



Determining Factors In Recommendation Of QR Code Enabled Payment Solutions In Creating A Cashless Society Among Sri Lankan Consumers: The Mediating Effect Of Intention To Use And Perceived Satisfaction In Usage Of QR.

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ABSTRACT

The purpose of this study is to analyse user's acceptance of Quick Response (QR) code mobile driven payment systems, in considering the Sri Lankan populations wide spread use of mobile phones and other mobile devices. The current research has been derived by using the UTAUT2 (Unified Theory of Acceptance and Use of Technology) model. This study develops a conceptual model to determine the most significant factors influencing user's Intention, Perceived Satisfaction and recommendation to use QR Code Payments as a payment platform in retail usage and purchasing. The research model included 457 responses from an online survey in Sri Lanka. The study tested the mediating effect of Behavioural Intention, Perceived Satisfaction to recommendation to use QR Code payment modes. The research derived that Ease of Use, Perceived Usefulness and Attitude to have significant effect on user's intention to use QR Code payment modes, which further influenced user's perceived satisfaction and recommendation to use QR Code payment modes as a direct testing. However, the indirect effects of Intention to Use to Perceived Satisfaction did not have any impact over Recommendation to Use QR code payments in the local context. Further, the overall study is directed at the consumers' acceptance of usage on QR Code payment platforms in Sri Lanka, and the academicians can research as future studies in the aspect of Merchants in Sri Lanka.

Key Words: QR – Quick Response Code payments NFC – Near Field Communication Payments UTAUT2 – Unified Theory of Acceptance and Use of Technology Recommendation to Use Intention to Use Perceived Satisfaction

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Introduction

The latest developments of mobile devices are launched with enhanced features that help make daily life of the consumer easier and productive and time efficient. Due to these reasons the trend in usage of mobile phones and digital devices has increased over the few years. (Calzada & Struch, Telefonía móvil en España: regulación y resultados, 2011). As per the International Telecommunication Union ((ITU), 2022), latest figures show that an estimated 4.9 Billion people are using the internet in 2021, and approximately 63% of the

worlds' population.

This is an increase of almost 17% since 2019, with almost 800 million people estimated to have engaged online during this period. As per (Digital, 2022) Sri Lanka's total population reached 21.54 Million in January 2022, and the internet users reached 11.34 Million reaching 52.65% of the total population using internet. In light of this trend in online usage most of the technology companies, financial institutions, non – financial institutions such as telecommunication service providers are focusing their efforts on increasing the number

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of services available, including mobile payments (Liébana-Cabanillas F. , El papel de los medios de pago en los nuevos entornos electrónicos, 2012), which are defined as all commercial transactions which take place as mobile transactions. (Hu, W. Li, & Hu, 2008)

In local context the Central Bank of Sri Lanka introduced the mobile payments via Lanka QR Platform, a closed loop payment system, where the Central Bank mandated the implementation to all the Financial Institutions in the country. (Central Bank S,2020)

The payment solutions and mobile payment transactions currently take numerous forms. The latest mode of payments is “NFC” Near Field enabled communication payments and also, mobile payment solutions, such as Tap to Mobile etc. Payment schemes such as Ru -Pay from the Indian context and Lanka QR are interoperable open loop and closed loop solutions that customers can use at most of merchant locations. (Central Bank S, 2020; Smith, Anderson, & Rainie, 2012)

Quick Response (QR) code payment systems payment systems.

A QR Code is a type of matrix barcode (or two – dimensional barcode), invented in 1994 by the Japanese automotive company Denso Wave. A barcode is a machine – readable optical label that can contain information about the item to which it is attached. In practice, QR codes contain data for a locator, identifier, or tracker that points to website or application. A QR Code uses four standardized encoding modes (numeric, alphanumeric, to store data efficiently). (Denso Wave, 2022)

The information that is normally linked to a QR code includes (Fonseca, Navarro, & Puig, 2011) web addresses (pages, Locations, Google Maps, I Tunes, You Tube links, etc) basic texts (alerts, SMS, e Mail, messages etc) or numeric information (phone numbers, coordinates etc) While initially the QR was designed for automotive industry, at present all segments of businesses have commenced using the QR codes in their production lines. The QR is now mostly used for advertising and communication campaigns, such as AI driven Augmented Reality campaigns. Companies use these QR codes included for textile companies, Mobile communication companies, signage in advertising media, product traceability and also

on the web sites and many more. (Nidhi, Neena, & Liébana-Cabanillas, 2020)

These QR codes are generated and used as a payment platform globally and in local context as well. As far as the mobile payments are concerned, in Sri Lanka the Lanka QR is used as an interoperable QR for merchant payments. There are 20 + Lanka QR Issuing Financial Issuers and Merchant acquirers in the country. The Lanka QR payment mode is used for Bill payments, payment for Retail transaction, Web base QR payments for Online Transactions, embedded to the POS machine for POS transactions. The Lanka QR can be used for all modes of Rupee transactions. This Lanka QR can be developed for the acceptance of VISA, MasterCard, Union Pay etc payment acceptance as well as can be configured for other wallet payment modes such as Ali Pay and WeChat Pay etc. (Central Bank S. , 2020)

Even though, Lanka QR Code payment method was launched in interoperable manner, it is still not at the full scale that is necessary for the usage of the local consumer and adoption as a payment platform in Sri Lanka. Despite performing a Lanka QR transaction is more beneficial the value of transactions is somewhat low, customers still prefer cash over digital payments, which they are more comfortable in using at the local small shops and groceries etc. Low awareness about the digital technology, its benefits, minimum consumer awareness, and the usefulness can be considered as the main challenges, to the minimum usage of Lanka QR payment platform. (Central Bank of Sri Lanka, 2021)

Quick Response (QR) code based payment solutions provide an alternative channel for initiating and accepting payments between a customer and a merchant. (Central Bank of Sri Lanka, 2021)

Central Bank of Sri Lanka issued a QR Code standard, titled as Lanka QR specifications, to promote customer convenience, security and ensure interoperability of different payment mechanisms, and instruments through the payment and settlement systems circular No 06 of 2018, on establishment of a National Quick Response Code standard for local currency payments. (Central Bank of Sri Lanka, 2021)

