ADOPTION OF CASHLESS SOCIETY BY SINGAPORE

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Abstract

With the adoption of technology becoming so prevalent where the digital era has taken over, the use of cashless transactions is on the rise. It is a more efficient and quicker alternative that has been adopted by so many organizations that the need for physical cash is reducing especially in Singapore's stable economy. The obvious concern would be those relating to security and privacy however in a nation like Singapore that is known for its safety, the adoption of cashless transactions only reduces the likelihood of corrupt activities. The authentications of cashless transactions increase its reliability as every payment can be cross verified and increasing the growth and trust factor of this economy would only help Singapore's good will. This paper attempts to determine the potential of a cashless society in Singapore given the mentality of the consumers as well as other factors relating to regulations and competition.

The primary data for this study has been attained by conducting a survey questionnaire of 202 Singaporean residents. The data were modelled using ADANCO 2.0.1 Software. ADANCO (PL-SEM) is a structural equation modelling tool used for modelling variance based structural equation and postulating hypotheses.

Keywords: cashless Society, issues with cashless, ease of use, Singapore Cashless

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INTRODUCTION

All governments across the globe are trying to impose cashless economy but the people are not comfortable switching to cashless, they are facing a lot of issues in going cashless due to concerns such as security, a lack of trust on the applications on which they have to share all their personal details, a lack of literacy about cashless payment methods. On the

other hand, being a cashless economy will be beneficial as it will decrease the level of black money in the society, majorly through the elimination of fake currencies and even put a halt on terrorism fundings.

CASHLESS SOCIETY

A cashless society is defined as an economic state in which all the monetary transactions are done without the regular money which is in the form of notes or coins, but rather through the transfer of digital information (mostly money) between the two parties.

SINGAPORE

Singapore is officially known as the Republic of Singapore. Singapore is a global hub for education, entertainment, finance, healthcare, human capital, innovation, logistics, manufacturing, technology, tourism, trade and transport. The city ranks highly in many segments such being recognized as the most technology ready nation (WEF), top international meetings city (UIA), with the "best investment potential". It is the world's smartest city, world's safest city and third least corrupt city.

CASHLESS SOCIETY IN SINGAPORE

As Singapore is a developed country, they want to become a fully cashless country but they are unsuccessful till now due to many reasons which are security concerns, lack of trust, illiteracy among citizens, and risks associated with the transaction. Going cashless has a lot of benefits such as it saves money and time, reduces the crime rate, reduction in production cost of coins and paper currency, less cash means more data for the government etc. (Oswal, 2019) but on the other hand people are afraid from the disadvantages that comes with the cashless society such as expose of your all personal details, technology glitches can halt your money access and many others. (PRITCHARD, 2019)

RESEARCH QUESTIONS
   a) Does increase in security enhance the usage of E-Platform in cashless society?
   b) Does increase in literacy enhance the usage of cashless payment methods?
   c) Does increase in regulations enhance the usage of Virtual currencies?
   d) Does increase in competition among cashless payments applications enhances the usage of cashless payments?
   e) Does increase in trust enhances the usage of cashless payments?
   f) Does decrease in risk enhances the usage of cashless payments?

RESEARCH OBJECTIVES
   a) To identify factors influencing security to enhance the usage of cashless society.
   b) To identify factors influencing financial literacy to enhance the usage of cashless society.
   c) To identify factors influencing regulation to enhance the usage of cashless society.

d) To identify factors influencing competition to enhance the usage of cashless society.
e) To identify factors influencing trust to enhance the usage of cashless society.
f) To identify factors influencing risk to enhance the usage of cashless society.

REVIEW OF LITERATURE

SECURITY

Security is one of the biggest factors that can lead to the adoption of cashless society. Increase in the security can increase the usage of the E-platforms and even the design and functionality of the platforms has a significant relationship with the Perceived Usefulness. the security issue in the E Service domain has been gaining more attention over the past two decades. (P C, 2019) The raw information has a negative effect on a person's perceived data security (PDS). E-Commerce business, standing out negatively in terms of data security would influence the store's PDS negatively. Experience of being hacked, user to root attack, remote to local attack, Internet infrastructure attack and Packet sniffers are also a great influencer. But the surveys show that 90% of the participants are interested to use e-services in developing countries. (Blazer and Bollig, n.d.)

In recent times it has been noticed that millions of debit cards are being compromised these cards include both visa and master cards and from various big banks. Symantec have said that there is an exponential increase in the cyber threads and there is a huge security concern to the stock markets as well. (ARTICLE and Economy, 2019)

LITERACY

Financial Literacy is one of the biggest barriers affecting the cashless society as the level of awareness is very less. The financial literacy can be treated instead of the concept. This concept includes Financial knowledge, familiarity with and experience in finances, financial skills and financial awareness. (Uzonwanne and Ezenekwe, 2019) The indefensible big cash demand is a sign of the low financial literacy, which on the other hand increases black money and also continues to rise cash creation costs in its place of promoting cashless alternative. (Luksander et al., 2019). There are 3 tenants of digital financial literacy-

1. Update Citizens about government policies and digital financial options available for them.
2. Increasing alertness of digital payment methods.
3. Informing knowledge of safety and security of digital payments.

Three Facilitators of digital financial Literacy-

1. Digital Infrastructure to allow digital transactions: Merchants and consumers.
2. Assisting less cash behaviour shift.
3. Incentivizing less cash behaviour. (jasuja, 2019)

REGULATIONS

Lack of proper regulations is also a major concern. The increase in the conventional currencies raises important issues including the integrity of the user, the security and efficiency of the technology and their scope of laundering money. Empowerment of the individual to have an unpreceded level of control over his or her money is a positive development, but it doesn't come without risks and once money is converted into a digital form, it can flow in and out of the countries at the fast speed using technology. (WAHLERT, 2019)

Even Virtual Currencies (VC) are neither backed by alternative currency nor by government and they are even not a legal tender. Actually, there is no VC only records of it. VC has a lot of risks such as Liquidity risks, Legal Risks & technological and operational risks. VC are highly involved in all wrong activities. (Vya and Sharma, 2017)

In Singapore if payment service providers that exceed a monthly average of $3 million in transaction or $5 million in electric money in their daily float will have to be a licensed as a major payment institution and whereas for payment service provider which do not go above the threshold will be licensed as standard payment institutions. For residents, they will not be able to withdraw Singapore dollars from the electronic money accounts. This is to promote greater adoption of cashless payments. (LIM, 2019)

COMPETITION

Less competition in an industry is not good where as having high competition is also not beneficial. Having one or two players dominating the market brings 'Short term convenience to consumers', but there will be "significant downside risk in the long term" due to lack of competition in Singapore. (NG, 2019)

