to advance the cashless society and the suggestions for advertisers accused of winning customer acknowledgment for payment by plastic cards, initiating with a European-wide perspective on the European plastic card market centers around ongoing advancements inside the UK, one of Europe's driving nations in the utilization of plastic cards as methods for Payments.

The plastic card payment item is investigated under the three headings of compensation later, pay now and pay previously, and a view is offered with regards to the prospects for each sort of plastic card in adding to the advancement of the cashless society. Mr. Humphrey [9] also led research entitled "Substitution of money via cards in US purchaser Payments" Creators use in recent years' time-arrangement information. The outcomes demonstrate that the portion of money in purchaser Payments seems to have tumbled from different time series of years, checks supplanted money during 1970, charge cards supplanted a few checks during 1980, while platinum cards supplanted both money and checks during the 1990s. The creator feels that even though money is not anticipated to go to zero whenever.

Considering the elaboration, the upsides of a cashless society in Indonesia could exceed the impediments. Thus, understanding the advancement of a cashless society will make a piece of knowledge to discover attention on further improvement. This examination from there on focuses out that the status pointer of a cashless society in Indonesia does not demonstrate quick progress. In this way, an alternate way approach to quicken the adventure, for example, government initiative and inventive arrangement, is required[10].

The reliable and Cashless payment framework offers invulnerability against robbery of paper and e-cash. It likewise guarantees documentation of the economy through the formation of an exchange trail that is in rationality with the suggestions of the APG/World Bank. This gives official assurance to our model, which would make it simple to execute in an actual situation.

The proposed thought in this work will be actualized utilizing the third organization, mainly devoted to giving their administrations here. Moreover, the security highlights, just as a convenience, would render its greater ease of use and along with these lines' client acknowledgment. This structure, in any case, confines payment settlement in a Business to the Client situation[11]. The Demonetization and Technology Payments are most significant among the changes. The effect of demonetization was felt more in the common area, and the most noticeably awful influenced was likewise poor people and ordinary citizens. The cashless exchange is not just prerequisites yet additionally a rising need of today for straightforward monetary advancement.

In Hyderabad City, cashless can be accomplished effectively because a large portion of them previously receiving cashless payment, there is just a requirement for the Administration ought to guarantee the convenient accessibility and nature of the telecom arrange in all pieces of nation. Budgetary establishments or mediators like banks and related master associations should consistently place assets into development to improve security and effortlessness of trade. People as a customer will perhaps move when it is progressively direct, fulfilled, and safe to make cashless trades. Government and banks should get the arrangement of boosting cashless trades and cripple cash Payments by the technique for suitable use and oversight of repressions for using the cash based trade, at that point cashless India will come to legitimate in future[12].

Along these lines, it is recommended that it is essential to have Rearrangements in the procedure of cashless exchanges that went with computerized proficiency and budgetary training. The pressing issue is the expense of cashless exchanges that can defeat by amplifying the use of grouped cashless alternatives. Another downside of the

cashless exchanges is security in the methods of payment arrangement of cashless. Web office is likewise a most driving piece of cashless payments; it is prescribed to acquire online exchanges disconnected exchanges. The execution organizations and government must deliver these issues intensely to lift the cashless exchanges among the traders and clients, for example, network or society[13].

Likewise, endeavors ought to be made to fortify web conventions and controls in the banks to give their clients the affirmations to apply and utilize the administrations. It is likewise to suggest that applicable administrative laws checking cybercrimes be proclaimed by the National Get together as proactive measures by the legislature. This will make trust in the brains of the majority.

At long last, since there is a high pace of absence of education in Nigeria, and there is a craving that all individuals be brought into the framework, the banks in a joint effort with the CBN should structure uncommon edification programs for the non-proficient populace utilizing apparent signs and images to teach this section on the most proficient method to work the cashless framework[14].

From the investigation over, the paper found that the gathering of the cashless economy game plan can update the improvement of money related unfaltering quality in the country. It gives that much has quite recently been done in making the people aware of the cashless economy and that a sizeable degree of the people is envisioning the introduction of the cashless economy. The cashless economy activity will be of enormous advantage to building up the economy; subsequently, the cashless framework will be useful in the battle against debasement and illegal tax avoidance. One most outstanding commitment of the cashless economy is that it is depended upon to diminish the hazard related to conveying money.

Since most exchanges will presently be settled electronically, individuals will have less need to move around with money, and consequently, loss of money, burglary, and equipped theft will decrease[15]. As encouraged by the government, the will is required as far as a motivating force system if the individual does the cashless exchanges. Web-based businesses will have better development if the nation goes

cashless. Different types of payment frameworks are accessible for the buyer like wallets, plastic cards, Mobile Payments, and Aadhaar based Payments.

Purchaser complaint redressal must be fast at whatever point the client faces the issue as far as cashless exchanges. Every one of the banks needs to concentrate on the security of the client's cash necessarily, and they have to have a robust framework that must withstand hacking[16].

2.3 Theories and Studies on Technology Acceptance

Rising innovations can influence work and representatives fundamentally. The degree and speed of this effect depend on a considerable degree of advancements in the innovations themselves and the readiness of associations to receive them. A few appraisals demonstrate that, from the 1980s, around a half of all new capital interest in associations was in Information Technology, as revealed by Westland and Clark as stated in their book[17] at the page 187-188.

As it may be like that, with the end goal for Technologies to be wholly used to improve efficiency, they should be acknowledged and utilized by associations' workers and purchasers. Investigating and clarifying variables that impact the client's acknowledgment of innovation is regularly portrayed as one of the major broadly investigated territories in the new data frameworks Information Systems writing. Research around there has brought about a few hypothetical models, with establishes in Information System, psychology, and human science, which routinely clarify more than 40 percent of the fluctuation in singular aim to utilize new technology [18]–[20].

2.3.1 Theories on Technology Acceptance model

This model is from the TRA model. Because of dubious hypothetical and psychometric status in the TRA model, the TAM model is disposed of the client's subject standards and considerably [21]. TAM clears up the influence of clients by three components; saw handiness saw usability and frame of mind toward use. Consequently, Behavioral Intention would be contained in TAM as well as two other

convictions like apparent value and usability considerably affect the disposition of the client. These can be resolved as an unfavorableness and idealness toward the framework. Occasionally, different components known as external factors (client preparing, framework attributes, client investment in his plan, and the execution procedure nature) are considered in the TAM model [22].

The hat is likely one of the most generally referred to as models in the field of innovation acknowledgment [23]. During the previous decades, it got generous 974 exact help since Hat overlooked the social impact on the reception of innovation, so it has constraints in being applied past the working environment. Besides, a few factors as external factors should be added to Hat to give an increasingly reliable forecast of framework use [21],[22]. Since the inherent inspirations are not tended to in TAM to apply in a client setting where the acknowledgment and utilization of data innovations are not exclusively to accomplish undertakings yet, also, to satisfy the enthusiastic needs might be restricted.

Technology Acceptance Model as it has been invented by Davis [18] is one of the most conspicuous research models to envision the usage and affirmation of information systems and development by clients. The hat has been commonly thought of and affirmed by different assessments that take a gander at advancement affirmation direct in different information structures creates.

In the TAM model, there are two components found in handiness and saw convenience is relevant in PC use rehearses. Davis describes obvious convenience as the imminent customer's enthusiastic probability that using an application structure will overhaul their action or live execution. See usability (EOU) can be portrayed as how much the up and coming customer envisions that the target system ought to be liberated from the effort. As demonstrated by TAM, comfort and saw accommodation are the most critical determinants of genuine structure use. These two components are influenced by outer variables. The guideline outside parts that generally are indicated is social factors, social components, and political components. Social components fuse language, capacities, and empowering conditions. Political factors are essentially the

impact of using advancement in legislative issues and political crises. The temper to use is stressed over the customer's appraisal of the appealing nature of using an information structure application. The direct point is the extent of the likelihood of an individual using the application.

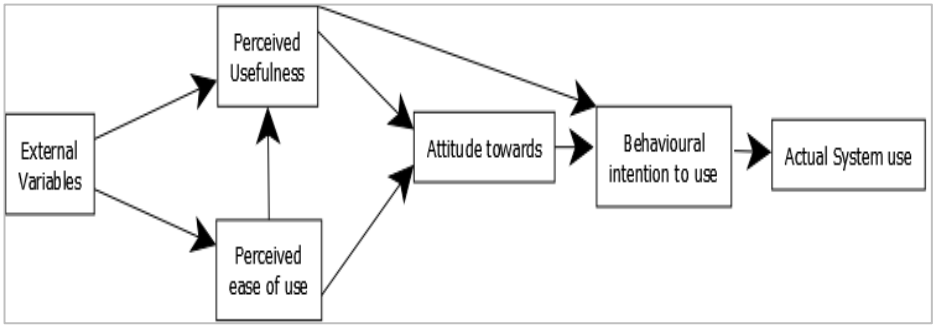

Figure 2-1Technology Acceptance Model (Davis)

Applications and progression of development allotment models and theories consolidate different points of view and understandings. The development of gathering models and theories with different theoretical encounters look at issues, variables, and estimations.

The improvement of the new speculative research structure will depend upon different elements, be that as it may, not compelled to the going with: the investigation issues and goals, opening assessment, the goal showcase (customers or engineers, etc), the affiliations' destinations and the appreciation of development gathering models and theories reliant on the available materials and others. Such understanding is basic to enable the contributed people (e.g., examines, researchers, researchers, government, relationship) to relate with both the theory and conventional pieces of the development choice models and theories. These will uncover some understanding and potential applications for inventive applications for future examiners to conceptualize, perceive and handle the essential advancement models and theories that may impact the past, current, and future usage of development gathering.

TAM has been an extensively used model to help fathom and explain customer direct in an information framework; there have been different investigates that have been used to test the model, and results have been substantial. The article has clarified the Technology Acceptance Model and the distinctive essential factors in it.

There has attempted to survey the model, and distinctive related investigates the region. The investigation additionally attempted to comprehend the various changes that have been done on the model by the various specialists.

The investigation additionally audited the application zones where the Technology Acceptance Model can be executed. Future research will attempt to give an augmentation of the Technology Acceptance Model and use it to comprehend the client's acknowledgment of innovation in e-recruitment.

2.4 Theories and Studies on Cashless Payment System

As defined previously, cashless payment is the transaction between the payer and the payee without any form of cash in hand between two involved parties. Cashless payment can be made up of many methods

2.5 The Journey from Cash to Cashless Payment

2.5.1 Definition and Description of Cashless Payment

A cashless Payment is an automated or online activity that may happen between two individuals, organizations, or associations. A digital transaction is a cashless exchange that explicitly includes no paper for the fruition of the exchange. Buying merchandise from web-based business sites, marking of business contracts on the web, or in any event, purchasing motion picture tickets through your cell phone application fall under the umbrella of Technology exchanges. Such tasks are precise, snappier, advantageous, and unquestionably more straightforward. Many are reluctant to acknowledge that there are advantages to a cashless exchange basically because they cannot explore their way around computerized gadgets or are only more joyful to

execute utilizing money. Peruse on about a variety of cashless exchanges that rearrange everyday exchanging.

A cashless payment society mirrors a financial state whereby budgetary trades are not driven with money as physical banknotes or coins, yet ideally through the trading of Innovation information (for the most part an electronic depiction of money) between the executing parties. Cashless social requests had existed from when human culture showed up, as a result of exchange and various methods for exchange, and cashless trades have also ended up being possible in current events using electronic cash structures, for instance, bitcoin. Anyway, this article examines and rotates around the explanation "cashless society" in the conclusion of a move towards, and repercussions of, a general populace where the cash is replaced by its mechanized equivalent - so to speak, legal sensitive exists, is recorded and is exchanged particularly in electronic Innovation structure. Such a thought has been discussed comprehensively, particularly the world is experiencing a fast and extending use of Innovation procedures for recording, managing, and exchanging money business, theory and regular day to day existence in various bits of the world, and trades which would truly have been grasped with cash are much of the time presently endeavored electronically[18] [19].
A few countries at present set purposes of constrainment on trades and trade regard for which non-electronic installment may be legally utilized.[4] The example of the usage of non-cash trades and reimbursement began in regular day to day existence during the 1990s when electronic financial injury up ordinary. By the 2010s Innovation, installment systems were vast in various countries, with models including center individuals, for instance, PayPal, automated wallet structures worked by associations like Apple, contactless and NFC installments by electronic card or wireless, and electronic bills and banking, all in across the board using[27].

By the 2010s cash had advanced toward turning out to be successfully disfavored in specific sorts of trade which would truly have been sensible to pay with physical fragile, and progressively critical cash wholes were in sure conditions treated with question, in view of its flexibility and comfort in tax avoidance and financing of

dread mongering, and adequately denied by explicit suppliers and retailers,[28] to the point of initiating the affirmation of a war on money [29].

By 2016 in the United Kingdom, it was represented that 1 of each seven people never again passes on or uses money [30]. The 2016 US Client Buyer Study ensures that 75% of respondents supported a recognize or plastic as their installment method, while only 11% of respondents supported money [31]. Since the foundation of the two associations in 2009, Innovation installments would have the option to be made by methodologies, for instance, Venmo and Square. Venmo empowers individuals to make direct installments to various individuals without having cash open. Square is an improvement that empowers for the most part free organizations to get installments from their clients. By 2016, just about 2% of the worth executed in Sweden was with money, and just about 20% of retail exchanges were in real money.

Less than half of bank offices in the nation led money exchanges. The move away from money is ascribed to banks persuading managers to utilize direct store during the 1960s, banks charging for checks beginning during the 1990s, banks propelling the helpful Swish cell phone to-telephone payment framework in 2012, and the dispatch of iZettle for little traders to acknowledge Visas in 2011[26].

2.5.2 Types of Cashless Payment Methods

There are numerous ways to go cashless. These are different methods that may help individuals to pilot their way into a cash-free world:

2.5.2.1 Cheques and Demand Drafts

A check is one of the most secure and most seasoned strategies for cashless Payment. A check is given to an individual or business for a sum. This check is saved in the collector's bank, and the cash is gotten through a Payment prepared by a clearinghouse. A new draft is more secure than a check since it cannot be defaulted or shamed, in contrast to a check. The DD is marked by a broker to guarantee that enough finances are accessible for active exchange. The disservice of checks and DDs are that

they are tedious because an individual must visit the bank and afterward trust that the check or DD will clear[32].

2.5.2.2 Debit and Credit Cards

Debit and Credit Cards have gotten on as a strategy for cashless exchange. A charge card is considered by numerous individuals to be more secure because you are executing with cash with your record. The hazard with a Visa is overspending. Charge and Visas can be utilized to make buys online just as over the counter at a store[33].

2.5.2.3 UPI Applications

UPI represents Brought together Payment Interface. UPI has changed the way we execute. At the center of a UPIs usefulness is the way that our portable numbers are enlisted with our banks and connected to our records. A virtual Payment address sends or gets cash without entering any bank-related data. Dealers would need to have a present record to get UPI Payments[34].

2.5.2.4 Mobile Wallets

Mobile wallets have turned into a helpful method for making Payments without money. When you load cash onto your portable wallet, you can utilize it anyplace it is acknowledged. The most prominent Mobile wallet that is inclining is Paytm. The inconvenience of portable wallets is that it is not connected to your record. When you load the cash into your portable wallet, you can go through it with a shipper who acknowledges Payment through the said application[35].

2.5.2.5 NEFT & RTGS

National Electronic Reserve Move and Constant Gross Settlement are electronic Payment frameworks that permit an advantageous store move between financial balances. The two offices are kept up by the RBI (Reserve Bank of India).

The offices can be utilized to move cash just inside India. The RTGS move window is from 8 am to 4.30 pm on weekdays and bank working days. NEFT settlements occur in conceded groups between 8 am to 7 pm on bank working days. There is no office for 'stop Payment' directions if there should arise an occurrence of either frameworks or the Payments made are unalterable[36].

2.5.2.6 IMPS

IMPS, which represents Immediate Payment Service, is assistance that was started by the National Payment Partnership of India. The pre-condition to profit IMPS administrations is that a client needs to likewise enroll for versatile banking. When enrolled, the client may benefit from the IMPS administration even through web banking. [37].

2.5.2.7 USSD

Unstructured Supplement Service Data is a cashless alternative for individuals who do not convey a cell phone or tablet. It works without a web association rather than the more significant part of the other advanced Payment administrations. It is a portable financial where you should dial *99# to utilize the administration. The administration reflects the IMPS administration and utilizations MMID with a portable number or IFSC code with the record number for the exchange to be fruitful[37][38].

2.5.2.8 ECS

ECS represents Electronic Clearance Service. It is an advantageous technique to make mass Payments, mainly to satisfy your utility administrations, likened regularly scheduled Payments, and for money related organizations to dispense Payments like benefits, compensations, or profit premium. ECS can be utilized for the two charges, just as credit administrations. The approval must be given to your bank to occasional charges or credits to be made. It is a sheltered technique since guidelines

can be given in regards to the most significant aggregate to charge, the legitimacy time frame for the said command, or the reason for the exchange[37].