Lanka QR On – Us transactions (Intra – Bank transactions) are settled within the institution while Off – Us transactions (Inter – Bank



transactions) are settled through CEFTS. (Central Bank of Sri Lanka, 2021)

Payment and Settlement Systems (Circular No 02 of 2019) on establishment of a National Quick Response code standard for local payments was issued replacing the payment and settlement systems circular of No 06 of 2018. (Central Bank of Sri Lanka, 2021)

Quick Response (QR) code based payment solutions, initiated using mobile devices, provide an alternative channel for initiating and accepting payments, specifically between a customer and the merchant. The usage of QR Codes for payments eliminates the requirement for customers to carry cash or payment cards and for merchants to invest in high costly Point – of – Sale devices to process transactions. The payment industry will benefit immensely from having a QR Code standard implemented in the payment ecosystem of the country. Accordingly, the Central Bank of Sri Lanka is hereby issuing a QR Code standard, titled Lanka QR specifications, to promote customers' convenience, security and ensure interoperability of different payment mechanisms and instruments by adopting a standard QR Code to initiate payments, financial institutions will be able to provide access to low – cost and secure digital payments to customers and merchants. (Central Bank of Sri Lanka, 2018)

This study aims to understand factors that are relevant and theoretically supportive in UTAUT2 in measuring QR Code base payment systems usage in the consumers' daily life and perceived satisfaction upon using a digital payment mode in the local Sri Lankan context. Due to the globalization and to the increase in Internet Usage the consumers / buyers and sellers distance has been narrowed and has made the retail business expand the boundaries. This has made the business owners to sell more goods and services to locations outside their locality. (Liébana & Cabanillas, 2017; Francisco Liébana-Cabanillas a, 2018). However, there are yet few issues that could be identified as barriers to the intention to use QR payment services, where even in mobile payments as well, such as lack of information about product usefulness and usage, privacy norms, low awareness, resistance, innovativeness, infrastructural support and interoperability issues. (Oliveira, Thomas,

Baptista, & Campos, Mobile payment Understanding the determinants of customer adoption and intention to recommend the technology, 2016). It is stated that consumers do get worried about information and data been getting hold by unauthorised parties and publicly sharing of such personal information is making the consumers nervous and not willing to share such information while performing transactions digitally. (Hossain, Quaresma, & Rahman, 2019).

To mitigate or overcome such barriers in usage of QR Code base driven payment modes and digital payments and to get the usage increased, research studies proposed several key factors that may influence the intention and continued usage of QR Code and digital payment services. (Rana N. P., Dwivedi, Williams, & Weerakkody, 2014). The key technology adoption models, TAM (Technology Acceptance Model), and UTAUT2 (Unified Theory of Acceptance and Use of Technology), clearly states that ease of use, usefulness, attitude, perceived trust, subjective norms are some significant factors, which have significant influence on users' intention and further on continued usage of technology. (Dwivedi Y. K. Rana, Jeyaraj. Clement, & Williams, 2017).

The model adopted for the research has been tested for the Indian context on Mobile Wallet services by (Sinha, J., & Cabanillas', 2019) during the year 2019. The variables such as Innovativeness, Stress to Use and Social Influence are introduced with the aim of verifying their influence on Perceived Satisfaction and recommendation to use QR Code Payment modes in Sri Lankan context. (Sinha, J., & Cabanillas', 2019). This study will show that the customers are becoming more towards digital payments, and the customers are benefiting from QR Code driven payments while using their mobile phones. (Shaw, 2014).

Review of Literature

The QR Code (Quick Response Code) and NFC (Near Field Contactless) payment solutions both comes under Self Service Technologies (SST) where the customer has the feasibility of performing the transaction via the mobile phone. The introduction of latest technologies such as Self Service Technologies (SST's) in the banking sector has been emerging as one of the key significant business drivers that



accommodates customers in operating their bank accounts with more ease and effectiveness (Saxena, Sinha, & Majra, 2016) SST's (Eg: ATM's Internet Banking, Mobile Banking, QR Code Payment Solutions, NFC enabled payment solutions) has allowed banking customers or to state consumers to carry out their banking transactions on 24/7 *365, mode based on their requirements and conveniences (Manikandan & Chandramohan, 2016)

The positive results of QR Code Payment Solutions can be observed by the augmented level of bank's profitability due to the introduction of the SST's into the banking operations and processors. (Technology in banking: Insight and Foresight, 2011)

However, notwithstanding the benefits provided by SST's, it's development has been reported to be low as compared to the projected growth levels specifically with reference to developing nations like India. (Kanal, 2014), In this context, the lack of wide acceptance of QR Code base payment solutions among the customers have been observed, as one of the primary concerns. (Pillai & Seedhar, 2014)

As mentioned by (Magotra, Sharma, & Sharma, 2019), in consideration the lack of wide acceptance of QR Code Base Payment mechanisms and NFC Payment modes among the customers, numerous attempts have been initiated to analyse the SST - adoption behaviours of the banking customers and consumers. (Akinci, Aksoy, & Atilgan, 2004), (Sathye, 1999), (Walczuch, Lemmink, & Streukens, The effect of service employees' technology readiness on technology acceptance., 2007), (Yu, 2012)}, As, self-service technologies similitude information - technology transformation in various fields, (Eg: Online technologies, Automated technologies) different attempts like the technology acceptance model (Davis, Bagozzi, & Warshaw, 1989), Unified theory of acceptance and use of technology (Venkatesh V. , Morris, Davis, & Davis, 2003) innovations diffusion theory (Rogers E. M., 1995) , Theory of Reasoned action (Rogers & Ajzen, 1975) and theory of planned behaviour (Ajzen, 1991) have been used by the researchers for exploring QR Code payment solutions and NFC enabled payment solutions adoption phenomenon

among the banking customers, (Akturan & Tezcan, 2012), (Arif, Min, Zakaun, & Ishak, 2012), (Giovanis, Binoriys, & Polychronopoulos, 2012), (Pikkarainen, Pikkarainen, Karjaluoto, & Pahnilala:, 2004) not only these researchers, the technology readiness index (TRI) framework of (Parasuraman, 2000), which highlighted four personal traits of customer (such as optimism, innovativeness , discomfort , insecurity) in context of online and other automated technology has also been replicated with reference to the adoption of SST's among the customers etc, (Berndt, Saunders, & Petzer, 2010), (Shambare, 2013), (Walczuch, Lemmink, & Streukens, 2007), All the aforesaid replications have validated the relevance of the TRI traits in exploring the personal disposition of the customers toward the readiness of adopting QR Code Payment solutions and NFC enabled payment solutions.