In Singapore the dominant player wields significant market power, and owns all the transaction data and customer information. The cash and credit cards remain the preferred payment modes among Singaporeans, and about two-thirds of the respondents said that more payment options meant more confusion. (NG, 2019)

Competition rises the innovation, the role of innovation attributes that meaningfully influence the behavioural purpose and actual adoption of potential consumers towards the interbank mobile payment service. The behavioural intension and cost showed significant impacts on the adoption of the IMPS applications. (Scholar.google.com, 2019)

TRUST

Trust is one the most important variables of our research because it significantly effects the adoption of the cashless society. Security and privacy over online transaction process and reliability of online vendors affect consumers' confidence in adopting e-commerce. (Anon, 2019)

Trust has been accepted as a critical element in electronic commerce due to the fact that online transaction is characterized as a process that involve uncertainty and risk. (Kim and Kim, 2005)

There is a major concern about user confidence in e- services. Trust is relativized to some business transactions; trust is a measurable belief. Trust is directed, trust evolves in time and even within some transactions. Trust between collectives does not necessarily

distribute to trust between their members, trust is reflexive, yet trust in oneself is measurable.

An operational classification of trust-

- Resources access trust
- Provision of service
- Certification based trust
- Reputation based trust
- Delegation trust.

Trust is also dependent on several independent variables –

- Enactment trust
- Enablement trust
- Regulatory trust
- Reputation trust (Dimitrakos, 2019)

RISK

A commonly recognized barrier to the diffusion and adoption of e-Commerce has been the lack of security and privacy over the Internet which increases the level of risk, raises concerns for privacy, security and vendors' trust lowers the usage of cashless methods. (Gordon, 2019)

Perceived usefulness (PU), perceived risk in the context of transaction (PRT), and perceived risk with product/service (PRP) have significant direct effects on consumer's adoption of e-Commerce. (Park, Lee and Ahn, 2014)

There is a huge increase from both the organized criminal gangs and nation states always coming up with the new ways of attacking digital systems, non-cash solutions may be more exposed.

Most online vendors allow consumers to pay through credit card, which effectively limits the number of consumers immediately.

Success of new electronic banking services is not only the problem of technology easibility, but also the problem of marketing and promotion efforts.

Researches indicates that the planner or suppliers have ignored or underestimated potential user's real life needs and concerns.

As the choices of the payment are increasing, the concerns are also increasing.

MEANINGFUL DATA

As mentioned earlier, with the digital transformation where a significant percentage of transactions are done through mobile applications, going cashless is only going to convenience the customers and this will add to their habitual lifestyle of using their smartphones and other digital devices. In addition, this adoption will benefit the government considering their priorities of maintaining anti-corrupt practices and reliable, highly secure channels to make various payments.

Security (SE)		Research Gap	DEPENDENT VARIABLE	Author and Year
SE 1	For non-internet user security of their data is very important.	Non-Internet users	SECURITY	Lai, P. C. (2016). Design and Security impact on consumers' intention to use single platform E-payment. Interdisciplinary Information Sciences, 22(1), 111-122.
SE 2	high security increases the intention to use cashless payments.	Intention to use		Lai, P. C. (2016). Design and Security impact on consumers' intention to use single platform E-payment. Interdisciplinary Information Sciences, 22(1), 111-122.
SE 3	Acceptance of E service technology systems depends on level of Security service provider.	E service technology system		Oseni, K., Dingley, K., & Hart, P. (2015). E-service security: taking proactive measures to guide against theft, case study of developing countries. International Journal for e-Learning Security, 5(2), 454-461.
SE 4	High Security increases the trust which will increase the customer acceptance of cashless society.	Trust		Balzer, F., Bollig, B., & Binckebanck, L. (2017). Perception of Data Security in e-Commerce. Hochschule Furtwangen.
Literacy (LT)		Research Gap		Author and Year

LT 1	Perceived Data Security and customer decision highly depends on security level of the process.	PDS and customer decision	LITERACY	Balzer, F., Bollig, B., & Binckebanck, L. (2017). Perception of Data Security in e-Commerce. Hochschule Furtwangen.
LT 2	Lack of knowledge on usage of payment system is one of the reasons for less usage of cashless payments.	Lack of knowledge on usage	LITERACY	Uzonwanne, M., & Ezenekwe, U. (2019). Retrieved from https://www.researchgate.net/publication/318641256_Financial_Illiteracy_and_Cashless_System_in_Nigeria
				Béres, D., & Huzdik, K. (2019). Retrieved from https://www.asz.hu/storage/files/files/public-finance-quarterly-articles/2012/a_298_312_beres_huzdik.pdf
LT 3	Low approach by the banks on usage of cashless payments systems decreases the usage.	approach by bank		Uzonwanne, M., & Ezenekwe, U. (2019). Retrieved from https://www.researchgate.net/publication/318641256_Financial_Illiteracy_and_Cashless_System_in_Nigeria
LT 4	Low financial literacy affects the usage of cashless payments.	Financial literacy		Béres, D., & Huzdik, K. (2019). Retrieved from https://www.asz.hu/storage/files/files/public-finance-quarterly-articles/2012/a_298_312_beres_huzdik.pdf

				Jasuja, M. (2019). Digital Financial Literacy - Key enabler for a less-cash India. Retrieved from https://www.finextra.com/blogposting/13750/digital-financial-literacy---key-enabler-for-a-less-cash-india
LT 5	Low information about Financial Identity and threats to it causes the less usage of cashless payments.	Financial Identity		Jasuja, M. (2019). Digital Financial Literacy - Key enabler for a less-cash India. Retrieved from https://www.finextra.com/blogposting/13750/digital-financial-literacy---key-enabler-for-a-less-cash-india
Regulations (RE)		**Research Gap**		**Author and Year**
RE 1	High law enforcement is required on both customer and vendors to increase security of transaction	Law enforcement	REGULATIONS	WAHLERT, G. (2019). Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.122.3527&rep=rep1&type=pdf

| R0 2 | Imposition of Proper security checks is required to reduce the anonymous nature of crime in cashless transaction. | anonymous nature of crime | | WAHLERT, G. (2019). Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.122.3527&rep=rep1&type=pdf |
| RE 3 | Proper Laws to check on powerful encryption devices to increase cashless transaction. | Powerful encryption devices | | WAHLERT, G. (2019). Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.122.3527&rep=rep1&type=pdf |

| RE 4 | implementation of policies and rules is required to check on tax theft and untraceable transaction. | tax and untraceable transaction | | Sharma, N., & Vyas, R. (2017). Virtual currencies: A hazard or a boon? A Perspective from the Digital finance ecosystem and associated Legal issues. National Journal of Multidisciplinary Research and Development, 2(3). |
| RE 5 | requirement of government license is necessary to have cashless transaction for vendors | license for cashless transaction | | Large payment-service providers must safeguard money in consumers' e-wallets under new law [Today Online]. (2019). Retrieved from https://www.gov.sg/news/content/legislation-e-payments |

