DEMOGRAPHIC BACKGROUND, PERCEPTIONS, AND E-PAYMENT USAGE AMONG YOUNG JAPANESE

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ABSTRACT

Japan is generally perceived to be a technologically advanced country, but it was found that its e-payment systems appear to be somewhat behind many other Asian countries. With the upcoming Summer Olympics in 2020, the Japanese government and business sectors want to improve Japan's e-payment systems. This provided motivation for the authors to study the state of e-payment in Japan and explore factors affecting e-payment behavior among young Japanese.

The authors used the Technology Acceptance Model (TAM) as a foundation and examined 152 survey responses to identify factors affecting e-payment usage in Japan. Age and gender were found to be two major factors associated with e-payment usage. Incentives from merchants were also found to be important for young Japanese consumers. Overall, males are more likely to use e-payment systems. Older respondents are also more likely to use e-payment systems. A regression model was performed on three demographic variables, one incentive variable, and five perception variables. We found that the model explained 23 percent of the variance of e-payment.

Such attitudinal variables as self-efficacy, ease of use, perceived quality, perceived trust, perceived benefit, and perceived security were found to be valid and reliable regarding items and questions for Japanese culture. The exception was security which had a low Cronbach alpha. The perception variables were not statistically important to e-payment usage in Japan.

INTRODUCTION

In spite of its technology-driven economy, Japan is still one of the most cash-dependent countries in the world, according to a recent Bank of Japan report (Morimoto, 2018). The Japan Credit Association's report in 2018 showed that the rate of people using e-payment systems in Japan was only 18%, while one of its neighboring countries, Korea, exceeded 85% (Morimoto, 2018). In an effort to determine why this difference exists, a sample survey was conducted of the Japanese population, and the findings are reported in this paper.

Other studies, including some from the authors, have been conducted on e-payment systems to identify factors that influence its use and adoption. Yet the impacts of cultural and social factors on e-payment systems in Japan appear relatively uninvestigated even though e-payment systems have been in use for quite some time. This will be discussed further in the literature review.

In 2020, Japan will host the Summer Olympic Games in Tokyo. The Tokyo Metropolitan Government estimated that the Tokyo Summer Olympic Games and the Paralympics games would create economic benefits totaling 32.3 trillion yen (about 283.5 billion dollars) throughout Japan (Nikkei Asian Review, 2017). Since millions of people are visiting Japan and expect to use e-payment systems, the Japanese government is trying to enhance the usage of e-payment via improved infrastructure, standards, and investment. According to Z'xent Pro (2018), for the Olympic Games in 2020, top banks in Japan are coordinating e-payment systems that require cooperation, standardization, and unity. The retail industry plans to invest in one hundred thousand machines to be used when processing cashless transactions (primarily credit cards). This cashless action promotes convenience and reduces lost sales for both customers and merchants. The Japanese government, businesses, and individuals have focused on changing the way Japanese merchants conduct business from cash to electronic payments. Accordingly, factors that contribute to the usage of e-payment systems were considered to be quite important. Such is the motivation for this research.

REVIEW OF THE LITERATURE

E-Payments - General

The wide availability of the Internet and advanced digitalization in payment processes has resulted in a variety of e-payment options, including credit and debit cards, digital and mobile wallets, electronic cash, contactless payment methods, etc. According to Juniper Research (2018), online physical goods sales will account for 3.8 trillion or 13% of global retail sales by 2020. The revenue for global mobile payment was forecast to be about $721 billion in 2017 (Statista (2015). E-payment and mobile payment allow consumers to eliminate carrying cash (Pham & Ho, 2015), offering convenience and speed (Teo et al., 2015; and Oliveira et al., 2016). Both merchants and consumers save transaction time and increase productivity and efficiency.