On the whole, all the attempts of such kind have identified that the decision of the customers relating to the technology adoption depends on three aspects, that is, technology attributes, presence of supporting conditions, and the personal attributes of the customers (Venkatesh, Michael, Gordon, Davis, & Fred, 2003). Technology attributes refers to the features of the technology including which includes perceived usefulness of the technology, (Davis, Bagozzi, & Warshaw, 1989), and Relative advantage (Rogers E. , 2003), whereas facilitating conditions' refer to the presence of such conditions (such as Technical Support, Manual support, and so on) that hold up the application of Self - Service Technologies for serving banking requirements of the customers (Venkatesh, Michael, Gordon, Davis, & Fred, 2003). Further, personal attributes refer to the customer - specific attributes, such as their technology readiness (Parasuraman, 2000), and Self - Efficacy (Venkatesh & al, 2012) , that encourage or discourage consumers from adopting the technology. Previous studies in the local context has brought in the aspect that there is a lack of knowhow on technology in the local context. In view of the above mentioned aspects, numerous studies have been made by the researchers in different situations to examine QR Base payment systems adoptions behaviours of the consumers. (Martins, Tiago, &



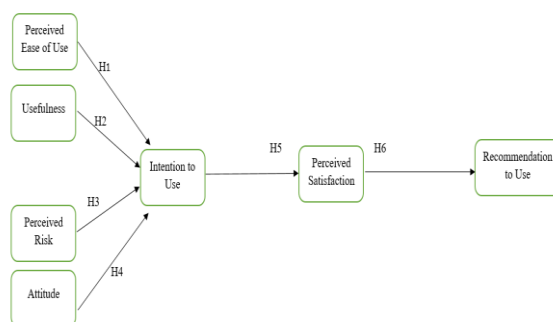
Popovic, 2014), These researchers conducted studies to explore the adoption of internet banking based on UTAUT models developed by (Venkatesh, Michael, Gordon, Davis, & Fred, 2003), in addition (Cheng, Lam, & Yeung, 2006), studies the adoption of internet banking with TAM, developed by (Davis, Bagozzi, & Warshaw, 1989). Also, literature has revealed to be enriched with studies integrating two or more models of this nature. As an example, (Podder, 2005), did explore Internet Banking adoption modes through the integration of Technology Adoption Model with another model, perceived characteristics of innovation, created by (Moore & Benbasat, 1991), but an insight into these studies of this nature has raised certain issues. (Magotra, Sharma, & Sharma, 2019), emphasized that the studies of this nature indicate that while formation of the framework for the study, researchers have taken a favoured model (based on their liking and perception or referral researches) also states that they have largely ignored the contributions of other alternative models in explaining SST's adoption behaviour of the consumers (Venkatesh V. , Morris, Davis, & Davis, 2003), Further, it has been identified that certain constructs used by the researchers for exploring the QR Code payment modes and NFC adopted payment modes decision of the customers have been developed in contexts other than self-service technologies offered to the banking consumers. As emphasised by (Magotra, Sharma, & Sharma, 2019), perceived usefulness has been developed in Technology Adaption Model (Davis, Bagozzi, & Warshaw, 1989), with reference to employees / customers using information technology at their workplace. However, perceived usefulness has been developed in context other than SST's the construct has been widely used with reference, to the adoption of QR Code Payment solutions and NFC enabled Payment solutions among the banking consumers (Murali & Mallikarjuna, 2014). Also, it is revealed that the same construct has shown significant impact on the QR Code payment solutions and NFC enabled payment solutions adoption behaviours of the consumers in different contexts and settings. Similarly self – efficacy has been found to show significant (direct and indirect) impact on the self-service technologies, adoption decision of the

consumers in various contexts (Nasri & Charfeddine, 2012), (Sundaravej, 2009), the analysis of these studies of this kind have pointed toward the need to review all the above mentioned constructs prior to considering them for further research in the field of QR base payment systems and NFC enabled payment mechanisms. In addition, with a view to analyse all such kind of constructs with relation to self-service technologies (SST's) adoption and implementation among the banking consumers, the present construction, on the framework have been composed.

Conceptual Framework

The Framework for the research is stated below. The research would be focused on Usage of QR Code payment modes enabled payment modes by the local consumers.

Conceptual Framework



Variables

The Variables considered on the frame work to be:

- a) Independent Variables (Exogenous Variable) – Perceived Ease of Use, Usefulness, Perceived Risk, Attitude
- b) Dependent Variables (Endogenous Variable) – Recommendation to Use
- c) Mediating Variables (Intervening Variable) – Intention to Use and Perceived Satisfaction

Variable	Number of Items
Perceived Ease of Use (PEOU)	7
Perceived Usefulness (PU)	5
Perceived Risk (Risk)	4
Attitude (ATTD)	6
Intention to Use (INTU)	3
Perceived Satisfaction with QR Code Base Enabled payment solutions	4
Recommendation to Use	3
	32



Methodology

The population considered for the research are account holders/ people who maintain any form of banking relationships/ and who are capable of performing online transaction. As data was collected by an online survey distribution, it is notable that these participants are capable of performing online transactions.

Sampling and Sampling Procedures

As these are customers having a banking relationship, the researcher will not be able to extract information or data from the banks. Overall Bank, Branch customers with accounts would be 36 Mn, (as per annual reports 2018 of the banks) defining that an individual would have opened over one account per customer. As the research is made to all local bank branches who has introduced the QR Code payment modes the sampling size of 457 respondents were obtained. (Sekaran & Bougie, Research Methods for Business A skill Building Approach, 2013).The sampling mechanism adopted for the research to be – sample design to be Non Probability sampling and in this the mechanism Convenience Sampling.