| Competition (C0)		**Research Gap**		**Author and Year**
CO1	The application and process are user friendly to make cashless transaction	User friendly	COMPETITION	Kapoor, K., Dwivedi, Y., & Williams, M. (2019). Retrieved from https://link.springer.com/content/pdf/10.1007%2F978-3-642-38862-0_13.pdf
				NG, K. (2019). Variety of e-payment options is to allow for competition, innovation: Ong Ye Kung. Retrieved from https://www.todayonline.com/singapore/variety-e-payment-options-allow-competition-innovation-ong-ye-kung
CO2	lot of options for customers to pay by cashless are available	consumer substitution		Mantel, B., & McHugh, T. (2001). Competition and innovation in the consumer e-payments market? Considering the demand, supply, and public policy issues. Federal Reserve Bank of Chicago Public Policy Working Paper No. EPS-2001-4.
Trust (TR)		**Research Gap**		**Author and Year**

TR 1	Proper quality standards in payments will increase the customer confidence in cashless payments.	Quality standards	TRUST	Ahmed, M., Minakhatun, R., Islam, R., & Hussein, R. (2019). Building consumers' confidence in adopting e-commerce: A Malaysian case - Munich Personal RePEc Archive. Retrieved from https://mpra.ub.uni-muenchen.de/10812/
TR 2	trust plays an important role in using cashless payments	Lack of trust		Ahmed, M., Minakhatun, R., Islam, R., & Hussein, R. (2019). Building consumers' confidence in adopting e-commerce: A Malaysian case - Munich Personal RePEc Archive. Retrieved from https://mpra.ub.uni-muenchen.de/10812/
TR 3	reliability of online vendors increases the online transactions.	Reliability of online vendors		Ahmed, M., Minakhatun, R., Islam, R., & Hussein, R. (2019). Building consumers' confidence in adopting e-commerce: A Malaysian case - Munich Personal RePEc Archive. Retrieved from https://mpra.ub.uni-muenchen.de/10812/
				Dimitrakos, T. (2019). Retrieved from https://link.springer.com/content/pdf/10.1007/0-306-47009-8_4.pdf

TR 4	Security of commercial websites is a major concern which decreases the customer confidence in making online payments.	Security of commercial websites		Ahmed, M., Minakhatun, R., Islam, R., & Hussein, R. (2019). Building consumers' confidence in adopting e-commerce: A Malaysian case - Munich Personal RePEc Archive. Retrieved from https://mpra.ub.uni-muenchen.de/10812/
				Kim, Y. H., & Kim, D. J. (2005, January). A study of online transaction self-efficacy, consumer trust, and uncertainty reduction in electronic commerce transaction. In *Proceedings of the 38th Annual Hawaii International Conference on System Sciences* (pp. 170c-170c). IEEE.
TR 5	very little trust in virtual market due to which customer confidence decreases in using them.	Virtual market place		Dimitrakos, T. (2019). Retrieved from https://link.springer.com/content/pdf/10.1007/0-306-47009-8_4.pdf
Risk (R0)		**Research Gap**	**DEPENDENT VARIABLE**	**Author and Year**
RO 1	Perceived risk in transaction is the biggest challenge for cashless economy	Perceived risk	RISK	Park, J., Lee, D., & Ahn, J. (2004). Risk-focused e-commerce adoption model: A cross-country study. *Journal of Global Information Technology Management, 7*(2), 6-30.

RO 2	risk of product and services directly affect the adoption of e -commerce.	risk of product and services.		Park, J., Lee, D., & Ahn, J. (2004). Risk-focused e-commerce adoption model: A cross-country study. *Journal of Global Information Technology Management, 7*(2), 6-30.
RO 3	Security and privacy risk reduce the cashless payment adaptation	security and privacy risk		Gordon, C. (2019). 5 challenges of a cashless society. Retrieved from https://www.ncr.com/company/blogs/financial/5-challenges-of-a-cashless-society
RO 4	enforcement of risk reduction methods will increase the usage of cashless transactions.	risk reduction methods		Ho, S. S., & Ng, V. T. (1994). Customers′ risk perceptions of electronic payment systems. *International Journal of Bank Marketing, 12*(8), 26-38.
RO 5	Psychological risk is the biggest risk that stops society to adopt cashless society	Psychological risk		Ho, S. S., & Ng, V. T. (1994). Customers′ risk perceptions of electronic payment systems. *International Journal of Bank Marketing, 12*(8), 26-38.
AH 1	CUSTOMER ACCEPTANCE			
AH 2	MORE USAGE		AH. Benefits of Adoption of cashless by Singapore	
AH 3	COMPLIANCES			
AH 4	CUSTOMER CENTRIC			
AH 5	CUSTOMER CONFIDENCE			
AH 6	MITIGATION			

RESEARCH METHODOLOGY

Research was conducted through primary research where there were 202 responses from local citizens to the questionnaire that was distributed using the convenience sampling method. Research was also conducted through secondary research from journal articles, books and reports to help determine the independent and dependent variables based on which the primary research was carried out.
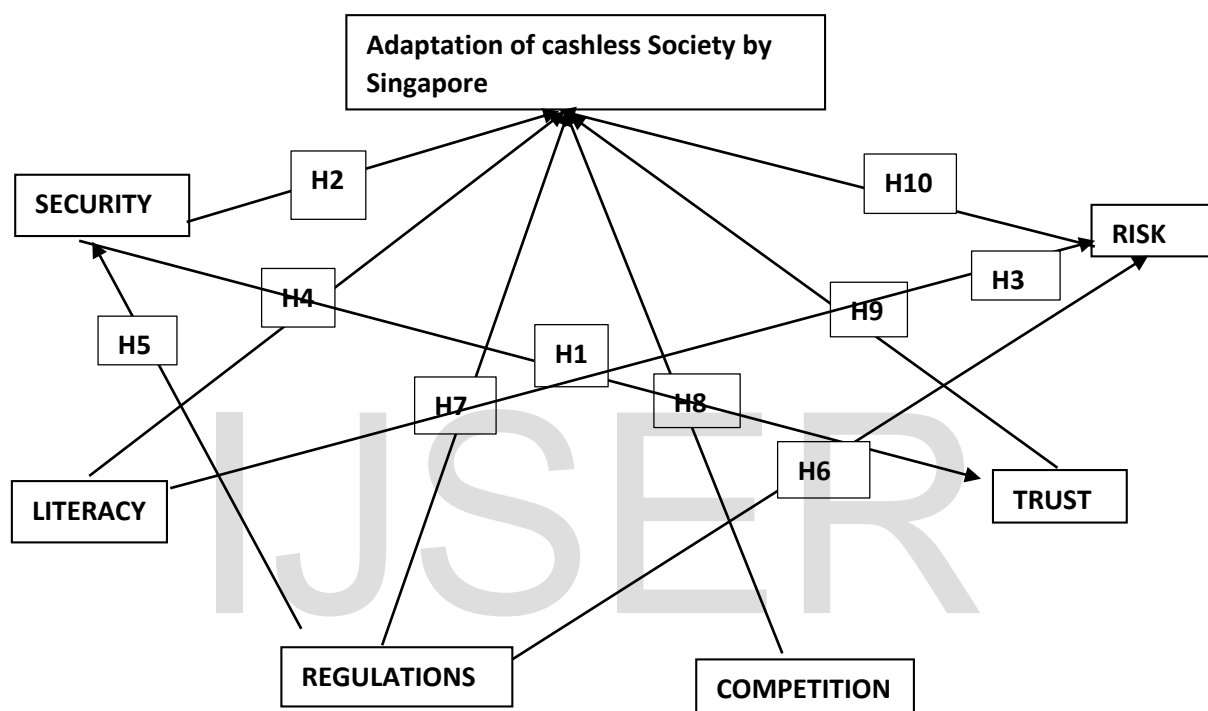
HYPOTHESIS