2.5.2.9 QR Codes

QR codes are an augmentation of Mobile wallet Payment administrations. You filter the code of the shipper administration to finish your exchange. This would require a savvy gadget with a camera and an examining officer. It is snappy and bothers a free strategy for executing carefully[39].

2.5.2.10 Net Banking

Net banking is another option for utilizing your Debit and credit card. The client needs to login to their net financial record to favor a Payment. Net financial gives you the adaptability of executing regardless of whether you have lost your charge card or lost it. You can utilize web banking to make utility payments, buy merchandise and ventures on the web, or send and get cash[40].

2.5.2.11 Gift Cards or Vouchers

Gift vouchers are a helpful method for going cashless and are an incredible blessing thought because the collector can choose what they might want to buy with the voucher. Stores additionally give out limits on blessing vouchers, which function admirably for the buyer also[41].

2.5.2.12 Contactless payment systems

Contactless payment is a protected strategy for buyers to buy products or services utilizing a debit, credit, or smartcard enabled—otherwise called a chip card—by utilizing RFID innovation or close field correspondence (NFC).To make a Payment, tap your card almost a point-of-sale terminal that is outfitted with the contactless payment innovation. Because contactless payments do not require a signature or

personal identification number (PIN), exchange estimates on cards are constrained or predefined[42].

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CHAPTER 3
CONCEPTUAL FRAMEWORK

3.1 Introduction

In this part, we will highlight the theoretical framework and everything that is related to the variables and indicators that will be used in this research and develop the hypothesis.

- Variables

An image, perception, or concept that is capable of measurement hence capable of taking on different values.

- Indicators

Indicators are used to show whether the objectives have been achieved.

- Hypothesis

A recommendation, condition, or rule which is accepted, maybe without conviction to draw out its intelligent results and by this technique to test its agreement with realities which are known or might be resolved.

3.2 Classification of Variables

In this study, passenger's acceptance of a cashless payment system in public transportation: a case study of Kigali and Surabaya, the theoretical framework will be divided into three main parts, namely the technology acceptance model, consumers' behavioral toward the cashless payment and cashless payment.

- **Variables for the Technology Acceptance Model**

To address the inquiry on why clients, acknowledge or dismiss data and correspondence innovation (ICT). Davis and David [18] have proposed speculation, for the most part, known as the Technology Acceptance Model (TAM). The Hat suggests two essential determinants that sway customers' decision to acknowledge and utilize a system or Innovation: Perceived Usefulness (PU) and for Perceived ease of

Use (PEOU). With the TAM, Davis was trying to give a premise to following the effect of outside factors on inward convictions, dispositions, and goals [43].

Based on the nature of our theoretical framework, we here can confirm that it is a reflective model because of the following references on theoretical considerations:

- Nature of construct: this consist of the existence of independent of the measure that has been used as stated by Borsboom [44].
- Direction of causality between items and latent construct as the variation in the construct occurs, it also causes the variation in the items but the variation in items do not cause the variation in the construct. Bollen and Edward stated [45], [46].
- Characteristics of items used to measure the construct: the manifestation in of items for the construct share common them and are interchangeably adding or dropping an item that do not change the conceptual domain of the construct[47].

Table 3-1 Technology Acceptance Variables

Variables	Definition	Source references
Perceived usefulness (PU)	How much an individual accepts that utilizing cashless payment would improve their activity execution.	[18], [48], [49]
Perceived ease of use (PEOU)	The level to which an individual thinks that using cashless payment would be free from effort.	[18], [48], [49]

Table 3-1 characterizes the two factors as changed from Davis and utilized in this examination.

- **Underlying factors for passengers (External Variables) toward the cashless payment**

The journey of finding an external variable to our model will involve literature review and interview. Those variables refer to individuals' penchant to utilize technology for achieving objectives in home life and at work. The build is a general

perspective coming about because of a gestalt of mental empowering agents and inhibitors that, by and large, decide an individual's willingness to utilize new technologies. Quality of services also influence the passengers' view of travel execution, and it depends, all things considered, on the working choices made by a travel framework inside the requirements of its spending limit, especially choices on where travel administration ought to be given, how regularly and to what extent it is given, and the sort of management that is given. To go on with our research, we are going to adopt TRI verified by Parasuraman [50] and we will add our variables obtained from the interview.

Table 3-2 Behavioral of Passengers toward a Cashless Payment System (TRI)

Variables	Definition	Resources reference
Innovativeness (INN)	A tendency to be a Cashless Payment System for bus public Transport pioneer and thought leader	[51][52][53][54][49]
Optimism (OPT)	A positive view of the cashless payment system for public bus Transport and the belief that it will offer people increased control, flexibility, and efficiency in their lives.	[51][52][53] [54][49]
Discomfort (DISC)	A perceived lack of control over a cashless payment system for public bus Transport and a feeling of being burdened by it.	[51][52][53] [54][49]
Insecurity (INS)	Distrust of Cashless Payment System for bus public Transport and skepticism about its ability to work properly.	[51][52][53] [54][49]

- **Variables of Cashless Payment System**

As we defined it previously that a cashless payment society reflects a monetary state whereby budgetary exchanges are not led with cash as physical banknotes or coins, yet preferably through the exchange of Technology data (generally an electronic portrayal of cash) between the executing parties. As there are many types of payment that may be adopted to make a cashless society, but for this study, we will concentrate on a contactless payment card as it is popularly used to make fare payments

in public bus transport. Furthermore, we will also go in deep to explore another cashless payment type that is neither cashless using a specified card.it is not quite a long time that the government of Surabaya has introduced a payment system with plastic bottles to pay a trip in a specific public transport (Suroboyo bus).

3.3 Hypothesis Development

In the research, the hypothesis to be developed have to understand how the individual emblem that poses as cashless readiness factors by the TAM's variables (which are perceived ease of use and perceived usefulness) may have an effect on passengers' attitude towards technology acceptance of Cashless Payment System.

The first individual cashless payment system for the public bus transport readiness factor is innovativeness. Innovativeness, when all is said in done, is 'an inclination to be an innovation pioneer and thought pioneer' [55]**.** otherwise, it is the eagerness of some individuals to try out any newly adopted system disclosed into the market [56]**,**[57]. Individuals who are high in technology innovativeness all the time have a strong motivation to use and enjoy the stimulation of trying new cashless payment methods adopted. The comparison of less-innovative individuals, highly innovative individuals are not much concerned about whether new cashless payment methods adopted are easy to use and may still intend to try them despite the possible difficulties in using them [58]. Besides, highly innovative individuals have less-complex belief sets about new technologies [59]. From this, I will hypothesize that:

Hypothesis Related to TRI and Attitude towards Technology Acceptance

"Is individual innovativeness about technology has a significant relationship with the attitude towards technology acceptance."

- H1: the individual innovativeness about technology, in general, leads to a higher attitude towards technology acceptance.

The second personality trait or individual cashless payment readiness factor is an individual's personal optimism towards technology in general. Optimism would be defined as 'a positive view of technology and a belief that technology offers people increased control, flexibility, and efficiency' according to [55]. Alternatively,

optimism is ‘the tendency to believe that one will generally experience good versus bad outcomes in life’[60]**.** A cashless payment system for public bus transport optimist believes that newly adopted method of cashless payment will offer people increased control, flexibility, and efficiency in their lives [50], which means that they have a pre-determined positive view of the new cashless payment method adopted before they are ready for the introduction. Optimists use more-active coping strategies than pessimists. These strategies are more effective in achieving high results, and vice versa, related to emotional distresses, worries, and concern about bad experiences, perceived risk, and perceived control [61].

Optimists may have more-positive attitudes in general that help foster more positive attitudes towards new technology [62], which is a cashless payment method adopted in my case. Some people are more likely to accept their situation and confront technology more openly and less likely to be escapists or focus on adverse events [60]. Since technology (cashless payment method adopted) optimists generally expecting things to go their way and consider that good rather than bad things will be happening to them, they have an innate positive perception of new technologies (cashless payment method adopted) due to their self-confidence in their ability to master new technologies. Therefore, optimists are highly willing to use new technologies [60]. Based on the above arguments, I will argue that optimists will perceive new technology (cashless payment method adopted) as being more useful and easier to use because they worry less about possible adverse outcomes. From that reason, I will hypothesize that: ***“Is individual Optimism about technology has a significant relationship with the attitude towards technology acceptance.”***

- H2: High personal optimism about technology (cashless payment method adopted) in general leads to a higher attitude towards technology acceptance.

The third factor that is revealed is insecurity, which refers to ‘distrust of technology and skepticism about its ability to work properly’ [63]. Mistrust results in individuals avoiding technology due to their great fear of it. This may be due to skepticism that people have towards new technologies [64]. Individuals with high insecurity are not

confident in the security level that new technologies have and need assurances on its safety [50]**.** Those people are only willing to take risks in adopting new technology if they believe that they will significantly benefit from it. Thus, I will posit that people with a sense of insecurity will have lower perceived ease of use and perceived usefulness of new technology.

From this, I will hypothesize that:

"Is Personal insecurity about technology has a significant relationship with the attitude towards technology acceptance."

- H3: High personal insecurity about technology (cashless payment method adopted), in general, leads to a lower attitude towards technology acceptance.

The fourth factor is discomfort, which refers to individuals who have a lack of control over new technology and a sense of being overwhelmed by it. People who are profoundly uncomfortable with the technology believe that they are controlled by it and that it is not for ordinary people [50]. Besides, individuals with a low comfort level in adopting new technology usually feel more involved and uncertain about new things [65]. From that point, to achieve the same level of intention to adopt new technology with an individual with high comfort levels, someone uncomfortable with technology must find new technology much easier to use. Similarly, to have the same level of behavioral intention, these individuals must believe that adopting new technology is useful to a greater extent than those with a higher level of comfort [66]. Therefore, I will hypothesize that:

"Is Personal Discomfort about technology has a significant relationship with the attitude towards technology acceptance."

- H4: High personal discomfort for technology, in general, will lead to a lower attitude towards technology acceptance.

The firth factor is Awareness. In general, when you are aware of technology innovation and its benefits is a crucial initial stage in accepting the Cashless Payment System. Many studies on technology innovation [67][68] have found that a lack of awareness and not knowing innovations were among the problems in successfully adopting them.

Indeed, having awareness about innovations and their benefits is a critical stage that affects whether an innovation is rejected or adopted. Moreover, awareness and knowledge of cashless payment's appropriate and relevant models, perceived benefits, opportunities, and threats are believed to effect of cashless payment. For example, a business that is aware of the opportunities and threats of Cashless payment methods of transactions might have a stronger influence on their decision making. Hence, I will hypothesize that:

- H5: Personal Awareness about technology is positively related to attitude towards technology acceptance.

Many types of research have extensively tested the relationship between TAM's two cognitive dimensions. Many empirical studies support the perceived ease of use that has significant and positive influences on perceived usefulness[20]. We can conclude that perceived ease of use and perceived usefulness will be positively related when the perceived usefulness refers to 'a prospective user's subjective belief that using a specific technology will increase their job performance'[49]. Hence, I will hypothesize that:

Hypothesis Related to TAM and Attitude Towards Technology Acceptance

Hence, I hypothesize that:

- H6: Perceived usefulness is positively related to attitude towards technology acceptance.
- H7: Perceived ease of use is positively related to attitude towards technology acceptance.

Additionally, past examinations have likewise tended to the connections between both saw usability and saw helpfulness with the real use considers. Ample proof exists that exhibits that apparent usability is altogether connected to the actual usage [18], both directly and indirectly, via its impact on perceived usefulness.

- H8: Perceived usefulness is positively related to intention to use Cashless Payment.

Hypothesis Related to Attitude and Intention to use cashless Payment

"*Is Personal Attitude technology acceptance having a significant relationship with the intention to use a cashless payment system.*"

- H9: Attitude towards technology acceptance positively affects intention to use the cashless payment system

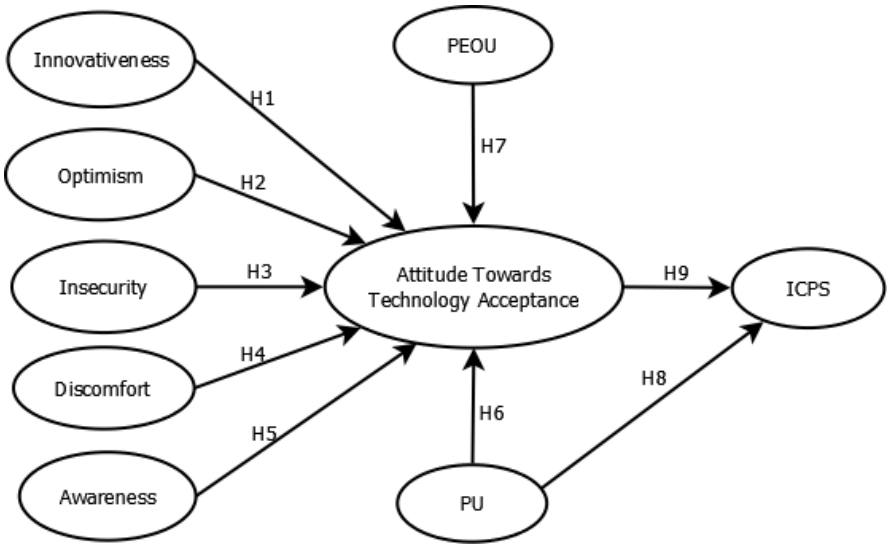

Figure 3-1 Theoretical Framework to be Used

3.4 Partial Least Square Analysis (PLS)

Partial least squares are a known method for smooth displaying in the territory application; PLS is a strategy for making systematic models when the variables are numerous and profoundly collinear. The regular thought of PLS is to endeavor to extricate the idle variables, representing however much of the show factor distinction as could reasonably be expected while demonstrating the responses well [69]. PLS is a generally utilized procedure in econometrics, particularly for the situation where the quantity of autonomous factors is fundamentally bigger than the quantity of information focuses. The thought from PLS is to breakdown all the structure network X and reaction lattice Y [70]. PLS regression is a recent technique that generalizes and combines features from principal component analysis and multiple regressions. It is

particularly useful when we need to predict a set of dependent variables from a very large set of independent variables or predictors.

3.4.1 Measuring of Structural and Measurement Model

PLS path models are formally defined by two sets of linear equations, the inner model (structural model) and the outer model. The inner model specifies the relationships between unobserved or latent variables, whereas the outer model specifies the relationships between a latent variable and its observed or manifest variables [71]. The inner model and outer model were measures to test the wellness of the model utilizing trial of focalized and discriminant legitimacy and dependability through PLS-SEM and SmartPLS 3. PLS is a helpful apparatus to gauge the auxiliary condition demonstrating in a measurable report, especially with restricted members and slanted information circulation [72].

- It may create large mean square errors in the estimation of the path coefficient.
- Since arrows are always single headed, it cannot model two ways correlation.
- For the small sample size, it needs a high-valued of the structural path coefficient.

Besides, all the above PLS can be good statistical tools for the specific situation as follows.

- It is good for small sample size.
- Q^2 is Outstanding.
- The use has a limited available theory.

From the fact above as noted by [72], therefore in the measurement model the measures were reliability, convergent validity, and discriminant validity, moreover the structural model the measures were R^2 (explained variance), f^2 (effect size) and Q^2 (predictive relevance)

3.5 Evaluation of the Model

The investigation model is reflective; consequently, unwavering quality and legitimacy ought to be analyzed. To decide the develop legitimacy for intelligent measures, merged and discriminant legitimacy ought to be evaluated. Both can be considered as a subcategory to build legitimacy and distinguish between connections among the things. Concurrent legitimacy shows that the estimation is identified with hypothetical documentations. United legitimacy is how much different proportions of a build concur. It is helpful when the focuses acquired from two unique things estimating a comparable idea are highly correlated [73].

At the point when every one of the estimation things loads with a huge t-esteem on its inactive build, merged legitimacy has uncovered this relationship. One-unit change of exogenous develops changes the endogenous build by the size of the way coefficient when everything else stays consistent way coefficient will be huge at the T-Insights is bigger than 1.96 at $p < 0.05$[74]. Indicator' loadings onto their separate builds were resolved and along these lines broke down to quantify the convergent validity for reflective indicators.

In PLS, the average variance extracted (AVE) examination ought to be led to consider the discriminant validity of the measurement model. AVE's worth can be determined utilizing the bootstrap strategy offered in SmartPLS. In convergent validity, the estimation value(AVE) ought to be 0.5 or higher [75]. In discriminant validity, the test is for AVE numbers, and latent variables, based on [76] the square root of AVE of each latent variable should be greater than the correlation among the latent variable.