E-payment systems are generally defined as a way to pay for goods or services electronically instead of using cash or check or mail, and it has been a popular payment method that began in the 1950s (Wróbel-Konior, 2017). An e-payment system involves customers, merchants, banks or financial institutions, payment service providers, security and authentication providers, and Internet providers (Dahlberg et al., 2008; CPSS, 2012; Jeffus et al., 2015). Hayashi (2015) defines e-payment as a payment system that consists of a set of functions, processes, rules, devices, technologies, and standards that enables its users to make a payment. Au and Kauffman (2008) focus on the transaction process and define it as an electronic device utilized to initiate, authorize, and confirm a commercial transaction. E-payment represents any kind of non-cash payment that does not involve cash or a paper check (Hord, 2005). E-payment or e-commerce involves the sale of goods, services, and contents via electronic devices, without time or space limitations (Kim, Mirusmonov, and Lee, 2010; Au and Kauffman, 2008; and Mallat, 2007).

E-Payments - Japan

Suica is a contactless card that is most often used on Japanese transport. This payment system is commonly used for rail passes and small transactions at retail stores. Apple-Pay

enabled Japanese iPhones to allow users to create a virtual card in a Suica app, charge either through Apple Pay or another method, and add to Apple Wallet. Since Suica cards can be charged with up to 20,000 yen (about $192) and essentially function as electronic cash, security is less of an issue than it is with credit cards (Byford, 2016).

Previous research suggests that there are several factors that inhibit Japanese consumers from adopting traditional e-payment systems (Abeshi, 2016). Abeshi argues that one of the reasons why Japanese consumers don't use e-payment more frequently is that there are still many local stores and retailers that do not accept e-payment. In addition to consumers, various studies have shown that there are other important components to an e-payment system, including merchants, network operators, financial institutions, and regulators. (Chen, A., Aba, F., and Ouattara, N., 2016; Jeffus, A., Zeltmann, S., Griffin, K., and Chen, A., 2015).

Even though the online retail market is growing rapidly, it is reasonable that consumers are concerned about the security of using e-payment systems. Cash payment is still considered a safe payment method in Japan. Vilmos (2004) discusses concerns related to security and the use of technology. He claims that a payment service should be available for practically anyone and suitable for any type of transaction in any value. But satisfaction for both merchants and customers is important.

Only 17% of Japan's retail consumption is made by credit, debit, and e-money. Compare this to 85% in South Korea, 56% in Singapore, and 35% in India, according to a 2015 report by the credit association (Kawamoto & Allan, 2016). Abrazhevich (2001) argues that e-payment system designers are failing to design payment systems that meet user requirements and expectations.

User Acceptance

There are numerous factors influencing user acceptance of e-payment systems (Zmijewska, A., Lawrence, E., Steele, R., 2004; Dahlberg, T., Guo, J., and Ondrus, A., 2015). Fishbein and Ajzen (1975) proposed a Theory of Reasoned Action (TRA) that is based on beliefs-attitudes-intension-behavior. In TRA, the attitude towards behavior and the consumer's subjective norm are two important explanatory variables for intention (Ajzen and Fishbein 1980; Liébana-Cabanillas et al., 2014). Ajzen (1991) proposed their Theory of Planned Behavior (TPB) model in which certain specific beliefs have been hypothesized to have an impact on behavioral perceptions and on actual behavior (Liébana-Cabanillas et al., 2014; and Shin, Y., 2004).

The Technology Acceptance Model (TAM) has been a widely used model, and it was the revised TRA model by Davis, Bagozzi, & Warshaw (1989) and Davis (1989) that was used in this research. The TAM has been cited as a trusted model for technology acceptance behavior (Davis, 1989; Davis et al., 1989; Lymperopoulos & Chaniotakis, 2005). TAM in various revisions has become a widely used research model on technology and innovation acceptance. TAM2 is a revised model that includes social influence and instrumental cognitive processes (Venkatesh & Davis, 2000). TAM3 and Mobile Phone Technology Acceptance Model (MOPTAM) expanded earlier models with different predictive and moderating factors (Venkatesh & Bala, 2008; and Renaud and Biljon, 2008).