H1: The security, by increasing security levels, is positively related to trust.

H2: Security has a positive impact on the adaptation of cashless society by Singapore.

H3: Literacy rate, by increasing knowledge on usage of payment systems and increase in financial literacy, is negatively related to the risk.

H4: Literacy, increase in approach by the banks on cashless usage, has a positive impact on the adaptation of cashless society by Singapore.

H5: Regulation, increase in high law enforcement and imposition of proper security checks, has a positive association with Security.

H6: Regulation, increase in proper laws to check on powerful encryption device and requirement of government license for cashless transaction for vendors, is positively related to risks

H7: Regulations has a positive impact on the adaptation of cashless society by Singapore.

H8: Competition has a positive impact on the adaptation of cashless society by Singapore.

H9: Trust has a positive impact on the adaptation of cashless society by Singapore.

H10: Risk has a positive impact on the adaptation of cashless society in Singapore.

DATA COLLECTION

The questionnaire was 32 questions long and it tested the independent variables that were mentioned above based on the dependent variable. There was a total of 202 respondents where all the questions that were testing the variables had answers on a Likert scale from 1-5 where 1 was strongly disagree and 5 was strongly agree. There were also basic screener questions which helped getting a gist of the demographics of the respondents based on which a cross-tabulation analysis was conducted which will be discussed in further depth below.

PROFILE OF RESPONDENTS

The criteria in terms of the respondents was fairly simple. The respondents had to be above 18 and citizens of Singapore. The questionnaire was circulated to the respondents via WhatsApp and LinkedIn.

Item	Measure	Frequency	Percentage
Region	Singapore	202	100
My role in Cashless society	User	128	63.4
	Implementer	17	8.4
	Touch base with Cashless Society Service flow	20	9.9
	Developing software/hardware for the cashless society development	20	9.9
	Observer	17	8.4
If any new innovative cashless device/Service is introduced in the market, I	Immediately Adopt	81	40.1
	Adopt after seeing the trend	39	19.3
	Adopt only after my friend's recommendation	14	6.9
	Adopt gradually	43	21.3
	Adopt it leisurely at my own pace	23	11.4
	Never Adopt	2	1

DATA ANALYSIS

The sample size for the primary data is of 202 respondents. These data were modelled using ADANCO 2.0.1 Software. ADANCO (PL-SEM) is a structural equation modelling tool used for modelling variance-based structural equations and postulating hypotheses. The software constructs a research framework based on Dijkstra and Henseler. This research is conducted in two steps: in the first step, through modelling a structural model is constructed: in the second step the validity and the reliability were measured to find the best fit, a path analysis was done as well as the parameters of the models were estimated.

RELIABILITY

Cronbach's alpha was used to determine the reliability of the model. A satisfactory level of reliability is considered if the value for Cronbach's alpha is greater than 0.6 and less than 1.(Cronbach,1951;Sijtsma,2009). Jöreskog's Rho was used to evaluate composite reliability,

a measure to understand the integrity and homogeneity of the model (Werts, Rock, Linn, & Joreskog, 1978).

Construct	R²	Jöreskog's Rho (ρ_c)	Cronbach's Alpha (α)
Adaptation of Cashless Society by Singapore	R²=0.637	0.8362	.07642
Security		0.7914	0.6530
Literacy		0.8355	0.7575
Regulation		0.8729	0.8188
Competition		0.8380	0.6133
Trust		0.8555	0.7878
Risk		0.8144	0.7150

VALIDITY
CONVERGENT VALIDITY

convergent validity is a parameter used to assess to what degree two measures of constructs that should be related hypothetically are in fact related. for each independent variable, convergent validity was used to examine the construct validity by using conformity scores; the acceptable value for the AVE should be equal to or above 0.5 (campbell & fiske, 1959; carlson & herdman, 2012)

Construct	Average Variance Extracted (AVE)
Adaptation of cashless society	0.4626
Security	0.4870
Literacy	0.5045
Regulation	0.5800
Competition	0.7212
Trust	0.5436
Risk	0.4722

DISCRIMINANT VALIDITY

Discriminant validity is a parameter used to assess whether constructs that are supposed to be unrelated are in fact unrelated. The degree of differentiation between the variables was examined by assessing whether the AVE of other constructs was lower than the square root of the average variance extracted from a specific construct (Campbell & Fiske, 1959; Carless, 2004)

Construct	Security	Literacy	Regulation	Competition	Trust	Risk	Adaptation of Cashless Society
Security	0.4870						
Literacy	0.4185	0.5045					
Regulation	.3431	0.1923	0.5800				

Competition	.02269	0.1291	0.3331	0.7212			
Trust	0.2263	0.1459	0.5880	0.3013	0.5436		
Risk	0.1825	0.2231	0.4150	0.2140	0.5217	0.4722	
Adaptation of Cashless Society	0.2181	0.2209	0.4251	0.2884	0.5114	0.5284	0.4626

Squared correlation; AVE on the diagonal

MULTICOLLINEARITY

In the multiple regression model, multicollinearity shows the occurrence of intercorrelation among the independent variables. Multicollinearity can lead to severe results such as it can lead to skewed results while attempting to determine how well each independent variable can be used most effectively to forecast dependent variable in a statistical model. (KENTON, 2019)