Factor Loading

PLS could test the combined and discriminant Validity of the scales. Taking everything into account, the assessment model is reflective; along these lines, reliability and validity should be dissected. As the reliability of loadings differs, the reliability of every indicator ought to be evaluated; Invalidity, the test is indicator reliability accessible by square every one of the outer loading, the favored worth ought to be 0.7

or higher, for this situation, external stacking ought to be more prominent than 0.708. indicator reliability, which is lower than 0.4 suggested being eliminated from measurement models[71].

2.7.1 Reliability Test

The reliability test is applied when you want to test the reliability of constructing. There are two principle ways when you want to determine construct reliability, like Cronbach ‘s alpha and composite reliability. The internal consistency reliability, Cronbach ‘s alpha is applied to determine abnormally in social research, but it bears to provide a conservative measurement in Partial Least Square-Structural Equation modelling. Preceding researches have recommended that the use of Composite Reliability as a substitute if the value of composite reliability of each feature is more than 0.70, which proves that variable is acceptable [71].

2.7.2 Variance extracted (AVE)

The average variance extracted is the variance in the indicators explained by the common factor, and average trait-related variance extracted. AVE varies from 0 to 1, and it represents the ratio of the total variance that is due to the latent variable. In convergent Validity, the estimation of convergent Validity (AVE) ought to be 0.5 or higher. A variable removed of more prominent than 0.50 demonstrates that the legitimacy of the two builds and the individual factors is exceptionally legitimate. Discriminant validity issue emerges when various develops don't contrast from one another as they should. In PLS, the normal fluctuation extricated (AVE) investigation ought to be led to consider the discriminant legitimacy of the estimation model. AVE's worth can be determined to utilize the bootstrap procedure offered in SmartPLS. The square foundation of each AVE should be bigger than the correlation of the particular build that ought to be considered in an AVE examination or in discriminant validity, the test for AVE numbers and dormant factors, the square base of AVE of each latent

variable ought to be more noteworthy than the connection among the latent variable [76].

3.5.1 Structural Equation Modeling (SEM)

The structural equation modeling approach was used to validate our research model, to perform it the analysis of partial least squares (PLS) was employed. PLS offers several strengths.

- It places the least demands on measurement scales.
- It is appropriate for conditions with little theory development.
- It prevents identification problems of recursive models.
- It prevents factor indeterminacy problems.
- It makes no assumptions about the data.
- Assumes the errors are uncorrelated.
- There is no need to specify the distribution of measured variables.
- It shows the outstanding results on the very small samples.

SEM techniques such as PLS and LISREL are second-generation data analysis techniques that can be used to test specified relationships among multiple independent and dependent constructs simultaneously as well as measurement models [77]. SEM is superior to first-generation methods such as linear regression because of a few advantages. In the context of Information System, SEM has become widely accepted for several variables data sets in which the researcher collects numerous measures of proposed constructs.

Choosing the best suitable technique to analyze the data is the preliminary step when applying SEM. To analyze the data, researchers should consider a few issues.

a) PLS supports smaller sample sizes for data analysis. Additionally, a covariance-based study generally needs more cases for data analysis [73].

b) Scientists have contended that PLS is primarily proper for prescient applications and hypothesis building [73].

PLS can handle reflective indicators better than other methods. For other techniques, the inclusion of formative variables is often problematic and has been revealed to lead to identification problems [78]. Data analysis is regularly carried out in two steps when using PLS evaluation of the measurement model and evaluation of the structural model. Determining the construct validity and reliability of the scales is part of the assessment of the measurement model. Examination of the strength and significance of the path coefficients between the constructs of the research model is part of the evaluation of the structural model [78].

3.5.2 Bootstrapping Procedure

SmartPLS software can examine the paths in the model for every bootstrap sample automatically provided through the processes used in the bootstrapping process. Such an approach has been utilized for analyzing the significant regresses, T-values are obtained based on the bootstrapping method, which coordinates with inner and outer model paths[79].

The T-Statistics investigation will be applied for the essentialness of model at 97% confirmation level, One unit change of exogenous constructs changes the endogenous construct by the size of the path coefficient when everything else remains constant path coefficient will be significant at the T- Statistics is larger than 1.96 at $p < 0.05$ [77]. For preceding the study, according to the evaluation and prediction of the structural model, some data about the t-values, path coefficients (β), p- values (p), squared R (R2) should be identified in detail.

- Path coefficients (β)

Path coefficients (β), shows how strong and significant to the associations between dependent and independent variables are [80]. It means that a path coefficient reveals the immediate influence of a variable (considered as the cause) that is supposed to result in a different variable (considered as effect). Since a Path coefficient can be identified based on the correlation, it is Standardized while a path regression coefficient cannot be considered standardized. Path coefficients should vary between 1 and -1 [71]

- Hypothesis testing

For conducting the hypothesis testing, the path significance can be determined via t-tests values by using the bootstrapping procedure. Commonly, the acceptable value for the t-value is larger than 1.96. (T-value >1.96 at $p < 0.05$) means a significant level.

- P-value

The P-value can be considered as a quantitative measure of the numerical importance of testing a hypothesis. Furthermore, regarding the studies conducted formerly, P-value < 0.05 implies the significance of the related hypothesis (Michael Haenlein 2004).

3.5.3 R Squared (R^2)

The R^2 shows the normal impact of the model of ward factors by evaluating the level of a develop 's difference in the model [81]. For the structural model, the measure was R^2 (explained variance), f^2 (effect size), and Q^2 (predictive relevance). The range of R^2 is from 0 to 1, which high levels are indicating a higher level of predicting accuracy; the value of 0.75, 0.50, and 0.25 can be described as substantial, moderate, and weak. The existing correlation between the dependent variable and independent variables shows by multiple R and its statistical significance at $p<0.05$.

CHAPTER 4
METHODOLOGY

4.1 Introduction

The technique is the precise, hypothetical examination of the strategies applied to a field of study. It additionally includes the hypothetical investigation of the collection of techniques and standards related to a part of information. Regularly, it incorporates ideas like a worldview, hypothetical model, stages, and quantitative or subjective strategies. A strategy does not just decide to give arrangements. It is from that, not equivalent to a technique to be utilized. Rather, it additionally offers the hypothetical establishment for understanding which strategy to utilize or to set, or best practices to apply to a case, for instance, to ascertain a particular outcome. This part manages the examination configuration, target populace, test size and inspecting strategy, research instruments, wellsprings of information, information assortment methodology, pilot testing of the exploration instrument, unwavering quality and legitimacy, stream diagram of examination technique and information investigation (engaging insights, dependability investigation, connection, and speculation testing).

4.2 Research Design

The considerable issue that follows the undertaking of characterizing the examination issue is the readiness of the arrangement of the exploration venture, prevalently known as the exploration plan. The study seeks to investigate and provide a framework on the impact of supply chain practices on the effectiveness of smart mobility in Selected cities and, to a more considerable extent, examine the characteristics of the independent variables.

The study is qualitative and somehow in quantitative. Qualitative[82] because it involves the description in many words on passengers' perception of cashless payment system adoption. Equally so, some aspect of the study is quantitative. Quantitative analysis is involving measurement of achievements made, and mathematical

calculations of input used. The effort will also be used to construct graphs which are quantitative but ordinal to describe some aspect of the purpose of the study. To further understand the link between the variables of the study, an outline of the methodology to use in data analysis and discussion to identify.

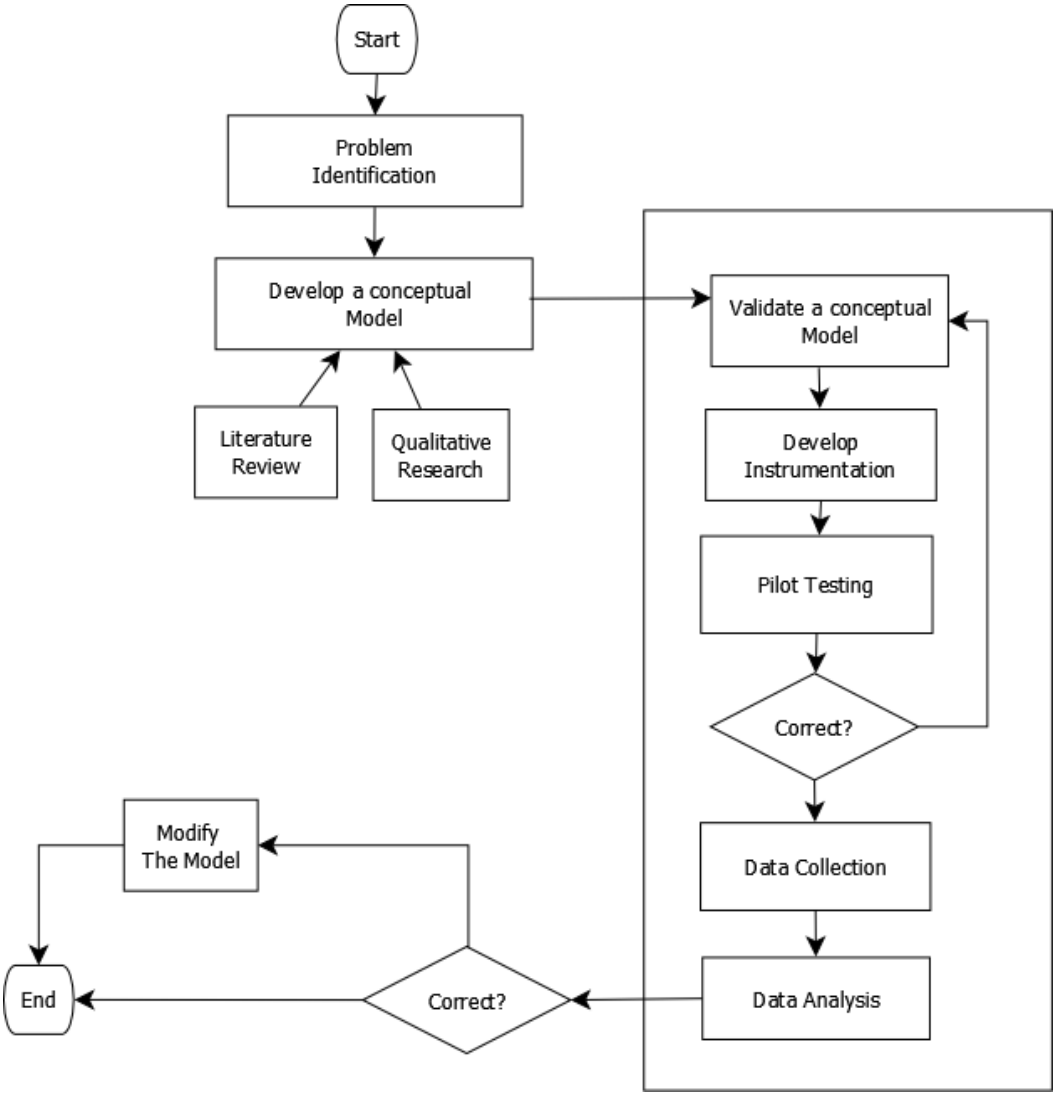

Figure 4-1 Research design

4.2.1 Sample Size and Sampling Technique

This study will use stratified random sampling techniques to sample relevant data of two cites since it empowered the speculation of a bigger sample size of the level of the entire population. The sampling technique is a procedure of choosing a few people or articles from a populace with the end goal that the chose gathering is illustrative of the attributes found in the whole group. It might rely upon the idea of the number of inhabitants in intrigue or the information to be gathered. Respondents will be drawn from the example edge utilizing necessary stratified irregular examination to advance the requirements for proficiency and representativeness. 50% of the objective population will be used as an agent test of this investigation. Since the examination means to use tests with variables and for accommodation inspecting, consequently, the study will utilize Jacob Cohen[83] control groundwork table to choose the sample size for the exploration of N for Small, Medium, and massive impact size at power as appeared underneath in the figure.

In this investigation, the sample size as suggested by Kothali [84] page 197, will be given by the following formula:

Sample size $n = \frac{z^2 pq}{d^2}$ ..... (1)

Where

n = sample size of the population in Surabaya and Kigali

z = Statistical certainty chosen. In this study, we prefer to use a 95% confidence level

p = Estimated proportion level/ coverage to be investigated

q = Difference of 1 and p

d = The precision desired or the tolerated maximum value of relative sampling error

Currently, the population of Surabaya is estimated to be 2.9 million [85], and that of Kigali is 1.5 million[86]. The assumed proportion level of the sample at 95% confidence intervals will cover 50 percent, and the difference of proportion covered also will be 50 percent. The degree of precision of the estimated sample will be 0.05. Therefore, by applying the formula (1) above, the total sample size of the present study

would be 384. To get the original, the size of population for two regions in the case study area, we consider the proportion size of the total population from each region. It was found that the population proportion of the Kigali would be 48 percent, and that of Surabaya is 52 percent. There the sample size should be included in the study for Kigali will be 184, and the sample size for the Surabaya region will be 200.

4.2.2 Research Instrument

In this research, the instrument to be used includes an interview guide/personal interview, questionnaire, and observation guide, which will be designed in the open and closed-ended with variables identified from the research objective that will administer to the respondents. To have a favorable evaluation, the analysis of the variables under investigation, the use of statistical tools such as tabulation, and the transformation of the absolute data value into percentages is also adopted. Finally, the observation guide is a two-dimensional chart where units or attributes to observe are correlated in the form of a scale. In a case like the interested partners for observation must be predetermined with provision made for consequences. The use of an interview is justified by the fact that a high percentage of the respondents are not familiar with a cashless payment system to respond to the items in the questionnaires whilst at the same time rephrasing the questions to avoid ambiguity.

Observation will be used so that we minimize the effect. That is the effect of the respondent being aware of the fact he/she is studying. View tends to produce more reliable results. To further trace the trends and pattern of the data on the passengers' perception of cashless payment system adoption for public transport, charts will also be suitably adapted to examine the magnitude of the relationship between (Independent variables) and its component variable (Dependent variable).

The research instrument to be used in this study is a list of statements designed by the variables in the conceptual model. The explanation of the measurement items of each variable was discussed in Chapter 1. Furthermore, the measurement items will be poured into statement formulation in the questionnaire used in this study. The Likert

scale used to measure or assess the answer of each element of the statement using a range of values 1-5, where the higher the value indicates the more positive responses and vice versa. The Likert scale is used to represent respondents' agreement or disagreement with the statement submitted in the questionnaire.

4.2.3 Sources of Data

This study will explore and use the primary data obtained from various sources, including the research and statistical unit of both cities. Equally so, we will want to get the perception of passengers, respectively. As we want to get attention to the problem, we will not concentrate only to passengers but also on drivers because we also think that the system adopted would affect them as well. Some reports of the transportation system but focusing only on cashless payment, lecture notes, published work such as past dissertations/thesis, textbooks, journals are other sources of data for this research.

4.2.4 Data Collection Procedure

The questionnaire would be administered using google form and drop and pick later method. To ensure an adequate data collection process, ensure that the survey would be designed in an open and closed-ended question to enable the respondent to answer the questions independently. To avoid missing out crucial details from the interview, the researcher will use an interview guide to ask the questions or pose the statement and then record the responses through notetaking.

We will distribute the questionnaires for one week, after which they would collect. The surveys will be presented into blocks, thereby indicating the objectives variables to be investigated and that of the respondent.

The respondent will be asked to mark on a Likert scale of 0 to 5, about their perception regarding the aspects related to the acceptance of cashless payment system of public bus transport, which formed the underlying constructs.

4.2.5 Pilot Testing of the Research Instrument

The last advance in the survey configuration is to test a poll with few meetings before directing your essential sessions. In a perfect world, you should verify the review on similar sorts of individuals you will incorporate into the primary investigation. On the off chance that is beyond the realm of imagination, in any event, have a couple of individuals, other than the inquiry essayist, attempt the poll. This sort of trial can uncover unforeseen issues with question-wording, guidelines to skip questions, and many more. It can also assist in checking whether the interviewees comprehend your inquiries and offer valuable responses. On the off chance that you change any queries after a pre-test, you ought not to join the outcomes from the pre-test with the consequences of post-test interviews. The Review Framework will perpetually furnish you with numerically right solutions to your inquiries; however, picking reasonable questions and directing studies with affectability and sound judgment will improve the nature of your outcomes significantly.

A Pre-testing of the research instrument would be adopted before the main study on a group of respondents. A sample size of 1- 10% of the sample frame is a suitable frame to engage in pilot testing. Our respondents from the sample population, some respondents from the sample size, would be used for pilot testing in order to determine the suitability, appropriateness, and clarity of the questionnaire in addressing the variables under investigation whilst at the same time assess the reliability of the instrument. The respondents that would be selected for the pilot test will not be used again as a target in the completion of the main study. The pre-test will be carried out to two cities that did not form part of the sample, and in the event where the respondents did not correctly understand the question, adjustments would be made by rephrasing questions to avoid ambiguity to make them more evident to the respondents thereby helping to improve the questionnaire.

Emails will be sent to Respondents (both commuters and officials in charge of the transportation system in the city) at an earlier period explaining the aims and objectives of the study and inviting/requesting their participation.