TAM and revised TAM models have been the main theories in acceptance of e-payment or mobile payment area (Dahlberg, T., Guo, J., and Ondrus, A., 2015b; and Dahlberg, T., Mallat, N., Oorni, A., 2003; Gholami, R., 2010; and Lin, C., 2011). Several major measures have been

used in TAM, i.e., perceived usefulness and perceived ease of use (Legris et al., 2003; Davis, 1989; Park, Y., 2007; and Venkatesh et al., 2000). Additions and modifications to TAM have been proposed by other researchers, such as in the Motivational Model (MM), where extrinsic and intrinsic motivation were added (Davis et al., 1992). Extrinsic motivation could be an individual's personal gain associated with the use of technology, while the intrinsic value could be perceived as enjoyment associated with the technology. For a summary, see Zmijewska, A., Lawrence, E., Steele, R, (2004) in which different user acceptance models for mobile payment systems can be found.

Some factors such as benefit, trust, security, ease of use, perceived quality, and self-efficacy have been suggested (Özkan, 2010). Davis (1989) also finds that a user's overall attitude toward specific information technology (IT) and its application is a major factor determining whether an individual uses that system. Teoh et al. (2013) proposed a model of five constructs that affect consumers' perception towards e-payment, i.e., benefit, trust, security, ease of use, perceived quality, and self-efficacy. In Teoh's model, a traditional widely used construct of usefulness was replaced by benefits. E-payment is intended to benefit consumers mainly in terms of convenience and lower transaction costs. However, traditional payment systems remain popular because consumers are not convinced of the benefit of using e-payment (Teoh et al., 2013; Hataiseree, 2008). Both Chou et al., (2004) and Eastin (2002) identify benefits as a significant driver for an e-payment system. More specifically, Gerrard and Cunningham (2003) found that perceived economic benefits, i.e., fixed costs and transaction costs were crucial in adopting e-payment. If users and merchants can enjoy a low cost to their transactions, they are more likely to use the e-payment system (Gerrard and Cunningham 2003; Sonia San-Martin et al., 2012; San-Martin and Lopez-Calalan, 2013).

Using e-payment requires the ability to use digital devices and reliable Internet access (Teoh et al., 2013). But some consumers are still reluctant to deal with it because of security and privacy concerns (Raja, 2008). Because the Internet also provides a gateway to access personal information, many consumers feel that their personal information might be disclosed to others without their knowledge. Trust depends upon, in part, the perceived risk involved in financial transactions (Yousafzai et al., 2003). Previous studies found trust to be an important influencing factor for a user to adopt e-commerce transactions or engage in online exchanges of money (Friedman et al., 2000; Jarvenpaa et al., 2000, Gefen, 2000, 2003; Hoffman et al., 1999; and Wang et al., 2003). Furthermore, viruses, hackers, crackers, and worms have become the stuff of headlines with results that range from a mere headache to a complete disaster (Md Johar, 2011).

Self-efficacy is the experience of one's personal mastery of technology (Bandura, 1986). It represents a person's understanding and beliefs in his or her own skills and capability to perform a given task (Dory et al., 2009). Self-efficacy normally covers four areas: previous experience (success and failure), vicarious experience (observing others' successes and failures), affective state (emotional arousal such as anxiety), and verbal persuasion (from peers, relatives, or colleagues). It has consistently been found that self-efficacy has a positive influence on perception and behavioral intention to use information technology (Hill et al., 1986, 1987; Luarn and Lin, 2005). In the context of e-payment, self-efficacy refers to a perceived level of ability to use an e-payment system and is recognized to have an impact on the use of e-payment systems.

Perceived ease of use can be defined as "the degree to which a person believes that using a particular system would be free of effort" (Davis, 1989). Flavian, Kahn, Jr, and Howe (2006) argue that ease of use of a computer system increases trust levels because greater usability reduces the likelihood of errors and reduces searching costs (Bakos, 1997). PEOU has been

found to be statistically significant to much e-payment, e-banking, and e-commerce adoption (Schierz et al., 2010; Su et al., 2012; Kim, 2010; Pikkarainen et al., 2004).