Indicator	Security	Literacy	Regulations	Competition	Trust	Risk	Adaptation of cashless society
SE1	1.2105						
SE2	1.2029						
SE3	1.4147						
SE4	1.2663						
LT1		1.4425					
LT2		1.5230					
LT3		1.3406					
LT4		1.4150					
LT5		1.3012					
RE1			1.7868				
RE2			2.1113				
RE3			1.7899				
RE4			1.6681				
RE5			1.4174				
CO1				1.2432			
CO2				1.2432			
TR1					1.7976		
TR2					1.5593		
TR3					1.7215		
TR4					1.6965		
TR5					1.2734		
RO1						1.4255	
RO2						1.7748	
RO3						1.5361	
RO4						1.2316	
RO5						1.2466	
AH1							1.6233
AH2							1.6816
AH3							1.3076
AH4							1.3878

| AH5 | | | | | | 1.7857 |
| AH6 | | | | | | 1.4543 |

PATH ANALYSIS

Path analysis is a unique case of the structural equation modelling (SEM). In this Path analysis each indicator is used in the model of each variable and the strength of each path is calculated as a product of the path coefficient along that path. In our research the value of R^2 = 0.637 which is acceptable and support the model. (Hooper, Coughlan, & Mullen, 2008).
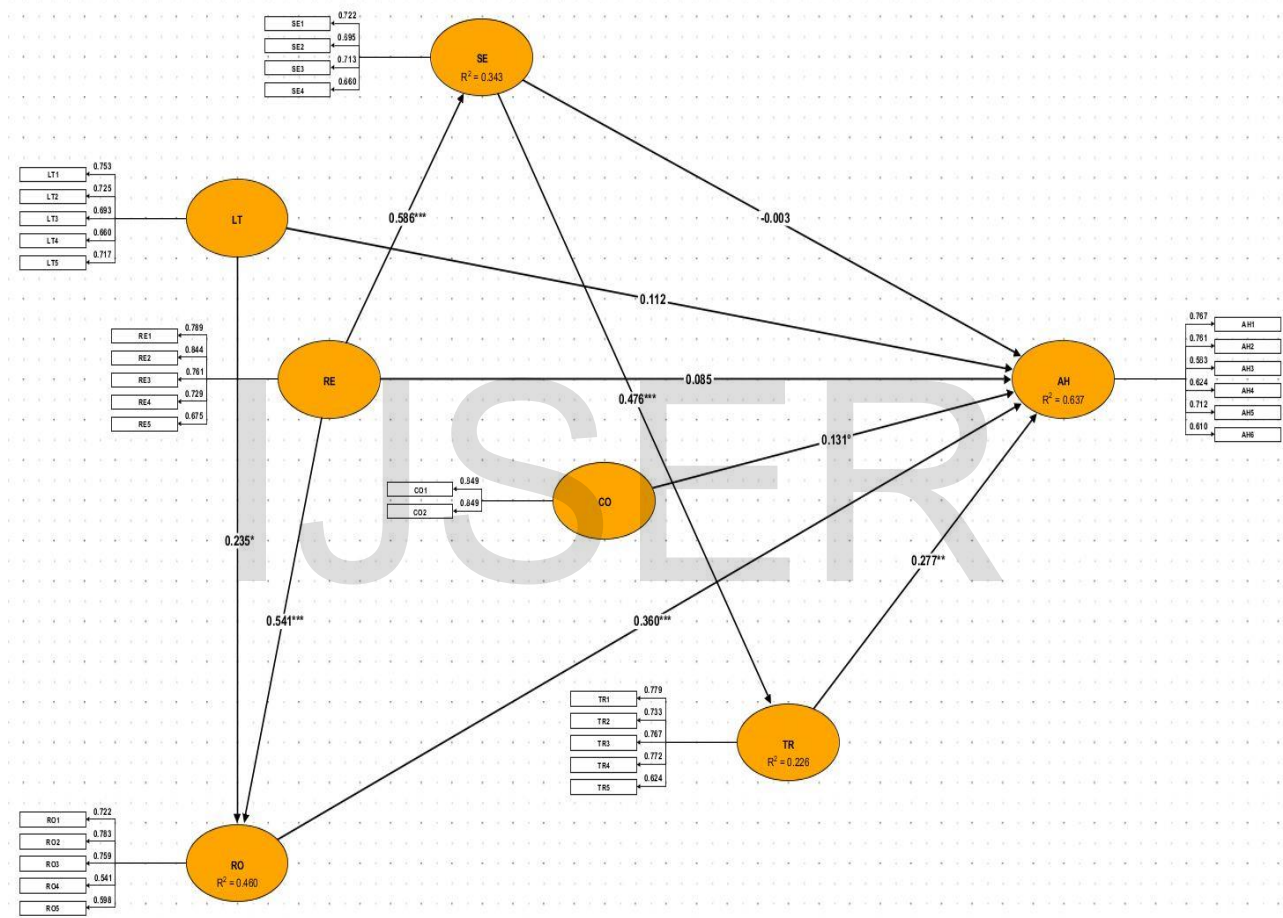
HYPOTHESIS TESTING

We have used ADANCO 2.0.1 software to conduct hypothesis testing in our research. This tool uses variance to model structural equations. For an unknown population data, a bootstrapping method should be used for modelling (Efron, 1987). Significance levels are measured using the t-values and the p-values,

 Significance levels

	Significance	t-value
Level of significance	p<0.1	1.65
	p<0.05	1.96
	p<0.01	2.59

In this research I have 10 hypotheses. To evaluate the reliability of each hypothesis, they were tested against recorded t-values of the independent variables and the dependent variable.

Hypothesis	Effect	Original coefficient	Standard bootstrap results					Percentile bootstrap quantiles				
			Mean value	Standard error	t-value	p-value (2-sided)	p-value (1-sided)	0.50%	2.50%	97.50%	99.50%	Support

H1	SE -> TR	0.4757	0.4955	0.0942	5.0486	0.000	0.000	0.2659	0.30 69	0.6 7 5 6	0.6 9 7 3	YES
H2	SE->AH	-0.0029	0.0174	0.1240	-0.0235	0.9813	0.4906	-0.2621	-0.20 75	0.2 7 3 7	0.3 5 4 0	NO
H3	LT -> RO	0.2350	0.2625	0.1072	2.1921	0.0286	0.0143	-0.0266	0.04 77	0.4 7 5 3	0.5 2 2 5	YES
H4	LT -> AH	0.1118	0.1348	0.0899	1.2437	0.2139	0.1069	-0.0839	-0.03 57	0.3 0 5 8	0.3 7 0 3	NO
H5	RE -> SE	0.5857	0.5958	0.1012	5.7859	0.000	0.000	0.3192	0.37 66	0.7 6 7 5	0.7 9 9 0	YES
H6	RE -> RO	0.5412	0.5284	0.1152	4.6977	0.000	0.000	0.2304	0.29 57	0.7 7 1	0.7 7 5	YES

									54	62	
H7	**RE -> AH**	0.0850	0.0753	0.0976	0.8712	0.3839	0.1919	-0.1736	-0.1161	0.26443	0.30299	NO
H8	**CO -> AH**	0.1306	0.1148	0.0742	1.7601	0.0787	0.0394	-0.1137	-0.04434	0.25916	0.27990	NO
H9	**TR->AH**	0.2767	0.2857	0.0906	3.0534	0.0023	0.0012	0.0719	0.10185	0.47077	0.54111	YES
H10	**RO -> AH**	0.3603	0.3366	0.0871	4.1383	0	0	0.1204	0.16181	0.50630	0.56661	YES

Note: SE – Security, Tr - Trust, AH – Adaptation of cashless society, LT – literacy, RO – risk, CO – Competition, RE – Regulations.