The research was targeted to the entire Western Province of the Island. The total population of the province to be 5,822,508 as at 2021. (Health Department Western Province, Government on population data) The Western Province is considered the largest business and technology hub in the island. Hence, the sample obtained can be extended to the entire island. The researcher approached 1537 members in the local community, where they maintain any form of banking relationship. Out of which 457 respondents took part in the online questionnaire and forwarded the online replies to the researcher. The researcher was able to derive at the conclusions to the research made, upon analysing the data collected from this survey. The number of participants was derived upon the theoretical justifications from Krejcie and Morgan (1970) and Cohen (1969), with the simplified size decision with the table that ensures a good decision model. This table extends the population of 1 Mn to be considered a sample size of 384, where this research carries a sample size of 457 with a 15% positive variance.

Hypotheses	Relationship
H1	Perceived ease of use positively affects user's intention to use QR code base enabled payment solutions
H2	Perceived usefulness positively influences user's intention to use QR Code base enabled payment solutions
H3	Perceived risk positively influences user's intention to use QR Code base enabled payment solutions
H4	Attitude towards QR Code Base enabled payment solutions has positive influence on intention to use QR Code Base enabled payment solutions
H5	The greater the user's intention to use, the greater the perceived satisfaction with QR Code Base enabled payment solutions
H6	The greater the user's perceived satisfaction with QR Code Base enabled payment solutions, the greater the user's recommendation to use QR Code Base enabled payment solutions

Results and Findings.

Sample Characteristics

There were 457 respondents in the survey. The respondents 'demographic' profiles are addressed through the following section:

Descriptive statistics of respondents

Survey was administered to members who have relationships with the banks or any other financial institution in the Western Province of the country. In this section the demographic profile of the members in terms of gender, age, level of education, employment / profession are documented below.

Descriptive statistics with of respondents:

Demographics	Frequency	Percentage
Total Participants	457	
Gender		
Male	365	80.50
Female	89	19.50
Age		
20-30 years	133	29.10
31-40 years	184	40.30
41-50 years	71	15.50
Above 50 years	69	15.10
Level of Education		
O/L	2	4
A/L	53	11.60
Degree	176	38.50
Masters	216	47.30
PhD	10	2.20
Profession		
Employed	395	86.40
Self Employed	62	13.60

According to the above table of Number of participants by age, the majority of the participants are reflected with in the age group of 31-40 years (40.30%). Further, it is noted



that the participants in the range of 20 – 30 years (29.10%) was also to be significant in comparison to the overall participants. Hence, we could come to a conclusion that the overall participants for this survey was quite competent in handling technology driven devices and in high tech savvy.

According to the above table of Number of Participants by Gender, the majority of the participants are reflected by the Male group (80.50%), and this is a clear indication that males are particularly interested and technology savvy, when it comes to the opposite gender. This is a clear indication of how the local Sri Lankan population would react to the latest technology in a male dominated context.

According to the above table of Number of Participants as per the Level of Education, it is noted that majority of the participants have completed their Masters degrees’ programs (47.30%) and there are participants who have completes degree programs (38.50%) and 2.2% have even completed reading for their PhD. Hence, it is noticeable that the participants are from an educated background.

According to the above table of Number of Participants by Profession, it is noted that 86.40% of the participants are employed. Self-employed participants presented were 13.60%, where we can derive that all the participants engage in any mode of financial relationship with the banks and financial institutions.

Cross Tabulation Results

Age	Gender		Education Level				Profession		
	Male	Female	O/L	A/L	Degree	Masters	PhD	Employed	Self Employed
20-30 Y	92	41	0	17	85	31	0	120	13
31-40 Y	149	35	2	25	50	104	3	165	19
41-50 Y	63	8	0	3	24	41	3	62	9
>50	64	5	0	8	17	40	4	48	21

Age to Gender Cross tabulation

According to the above table Age to Gender Cross tabulation, it is noticeable that majority of

the Male population who have participated on the survey are within the age group of 31 – 40 years (149), whom we can derive that they are financially independent.

Age to Level of Education Cross tabulation

According to the above table of Age to Level of Education Cross tabulation, yet again it is clear that majority of the participants completed their Master’s Degree Programs by the age of 31 – 40 years (104 members)

Age to Profession Cross tabulation

According to the above table of Age to Profession Cross Tabulation identifies that there have been participants with in the age group 31 – 40 years (165) of employed and also the younger crowd of 20 – 30 years (120) been employed. Hence it is noticeable and understandable that the participants are well aware with the latest technological developments in the market.

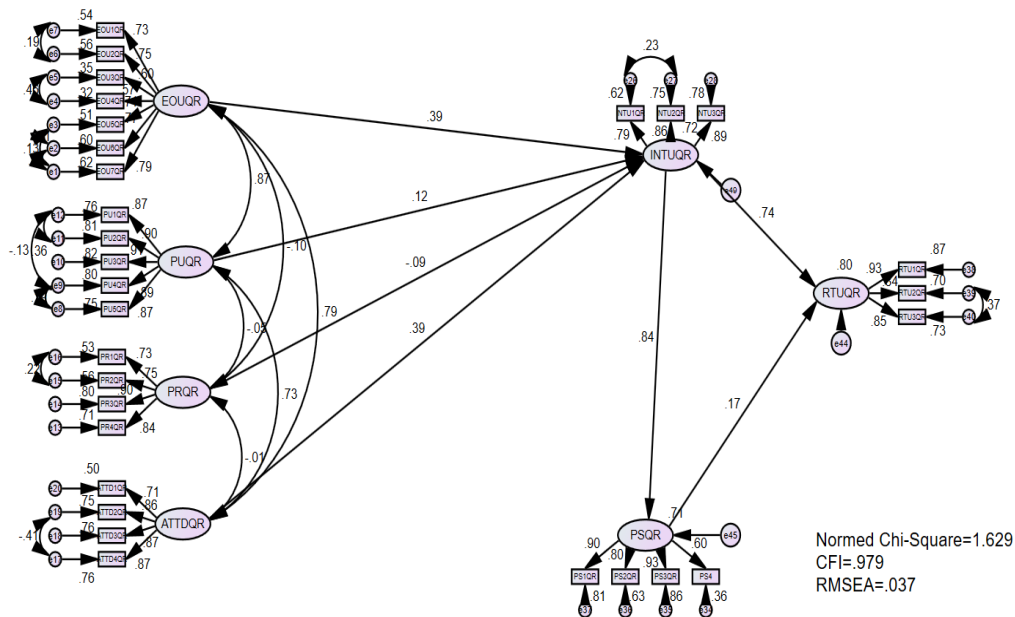
Reliability Analysis

Constructs	Pilot Study (Cronbach's Alpha)	Initial Items	Final Analysis (Cronbach's Alpha)	Items Used
Perceived Ease of Use	0.814	7	0.885	7
Perceived Usefulness	0.966	5	0.951	5
Perceived Risk	0.903	4	0.885	4
Attitude	0.611	6	0.630	4
Intention to Use	0.945	3	0.899	3
Perceived Satisfaction	0.839	4	0.880	4
Recommendation to Use	0.914	3	0.924	3
Total		32		30