Similar invitations will be repeated more frequently to other institutions before the final issuing out of the questionnaires to the required targeted. Finally, after the pre-testing, the inquiries will be sent via electronic using google form and electronic messages.

4.2.6 Data Analysis

This part will explain the test results and analysis of measurement models and structural models. As well as interpretations to obtain qualitative explanations based on quantitative data used to counter research hypotheses. After the questionnaire results are collected, the data is processed use SmartPLS software under the steps described in the following figure 3-2 below.

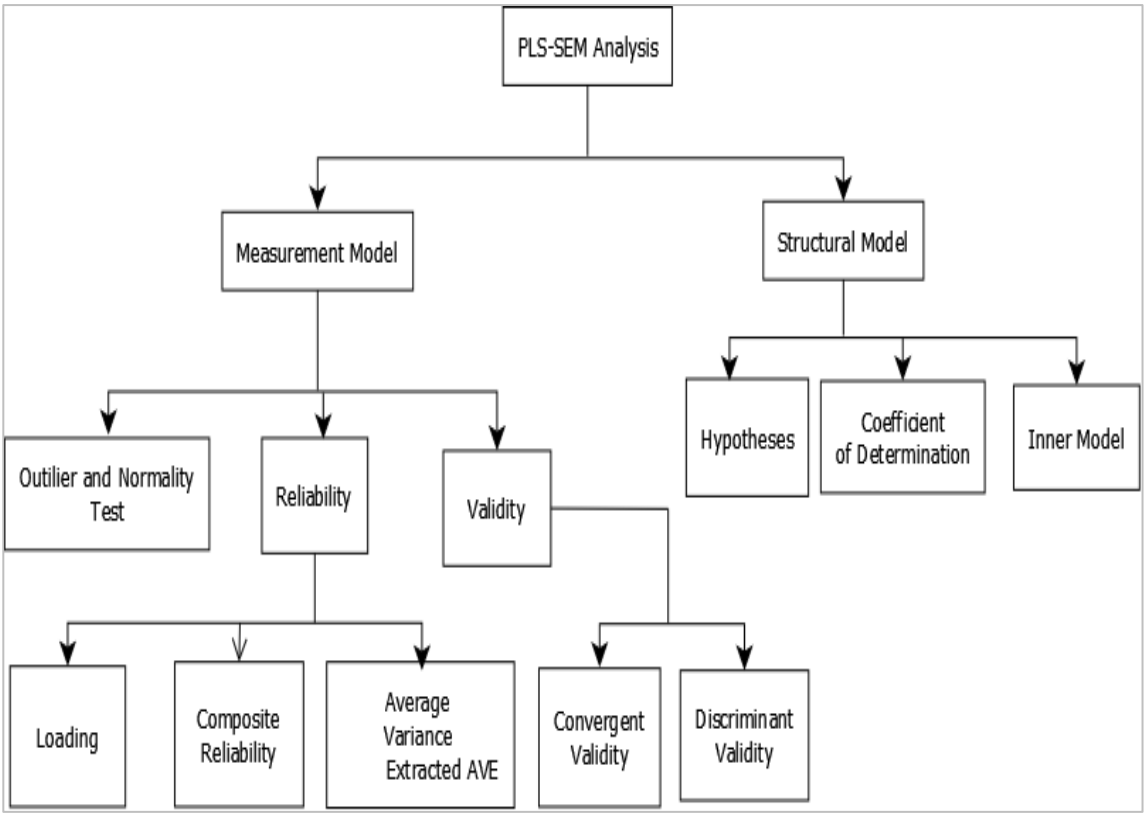

Figure 4-2 PLS-SEM Analysis (Source: Author)

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CHAPTER 5
ANALYSIS, FINDING, AND DISCUSSION

5.1 Introduction

This chapter presents the research model, its constructs, and the relationships hypothesized among the constructs. The theoretical model supporting this study is presented and suggests that the constructs of the TAM Framework have a positive effect on passengers' acceptance of a cashless payment system in public transportation. A survey dependent on the proposed model was set up by an audit of writing in the appropriation of innovation dependent on the TAM hypothesis. Additionally, this part presents an investigation of the information accumulated by the establishment of the development of the examination model. It will likewise uncover the consequences of the examination to assess the recommended research demonstrate and accomplish the exploration goals. This segment clarifies what is required for the proposed model. Thus, to demonstrate the speculation of the current examination, this part incorporates four areas. The principal segment talks about the information; the subsequent segment uncovers "Theories Testing," Then the outcomes are featured. At long last, research goals and accomplishing them are examined. The information was investigated through Smart Partial Least Square (Smart PLS 3.2.8), utilizing the auxiliary condition displaying (SEM) strategy was chosen for sensible examination.

Figure 4.1 shows the structure overview of the first section of this chapter in which the organization of the first section of chapter four is well detailed and starting with the Introduction, research model, hypothesis development, and finally, the survey development. Hypothesis development is far more expressed in the details about the hypothesis of the research constructs, such as hypothesized factors and the TAM hypothesis factors that have been formulated in this research.

5.2 Research Model

Chapter 3, section 3.3, explained about Technology Readiness Index and Technology acceptance model both merged to study the way passengers' acceptance of a cashless payment system and through our literature review has revealed another variable that is going to be tested in our research. This section explained more about the models that would be used to measure the passengers' intention to use cashless payment; besides of that also the section explains the combination of the models that would be used in this study. Those models are the TRI framework and TAM theory that makes the combination of the model named our model that will determine the passengers 'acceptance of a cashless payment system for the transportation system.

Based on the above discussion, there is a hypothesis that link to our adopted model, the context of the TRI framework consists of four (4) hypothesis (**H1**, **H2, H3**, and **H4**) that links to the attitude and TAM framework. The part of TAM and intention to use the cashless payment system consists of hypothesis **H6, H7, H7, H8** that link to the ICPS. the formulated hypothesis that links the model to their constructs, and it also expresses more about manifest (reflective variables) that is used to measure the constructs of the study.

5.3 Survey Development

To evaluate the method that was proposed for this research model, a quantitative method was carried out. The selected questionnaire was designed to explore the factors that influence the use of a cashless payment system in the public transportation system in two selected cities (Kigali and Surabaya). To ensure that a comprehensive list of items is included in the questionnaire, the works of all previous research that studied technology adoption were reviewed. An organized survey was created from existing instruments to stay away from issues of legitimacy and unwavering quality of the measures. It implies for each factor in embracing the total inquiries from past examination in the reception territory with TAM hypothesis and TRI hypothesis that utilized these components.

Furthermore, we have included another variable that was gathered during the interview conducted in the response format, source, and development of the questionnaire. This questionnaire was talked about and concurred with the boss. In the wake of being affirmed in the last stage, as per past exploration, as per the examination goals, polls were arranged and sent to the respondent through email messages. This survey comprises of two principle classes: A and B. Part A, in which respondents were asked demographic characters, designation, and employment and work experience questions. Part B is made of research questions, and this is where all our questionnaire starts.

5.4 Analysis and Findings

This section presents an investigation of information accumulated by the establishment of the development of the exploration model. It will likewise uncover the aftereffects of the task to assess the recommended research display and accomplish the examination targets.

This part clarifies what is required for the recommended model. Subsequently, to demonstrate the theory of the current examination, this part incorporates four segments. The principal area examines the information; the subsequent segment uncovers ―Hypotheses Testing. At that point, the outcomes are featured. At last, research goals and accomplishing them are talked about. The information was investigated through Smart Partial Least Squares (Smart PLS 3.0) understudy variant, utilizing the basic condition displaying (SEM) procedure was chosen for consistent examination.

5.4.1 Data Description

The primarily procedure analyzing data was the preparation of data in which the data were arranged based on the hypotheses formulated to this research into a file that was given before. Then, all data should be tested and must make it ready for the cleaning procedure.

5.4.2 Data Collection

We have collected data based on the responses of students, staff, and lecturers of two cities (Kigali and Surabaya). These two Cities were chosen based on the condition that there are two cities that have almost a similar system of public transport. In this study, the suitability of the indicator to the variable and the reliability and validity of the variable was tested by an analysis of these two cities (Kigali and Surabaya) case studies information from their passengers. Three hundred eighty-seven respondents (387) were selected from these two cities (Kigali and Surabaya), including students, staff, and lectures for the measurement model. The respondents were selected from different demographics in the two cities (Kigali and Surabaya), but the priority was given to the people who mostly use public transportation as their means of mobility. Afterward, the reacted surveys were accumulated with the standard request.

The information was moved to Microsoft Excel programming, and from that point onward, SmartPLS programming was utilized to break down them. It was necessary to check the data to understand how accurate the answers and participants were. After reviewing the data carefully, the data detail shows that all the 387 respondents from all two cities (Kigali and Surabaya) were fully responded to the questions provided, and there were no missing items or data. Hence all the 387 respondents answer was taken for analysis.

5.4.3 Demographic Statistics

In this part we deal with the sorting of data and the valid response rate was categorized into five sections, based on Cities, lectures in both Cities, gender in both Cities, educational level for all respondents in both Cities, and finally based on the age of the respondents in both Cities (Kigali and Surabaya).

5.4.4 Respondent Based on the City

Table 5.1 reveals the demographics of the answers in the present study based on the cities. It also shows the percentage of the obtained answers from both cities

(Kigali and Surabaya). Approximately 48% of all participants were from Kigali, whereby 52% came from Surabaya, as previously proposed in the sample design.

Table 5-1 Respondents number based on City

CITY	RESPONDENT NUMBER	PERCENTAGE
Kigali	187	49.1%
Surabaya	200	51.9%
TOTAL	387	100

The following figure represents the results of demographic statistics based on the city where they are from with their percentage of all cities' respondents through a pie chart graph.

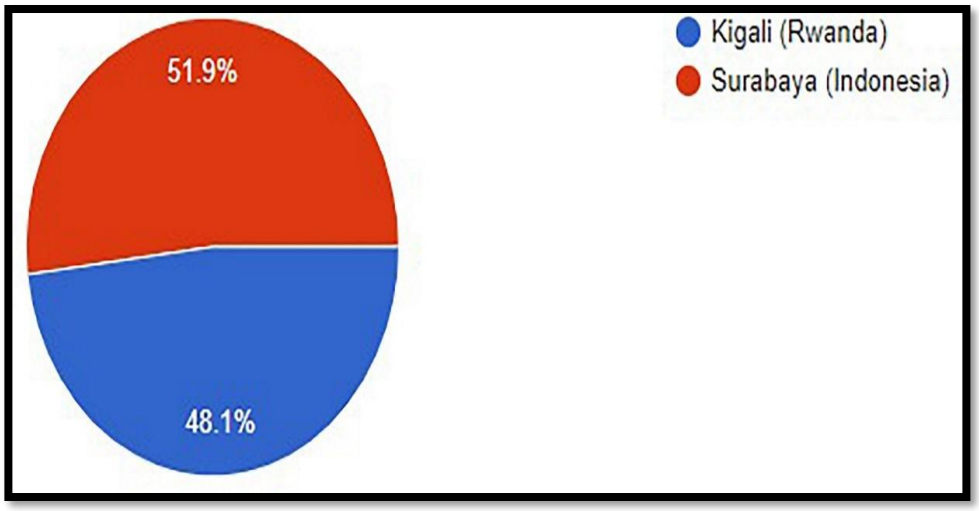

Figure 5-1 Respondents number based on City

5.4.4.1 Respondent Based on Gender

Gender was categorized into two groups, male and female in each city (Kigali and Surabaya). According to what we collected. Figure 5.1 generally shows demographic statistics based on gender in both cities; the analysis result shows that male categories found to have 43.9% and females exposed to have 56.1% in both cities respondent. Figure 5. 1 Gender demographic statistics in both cities.

Table 5-2 Respondents Based on Gender

Gender	RESPONDENT NUMBER	PERCENTAGE
Male	170	43.9%
Female	217	56.1%
TOTAL	387	100

Figure 5.2 represents the results of demographic statistics based on gender with their percentage found in these two Cities (Kigali and Surabaya) respondents through a pie chart graph.

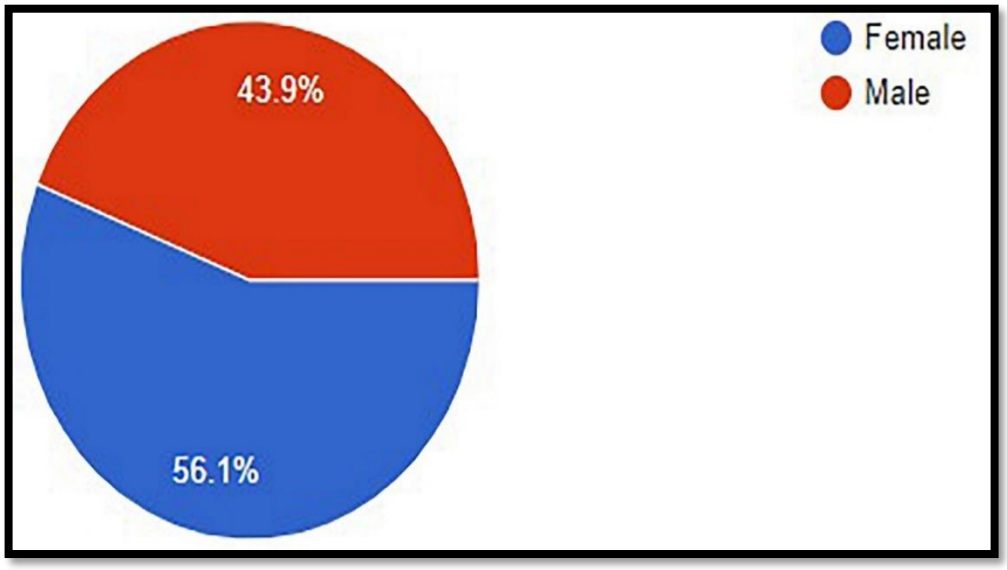

Figure 5-2 Respondent Based on Gender

5.4.4.2 Respondent Based on Age

The obtained data was analyzed in three distinguished age scale of the years. Respondents were categorized according to the range of their age scale.

Table 5.3 elaborates the respondent's ages into three fields, including age range from 18 to 24 years, age range from 25 to 29 years, and age ranges from 30 to 44 and age range from 45 to 54 and 55+.

Table 5-3 Respondent based on Age

Age	RESPONDENT NUMBER	PERCENTAGE
18 to 24	150	38.8%
25 to 29	94	24.3%
30 to 44	127	32.8%
44 to 54	16	4.1%
55+	0	0%
TOTAL	378	100%

Figure 5.3 shows general demographic statistics based on age in both cities; analysis results show the following results in both cities.

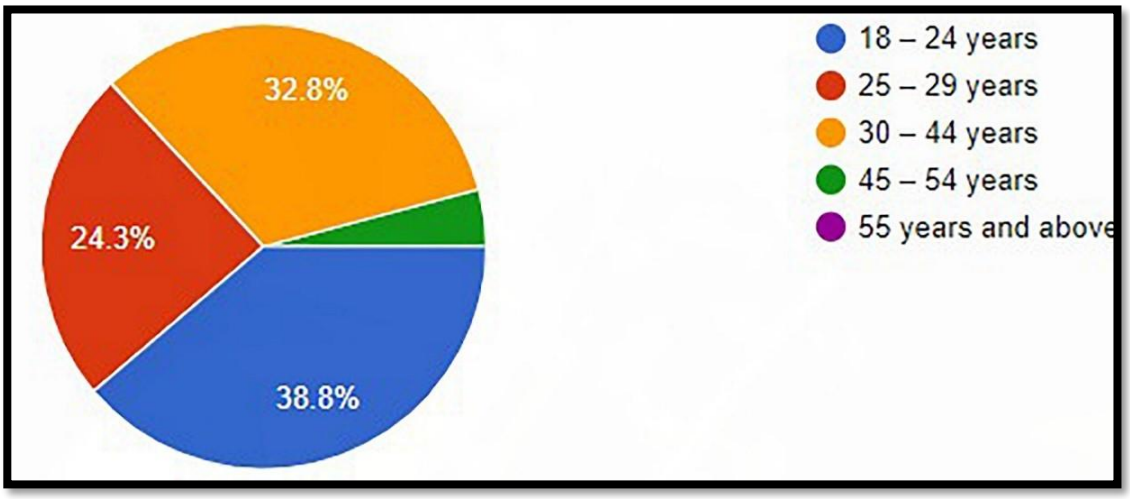

Figure 5-3 Respondent Based on Age

5.4.4.3 Respondent Based on Occupation

Table 5.4 shows respondents with their occupations, respectively, were analyzed in three distinguished ranges of their professions. Respondents were sorted out according to the scope of their professions. The reason why we have chosen these occupations is that we already know that they are the ones that use Public transportation at the highest rate. From that, we decided to take these occupations so that they will be used in our research and exploration of the perception of how they also use a cashless payment system.