Research Findings

There are 10 hypothesis that were identified in our research, the path co-efficient of 7 hypotheses emerge as strong and these hypotheses are hence accepted. Hypotheses other shows very less impact and hence have been rejected.

Accepted-
H1: *The security, by increasing security levels, is positively related to trust.*

H3*: Literacy rate, by increasing knowledge on usage of payment systems and increase in financial literacy, is negatively related to the risk.*

H5: *Regulation, increase in high law enforcement and imposition of proper security checks, has a positive association with Security.*

H6: *Regulation, increase in proper laws to check on powerful encryption device and requirement of government license for cashless transaction for vendors, is positively related to risks*

H8: *Competition has a positive impact on the adaptation of cashless society by Singapore.*

H9: Trust has a positive impact on the adaptation of cashless society by Singapore.

H10: Risk has a positive impact on the adaptation of cashless society in Singapore.

Rejected-

H2: *Security has a positive impact on the adaptation of cashless society by Singapore.*

H4: *Literacy, increase in approach by the banks on cashless usage, has a positive impact on the adaptation of cashless society by Singapore.*

H7: *Regulations has a positive impact on the adaptation of cashless society by Singapore.*

EXPLANATION

The first Hypothesis H1, highlights the influence of security on the trust level. The t-value =5.0486 thus H1 is accepted and highly significant. This indicates that the increase in Security increases the trust level among people which can increase the rate of adaptation of cashless society by Singapore.

Non internet users	Intention to use	E service technology	trust
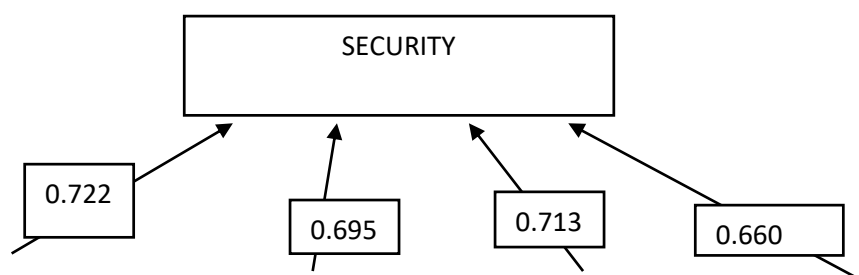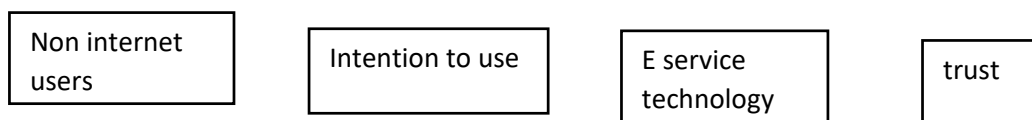
In the structural equation model above, the path coefficient for non-internet users is 0.722, intension to use is 0.695, E service Technology is 0.713 and trust is 0.660. By this, we found out that Non internet users and E service Technology has the strongest impact on Security and Intention to use and Trust has a moderate effect on the Security.

The second hypothesis, H2, shows that Security has a positive impact on the adaptation of cashless society by Singapore. The t value is 0.0235 which is very less therefore this Hypothesis is not accepted.

The third hypothesis, H3 shows Literacy rate, by increasing knowledge on usage of payment systems and increase in financial literacy, is negatively related to the risk. The t value is 2.192 which is good and that is why this hypothesis is significance which shows that the increase in the literacy rate among people there will be a decrease in risk of adaptation of cashless society by Singapore.
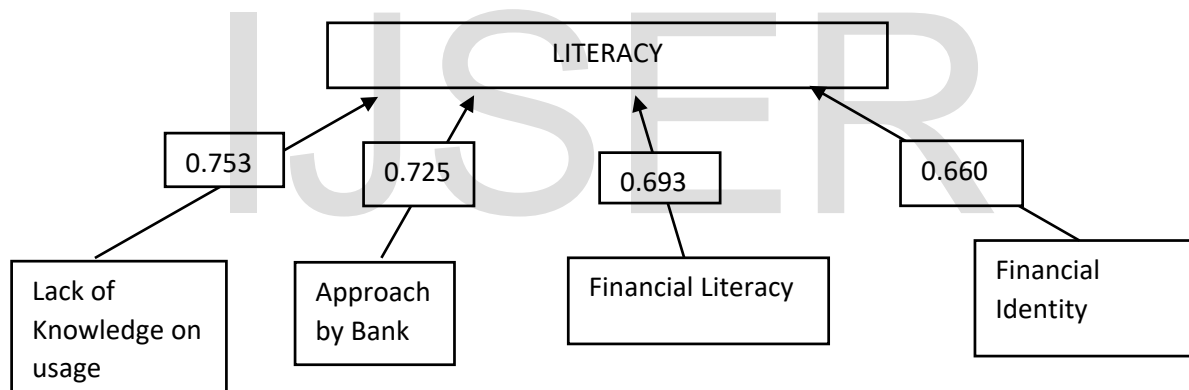
In the structural equation model above, the path coefficient for Lack of knowledge on usage is 0.753, the path coefficient of approach by banks is 0.725, the path coefficient for Financial Literacy is 0.693 and Financial Identity is 0.660.By this we see that lack of knowledge on usage and Approach by banks have a significant effect on the Literacy whereas Financial literacy and Financial identity also have a moderate effect.

The fourth Hypothesis, H4 shows that Literacy, increase in approach by the banks on cashless usage, has a positive impact on the adaptation of cashless society by Singapore. The t value is 1.2437 which is not enough to make this hypothesis significant that's why we reject this hypothesis.