Security motivates the integrity and privacy of information through a set of procedures and programs (Tsiakis and Sthephanides, 2005). In e-payment or Internet context, security refers to the perception of security on payment means and mechanisms for storing and transmission of information (Lim et al., 2006). Kobsa, (2001, and 2002) found that users want to make sure that data collected and processed by e-payment systems are secure. Substantial research in the field of e-payment and e-banking suggests that security is a significant factor that affects the adoption of these technologies (Dathye, 1999; Kobsa, 2001, 2002; Abrazhevich, 2004).

Perceived quality of the e-payment system is also identified as one of the important factors that affect the usage of e-payment and e-banking systems (Pikkarainen et al., 2004; and Ives et al., 1983). Quality will affect and attract users to use the system. Sathy (1999) found that the amount of information and the quality of Internet connection were important to Australian consumers regarding online banking. Zhou (2011) found that information quality and system quality significantly affect perceived usefulness and mobile banking usage.

METHODOLOGY

Survey Instrument

Six constructs were selected for this study: self-efficacy, ease of use, perceived quality, perceived trust, perceived benefit, and perceived security. Most of the question items were adopted and adjusted from a study conducted by Teoh et al. (2013). That study was also conducted in an Asian country. Our survey instrument is included in an appendix. To assure a valid and quality translation, a faculty member who teaches the Japanese language at the university reviewed and suggested changes. A pilot survey with 10 Japanese students was conducted to ensure the quality of the translation and validity of the measurement.

Sample

Survey methodology was used since the research is exploratory. Survey methodology also allowed access to Japanese people who were living in Japan instead of selecting a sample from Japanese Americans. Japanese Americans might not accurately reflect the mainland perspective.

The survey was conducted online in 2017. Two students sent out linkage or a barcode via social media, which connected to the survey. Respondents were chosen by a convenience sample, and the survey targeted young Japanese people whose ages range from 15 to 35 years old. They were asked to complete the online survey, which was posted on Qualtrics. About 240 Japanese responded to the survey. Several responses contained missing values and were not included in the analysis. In addition, there were respondents who were identified with IP addresses from the USA, China, Hong Kong, Canada, Australia, or other countries. We decided not to include IP addresses outside of Japan for the reasons discussed above. The remaining sample consisted of 152 Japanese who resided in Japan.

RESULTS

The sample contained more females (n=109 or 72%) than males (n=43, or 28%). Since the sample was a convenience sampling by two female students, more female respondents were expected. Similarly, it was found that younger people were more likely to respond to this survey because respondents were solicited by two college students. About 90 (59.6%) of respondents were age 20-24. Seventeen percent of respondents were age 19 or younger. The average age was 23.76, with a standard deviation of 6.47. Information on working status was also collected. It was found that 58 (38%) of respondents worked full-time. There were 72 (47.4 %) of respondents who worked part-time. Only 22 (14.5 %) of respondents were not working at the time of the survey. When coding working full-time as 1, part-time as 0.5, and not working as 0, it was found that average working status was 0.62.

Table 1
Demographic Distribution

Variables	Frequency	Percent	Mean	S.D.
Gender			0.72*	0.45
Male	43	28.3		
Female	109	71.7		
Total	252	100		
Age			23.75**	6.47
17-19	26	17.2		
20-24	90	59.6		
25-29	16	10.6		
30-58	19	12.6		
Total	151	100		
Working status			0.62***	0.34
Working	58	38.2		
Part-time	72	47.4		
Non-working	22	14.5		
Total	152	100		

*Males=0 and Female=1
**Original data was in numbers
***Working=1, part-working=0.5, non-working=0