Table 5-4 Respondent Based on Occupation

Occupation	RESPONDENT NUMBER	PERCENTAGE
Student	171	44.2%
Businessperson	46	11.9%
Public Sector Employee	124	32%
Private Sector Employee	46	11.9%
Others	0	0%
TOTAL	387	100%

The result of what we collected is also displayed in figure 5-4 below:

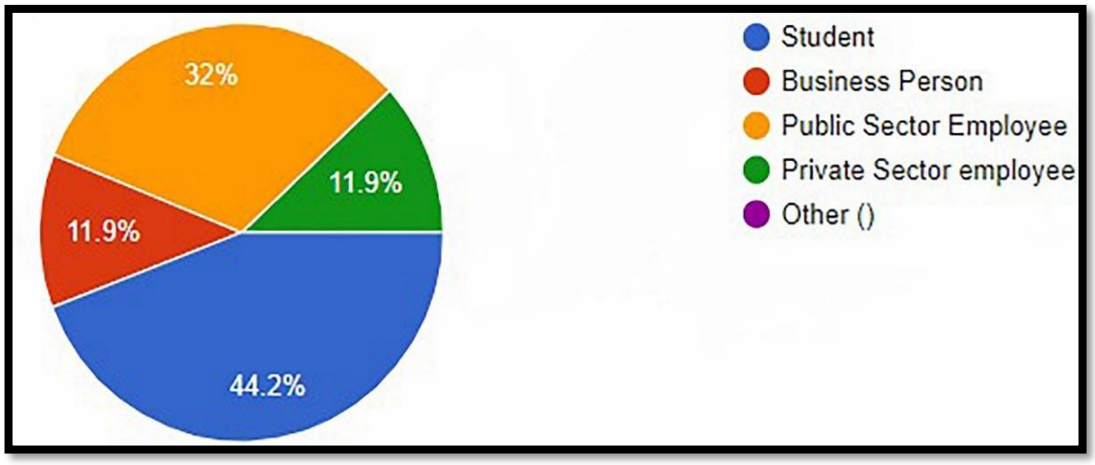

Figure 5-4 Respondent based on Occupation

5.4.5 Measuring of Structural and Measurement model

In this study, we measure the inner model to get the relationships among the latent variables, and we measure the outer model to understand the relationships among latent variables and their indicators. The desired model of this study model consists of the inner model with latent variables INN, OPT, INS, DISC, AW, PEOU, PU, AT, and ICPS. In contrast, the outer model consists of indicators of those latent variables.
PLS-SEM is a useful tool used in this study to measure both the structural (inner) and measurement (outer) model of the desired model. Smart pls 3 is analysis software used to test the fitness of the model, therefore in measurement model, the measures were

reliability, convergent validity, and discriminant validity, moreover the structural model the rules were R^2 (explained variance), f^2 (effect size) and Q^2 (predictive relevance).

5.4.6 Evaluation of Proposed Model

The most significant perspective to take in thought when building up a study technique is the develop legitimacy of the different scales. Develop legitimacy concerns whether the instrumentation really catches the wonder of intrigue and how well the thoughts/ideas are converted into genuine measures. In this examination, the appropriateness of the indicator to the construct and the reliability and validity of the constructs was tested by an analysis of two Cities Separately (Kigali and Surabaya) case studies information from respondents. One hundred eighty-seven respondents (187) were selected from Kigali for the measurement model, and 200 respondents were selected from Surabaya. The result below shows that the questionnaire is reliable.

5.4.6.1 Factor Loadings

PLS-SEM could test the convergent and discriminant validity of the scales. Figure 4.10 shows the factor loadings of the estimation things as per the reception model in SmartPLS programming. The factor loadings of the considerable number of things surpass the suggested level, with 0.708 speaking to; it likewise shows that all elements stacking coming about because of SmartPLS programming result for everything more prominent than 0.708, and it implies all the things for each factor substantial dependent on the point alluded. Factor stacking is the number on the line between the yellow Rectangular (each item) and the blue cycle (each factor). Once the SmartPLS was running, the first results were not valid for some constructs and items. Hence there were several runs of the data until finally, the data became clear for reliability and validity results. From the process some of the things from the latent variables were removed, this is due to the criterion that the indicator reliability was less than 0.4 while the rest of the manifests were reliable because their indicator reliability

is more than the recommended value of 0.4, some are close, and some are above the preferred level of 0.7. Below is the figure of the model of both cities.

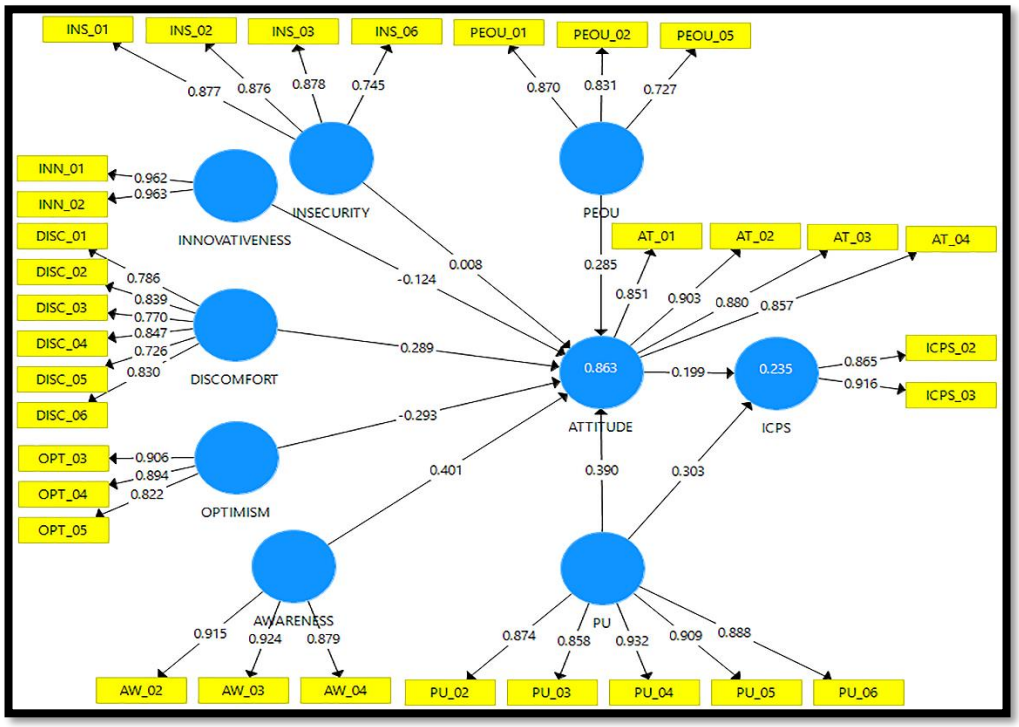

Figure 5-5 Factor Loadings for Kigali Model

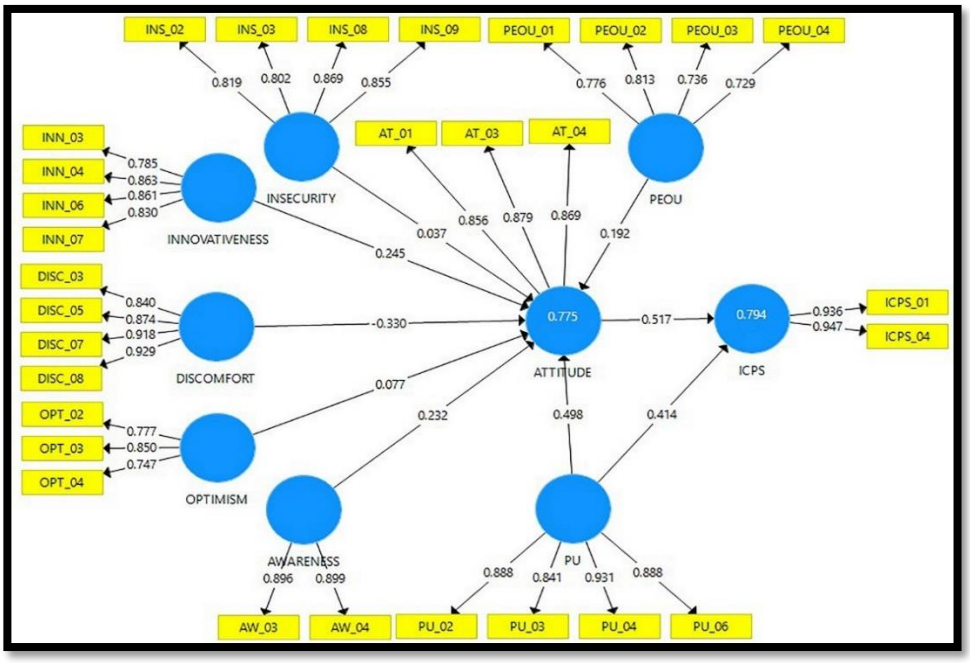

Figure 5-6 Factor Loadings for Surabaya Model

5.4.7 Reliability and Validity of the Constructs

The reliability test is utilized for testing the dependability of developing. The fundamental route exists for deciding agreement unwavering quality like Cronbach 's alpha and composite dependability. For interior consistency unwavering quality, typically Cronbach 's alpha is utilized to quantify in sociology research, however, it will in general give a traditionalist estimation in PLS-SEM. Consequently, in this, the inner consistency dependability was estimated with composite unwavering quality rather than Cronbach 's alpha because of the explanation gave.

Composite reliability is utilized for estimating the dependability of a particular related thing to the component, which is comparative however heterogeneous. The estimation of the unwavering quality of the develops is affirmed by exceptionally dependable if composite dependability is more noteworthy than 0.70. in view of the writing gave are solid. In the examination, we use SmartPLS programming to make a normal change removed (AVE) investigation that ought to be directed to consider the discriminant legitimacy of the estimation model. In table 4.10, the AVE results from the SmartPLS

programming results, which are utilized to gauge venture wellbeing and undertaking execution. As indicated by these outcomes, all the agreements are variable on the grounds that their substance is more noteworthy than 0.50. The value of AVE is greater than 0.5, meaning the validity of both constructs and the individual variables is highly valid. For the indicators to be accepted in the model, the outer loading criteria of greater than or equal to 0.708 and indicator reliability of greater than 0.5 as well as AVE value of constructs greater than or equal 0.5 should be fulfilled to satisfy convergent validity. For internal consistency (Reliability) of the constructs be satisfied, both composite reliability and Cronbach's alpha should be greater than or equal to 0.7.

Internal consistency

Internal consistency measures the reliability of sets of indicators. It involves two measures of composite reliability and Cronbach's' as indicated in Table 5.5 and Table 5.6 below.

Table 5-5 Reliability and Validity of the constructs for Kigali

Latent and Manifested Variables	Outer loadings	IR	AVE	CR	Cronbach's Alpha	Results
Attitude:						
AT_01	0.851	0.724				
AT_02	0.903	0.815	0.762	0.928	0.896	Reliable
AT_03	0.880	0.774				
AT_04	0.857	0.734				
Awareness						
AW_02	0.915	0.837				
AW_03	0.924	0.853	0.821	0.932	0.891	Reliable
AW_04	0.879	0.772				
Discomfort:						
DISC_01	0.786	0.617				
DISC_02	0.839	0.703				
DISC_03	0.770	0.529	0.641	0.914	0.887	Reliable
DISC_04	0.847	0.717				
DISC_05	0.726	0.527				
DISC_06	0.830	0.688				
ICPS:						
ICSPS_02	0.865	0.748	0.794	0.885	0.743	Reliable
ICSPS_03	0.916	0.839				
Innovativeness:						
INN_01	0.962	0.925	0.926	0.962	0.920	Reliable
INN_02	0.963	0.927				

Insecurity:							
	INS_01	0.877	0.769				
	INS_02	0.876	0.767	0.715	0.909	0.865	Reliable
	INS_03	0.878	0.770				
	INS_06	0.745	0.555				
Optimism:							
	OPT_03	0.906	0.820				
	OPT_04	0.894	0.799	0.765	0.907	0.846	Reliable
	OPT_05	0.822	0.675				
PEOU:							
	PEOU_01	0.870	0.756				
	PEOU_02	0.831	0.690	0.659	0.852	0.738	Reliable
	PEOU_05	0.727	0.528				
PU:							
	PU_02	0.874	0.763				
	PU_03	0.858	0.736				
	PU_04	0.932	0.868	0.796	0.951	0.936	Reliable
	PU_05	0.909	0.826				
	PU_06	0.888	0.788				

Table 5-6 Reliability and Validity of the constructs for Surabaya

Latent and Manifested Variables		Outer loadings	IR	AVE	CR	Cronbach's Alpha	Results
Attitude:							
	AT_01	0.856	0.832				
	AT_03	0.879	0.767	0.753	0.902	0.836	Reliable
	AT_04	0.869	0.755				
Awareness							
	AW_03	0.896	0.802	0.806	0.893	0.760	Reliable
	AW_04	0.899	0.808				
Discomfort:							
	DISC_03	0.840	0.705				
	DISC_05	0.874	0.763	0.793	0.939	0.913	Reliable
	DISC_07	0.918	0.842				
	DISC_08	0.929	0.863				
ICPS:							
	ICSPS_01	0.936	0.876	0.887	0.940	0.872	Reliable
	ICSPS_04	0.947	0.896				
Innovativeness:							
	INN_03	0.785	0.616				
	INN_04	0.863	0.744	0.698	0.902	0.855	Reliable
	INN_06	0.861	0.741				
	INN_07	0.830	0.689				
Insecurity:							
	INS_02	0.819	0.670				

	INS_03	0.802	0.643	0.700	0.903	0.860	Reliable
	INS_08	0.869	0.755				
	INS_09	0.855	0.731				
Optimism:							
	OPT_02	0.777	0.603				
	OPT_03	0.850	0.722	0.628	0.835	0.708	Reliable
	OPT_04	0.747	0.558				
PEOU:							
	PEOU_01	0.776	0.602				
	PEOU_02	0.813	0.661	0.584	0.849	0.762	Reliable
	PEOU_03	0.736	0.541				
	PEOU_04	0.729	0.531				
PU:							
	PU_02	0.888	0.788				
	PU_03	0.841	0.707	0.788	0.937	0.910	Reliable
	PU_04	0.931	0.866				
	PU_06	0.888	0.788				

5.4.7.1 Discriminant Validity

In discriminant validity, the test is for AVE numbers, and latent variables, the square root of AVE of each latent variable should be greater than the correlation among the latent variable, the test known as Fornell-larcker. In table 4.11, the AVE of the constructs INN, OPT, INS, DISC, AW, PEOU, PU, AT, and ICPS found to have the square root values that are bigger than the correlation value of their separate sections. In this manner, the outcome demonstrates that the discriminant validity is settled, as appeared in table 5:7 and Table 5:8.

Note: The central off leading diagonal values of the left matrix represent the square root of the AVE of each among constructs, which should be higher than the other correlations of the constructs in the respective column. The entry values are the correlation among latent variables. Discriminant validity for the reflective measurement model also evaluated through cross-loading of the manifested variable against its corresponding constructs to assess the association Table 5:7 and Table 5:8.

5.4.7.1.1 The importance relationship among variables

In extent to know the relationship that exists among the following variables: Perceived usefulness (PU), Perceived ease of use (PEOU), Innovativeness (INN) Optimism (OPT), Discomfort (DISC), Insecurity (INS) and Awareness (AW). We have done a correlation analysis test to know the relationship between two continuous variables in terms of how strong the relationship is, and in what direction the relationship goes. the strength of relationship lies between -1 to +1. To know whether relationship is strong or weak, we used the rule of thumb[87] at correlation test section page 141. From -1 to 1 the correlation is strong, from -0.9 to 0.7 the correlation is strong, from -0.6 to -0.4 up to 0.4 to 0.6 the correlation is moderate, and from -0.3 to -0.1 to 0.3 the correlation is weak. The negative and positive reflect the direction of relationship. A negative correlation means that the values of one variable increases, the value of other decreases while the positive correlation means that as a value of one variable increases, the value of the other variable will also increase.