The fifth Hypothesis, H5 shows that Regulation, increase in high law enforcement and imposition of proper security checks, has a positive association with Security. The t value is 5.7859 which is very high and make a significant impact. Therefore, this hypothesis is accepted.
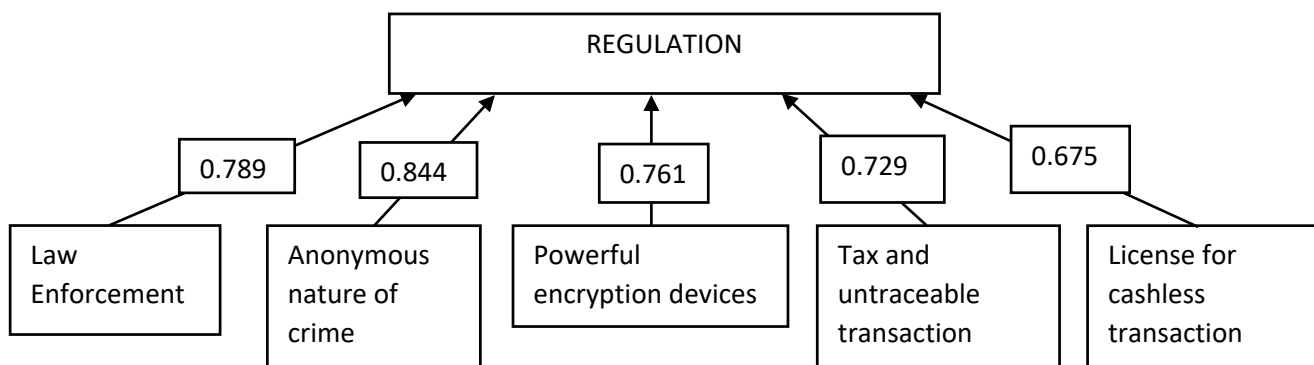
In the structural equation model above, the path coefficient for Law enforcement is 0.789, Anonymous nature of crime is 0.844, Powerful encryption devices is 0.761, Tax and untraceable transaction is 0.729 and License for cashless transaction is 0.675. this implies that Anonymous nature of crime and Law enforcement have a strongest impact on the regulations where as Powerful encryption devices, tax and untraceable transaction and License for cashless transaction have a moderate effect on regulation which is an independent variable.

The sixth hypothesis, H6 shows that Regulation, increase in proper laws to check on powerful encryption device and requirement of government license for cashless transaction for vendors, is positively related to risks. The t value is 4.6977 which is very high and make a significant impact. Therefore, this hypothesis is accepted.
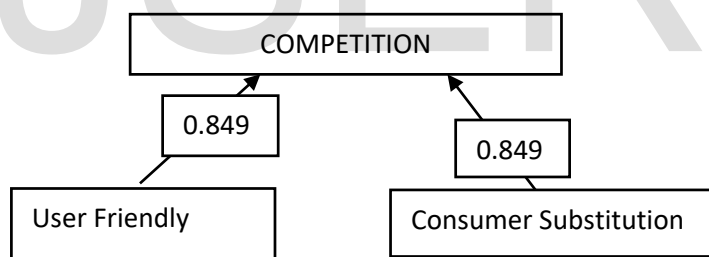
In the structural equation model above, the path coefficient of User friendly is 0.849 and the path coefficient of consumer substitution is 0. 849.This implies that both of them has a strong impact on independent variable.

The seventh hypothesis, H7 says that Regulations has a positive impact on the adaptation of cashless society by Singapore. The t value is 0.8712 which is low and therefore we reject this hypothesis.

The eight hypotheses, H8 shows that Competition has a positive impact on the adaptation of cashless society by Singapore. The t value for this is 1.7601 which shows us that competition slightly impact the adaptation of cashless society. Therefore, this hypothesis is accepted.
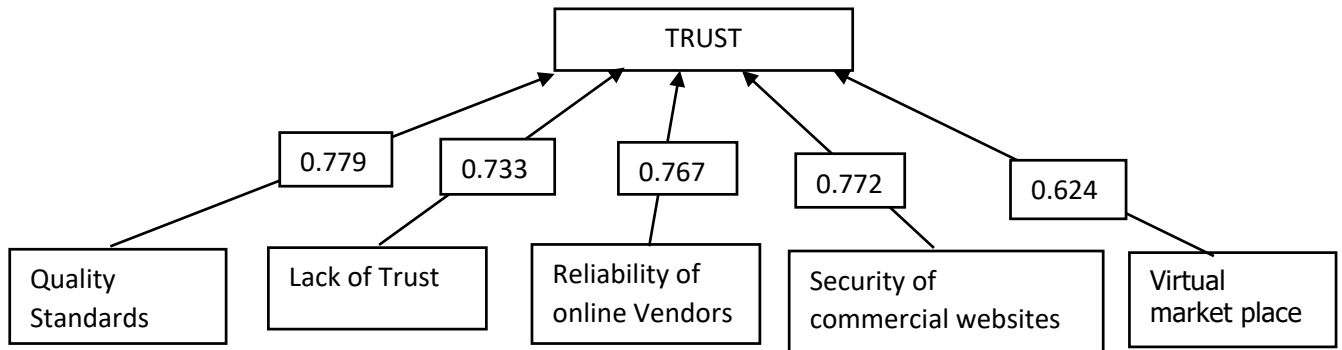
In the structural equation model above, the path coefficient for quality standard is 0.779, lack of trust is 0.733, Reliability of online vendors is 0.767, security of commercial website is 0.772 and for virtual market place is 0.624.From this we found out that quality standards, security of commercial websites and reliability of online vendors has the strongest effect on the trust whereas lack of trust and virtual market has a moderate effect on the independent variable.

The ninth hypothesis, H9 shows that Trust has a positive impact on the adaptation of cashless society by Singapore. The t value for 3.0534 is very high and which shows that this independent variable has a significant impact on the adaptation of cashless society by Singapore. This hypothesis is accepted.

The tenth hypothesis, H10 shows that Risk has a positive impact on the adaptation of cashless society in Singapore. The t value is 4.1383 which is very high and due to this it is confirmed that Risk is the independent variable which effect significantly adaptation of cashless society by Singapore. This hypothesis is accepted.
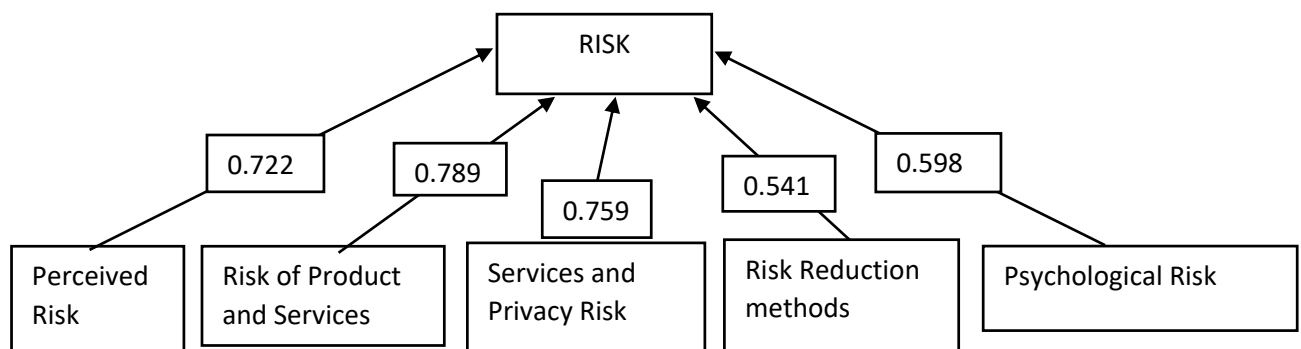
In the structural equation model above, the path coefficient of Perceived risk is 0.722, Risk of product and services is 0.789, Services and privacy risk is 0.759, Risk reduction methods is 0.541 and Psychological risk is 0.598. this implies that Perceived risk and risk of products and service has a high impact on Risk whereas services and privacy risk, risk reduction methods and psychological risk has a moderate effect on the independent variable.