Data were collected on six constructs discussed earlier in this paper. These include user perceptions of benefits, trust, security, ease of use, perceived quality, and self-efficacy. A Cronbach alphas analysis was conducted using SPSS. The initial results revealed that items for security did not hold together for Japanese respondents with an alpha of 0.485. Self-efficacy and perceived quality were found to be good constructs with alphas of .849 and .871. Two items were dropped to get an alpha of .862 for ease of use. Finally, one item was dropped for benefit issue and trust issue, respectively, to get alphas of .772 and .774. In table 2, alphas, means, and standard deviations of all five perception variables are presented. By comparing means, it was found that the benefits issue and self-efficacy were relatively higher, with scores of 4.11 and 4.05. This implies that most Japanese young people in the sample perceived benefits by using the e-payment system. Similarly, young Japanese in the sample feel confident about their computer skills. Relatively, trust has the lowest mean score of 2.72 for a 1-5 Likert scale

measure. This is interpreted to mean that, among the five perception related variables, Japanese have a relatively lower level of trust in e-payment systems (see Table 2).

Table 2
Cronbach Alphas for Subject Norms

Name	# of item	Alphas	Means	S.D.
Self-Efficacy	7	0.849	4.05	0.79
Ease of Use	3	0.862	3.86	0.88
Perceived Quality	4	0.871	3.30	0.85
Perceived Trust	4	0.774	2.72	0.82
Perceived Benefit	3	0.772	4.11	0.90

The question "How frequently do you use an e-payment system per week?" was asked. This is the key dependent variable that measured the e-payment behavior. It was found that 33, or 21.6 % of respondents did not use e-payment. Most of the Japanese young people (96 or 62.7%) used an e-payment system once or twice per week. Less than 20% of respondents used it more than 3 times a week (see Table 3). The average of the weekly usage was 1.5 times, with a standard deviation of 1.82.

Table 3
Frequency and Descriptive analysis of E-Payment Usage Weekly

Variables	Frequency	Percent	Mean	S.D.
Usage for per week			1.50*	1.82
0	33	21.6		
1-2	96	62.7		
3-5	18	11.8		
6-10	6	3.9		
Total	153	100		

*Original data was in numbers

Bivariate analysis is presented in Table 4. The first three variables are demographic variables, i.e., age, gender, and working status. The next variable is an incentive. It is followed by the five major attitudinal variables: benefit, trust, self-efficacy, perceived quality, and ease of use. The final variable is the behavioral measurement for e-payment: frequency of usage per week.

Table 4
Pearson Correlation Matrices

		1	2	3	4	5	6	7	8	9	10
1	Age	1									
2	Gender	-.16*	1								
3	Working Status	.37**	0	1							
4	Incentives	0.13	-.17*	.20*	1						
5	Benefit	.16*	-0.06	0.11	0.11	1					
6	Trust	0.09	-0.01	0.02	0.12	.52**	1				
7	Self-Efficacy	0.01	-0.07	-0.03	-0	.38**	.20*	1			
8	Perceived- Quality	0.01	-0.02	0.05	0.01	.43**	.47**	.31**	1		
9	Ease of Use	0.15	-0.16	0.11	0.02	.52**	.38**	.53**	.39**	1	
10	Freq./Week	.35**	-.22**	0.09	.18*	0	0.16	-0.1	0.02	0.1	1

*0.05 level of significance
**0.01 level of significance

Age is correlated with gender and working status. In this sample, females are more likely to be younger than males. There is also a positive relationship between age and working status. Older respondents are more likely to have a full-time job. The incentives are negatively related to gender and positively related to working status. Females are less likely to care about incentives than males. An interesting finding is that people working full-time care more about incentives than those who work part-time or do not work.

Five attitudinal variables are highly correlated among themselves. This implies that people who feel e-payment is beneficial are also likely to have higher scores in trust, self-efficacy, perceived quality, and ease of use. Also, people with a higher score in trust in e-payment are more likely to have higher scores in benefit, self-efficacy, perceived quality, and ease of use.