Table 5-7 Discriminant validity (Farrell-Larcker Criterion) for Kigali

	AT	AW	DISC	ICPS	INN	INS	OPT	PEOU	PU
AT	**0.873**								
AW	0.851	**0.906**							
DISC	0.629	0.541	**0.801**						
ICPS	0.458	0.445	0.799	**0.891**					
INN	0.499	0.548	0.756	0.680	**0.962**				
INS	0.542	0.573	0.763	0.658	0.790	**0.846**			
OPT	0.537	0.582	0.792	0.714	0.747	0.815	**0.875**		
PEOU	0.778	0.655	0.750	0.631	0.611	0.626	0.672	**0.812**	
PU	0.853	0.875	0.588	0.473	0.574	0.621	0.672	0.722	**0.892**

Table 5-8 Discriminant validity (Farrell-Larcker Criterion) for Surabaya

	AT	AW	DISC	ICPS	INN	INS	OPT	PEOU	PU
AT	**0.868**								
AW	0.788	**0.898**							
DISC	0.508	0.506	**0.891**						
ICPS	0.860	0.839	0.574	**0.942**					
INN	0.609	0.481	0.746	0.540	**0.835**				
INS	0.650	0.607	0.817	0.662	0.727	**0.837**			
OPT	0.593	0.550	0.626	0.521	0.674	0.636	**0.792**		
PEOU	0.669	0.584	0.831	0.670	0.792	0.799	0.729	**0.764**	
PU	0.828	0.860	0.603	0.843	0.537	0.725	0.535	0.675	**0.888**

For example, on Surabaya correlation, the correlation of Awareness (AW) and Attitude (AT) is 0.788 which is positive. Concerning the strength and weakness of the correlation, 0.788 can be said to be strong for the correlation and so on for the other variables using the said above low of thumb. The correlation of Discomfort (DISC) and Attitude (AT) is 0.508 which is positive. The strength of the said correlation in this case can be said to be moderate. Since the P-value (0.05) is less than 0.05, it can be indicating that the correlation is significant at 5% level.

5.4.7.2 Cross Loading and HTMT Evaluation

The yield can without much of a stretch be determined to utilize the equation as in Henseler [1] in 2015. From the HTMT results, the qualities (in feature) in Table 2 showed discriminant legitimacy issues as indicated by the HTMT, which is underneath 0.9 models. This inferred the HTMT basis identifies the collinearity issues among the idle develops (multicollinearity). The builds of INN, OPT, INS, DISC, AW, PEOU, PU, AT, and ICPS. Presumably, most of the things of builds are estimating

something very similar. As it were, it contains the covering components from the respondents' impression of the influenced builds.

Table 5-9 Cross loading and HTMT evaluation for Kigali

Manifested Variables	AT	AW	DISC	ICPS	INN	INS	OPT	PEOU	PU	HTMT
AT_01	0.851	0.739	0.566	0.375	0.456	0.484	0.504	0.730	0.775	
AT_02	0.903	0.764	0.582	0.430	0.450	0.475	0.448	0.655	0.742	Yes
AT_03	0.880	0.776	0.505	0.368	0.396	0.473	0.475	0.611	0.743	
AT_04	0.857	0.695	0.542	0.424	0.440	0.459	0.449	0.720	0.719	
AW_02	0.807	0.915	0.556	0.454	0.552	0.622	0.599	0.645	0.844	
AW_03	0.773	0.924	0.494	0.377	0.541	0.524	0.553	0.603	0.820	Yes
AW_04	0.732	0.879	0.415	0.375	0.389	0.400	0.423	0.528	0.708	
DISC_01	0.452	0.433	0.786	0.618	0.588	0.633	0.695	0.575	0.498	
DISC_02	0.510	0.513	0.839	0.756	0.726	0.741	0.753	0.687	0.566	
DISC_03	0.464	0.313	0.770	0.565	0.478	0.552	0.607	0.593	0.405	Yes
DISC_04	0.562	0.484	0.847	0.684	0.678	0.614	0.606	0.607	0.475	
DISC_05	0.479	0.390	0.726	0.500	0.484	0.516	0.526	0.454	0.391	
DISC_06	0.543	0.449	0.830	0.698	0.655	0.605	0.625	0.676	0.487	
ICPS_02	0.374	0.345	0.637	0.865	0.538	0.506	0.584	0.517	0.360	Yes
ICPS_03	0.437	0.439	0.776	0.916	0.663	0.653	0.680	0.600	0.473	
INN_01	0.480	0.539	0.723	0.661	0.962	0.764	0.726	0.596	0.564	Yes
INN_02	0.482	0.515	0.733	0.648	0.963	0.756	0.713	0.580	0.541	
INS_01	0.486	0.577	0.660	0.563	0.660	0.877	0.784	0.493	0.569	
INS_02	0.425	0.467	0.692	0.648	0.772	0.876	0.728	0.540	0.523	Yes
INS_03	0.462	0.498	0.644	0.516	0.748	0.878	0.695	0.494	0.545	
INS_06	0.452	0.382	0.580	0.501	0.491	0.745	0.541	0.590	0.456	
OPT_03	0.511	0.515	0.738	0.680	0.682	0.711	0.906	0.645	0.625	
OPT_04	0.463	0.514	0.717	0.672	0.658	0.665	0.894	0.631	0.585	Yes
OPT_05	0.431	0.499	0.617	0.511	0.619	0.772	0.822	0.478	0.550	
PEOU_01	0.689	0.679	0.716	0.642	0.654	0.688	0.707	0.870	0.735	
PEOU_02	0.617	0.475	0.615	0.461	0.508	0.496	0.560	0.831	0.587	Yes
PEOU_05	0.583	0.421	0.479	0.414	0.299	0.311	0.343	0.727	0.411	
PU_02	0.776	0.778	0.509	0.394	0.482	0.525	0.551	0.661	0.874	
PU_03	0.707	0.736	0.464	0.414	0.459	0.517	0.511	0.575	0.858	
PU_04	0.810	0.812	0.554	0.411	0.564	0.629	0.609	0.697	0.932	Yes
PU_05	0.769	0.788	0.567	0.463	0.555	0.577	0.682	0.639	0.909	
PU_06	0.743	0.786	0.527	0.430	0.496	0.519	0.640	0.644	0.888	

Table 5-10 Cross loading and HTMT evaluation for Surabaya

Manifested Variables	AT	AW	DISC	ICPS	INN	INS	OPT	PEOU	PU	HTMT
AT_01	0.856	0.661	0.433	0.719	0.564	0.570	0.472	0.553	0.735	
AT_03	0.879	0.722	0.466	0.781	0.463	0.546	0.568	0.650	0.731	Yes
AT_04	0.869	0.667	0.423	0.739	0.561	0.577	0.503	0.538	0.690	
AW_03	0.703	0.896	0.488	0.746	0.443	0.581	0.444	0.563	0.847	Yes
AW_04	0.712	0.899	0.420	0.761	0.420	0.509	0.542	0.487	0.699	
DISC_03	0.418	0.443	0.840	0.430	0.617	0.657	0.650	0.707	0.507	
DISC_05	0.453	0.446	0.874	0.564	0.671	0.731	0.553	0.715	0.528	Yes
DISC_07	0.465	0.473	0.918	0.545	0.691	0.762	0.502	0.776	0.560	
DISC_08	0.473	0.441	0.929	0.501	0.678	0.754	0.536	0.761	0.550	
ICPS_01	0.786	0.781	0.454	0.936	0.497	0.555	0.482	0.587	0.739	Yes
ICPS_04	0.832	0.799	0.620	0.947	0.520	0.686	0.498	0.671	0.843	
INN_03	0.504	0.332	0.498	0.372	0.785	0.532	0.530	0.616	0.390	
INN_04	0.493	0.416	0.632	0.459	0.863	0.615	0.556	0.651	0.441	Yes
INN_06	0.540	0.427	0.672	0.483	0.861	0.676	0.578	0.628	0.485	
INN_07	0.493	0.429	0.689	0.489	0.830	0.602	0.588	0.756	0.477	
INS_02	0.415	0.425	0.759	0.452	0.649	0.819	0.506	0.717	0.518	
INS_03	0.464	0.434	0.742	0.481	0.595	0.802	0.504	0.699	0.539	Yes
INS_08	0.629	0.571	0.610	0.639	0.559	0.869	0.543	0.632	0.639	
INS_09	0.613	0.563	0.673	0.600	0.652	0.855	0.570	0.661	0.694	
OPT_02	0.512	0.356	0.532	0.418	0.636	0.491	0.777	0.736	0.378	
OPT_03	0.516	0.469	0.559	0.452	0.511	0.568	0.850	0.558	0.515	Yes
OPT_04	0.350	0.512	0.360	0.354	0.432	0.441	0.747	0.388	0.365	
PEOU_01	0.465	0.473	0.918	0.545	0.691	0.762	0.502	0.776	0.560	
PEOU_02	0.484	0.455	0.704	0.504	0.615	0.711	0.526	0.813	0.561	Yes
PEOU_03	0.512	0.356	0.532	0.418	0.636	0.491	0.777	0.736	0.378	
PEOU_04	0.567	0.493	0.430	0.569	0.493	0.502	0.423	0.729	0.560	
PU_02	0.748	0.735	0.515	0.714	0.478	0.655	0.520	0.573	0.888	
PU_03	0.669	0.832	0.481	0.756	0.424	0.564	0.400	0.570	0.841	Yes
PU_04	0.799	0.784	0.602	0.779	0.518	0.720	0.499	0.647	0.931	
PU_06	0.720	0.706	0.536	0.743	0.484	0.629	0.476	0.604	0.888	

5.4.7.3 Bootstrapping Procedure and Hypothesis Test

One of the valuable strategies for getting measures on interior consistency, inclusion legitimacy, and discriminant legitimacy of the examination model is the PLS strategy. The thoughts, inward consistency, merged legitimacy, and discriminant

legitimacy of the examination model that is essential for the recommended model. Subsequently, this area underscores the Hypotheses Testing to the speculation in the examination can be checked. SmartPLS software can examine the paths in the model for every bootstrap sample automatically provided through the processes used in the bootstrapping process. In this study, Bootstrapping was used to obtain T-values, which coordinates with inner and outer model paths.

The t-statistical analysis applied for the significance of the model at a 97% assurance level, with AT and ICPS dependent variable and seven independent variables of the model as predictors. The relationship between the inner model (AT and ICPS) and the outer model (INN, OPT, INS, DISC, AW, PEOU, PU) will be significant when T-statistics are more prominent than 1.96 and p-value are less than 0.05 at a substantial level of 5%. For preceding the study, according to the evaluation and prediction of the structural model, some data about the t-values, path coefficients (β), p- values (p), squared R (R^2) identified in detail. Table 5:11 and Table 5:12 show the relationship between construct (inner model and outer model) and show the Path coefficient (β), T-value, and P-values based on SmartPLS software.

Table 5-11 Path coefficient Model for Kigali

Constructs	Hypothesis	Beta Coefficients	T-value	P-value	Results
INNOVATIVENESS -> ATTITUDE	H1	-0.124	2.013	0.045	Accepted
OPTMISM -> ATTITUDE	H2	-0.293	4.852	0.000	Accepted
INSECURITY -> ATTITUDE	H3	0.008	0.111	0.911	Not Accepted
DISCOMFORT -> ATTITUDE	H4	0.289	3.856	0.000	Accepted
AWARENESS -> ATTITUDE	H5	0.401	6.04	0.000	Accepted
PU -> ATTITUDE	H6	0.39	4.536	0.000	Accepted
PEOU -> ATTITUDE	H7	0.285	4.304	0.000	Accepted
PU -> ICPS	H8	0.303	2.249	0.025	Accepted
ATTITUDE -> ICPS	H9	0.199	1.516	0.130	Not Accepted

Table 5-12 Path coefficient Model for Surabaya

Constructs	Hypothesis	Beta Coefficients	T-value	P-value	Results
INNOVATIVENESS -> ATTITUDE	H1	0.245	3.277	0.001	Accepted
OPTMISM -> ATTITUDE	H2	0.077	1.405	0.161	Not Accepted
INSECURITY -> ATTITUDE	H3	0.037	0.474	0.636	Not Accepted
DISCOMFORT -> ATTITUDE	H4	-0.330	3.674	0.000	Accepted
AWARENESS -> ATTITUDE	H5	0.232	2.670	0.008	Accepted
PU -> ATTITUDE	H6	0.498	4.987	0.000	Accepted
PEOU -> ATTITUDE	H7	0.192	2.029	0.043	Accepted
PU -> ICPS	H8	0.414	5.608	0.000	Accepted
ATTITUDE -> ICPS	H9	0.517	7.120	0.000	Accepted

As we expected, we acquired a positive connection among Innovativeness and Attitude for both Kigali and Surabaya. This features imaginativeness impacts apparent straightforwardness and Attitude to use technology. This can be clarified by the way that inventive individuals are progressively open to new thoughts all in all [88]. A person's degree of inventive demeanour has been demonstrated to be a key component in his/her acknowledgment of new advances. Creative people are anxious to learn new advances and to comprehend and utilize them which expands their innovation acknowledgment rate [89]. We expect that imaginative individuals are progressively acquainted with new innovative ideas, for example, information guidelines. Optimism H2 is rejected for Surabaya and is accepted for Kigali.it rejected for Surabaya because the connection is not measurably critical. Optimism concerns the inspirational mentality toward innovation, for example, one's apparent degree of control, the innovation's adaptability, accommodation, and proficiency [55]. For individuals to be optimistic it is especially fundamental that they are certain that the innovation is heavily influenced by them [90]. The outcomes show that whether somebody is a mechanical

hopeful person is not identified with the attitude to use technology. Different components may be increasingly important. Hypothesis H3 (Insecurity) is rejected on for both Kigali and Surabaya grounds that the relationship is not factually huge. This implies there are different indicators that impact the attitude to use technologies that might be further explored [91]. Hypothesis H4 is bolstered and suggests that Discomfort has decidedly corresponded with attitude towards technology usage principles. It infers that if individuals are awkward with innovation, they will be bound to see information measures as being valuable. These outcomes are not reliable with past writing where Discomfort adversely impacted attitude. This may appear to be nonsensical; notwithstanding, this could prompt new arrangements that moderate the inconvenience. Likewise, individuals feeling increasingly awkward with innovation may have gotten acquainted with utilizing existing advances that do not address their issues and, in this way, see information guidelines as helpful [91]. Hypothesis H5 Awareness is acknowledged for both cities because the connection is measurably huge. In accordance with the discoveries of Lin [55], we see that hypothesis H5 is bolstered, showing the positive impact of mindfulness on the accessibility of the framework on the demeanour to utilize. This demonstrates the "mindfulness" of the administration is related to the utilization of purpose. In conclusion, hypothesis H6 and H7 are significant for Kigali and Surabaya. It is broadly recognized those variables Perceived Ease of use and Perceived Usefulness [24]. This depends on the hypothetical contention that some easy to understand advances could be valuable, however not every single helpful innovation is easy to use. H8 which is Perceived Usefulness is affected by the ICPS, which implies that if the framework is seen as simple to utilize, it is likewise seen as increasingly valuable[48] however, hypothesis H9 is not significant for Kigali while its significant on Surabaya. This can be seen as a problem for Kigali because most of theories have proved that attitude toward intention to use technology is significantly approved.

5.4.7.4 Squared R (R^2)

In this study, SmartPLS software used to find the real correlation and the dependent variable and independent variables shown by multiple R and its statistical significance at $p<0.05$. The values of R^2 in the models are highly fitted, and it covers more than 50%.

Table 5.13 and Table 5:14 indicate that the coefficient of determination with R^2 value together with R^2 adjusted and its value confirmed the correlation between the constructs of both models was totally fit and confirmed for more than 50%.

Table 5-13 Fitness of Model for Kigali

Model	R	R squared	Adjusted R squared	
ATTITUDE	0.929	0.863	0.858	Strong
ICPS	0.484	0.235	0.226	Not Strong

Table 5-14 Fitness of Model for Surabaya

Model	R	R squared	Adjusted R squared	
ATTITUDE	0.880	0.775	0.767	Strong
ICPS	0.891	0.794	0.792	Strong

Standardized Root Mean Square Residual (SRMR)

While the root mean square remaining (RMSR) is a proportion of the mean total value of the covariance residuals, the standardized root mean square residuals (SRMR) in view of changing both the sample covariance matrix and the predicted covariance matrix into correlation matrices.

Literature on PLS-SEM needs to better clarify where and how the covariance matrix is inferred in PLS-SEM. Most importantly, should the researcher utilize the estimated model (most sensible decision) or the saturated model to acquire the

covariance matrix. The SRMR is defined as the difference between the observed correlation and the model inferred correlation matrix. Along these lines, it permits evaluating the average magnitude of the discrepancies among observed and expected correlations as an absolute measure of (model) fit criterion.

A value under 0.10 or 0.08 is considered as a good fit. Henseler [92] introduced the SRMR as the goodness of fit model for PLS-SEM that can be utilized to avoid model misspecification. SmartPLS additionally gives bootstrap-based induction measurements of the SRMR criterion. For the interpretation of SRMR bootstrap confidence interval outcomes.

Exact Model Fit

Very little information and data on accurate fit measures, their helpfulness, conduct, significance, and appropriate application is accessible in PLS-SEM writing up to this point. The specific model fit tests the measurable (bootstrap-based) derivation of the error between the experimental covariance network and the covariance framework suggested by the composite factor model. Note: Literature on PLS-SEM needs to more readily clarify where and how the covariance network is inferred in PLS-SEM (since it is not quite the same as CB-SEM, which is a full data technique and PLS-SEM isn't). Generally significant, should the analyst utilize the evaluated model (most sensible decision) or the soaked model to acquire the covariance grid.