As per the above table, for all the study constructs, Cronbach’s alpha coefficients were well above 0.60. In contrast, the overall, the overall alpha coefficient of Cronbach for all of the constructs was 0.924. This research proposes that the internal steadiness of each and every construct was within the acceptable ceilings.



Structural Model with Covariance for the Independent variables:



After having analysed the Structural Equation model following model fit has been derived. While considering the model fit indices, P – value is 0.000, where the indices is statistically significant and acceptable as ≥ 0.05 (Joreskog & Sorbon, (1996). While considering the CMIN/df which reflects 1.629 on the default model is statistically significant as it is ≤ 5 , (March & Hocevar 1985), therefore which is acceptable. GFI indices reflects as 0.918 which can be considered as per previous researcher conducted on the similar studies. (Hair et al 2010). AGFI in the default model is derived as 0.900 and will be taken in to consideration as is ≥ 0.80 . In analysis of the Base Line Comparison, CFI which reflects 0.979 which is ≥ 0.90 , (Hu & Bentler, 1999). While analysing RMSEA of the default model which reflects 0.037, which is acceptable < 0.05 . Hence, we are confident that the overall measurement model which is depicted above can be acceptable and acceptable model fit.

Further, while analysing the Regression weights of the overall measurement model P – value 0.000 is statistically significant ≥ 0.05 , and acceptable.

Therefore, we can derive that the overall structural model can be accepted for the

research and can be used for further for the analysis.

Outcome of the Hypothesis - evaluations from Structural Model

		Estimate	S.E.	C.R.	P	Supported
INTUQR <---	EOUQR	.406	.107	3.796	***	Yes
INTUQR <---	PUQR	.103	.069	1.479	.139	No
INTUQR <---	PRQR	-.072	.027	-2.647	.008	No
INTUQR <---	ATTDQR	.342	.054	6.348	***	Yes
PSQR <---	INTUQR	.630	.052	12.151	***	Yes
RTUQR <---	PSQR	.283	.111	2.548	.011	No
RTUQR <---	INTUQR	.925	.090	10.243	***	Yes

Hypotheses 01 (H1) - Perceived ease of use positively affects user’s intention to use QR code base enabled payment solutions. The statement is perfectly acceptable as per the above stated derived results from the research analysis. Where ($\beta = 0.406$ & $p < 0.000$), which is significant and supported to the statement. Having derived the above results, Perceived Ease of Use has a direct and positive relationship over Intention to Use, the QR Payment modes in the consumers’ daily usage.

Hypotheses 02 (H2) - Perceived Usefulness positively influences user’s Intention to Use QR Code base enabled payment solutions. The statement is not acceptable as per the above stated derived results from the research



analysis. Where ($\beta = 0.103$ & $p = 0.139$ where should be $p < 0.05$), hence which will be not significant and not supported to the statement. With the results for the (H2) it is clear that Perceived Usefulness does not reflect a direct and positive relationship over Intention to Use, the QR Payment modes in the consumers' daily usage.

Hypotheses 03 (H3) - H3 presumption has been that Perceived Risk positively influences user's intention to use QR Code base enabled payment solutions. However, after analysing the data the null hypotheses (H0) became true and acceptable. Where the statistical evidence showed that ($\beta = -0.072$ & $p < 0.008$), which is negative and can be illustrated as Perceived Risk has a negative relationship and impact on the Intention to Use the QR Payment modes in the consumers' daily usage. In the context of this research Perceived risk positively influences user's intention to use QR Code base enabled payment solutions has been rejected.

Hypotheses 04 (H4) - Attitude towards QR Code Base enabled payment solutions has a positive influence on intention to use QR Code Base enabled payment solutions. The statement is perfectly acceptable as per the above stated derived results from the research analysis. Where ($\beta = 0.342$ & $p < 0.000$), which is significant and supported to the statement. With the results derived, Attitude has a direct

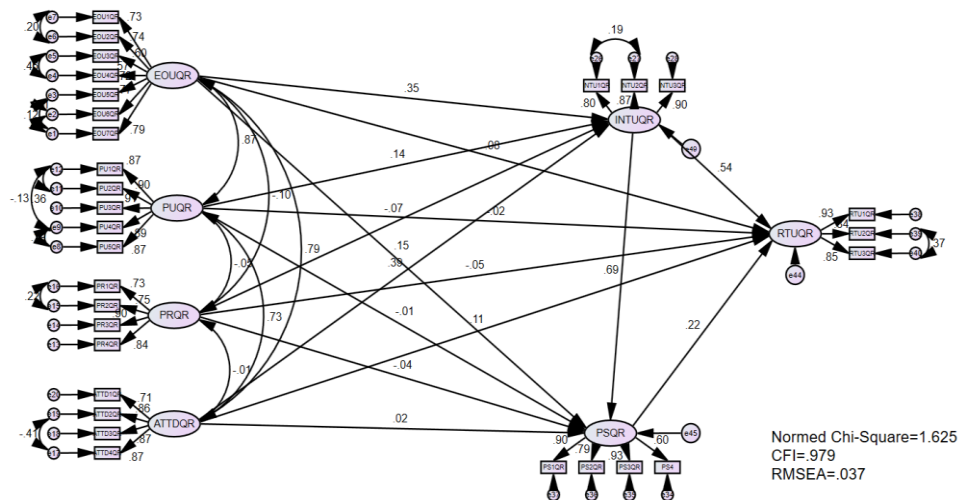
and positive relationship over Intention to Use, the QR Payment modes in the consumers' daily usage.