For the dependent variable, the frequency of e-payment usage weekly is statistically related to age and gender. Older respondents are more like to use e-payment than younger ones. Females have a higher frequency in using e-payment systems weekly than males. Incentives are also found to be positively associated with the frequency of using e-payment. All five attitudinal variables are found to be not statistically significant regarding the relationship with the dependent variable (see Table 4).

Table 5 Regression Analysis	
Independent Variable	Unstandardized Beta
Constant	1.12
Gender	-.74*
Age	.080**
Waking status	-.71
Incentives	.24
Self-efficacy	-.24
Ease of use	.23
Perceive quality	-.03
Trust	.38
Benefit	-.33
*sig at .05 and ** sig. at .01	

Since independent variables are correlated, a regression analysis was conducted. The model is statistically significant, with an F value of 4.15, $p < .00$, and R square of .23 (see Table 5). As indicated in Table 5, only two variables are statistically significant: age and gender. Incentives are found to be statistically important in correlation analysis but not statistically significant in regression analysis. The correlations between incentives with age and gender could be the reason. The impact of incentives on e-payment was mainly explained by age and gender in the regression.

E-PAYMENT MARKETING

Reasonable use of the findings would address how to better market e-payment systems to the Japanese population. However, the upcoming Olympic Games in Japan will serve as the most significant marketing tool for e-payment systems. People from all over the world are expected at the Olympic Games, and those people will expect the availability of e-payment. The Japanese government and banking system understand this, and e-payment systems are being promoted as necessary to attract this business to Japanese venders. Japanese businesses will hopefully be ready with the systems for global visitors.

The question is: will the Japanese population embrace these systems that will be in place? After the Olympics, these systems will be widely available to Japanese consumers. That is one important change. Also, one would expect that Japanese consumers will observe these systems being widely used by foreign consumers. It is expected that Japanese consumers will then utilize e-payment systems much more than they do now. That will be a possible study for further research.

CONCLUSIONS

Analyzing the collected data, with direction provided by our literature review, can provide insights for academics and the business community to understand the Japanese consumer's use of e-payment systems better.

Three demographic variables, one incentives variable, and five attitudinal variables were examined. A survey using convenience sample methods was conducted via social media promotion and an online survey. A Likert scale ranging from 1 to 5 was applied to six attitudinal variables, i.e., self-efficacy, ease of use, perceived quality, trust, benefits, and security. It was found that items for security did not hold together (a very low alpha). However, the construct has been validated in another country in other research (Teoh et al. (2013). It is possible that Japanese users might not be concerned with the details of security provided by information technology vendors and financial institutions. Information security is a somewhat esoteric idea that is not well understood by many. In addition, the Japanese might trust their government institutions as well as their e-payment systems and, therefore, security is not an important issue for them. The other five constructs had alphas from .77 to .87 (see Table 2). This study verified and confirmed that items for five attitudinal constructs (self-efficacy, ease of use, perceived quality, trust, and benefit) that have been used widely in the TAM model in the USA are also appropriate for Japanese youth.

However, these five constructs are not associated with e-payment usage among young Japanese. According to Teoh et al. (2013), trust and security were found to be insignificant to customers' perception of e-payment in Malaysia. Benefits, self-efficacy, and ease-of-use contributed to e-payment in Malaysia. It is reasonable to suggest that self-efficacy and ease of use in Japan are significantly higher because it is a technologically advanced country. Similarly, Japan is a wealthy country and the level of benefits might not be important to young Japanese users regarding the use of e-payment systems.

One of our major findings is the relationship between gender and e-payment behavior. This is in keeping with Venkatesh and Morris (2000), who found that females are more strongly influenced by perceptions of ease of use and subjective norm. Males are more concerned with usefulness. In this study, it was found that females are less likely to use e-payment among younger Japanese. Since no relationships were found between gender and ease of use and/or benefit, the impacts of usefulness, benefit, and ease-of-use need to be further examined between gender differences in Japan.

Age was also found to be important. Our survey respondents are younger. About 70% of them are between 20-30 years old. The findings support other findings that indicate age as an important factor. It is reasonable to say older people in this group are more likely to have a full-time job and, perhaps, higher income. Since they probably spend more money and have more money to manage, e-payment is a good platform for them to use. Further research in this area is recommended.