As characterized by Dijkstra and Henseler [92], d_ULS (i.e., the squared Euclidean separation) and d_G (i.e., the geodesic separation) speak to two unique approaches to process this disparity. The bootstrap routine gives the certainty interims of these inconsistency values. The d_G basis expands on PLS-SEM eigenvalue calculations. Nonetheless, the inquiry remains how these eigenvalues vary from CB-SEM. The value of the d_ULS and d_G do not relate any worth. Just the bootstrap consequences of the specific model fit measures permit an understanding of results. All the more explicitly, since the d_ULS and d_G (and SRMR) certainty interims are not gotten by running the "ordinary" bootstrapping method, yet the adjusted Bollen-Stine bootstrapping technique, their outcomes translation to some degree varies from the

"typical" bootstrap outcomes. For the specific fit standards (i.e., d_ULS and d_G), you think about their unique incentive against the certainty interim made from the inspecting dispersion. The certainty interim ought to incorporate the first worth.

Thus, the upper bound of the certainty interim ought to be bigger than the first value of the specific d_ULS and d_G fit measures to demonstrate that the model has a "solid match". Pick the certainty interim such that the upper bound is at the 95% or 99% point. In different words, a model fits well if the distinction between the connection lattice suggested by your model and the observational relationship framework is little to the point that it tends to be absolutely credited to testing mistakes. Subsequently, the distinction between the relationship network suggested by your model and the observational connection lattice ought to be non-huge ($p > 0.05$). Something else, if the disparity is huge ($p < 0.05$), the model fit has not been set up.

Normed Fit Index (NFI)

One of the first fit measures proposed in SEM writing is the normed fit Index by Bentler and Bonett [93]. It computes the Chi^2 value of the proposed model and analyzes it against a meaningful benchmark. Since the Chi^2 value of the proposed model does not give adequate information to pass judgment on model fit, the NFI utilizes the Chi^2 value from the null model, as a measuring stick. Writing, notwithstanding, does not clarify how the PLS-SEM Chi^2 value varies from the CB-SEM one. The NFI is then characterized as 1 minus the Chi^2 value of the proposed model divided by the Chi^2 values of the null model.

Subsequently, the NFI brings about qualities somewhere in the range of 0 and 1. The closer the NFI to 1, the better the fit. NFI values above 0.9, as a rule, represent an acceptable fit. Lohmöller [94] provides detailed information on the NFI calculation of PLS path models. In any case, for the applied user, these elucidations are very hard to understand. The NFI represent an incremental fit measure. The more parameters in the model, the bigger (i.e., better) the NFI result. It is thus that this measure is not suggested, yet choices, for example, the non-normed fit list (NNFI) or Tucker-Lewis list, which punishes the Chi^2 values by the degrees of opportunity (df). Lohmöller [94]

recommends registering the NNFI of PLS way models. Nonetheless, the NNFI has not been actualized in SmartPLS.

Chi² and Degrees of Freedom

Accepting a multinormal distribution, the Chi² value of a PLS path model with df degrees of freedom roughly is (N-1)*L, whereby N is the number of observations and L the maximum likelihood function as designed by Lohmöller [94]. The degrees of freedom (df) is defined as $(K^2 + K)/2 – t$, whereby is the number of manifested variables in the PLS path model and t the number of independent variables to estimate the model implied covariance matrix.

RMS_theta

The RMS-theta is the root mean squared lingering covariance matrix of the outer model residuals [94]. This fit measure is useful to survey reflective models like our own. because the outer model residuals for formative measurement models are not meaningful. The RMS-theta evaluates how much the outer model residuals correlate. The measure should be near zero indicate good model fit, since it would suggest that the correlation between the outer model residuals are extremely little (near zero). The RMS-theta build on the outer model residuals, which are the differences between predicted indicator values and the observed indicator values.

For predicting the indicator values it is necessary in PLS-SEM to have the latent variables scores. In any case, PLSc-SEM assumes common factors, which are subjective to factor indeterminacy, and, along these lines, determinate inactive variable scores do not exist. Subsequently, even though RMS_theta calculation ought to be utilized for evaluating common factor models figured by PLSc-SEM, it exists only for composite models computed by PLS-SEM. This discussion should be additionally separated between PLS-SEM and PLSc-SEM. RMS_theta values less than 0.12 show a well-fitting model, though higher qualities demonstrate an absence of fit [92].

Estimated and Saturated Model

The differentiation of estimated and saturated models in PLS-SEM is in its beginning periods. The saturated model evaluates the correlation between all constructs. The saturated model is a model that depends on total effects scheme and considers the model structure. It is subsequently a progressively confined rendition of the fit measure.

Table 5-15 Model_Fit Summary for Surabaya

Fit Indexes	Saturated Model	Estimated Model
SRMR	0.0534	0.057
d_ULS	0.437	0.502
d_G	0.840	0.885
Chi-Square	591.026	622.829
NFI	0.914	0.924

RMS_theta

rms Theta	0.189

Table 5-16 Model_Fit Summary for Kigali

Fit Indexes	Saturated Model	Estimated Model
SRMR	0.052	0.053
d_ULS	0.949	0.984
d_G	1.225	1.254
Chi-Square	991.670	1012.595
NFI	0.906	0.9168

RMS_theta

rms Theta	0.182

Now from the whole above explanations, the research concludes the hypothesis test and sees how the formulated hypothesis agree (accepted) or disagree (rejected) with the study model.

Hypothesis Related to TRI and Attitude Towards Technology Acceptance

H1: **the individual innovativeness about technology, in general, leads to a higher attitude towards technology acceptance.**

There are two Items, which are related to innovativeness factors (INN) for Kigali and four items related to innovativeness for Surabaya. The factor loading results are shown in figure 5-5 and figure 5-6, respectively, and they show all indicators that are greater than 0.5, it shows the validity of indicators. As in Table 5-11 and Table 5-12 there is a statistically negative relationship between Innovativeness factors and Attitude to use cashless payment system for Kigali model (β=-0.124), and there is a statistically high positive relationship between Innovativeness factor and Attitude to use Cashless payment System for Surabaya model (β=0.245). The results of the analysis show that the Innovativeness factors (INN) could be one of the factors that can be a problem to use a cashless payment system for both models in Two Cities (Kigali and Surabaya), which have a positive impact on attitude towards the model. Based on the results, the test of hypothesis 1a is accepted. Refer to tables 5-11 and Table 5-12, which display the Results related to Innovativeness (INN) and attitude for the model of these two Cities (Kigali and Surabaya) and based on the analysis and reference from previous literature; INN variables are supported in a model. The findings suggest that Innovativeness factors are more significant in both Cities (Kigali and Surabaya). This can be clarified by the way that creative individuals are increasingly open to new technology[88].

H2: **High personal optimism about technology, in general, leads to a higher attitude towards technology acceptance.**

There are three items, which are related to optimism factors (OPT) for Kigali and three items related to optimism for Surabaya. The factor loading results are shown in figure 5-5 and figure 5-6, respectively, and they show all indicators which are more prominent than 0.5, it implies that every single related factor to this build is substantial. In view of the outcomes in Table 5-11 and Table 5-12 there is a statistically negative relationship between Innovativeness factors and Attitude to use cashless payment

system for Kigali model (β=-0.293), and there is a statistically high positive relationship between optimism factor and Attitude to use Cashless payment System for Surabaya model (β=0.077). The outcome of the analyzed data show that optimism factors (OPT) can be one of the effective factors that can be a challenge to use a cashless payment system for both models in Two Cities (Kigali and Surabaya), which have a positive impact on attitude towards the model. Based on the outcome, hypothesis 1b is reliable and accepted. Refer to tables 5-11 and Table 5-12 which display the Results related to optimism (OPT) and attitude for the model of these two Cities (Kigali and Surabaya) and based on the analysis and reference from previous literature; OPT variables are supported for Kigali model while it does not work in Surabaya model.

The findings suggest that optimism factors are more significant in Kigali city and are not in Surabaya city. For individuals to be idealistic it is especially basic that they are certain that the innovation is heavily influenced by them[90].

H3: **High personal insecurity about technology (cashless payment method adopted) in general leads to a lower attitude towards technology acceptance**

There are three items, which are related to Insecurity factors (INS) for Kigali and Surabaya. The factor loading results are shown in figure 5-5 and figure 5-6, respectively, and they show all indicators which are more prominent than 0.5, it implies that every single related factor to this construct is valid. Based on the results in Table 5-11 and Table 5-12 there is a statistically positive relationship between Insecurity factors and Attitude to use cashless payment system for Kigali model (β=0.008), and there is a statistically high positive relationship between Insecurity factor and Attitude to use Cashless payment System for Surabaya model (β=0.037). The results of the analysis show that the Insecurity factors (INS) can be one of the effective factors that can be a challenge to use cashless payment system for both model in Two Cities (Kigali and Surabaya), which have a positive impact on attitude towards the model, however, Based on the outcome, hypothesis 1c is not Positive and acknowledged.

Refer to tables 5-11 and Table 5-12, which display the Results related to Insecurity (INS) and attitude for the model of these two Cities (Kigali and Surabaya) and based

on the analysis and reference from previous literature, INS variables in our proposed are not supporting our model. The findings show that Insecurity factors are not significant in both Cities (Kigali and Surabaya), even if the Insecurity factors towards attitude to use a Cashless Payment system in the Public transportation system can be considered as a challenge. In accordance with the discoveries of [91], we see that theory H5b is upheld, exhibiting the positive impact of PEU on the aim to utilize information norms. This demonstrates the attitude of information gauges is related to the utilization of goal.

H4: **High personal discomfort for technology, in general, will lead to a lower attitude towards technology acceptance.**

There are six items, which are related to discomfort factors (DISC) for Kigali and four factors for Surabaya. The factor loading results are shown in figure 5-5 and figure 5-6, respectively, and they show all indicators which are more prominent than 0.5, it implies that every single related factor to this construct is valid. Based on the results in Table 5-11 and Table 5-12 there is a statistically positive relationship between discomfort factors and Attitude to use cashless payment system for Kigali model (β=0.289). There is a statistically high positive relationship between discomfort factor, and there is a statistically negative relationship Attitude to use Cashless payment System for Surabaya model (β=-0.330).

The results of the analysis show that the discomfort factors (DISC) can be one of the effective factors that can be a challenge to use cashless payment system for both model in Two Cities (Kigali and Surabaya), which have a positive impact on attitude towards the model, however, Based on the outcome, hypothesis 1d is not Positive and acknowledged. Refer to tables 5-11 and Table 5-12, which display the Results related to discomfort (DISC) and attitude for the model of these two Cities (Kigali and Surabaya) and based on the analysis and reference from previous literature, DISC variables in our proposed are supporting our model. people feeling more uncomfortable with technology may have become accustomed to using existing technologies which do not meet their needs and therefore perceive data standards as useful[48], [91].

H5: **Personal Awareness about technology is positively related to attitude towards technology acceptance.**

There are three items, which are related to Awareness factors (AW) for Kigali and two factors for Surabaya. The factor loading results are shown in figure 5-5 and figure 5-6, respectively, and they show all indicators which are more prominent than 0.5, it implies that every single related factor to this construct is valid. Based on the results in Table 5-11 and Table 5-12, there is a statistically positive relationship between Awareness factors and Attitude to use a cashless payment system for the Kigali model (β=0.401). There is a statistically high positive relationship between the Awareness factor, and there is a statistically negative relationship Attitude to use Cashless payment System for the Surabaya model (β=0.232). The results of the analysis show that the discomfort factors (AW) can be one of the effective factors that can be a challenge to use cashless payment system for both model in Two Cities (Kigali and Surabaya), which have a positive impact on attitude towards the model, however, Based on the outcome, hypothesis H2 is reliable and accepted.

Refer to tables 5-11 and Table 5-12, which display the Results related to Awareness (AW) and attitude for the model of these two Cities (Kigali and Surabaya) and based on the analysis and reference from previous literature, AW variables in our proposed model are supporting our model. this is in line that high personal awareness of technology will affect the use of it[95].

Hypothesis Related to TAM and Attitude Towards Technology Acceptance

H7: **Perceived ease of use is positively related to attitude towards technology acceptance.**

There are six items, which are related to Perceived ease of use factors (PEOU) for Kigali and four factors for Surabaya. The factor loading results are shown in figure 5-5 and figure 5-6, respectively, and they show all indicators which are more prominent than 0.5, it implies that every single related factor to this construct is valid. Based on the results in Table 5-11 and Table 5-12, there is a statistically positive relationship between Perceived ease of use factors and Attitude to use a cashless payment system

for the Kigali model and Surabaya model (β=0.285 and β=0.192 respectively). The results of the analysis show that the Perceived ease of use factors (PEOU) can be one of the effective factors that can be a challenge to use cashless payment system for both model in Two Cities (Kigali and Surabaya), which have a positive impact on attitude towards the model, however, Based on the outcome, hypothesis H3a is Positive and acknowledged.

Refer to tables 5-11 and Table 5-12, which display the Results related to Perceived ease of use (PEOU) and attitude for the model of these two Cities (Kigali and Surabaya) and based on the analysis and reference from previous literature, PEOU variables in our proposed are supporting our model as we were expecting previously and the way also has proposed by Davis [96].

H6: **Perceived usefulness is positively related to attitude towards technology acceptance.**

There are six items, which are related to Perceived usefulness factors (PU) for Kigali and four factors for Surabaya. The factor loading results are shown in figure 5-5 and figure 5-6, respectively, and they show all indicators which are more prominent than 0.5, it implies that every single related factor to this construct is valid. Based on the results in Table 5-11 and Table 5-12, there is a statistically positive relationship between Perceived usefulness factors and Attitude to use a cashless payment system for the Kigali model (β=0.289). There is a statistically high positive relationship between Perceived usefulness factor, and there is a statistically negative relationship Attitude to use Cashless payment System for the Surabaya model (β=-0.330). The results of the analysis show that the Perceived usefulness factors (PU) can be one of the effective factors that can be a challenge to use cashless payment system for both model in Two Cities (Kigali and Surabaya), which have a positive impact on attitude towards the model, however, Based on the outcome, hypothesis H3b is Positive and acknowledged. Refer to tables 5-11 and Table 5-12, which display the Results related to Perceived usefulness (PU) and attitude for the model of these two Cities (Kigali and Surabaya) and based on the analysis and reference from previous literature, PU

variables in our proposed are supporting our model as we were expecting previously and the way also has proposed by Davis[96].

H8: Perceived usefulness is positively related to intention to use Cashless Payment (ICPS). There are five items, which are related to Perceived usefulness factors (PU) for Kigali and four factors for Surabaya. The factor loading results are shown in figure 5-5 and figure 5-6, respectively, and they show all indicators which are more prominent than 0.5, it implies that every single related factor to this construct is valid. Based on the results in Table 5-11 and Table 5-12, there is a statistically positive relationship between Perceived usefulness factors and Attitude to use a cashless payment system for the Kigali model (β=0.303). There is a statistically high positive relationship between Perceived usefulness factor, and there is a statistically negative relationship Attitude to use Cashless payment System for the Surabaya model (β=0.414). The results of the analysis show that the Perceived usefulness factors (PU) can be one of the effective factors that can be a challenge to use cashless payment system for both model in Two Cities (Kigali and Surabaya), which have a positive impact on attitude towards the model, however, Based on the outcome, hypothesis H4 is Positive and acknowledged. Refer to tables 5-11 and Table 5-12, which display the Results related to Perceived usefulness (PU) and attitude for the model of these two Cities (Kigali and Surabaya) and based on the analysis and reference from previous literature, PU variables in our proposed are supporting our model.

H9: **Attitude towards technology acceptance positively affects intention to use the cashless payment system**

There are four Items, which are related to Attitude factors (ATT) for Kigali and three factors for Surabaya. The factor loading results are shown in figure 5-5 and figure 5-6, respectively, and they show all indicators which are more prominent than 0.5, it implies that every single related factor to this construct is valid. Based on the results in Table 5-11 and Table 5-12 there is a statistically positive relationship between Attitude factors and to use cashless payment system for Kigali model (β=0.199). There is a statistically high positive relationship between Attitude factor, and there is a

statistically High positive relationship Attitude to use Cashless payment System for Surabaya model (β=0.517). The results of the analysis show that Attitude factors (ATT) can be one of the effective factors that can be a challenge to use cashless payment system for both models in Two Cities (Kigali and Surabaya) as their Path of the coefficient are positive, however, having a positive impact on attitude towards the model does not always grant that the hypothesis is significant. Based on the outcome, hypothesis H_5 is not reliable and is not accepted for the Kigali model. Otherwise, it does for Surabaya. Refer to tables 5-11 and Table 5-12 which display the Results related to Attitude (ATT) and ICPS for the model of these two Cities (Kigali and Surabaya) and based on the analysis and reference from previous literature, ATT variable in our proposed is supporting Surabaya model, however it does not support Kigali model. After deep discussion on the framework, now here come the validated model from the previous one with both significant hypothesis and insignificant ones. As we have two models from our case study (Kigali and Surabaya), we will see that figure 5-7 has not variables like Discomfort and Insecurity because they are not significant to the tested model and this is might be because people of that particular area of study want to use available service no matter how it. The most important is the availability of the service and that there is service continuity.