Hypotheses 05 (H5) - The greater the user's intention to use, the greater the perceived satisfaction with QR Code Base enabled payment solutions. The statement is perfectly acceptable as per the above stated derived results from the research analysis. Where ($\beta = 0.630$ & $p < 0.000$), which is significant and supported to the statement. Greater the user's intention to use, the greater the perceived satisfaction with QR Code Base enabled payment solutions in the consumers' daily usage. Therefore, findings of this research show that user's intention to use and to adopt a technology affects their perceived satisfaction regarding benefits of the QR Code Payment system.

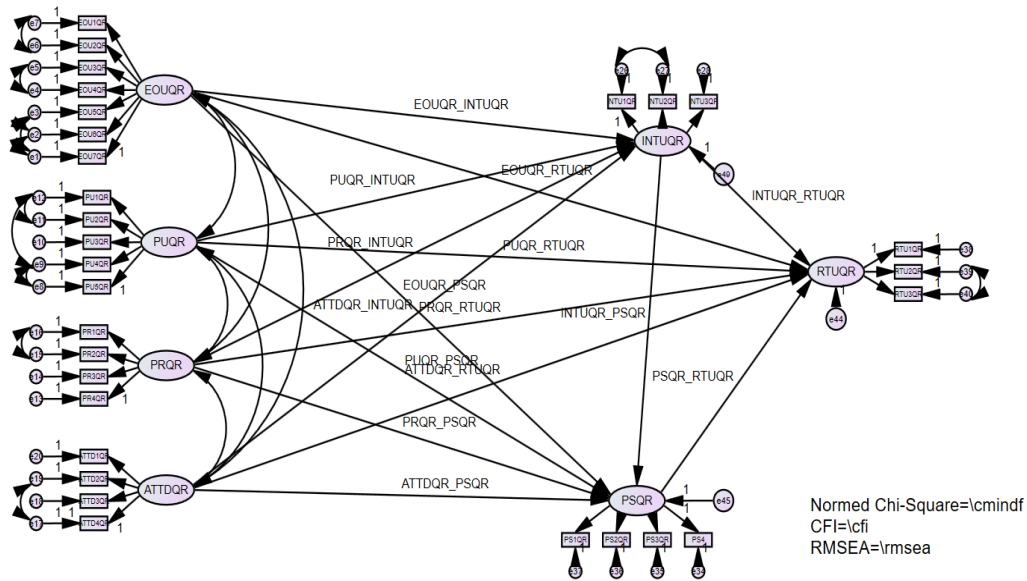
Hypotheses 06 (H6) - User's Perceived satisfaction with QR Code Base enabled payment solutions, to user's recommendation to use QR Code Base enabled payment solutions does not reflect significant. Where ($\beta = 0.283$ & $p < 0.011$), which is not significant. Hence, we can conclude that perceived satisfaction does not have a direct or positive effect on user's recommendation to use a technology. (Duarte, Silva, & Ferreira, 2018; Hsu, Chen, Chang, & Chao, 2010; Selvakumar, 2010).

Testing of Mediating effect of Perceived Satisfaction over Intention to Use and Recommendation to use the technology.

Indirect Effects on the Mediation variables



Analysis made for multiple mediators.



With the below indirect effect results derived, it is noted that there is no significant impact made indirectly to Intention to use the Lanka QR and Perceived satisfaction over the Recommendation to use the technology.

Indirect Path	Unstandardized Estimate	Lower	Upper	P-Value	Standardized Estimate
EOUQR -> INTUQR -> PSQR	0.191	0.085	0.361	0.003	0.245**
EOUQR -> INTUQR -> PSQR -> RTUQR	0.070	0.024	0.173	0.006	0.245**
EOUQR -> INTUQR -> RTUQR	0.249	0.112	0.488	0.003	0.192**
EOUQR -> PSQR -> RTUQR	0.044	-0.003	0.140	0.120	0.034
PUQR -> INTUQR -> PSQR	0.060	-0.012	0.148	0.154	0.094
PUQR -> INTUQR -> PSQR -> RTUQR	0.022	0.000	0.069	0.097	0.094†
PUQR -> INTUQR -> RTUQR	0.079	-0.013	0.208	0.147	0.073
PUQR -> PSQR -> RTUQR	-0.001	-0.037	0.041	0.898	-0.001
PRQR -> INTUQR -> PSQR	-0.030	-0.066	-0.006	0.039	-0.048*
PRQR -> INTUQR -> PSQR -> RTUQR	-0.011	-0.032	-0.002	0.030	-0.048*
PRQR -> INTUQR -> RTUQR	-0.040	-0.085	-0.007	0.040	-0.038*
PRQR -> PSQR -> RTUQR	-0.009	-0.034	0.004	0.281	-0.008
ATTDQR -> INTUQR -> PSQR	0.175	0.106	0.278	0.000	0.267***
ATTDQR -> INTUQR -> PSQR -> RTUQR	0.064	0.030	0.124	0.003	0.267**
ATTDQR -> INTUQR -> RTUQR	0.227	0.130	0.389	0.001	0.209***
ATTDQR -> PSQR -> RTUQR	0.005	-0.019	0.048	0.698	0.004
INTUQR -> PSQR -> RTUQR	0.187	0.084	0.328	0.007	0.152**

Significance of Estimates: *** p < 0.001, ** p < 0.010, * p < 0.050, † p < .100. (Gaskin, J. & Lim, J. 2018),

Conclusions and Recommendations

This study is an empirical research on determining factors in the adoption and recommendation of QR Code enabled payment solutions by the Sri Lankan consumer. Where this research analyses the effect of Perceived Satisfaction over Intention to Use the

technology how would have impacted the recommendation of the QR Code payments.

Taking a recap of the objective of this research, determining the adaptability and recommendation of QR Code Base payment solutions introducing to the local consumers. The study aims to traverse behavioural factors effecting users' / consumers intention and perceived satisfaction of the clients towards using of QR Code based payment platforms in the local market. The study encompasses the constructs, Perceived Ease of Use, Perceived Usefulness, Perceived Risk, Attitude to measure local consumers' perception and adoption towards using the QR Code payment modes for their daily usage. (Koenig-Lewis, Palmer, & Moll, 2010), (Wu, Liu, & Huang, 2017), (Nidhi, Neena, & Liébana-Cabanillas, 2020).