Incentives are statistically important in the bivariate analysis. This implies that more incentives will motivate e-payment behavior among Japanese young people. However, in the regression model, the impact of the incentives disappeared. Age and gender are strong predictors and are correlated with incentives. It could be the reason that incentives are not statistically important in the regression model. The incentives have a negative relationship with gender. This implies that males care more about incentives than females.

In the regression analysis, age and gender, along with other independent variables, can explain 23% of the variance of the e-payment usage per week. It was found that perceptions are

not good predictors for e-payment behavior, especially with how frequently the Japanese use e-payment on a weekly basis.

Demographic backgrounds within the sample are quite diverse, and the sample size is limited. However, as an exploratory study, some guidance is provided by the results of this study to support further e-payment studies in Japan, as well as other countries.

REFERENCES

Abeshi. (2016, Oct. 27). *The situation of the e-payment system and popularization in Japan. Money Motto*. Available at: https://news.hoken-mammoth.jp/e-money/ Accessed 08.16.18.

Abrazhevich, D. (2001). Electronic payment systems: issues of user acceptance, at Stanford Smith, B., and Chiozza, E. (Eds). *E-work and e-commerce, ISO Press, Amsterdam*, 354-360

Abrazhevich, D. (2004). *Electronic payment systems: a user-centered perspective and interaction design*. Ph.D. thesis, technical university of Eindhoven, Eindhoven

Abrazhevich, D. (2004). Electronic payment systems: a user-centered perspective and interaction design. *Technische universities Eindhoven*, 189

Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes*, 50(2), 179-211

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. London; prentice hall international.

Au, Y.A., & Kauffman. R.J. (2008). The economics of mobile payments: understanding stakeholder issues for an emerging financial technology application. *Electronic commerce research and applications*, 7, 141-164

Bakos, A. (1997). Reducing buyer search costs: implications for electronic marketplaces. *Management Science*, 43(2), 1676-1692

Bandura, A. (1986). *Social foundations of thought and action*. A social cognitive theory, prentice-hall, Englewood Cliffs, NJ

Byford, Sam. (2016, Oct. 25). *Apple pay is live in Japan and works on public transport*. Available at: https://www.theverge.com/2016/10/25/13401092/apple-pay-japan-suica-felica-nfc Accessed 08.16.18.

Chen, A., Aba, F., and Ouattara, N. (2016). Issues and models of e-payment system. *Presented at 65th annual meeting of Arkansas college teachers of economics & business*

Chou, Y., Lee, C., & Chung, J. (2004) Understanding m-commerce payment systems through the analytic hierarchy process. *Journal of business research*, 57(12), 1423-1430

CPSS. (2012). Payment, clearing, and settlement system in Japan. *Red book*, 263-311

Dahlberg, T., Guo, J., & Ondrus, A. (2015). Contemporary research on payments and cards in the global fin tech revolution. *Electronic commerce research and Applications*, 14 (5), 261-392

Dahlberg, T., Mallat, N., & Öörni, A. (2003a). Consumer acceptance of mobile payment solutions - ease of use, usefulness, and trust. *The 2nd international conference on mobile business, Vienna, Austria*, June 23-24.

Dahlberg, T., Mallat, N., & Öörni, A. (2003b). Trust enhanced technology acceptance model - consumer acceptance of mobile payment solutions. *The 2nd mobility Roundtable*, *Stockholm, Sweden*, May 22-23.