The figure below shows the final model after removing variables that are not significant.

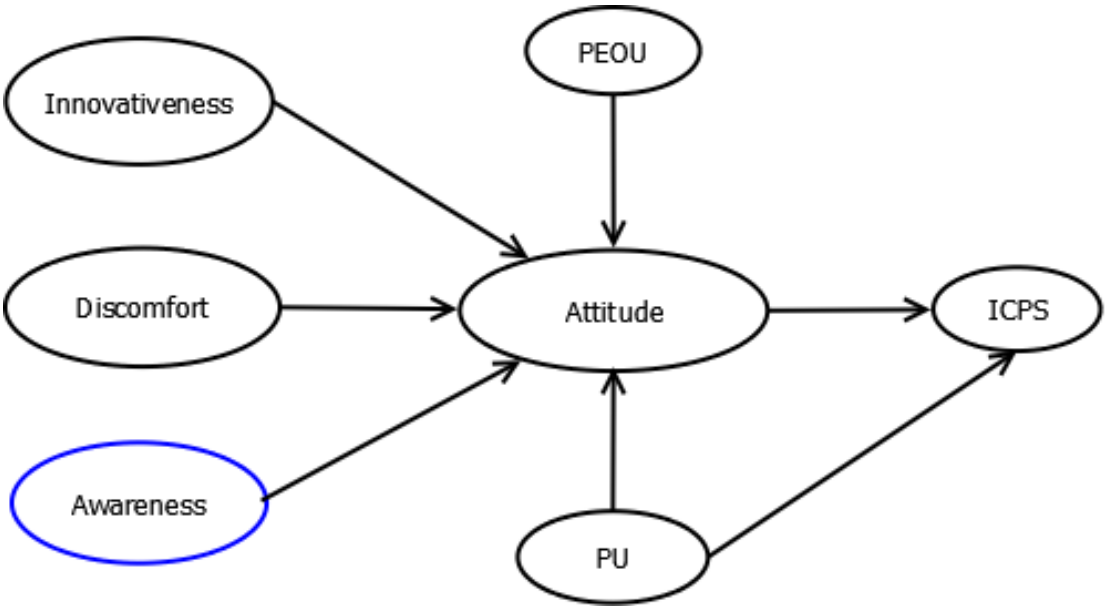

Figure 5-7 Final Model for Surabaya

As we have two models from our case study (Kigali and Surabaya), we will see that figure 5-8 has not variables like Insecurity because it is not significant to the tested model and this is might be because people of that particular area of study want to use available service no matter how it. The most important is the availability of the service and that there is service continuity. Both Surabaya and Kigali model have the common element that they share, insecurity toward Attitude is not significant for both models, however for Kigali Attitude towards Intention to use cashless payment system is not Significant. We can relate this as the fact that people from Kigali will not be affected by any new adopted system or previously used one to be able to use the new one.

The figure below shows the final model after removing variables that are not significant.

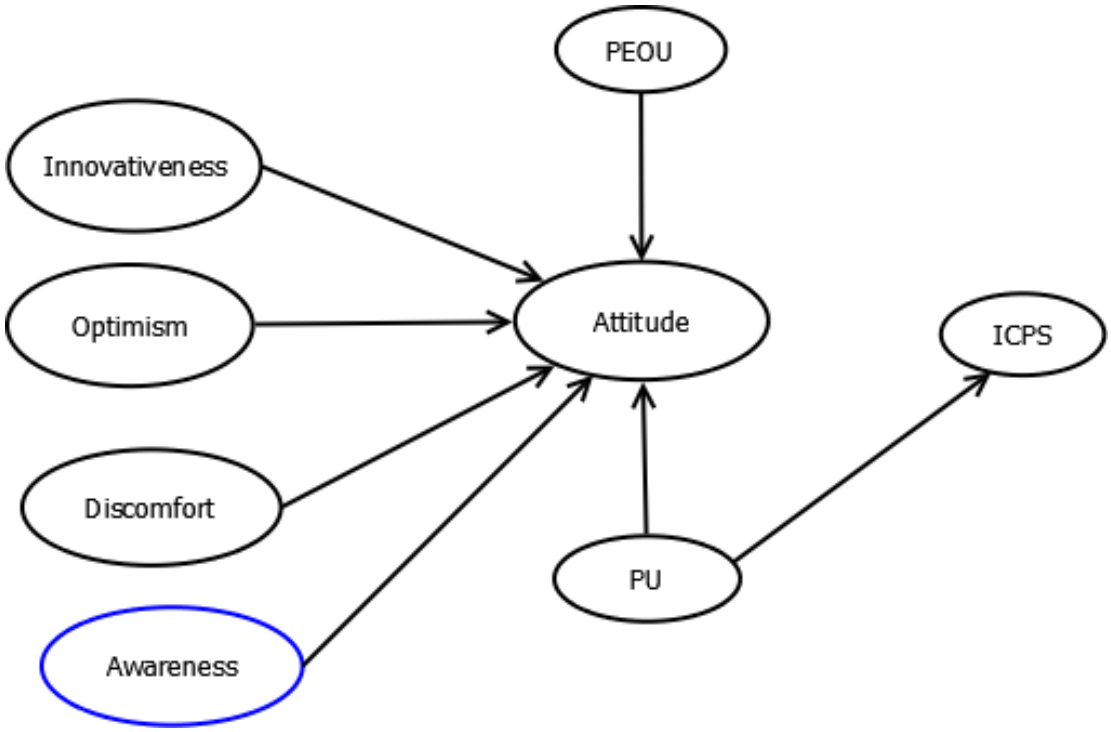

Figure 5-8 Final Model for Kigali

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CHAPTER 6
CONCLUSION AND RECOMMENDATION

6.1 Introduction

This chapter sums up the results and conclusions found in the study, established in all parts of this research. The following items covered by the following sections in this chapter: achievements, contributions to and implications of the investigation, limitations of the research, future research areas, and conclusion.

6.2 Conclusion

The discoveries recommend that seven hypotheses proposed have a remarkable impact, either straightforwardly or by implication, on the acceptance of the cashless payment in the public transportation system in both cities. Aside from these, two hypotheses are not significant to the proposed model. From the perspectives' information of passengers, I found that imaginative, Attitude and Insecurity of technologies used in that transportation system payment had noteworthy associations with possibly one or both saw usability and saw handiness in the TAM, and therefore with embracing cashless payment system innovation. In the interim, passengers with great inconvenience about change were unimportant to the investigation. Moreover, the criticalness of Innovativeness and optimism factors on the cashless payment system in public transportation system appropriation gives exact proof that affirms the TAM's legitimacy. The awareness of the system found to be relevant, we took it from the interview conducted during the research, and we are pleased that it is supporting both Kigali and Surabaya model. During this research, we also recognized a couple of connections in both the transport business and passenger's information models to have been incompletely interceded by specific factors. The business system and duty factors in the plan of action were middle people, and Technology readiness index factors were in the passenger's model. This examination additionally gives proof of the directing impacts of a few directing elements. Business qualities distinguished as arbitrators for the plan of action were company age, Company size, and Company execution. In the

interim, given passengers' segment data, the mediators for passengers' models and passenger's understanding. By responding to the research question of our study **how do passengers perceive the cashless payment system adopted for public bus transport fare collection**? We have seen that most of passenger will use the adopted system no matter what the complicity that the system may bring, the most important aspect we realized is the awareness of the service and the availability of that service. On the state of cashless payment system in both cities, even if our scope was limited to Suroboyo bus in Surabaya and the general public transportation in Kigali , we have found that both cities have the system that is operational though in the case of Suroboyo bus they have 2 system of cashless payment system for that particular bus which is the normal card usage and the other interested system for the purpose of reducing the plastic bottles in the city that normal is a problem word wide in polluting the environment. We have seen that Passengers who use Suroboyo bus and pay plastic bottles are not as many because it involves collecting those bottles outside either of their home or neighborhood. From that point it is not easy to get a certain number of the required bottles for a trip unless you got to the dump collection of those bottles. This is bringing us to the point that we compare the two systems of collection of fare in that Bus: we have seen that paying with plastic bottles has a great impact on the environment especially in Surabaya because they are eliminating those non-biodegradable material for further use or cleaning the area, but how in terms of preference people prefer to use their cards to pay for fare because it is easy to use and it does not require a lot of effort, while paying with plastic bottles require to have certain number of those bottles which is not easy to get as well. So as a conclusion, passengers in Surabaya prefer to use their cards to pay for transport fare instead of plastic bottles.

6.3 Recommendation

While this investigation has delivered intriguing discoveries, it likewise has a few confinements. Initially, this investigation depends on the nation explicit exact datasets with findings that are progressively suitable for creating cities with similar transportation systems that have adopted an entirely cashless payment system, which is Kigali (Rwanda) and Surabaya (Indonesia) through the Suroboyo Bus. Although focusing on specific research subjects to decisively support the exploration factors that add to a circumstance, this reality may by and by limit the discoveries' generalizability.

The study was limited on public bus transport in Kigali while in Surabaya was Suroboyo Bus. Besides, this examination assessed factors that impact passengers' acceptance of a cashless payment system in the public transportation system in Kigali and Surabaya appropriation by considering contribution from the amendment of two models' significant partners in the embracement of technology: The Technology Readiness Index and Technology Acceptance Model.

Although these are the most significant models which have a noteworthy impact in mapping the fate of the cashless payment system industry, getting their input alone may not extensively depict the present cashless payment system in public transportation system circumstances in both cities. Along these lines, acquiring the inclusion and contribution of different partners in the adoption, for example, the administration would give an increasingly complete outline. Comprehension of the contributing variables that have prompted the present circumstance and provide a clear awareness of the importance of the migration to the new system, and they should clearly explain why the new system is so essential to the users rather than harm. For future study, we highly suggest analyzing the acceptance of the public payment system in the public transportation system by considering the level of education, Gender, and Age. It will give show how different people with different backgrounds really embrace technology.

As we have seen that on both models, the awareness factor is supporting our study, because awareness increasingly more of our reality is connected to or impacted

by, innovation consistently. While a few developments enhance our lives, take care of troublesome issues, and help us associate, others bring up a few issues and outcomes that presently cannot seem to be settled. In what capacity would young be able to individuals influence progressively present and ground-breaking innovation to make themselves openings? Innovation use and acknowledgment require mindfulness as an expertise alludes to being aware of the innovation that is as of late getting well known and is promptly acknowledged in the market or industry. It additionally includes one's capacity to perceive and comprehend the handiness of any such innovation for progress. The acknowledgment of innovation can be seen either as a chance or as a danger to individuals and organizations. At the point when youngsters figure out how science and innovation work, they can more likely utilize their aptitudes for examination and enterprise. In any case, the innovation pattern mindfulness abilities fill in as the most significant resource.

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Appendix

Interview questionnaire

1. Why do you use a cashless payment system for bus public transport?
2. From your perspective, what are the essential factors that may influence the usage of new technology like the cashless payment system for bus public transport?
3. Can you describe your personal experiences that may discourage you from using a cashless payment system for bus public transport?
4. Do you have any personal experiences which make you feel insecure in using a cashless payment system for bus public transport?
5. Have you ever felt overwhelmed by the complexity of any new technology?
6. What makes you think that all new technologies are easy to use?
7. What would be your initial perception when you first confront with any new technology (i.e., openly, and positively, focus on its risk aspects, etc.)?
8. What your expectation for any new technology's usefulness for your daily routine activities (i.e., low, medium, high, etc.)?
9. How does your cashless payment system for bus public transport usage intention be affected by the reward program by card issuer?
10. How does your cashless payment system for bus public transport usage intention be affected by the surcharge fee imposed by the merchant?
11. Can the introduction of cashless payment systems for bus public transport affect people's usage of the service previously?

Survey questionnaire

Constructs and Indicators Variables of the Designed Model

Constructs and Indicators Variables	**Likert Scale**				
Perceived Ease of Use (PEOU)	**1**	**2**	**3**	**4**	**5**
Learning to operate a cashless payment system for bus public transport is easy for me					
I find it easy to get a cashless payment system for bus public transport to do what I want it to do.					
Usage of a cashless payment system for bus public transport is clear and understandable					
I find it challenging to use a cashless payment for bus public transport system					
It is easy for me to remember how to perform tasks using a cashless payment system for bus public transport.					
Overall, I find a cashless payment system for bus public transport easy to use.					
Constructs and Indicators Variables	**Likert Scale**				
Perceived Usefulness	**1**	**2**	**3**	**4**	**5**
Cashless payment system for bus public transport enables me to accomplish tasks more quickly					
Using a cashless payment system for bus public transport improves my job performance					
Using a cashless payment system for bus public transport increases my productivity					
Using a cashless payment system for bus public transport enhances my effectiveness on the job					
Using a cashless payment system for bus public transport makes it easier to do my job.					
Overall, I find a cashless payment system for bus public transport useful in my job					

Discomfort (DISC)

Constructs and Indicators Variables	**Likert Scale**				
Discomfort (DISC)	**1**	**2**	**3**	**4**	**5**
Technical support lines are not helpful because they do not explain things in terms you understand					
When you get technical support from a provider of a high-tech product or service, you sometimes feel as if you are being taken advantage of by someone who knows more than you do					
It is embarrassing when you have trouble with a high-tech gadget while Sometimes you think that technology systems are not designed for use by ordinary people					
There is no such thing as a manual for a high-tech product or service that is written in plain language					
There should be caution in replacing important people-tasks with technology because new technology can breakdown or get disconnected					
Many new technologies have health or safety risks that are not discovered until after people have used them					
New technology makes it too easy for governments and companies to spy on people					
Technology always seems to fail at the worst possible time					

Optimism (OPT)

Constructs and Indicators Variables	Likert Scale				
Optimism (OPT)	**1**	**2**	**3**	**4**	**5**
Technology gives people more control over their daily lives					
Technology gives you more freedom of mobility					
You like the idea of doing business via computers because you are not limited to regular business hours					
You feel confident that machines will follow through with what you instructed them to do					
You like computer programs that allow you to tailor things to fit your own needs					

Innovativeness

Constructs and Indicators Variables	Likert Scale				
Innovativeness (INN)	**1**	**2**	**3**	**4**	**5**
In general, you are among the first in the circle of friends to acquire new technology when it appears					
You can usually figure out new high-tech products and services without help from others					
You enjoy the challenge of figuring out high-tech gadgets.					
Other people come to you for advice on new technologies					
You keep up with the latest technological developments in your areas of interest					

You find you have fewer problems than other people in making technology work for you					
It seems your friends are learning more about the newest technologies than you are					

Insecurity (INS)

Constructs and Indicators Variables	**Likert Scale**				
Insecurity (INS)	**1**	**2**	**3**	**4**	**5**
You do not consider it safe giving out a credit card number over a computer					
You do not feel confident doing business with a place that can only be reached online					
Any business transaction you do electronically should be confirmed later with something in writing.					
You do not consider it safe to do any kind of financial business online					
You worry that information you send over the Internet will be seen by other people.					
Whenever something gets automated, you need to check carefully that the machine or computer is not making mistakes.					
If you provide information to a machine or over the Internet, you can never be sure it really gets to right place.					
The human touch is very important when doing business with a company					
When you call a business, you prefer to talk to a person rather than a machine					

Awareness (A)

Constructs and Indicators Variables	**References**				
Awareness (AW)	**1**	**2**	**3**	**4**	**5**
I have a clear understanding of the opportunities, benefits and threats enabled by Cashless Payment for bus public transport					
I have a good understanding of Cashless Payment for bus public transport using plastic bottles as a solution that is suitable for environment sustainability and protection.					
Businesses with whom our organization is partnering, and competing are already implementing Cashless Payment for bus public transport. .					
I know that adopting Cashless Payment for bus public transport using bottles will be advantageous.					
We consider that Cashless Payment for bus public transport has a tremendous impact on the way business is to be conducted in our life					
Attitude (AT)	**Likert Scale**				
Constructs and Indicators Variables	**1**	**2**	**3**	**4**	**5**
Using cashless payment by plastic bottle is a good idea					
Using cashless payment services is wise					
Using cashless payment services by plastic bottle is beneficial.					
Using cashless payment services for bus transportation is interesting.					

Intention to Use Cashless Payment System (ICPS)

Constructs and Indicators Variables	**Likert Scale**				
Intention to Use Cashless Payment System (ICPS)	**1**	**2**	**3**	**4**	**5**
I consider using a Cashless Payment System for bus public transport for my daily transport activities.					
I will choose to use cashless payment services using plastic bottles.					
I will recommend to my friends or others to use cashless payments services using plastic bottles.					
I would not hesitate to use cashless payment for bus transportation.					