CONTRIBUTIONS

The research was conducted to find out about the factors influencing the adaptation of cashless society by Singapore. The overall attitude is positive toward the adaptation of cashless society by Singapore.
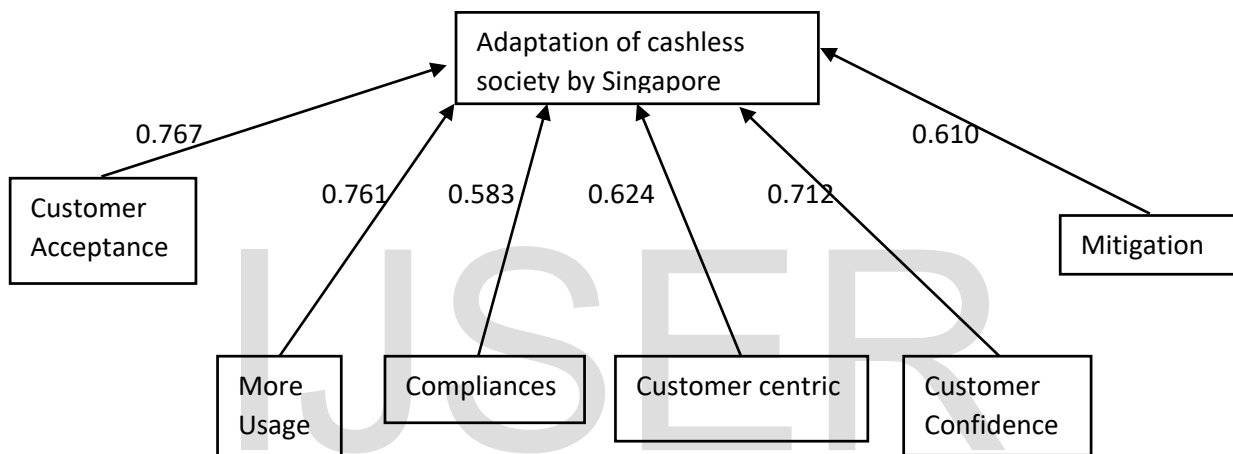
In the structural equation model, the path coefficient for Customer acceptance is 0.767, more usage is 0.761, compliances are 0.583, customer centric is 0.624, customer confidence is 0.712 and Mitigation is 0.610. This implies that customer acceptance, more usage and customer confidence have a strong impact on the adaptation of the decision whereas compliances, customer centric and mitigation have a moderate effect on the adaptation of the decision.

ROGERS THEORY

In the social system the innovations are not adopted by all the individuals at the same time. This process of innovation adoption happens in a time sequence and this can be classified into the adopter categories which is based on amount of time they take to use the new technology. (Frank et al., 2019)

This theory is also called as Multi Step Flow or Diffusion of Innovation Theory. There are 5 steps in this theory which are Innovators, Early Adopters, Early majority, Late majority and Laggards. (Management.net, 2019)

According to the theory, the adaptation rate for the innovators should be 2.5% whereas it is 40.1% according to our findings, adaptation rate for Early adopters should be 13.5% whereas according to our findings it is 19.3%, adaptation rate for Early majority is 34% by the theory whereas according to our finding it is 6.9%, Late majority consist of 34% according to theory and from our findings the adaptation is 21.3% and in the case of Laggards according to the theory they contribute 16% and from our findings we found out that they are 11.4%.

There is a huge difference in between both the theoretical values and our actual findings value, and the main reason for this difference is the high improvement and acceptance of technology. Nowadays every one is connected to the internet and using cell phone which was not the scenario in year 1962 when this theory was published.

Spread as per diffusion of innovation theory	Innovators 2.5%	Early adopters 13.5%	Early majority 34%	Late majority 34%	Laggards 16%
Findings from the study conducted	Innovators 40.1%	Early adopters 19.3%	Early majority 6.9%	Late majority 21.3%	Laggards 11.4%

Adaptation trend of cashless society by the Singapore among the Singapore residents.

IMPLICATIONS FOR THE GOVERNMENT

As becoming a cashless country have a lot of benefits which are very beneficial for the government such as less crimes, Paper trails, No cash management, International payments and many other. (Pritchard, 2019)

For the implication the authorities should focus on the Security concern as if the Security increases the trust will increase and in adaptation of cashless society trust plays a big factor. And the authorities should also focus on the financial Literary and regulations as increase in financial literacy and regulations will decrease the level of risk and if risk decreases the level of adaptation of cashless society will increase.

LIMITATION AND SCOPE OF FUTURE RESEARCH

This research was conducted to understand association between the customer adaptation of cashless society and the factors influencing the adaptation such as security, trust, competition, literacy, regulations and risk. This result was conducted in Singapore region only, and outcomes related to other parts of the world have not been tested. Another limitation is the sample size this study was only conducted on 202 respondents, even time was a constraint and the study were conducted with a very constraint financial resource. There is a huge scope of future research such as the research can be conducted in different

geographies and the research can be in more in-depth such as Security and regulations as well as with more sample size.

CONCLUSION

The research has clearly proven the factors that are affecting and slowing the adoption of a cashless society in this economy. The key factors that prove this are regulations, security, risk and trust. Many of the independent variables are also interdependent. For example, the first hypothesis that was accepted indicates that an increase in security is likely to increase the trust level among customers. Similarly, an increased rate of literacy is likely to result in reduced perceived risk among customers. This is logical because more literate people would be more aware about managing their finances hence, they would be more informed thereby reducing the risk of theft or a loss of finances. However, there are some variables that are absolutely paramount to customer in terms of where they rank it and how that would impact their likelihood to adopt this practice. Those factors are risk and trust.

Having tested all these variables extensively in the hypothesis through the primary research and analysis, if the government and organizations can focus on solidifying these variables in their cashless practices and promotional activities, then the adaptation can be anticipated far sooner.

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