As per the structural model diagram describe herewith, the affecting overall capacity enforced to the dependent constructs, Intention to Use (72%), Perceived Satisfaction (78%) and Recommendation to Use (71%), these measures depict the efficacy of various constructs on users' behaviour pattern of outcome on using the QR Code payment platforms in Sri Lanka.

Having logically performed the research on Intention to Use, the study put forward the relationships affected between Ease of Use, Perceived Usefulness, Perceived Risk and Attitude with the Intention to Use the QR



Payment Platform which is introduced to the local market. Taking into consideration the variables, Ease of Use was the most supportive, where to follow by Attitude. Perceived Risk and Perceived Usefulness variables were identified as not significant in determining the consumers' intention to use the QR Code payment platform in Sri Lanka.

The findings clearly identify that users of QR Platforms who performs transactions has a favourable attitude and will have a positive impact on the intention to use these platforms. (Humbani & Wiese, 2018; Schierz, Schilke, & Wirtz, 2009; Shin., 2009; Liu, Wu, & Buck, 2021), these studies conducted elaborates more on user's attitude to be a major driving force in usage of latest technology and adoption to QR Code payment modes. Hence, the research derives that attitude has a positive influence on the intention to use the Lanka QR for the consumer.

Further, the research made on Ease of Use also has a compelling influence in using the QR Code base payment system locally, taking into consideration the researches made in India and China (Nidhi, Neena, & Liébana-Cabanillas, 2020; Liu, Wu, & Buck, 2021), also, clearly states on the significant influence on the Ease of Use in using latest technology. (Liebana - cabanillas, Marinkovic, Luna, & Kalinic, 2018; Dwivedi Y. , et al., 2017; Dwivedi Y. , Rana, Jeyaraj, Clement, & Williams, 2017). The users' intention to use is purely driven by the Ease of Using the technology, hence the research derived that there is a positive impact on the Intention to Use by the construct Ease of Use.

As per the derived results on Perceived Risk and Perceived Satisfaction it is clearly noted that there is a negative impact on the Intention to Use QR Code Payment platforms in the local context. With reference to the previous studies made by (Liu, Wu, & Buck, 2021) defines the pleasure in using QR Code payment platforms and the increase in usage in China. Previous studies made in certain countries such as India, China, Lebanon have derived that consumer is concerned about digital payments, as there is somewhat technology knowhow is required. (Alalwan, Dwivedi, & Rana, 2017; Riquelme & Rios, 2010; Thakur & Srivastava, 2014). The key objective of this research is to determine the constructs which has the influence on User's Intention, Perceived Satisfaction and the

recommendation to use the QR Code Base payment platform in Sri Lanka. Having looked on previous studies made on Mobile Wallets and digital payment modes the technology adoption has been the main focal point of the research made on User's Intention. (Liébana-Cabanillas, Sánchez-Fernández, & Muñoz-Leiva, 2014; Singh, Srivastava, & Sinha, 2017; Tajvidi, Wang, Hajli, & Love, 2017). However, taking into consideration the Sri Lankan context, it is notable to mention that this is the first research made on Lanka QR Code base platform usage by the consumers. This research did derive statistical significant relationships connecting intention to use and perceived satisfaction of Lanka QR Code base payments.

This research confirms the consumers' Perceived Satisfaction dose not influence with a direct effect to the Recommendation to Use the QR Code Base payment platform in the local context. There are 24 Lanka QR Payment platform financial issuers who provide the digital apps to consumers to use for these transactions. These financial and non-financial institutions should keep in mind that the consumers should be satisfied with the latest technologies while using on Lanka QR, where they shall recommend this usage to their family and friends. That will in return increase the usage on QR Code Base payments. (Tajvidi, Wang, Hajli, & Love, 2017; Joo, Park, & Shin, 2017). Numerous previous studies related to User's Perceived Satisfaction and Recommendation to Use in various other countries also identified that there is a straight and strengthened correlation with the insight of usage on mobile payment and digital technology (Paulo & Susana, 2018; Mehmood & Najmi, 2017; Duarte, Silva, & Ferreira, 2018; Kapoor, Dwivedi, & Williams, 2015; Oliveira, Thomas, Baptista, & Campos, 2016; Thakur & Srivastava, 2014; Hsu, Chen, Chang, & Chao, 2010) has already stated a related find that once a consumer can perform transactions or use a digital platform easily and conveniently, that there is a tendency for the consumers to provide positive notes they would endorse the technology to others. The respective studies identified particularly once the technology is easy and convenient to use the consumers would opt for digital and mobile payments. Hence, this research clearly denotes that consumers would use the Lanka QR payment



methods if the technology supported would be convenient and easy to use by the consumer. (Abhishek & Hemchand, 2016; Amoroso & Watanabe, 2012; Rana, Dwivedi, Williams, & Weerakkody, 2015; Kumar & Seri, 2014) stated particularly if the consumers distinguish good and effective any of the technologies they use, the consumer will most undoubtedly recommend the technology to the friends and family. Therefore, the significance relationship between perceived satisfaction and the recommendation to use the technology is clearly justified and as per the results derived this relationship is clearly denoted.

This research clearly identifies the significance of recommendation to use the QR Code payment platforms in consumers' daily life. Recommendation is followed after users to share their views and acceptance about the technology. They will communicate their likeliness of using the current technology in all modes of communications the consumers prefer. This could be word of mouth, in all social media platforms etc. (Oliveira, Thomas, Baptista, & Campos, Mobile payment: Understanding the determinants of customer adoption and intention to recommend the technology, 2016). Present consumers have the options of freely communicating via social media on their experiences of technology usage. All social network platforms consumers' use to share their views and thoughts on the latest technology they have commenced using and to provide any possible opinions on the technology. (Oliveira, Thomas, Baptista, & Campos, Mobile payment: Understanding the determinants of customer adoption and intention to recommend the technology, 2016). All social media networks are a latest trend for consumers to share their behavioural intentions to adopt and recommend the latest technology to others. (Oliveira, Thomas, Baptista, & Campos, Mobile payment: Understanding the determinants of customer adoption and intention to recommend the technology, 2016). All these social network platforms are highly critical in spreading behavioural intention messages. These messages can be negative or positively impacted to the consumer. Consumers will resist the usage if the recommendations are negative. (F, Juan, & Francisco, 2014a; Liébana-Cabanillas, Veljko, Iviane, & Zoran, 2018;

Zolkepli & Kamarul, 2015). The direct impact of Perceived Satisfaction and Recommendation to Use the technologies have been significant. However greater the Social Influence will minimise the consumers perceived satisfaction and further effect the consumers' recommendation to use QR Code Base Payment platforms. The users will always accept a technology if someone else would recommend of the technologies use. (Jiang, et al., 2016; Liebana - cabanillas, Marinkovic, Luna, & Kalinic, 2018). The theory model UTAUT2 denotes Social Influence as the key factor of adoption of any latest technology by the consumers. (Amoroso & Watanabe, 2012; Venkatesh V. , Morris, Davis, & Davis, 2003; Venkatesh & al, 2012). Outcomes obtained from past researches confirmed that the finds are reflected that family, friends, social groups, peers and colleagues mostly influence the consumers' intention to use any technology. (Slade, Dwivedi, Piercy, & Williams, 2015a; Thakur & Srivastava, 2014; Venkatesh & al, 2012; Yang, Liu, Li, & Yu, 2015). People are mostly influenced by social media, recommendations and word of mouth, in adopting to any latest technology. In such context Social Influence is highly believable to motivate the consumers in adopting and using any latest technology. In line with this research, the respondents that participated for the research agreed to statements in the questionnaire stated "I do not use QR Code Payment modes because my family thinks I should not use it". The participated respondents to the questionnaire accepted that their decision to accept a new technology is influenced by family and friends. (Chong, Darmawan, & Ooi, 2010; Tag, Lee, Lin, & Ooi, 2017).

Theoretical Contributions to the research

The research done on Lanka QR Code Payment modes and platforms is a unique attempt made by the researcher to contribute to the effectiveness of the usage / perceived satisfaction and recommendation to use the platform in the local context. Mostly, the increase in the social networks and usage of online payment platforms in the country paved the consumers to share ones' opinions and provide feedback for this QR code payment mode. Further, with the current economic crisis



situation in the country, consumers to pump fuel for their vehicles, the government of Sri Lanka, introduced a QR Code mode of obtaining fuel at the petrol sheds. A quota system to minimise the usage of fuel. (BusinessStandard; 2022) All, these usages of QR should inculcate the habit of QR usage in the local context. (Abhishek & Hemchand, 2016; Madan & Yadar, 2018; Rana, Dwivedi, Williams, & Weerakkody, 2015). Most of the studies have not taken into consideration the consumers' perceived satisfaction neither the recommendation to use the technology in the local context. However, having taken in to consideration the global research, in this too, the user's perceived satisfaction and the recommendation to use was minimum. (Kapoor, Dwivedi, & Williams, 2015; Madan & Yadar, 2018; Sharma & Sharma, 2019; Nidhi, Neena, & Liébana-Cabanillas, 2020). The results derived from this current research shows the positive relationship of User's perceived satisfaction to Recommendation to use the QR Code mode base payment solutions in the Sri Lankan context. The results will undoubtedly help future studies on understanding user's perceived satisfaction and the recommendation to use the technology on QR Code base payment modes.

Further, as this is the only study available on QR Code Base payment modes in the Sri Lankan context, and the introduction of QR Code Base payments system to Sri Lanka also is very new, being 09th October 2018, where the Central Bank of Sri Lanka mandated the introduction to the local Banks and few Non - Financial institutions, (Central Bank of Sri Lanka, 2018). Therefore, this research would have been an early investigation in to the moderating aspect of Innovativeness and Stress to use the technology. The growing significance of Lanka QR Code payment modes in the country will increase the need for research on these aspects. This research will be an undoubtedly a base model for further studies on Lanka QR Code payment modes in the Sri Lankan context.

Practical Contribution to the research

As stated previously, this is the very first study made on Lanka QR Code base payment modes in the Sri Lankan context. Further, having taken into consideration the Recommendation to Use Lanka QR Code Payment modes in the country,

is a variable highly important to all the Lanka QR Code payment mode service providers, such as Banks, Non - Financial Organisations, Telecommunication service providers, mobile payment service providers, Marketers and social media platform service providers. As this is a mode where all users can provide feedback and provide new thoughts for improvements, where this will useful for further development of the platforms to support the usage. Social networking platforms such as Websites, all social networking platform and public goggle forums do provide an added benefit for the users to interact and share their experiences in Positive and negative ways, where the service providers will need to take this feedback in positive manner. (Miltgen, Popovic, & Oliveira, 2013). These recommendations will determine the success and failures of the QR Code base payment systems in the country. This research provides important insights and new modes such as social networking liking to measure the consumers' behavioural intention to use such latest technologies.

From a practical aspect this research provides guidance for the mobile app developers, bankers on deciding of any latest technology introductions to the consumers, where it is significantly justified that Perceived Usefulness and Perceived Ease of use on QR Code Payment modes will increase the consumers' usage on the application. In this aspect, the manufactures of mobile payment applications must have in mind that they will need to be mindful on the ease of use of these applications developed for the consumers to use. In line with the Recommendation to use, the mobile service platform providers, should commence communications and create awareness among the consumers to motivate the usage of QR Code base payment modes. Further, the banks and non - financial institutions should promote the advantages of using QR Code base payment modes in social media.

Furthermore, attitude also has been a key determinant in creating a constructive impact on intention to use QR Code Base payment modes. The attitude the users creates or the perception they will formulate towards the QR Code payment modes will increase the usage. The degree of attitude can also be upgraded by improving the consumers' own perception



about QR Code base payment platforms. (Dwivedi Y., et al., 2017).

All the elements in the research will undoubtedly improve the intention to use the technology, perceived satisfaction and recommendation to use the technologies. In order for consumers to recommend the technology to others it is justified that perceived satisfaction plays a major contribution. Therefore, all the application developers need to reflect on the benefits of usefulness, ease of use and positive attitude, where the customers' will be content with the technology prior to recommending same to their family and friends. (Oliveira, Thomas, Baptista, & Campos, Mobile payment: Understanding the determinants of customer adoption and intention to recommend the technology, 2016).

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