Dahlberg, T., Guo, J. & Ondrus, J. (2015). A critical review of mobile payment research. *Electronic commerce research and applications*, 14, 265-284

Dahlberg, T., Mallat, N., Ondrus, J. & Zmijewska, A. (2008). Mobile payment market and research – past, present, and future. *Association for information systems AIS electronic library*, 166

Davis, F.D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13 (3), 319-340

Davis, F.D., Bagozzi, R.P, & Warshaw, P.R. (1989). User acceptance of computer technology: a comparison of two theoretical models. *Management Science*, 35, 982-1003

Davis, F.D., Bagozzi, R.P., & Warshaw, P.R. (1992). Extrinsic and intrinsic motivation to use computers in the workplace. *Journal of applied social psychology*, 22 (14)

Dory, V., Beaulieu, M., Pestiaux, D., Pouchanin, D., Gay, B., Rocher, G., & Boucher, L. (2009). The development of self-efficacy beliefs during general practice vocational training: an exploratory study. *Medical teacher*, 31(1), 39-44

Eastin, M.J. (2002). Diffusion of e-commerce: an analysis of the adoption of four e-commerce actives. *Telematics and informatics*, 19(3), 251-267

Fishbein, M., & Ajzen, I. (1975). Belief. Attitude, intention, and behavior. An introduction to theory and research. *Reading, MA: Addison-Wesley*.

Flavian, B., Kahn, P.H. Jr., & Howe, D.C. (2006). Trust online. *Communications of the ACM*, 43(12), 34-40

Friedman, B., Kahn, P.H. Jr., & Howe, D.C. (2000). Trust online. Communications of the ACM, 43(12),34-40

Gefen, D. (2000). E-commerce: the role of familiarity and trust. *Omega: The international journal of management science*, 28(6), 725-737

Gefen, D. (2003). Tam or just plain habit: a look at experienced online shoppers. *Journal of organizational and end-user computing* 15(3), 1-13

Gerrard, P., & Cunningham, B.J. (2003). The diffusion of internet banking among Singapore consumers. *International journal of bank marketing,* 21(1), 16-28

Gholami, R., Ogun, A., Koh, E. & Lim, J. (2010). Factors affecting e-payment adoption in Nigeria. *Journal of electronic commerce in organizations*, 8(4), 51-67

Hataiseree, R. (2008), Development of e-payments and challenges for central banks: Thailand's recent experience. *Working paper payment systems department*.

Hayashi, F. (2015) Faster Payments in the United States: How Can Private Sector Systems Achieve Public Policy Goals. *Federal Reserve Bank of Kansas City working paper*, 15 (3)

Hen, L. (2008). A model of consumer acceptance of mobile payment. *International journal mobile communications*. 6(1), 32-52

Hill, T., Smith, N.D., & Mann, M.F. (1986). Communicating innovations: convincing computer-phobic to adopt innovative technologies, in Luts, R.J. (Ed). *Advances in consumer research, the accusation of consumer research, prove*, UT, 419-422

Hill, T., Smith, N.D., & Mann, M.F. (1987). Role of efficacy expectations in predicting the decision to use advanced technologies: the care of computers. *Journal of applied psychology*, 72(2), 307-313

Hoffman, D.L., Novak, T.P., & Peralta, M. (1999). Building consumer trust online. *Communications of the ACM*, 42(4), 80-85

Hord, J. (2005, October 19). *How Electronic Payment Works*. Available at: https://money.howstuffworks.com/personal-finance/online-banking/electronic-payment2.htm Accessed 08.16.18.

Ives, B., Olson, M.H., & Baroudi, J.J. (1983). The measurement of user information satisfaction. *Communications of ACM*, 26(10), 785-93

Javenpaa, S.L., Tractinsky, J., & Vitale, M. (2000). Consumer trust in an internet store. *Information technology and management*, 1(Nos1-2), 45-71

Jeffus, B., Zeltmann, S., Griffin, K., & Chen, A. (2015). The future of mobile electronic payments. *Competition Forum*, 13 (2), 337-342

Juniper Research. (2018). Mobile & online remote payments for digital & physical goods, 2018-2022. *Juniper research.*

Kawamoto, S., & Allan, G. (2016, Sep 2). Japanese have for years been using rail passes that double as electronic money cards: Apple hopes for e-money growth in cash-carrying. *Japan Times*. Available at: https://www.japantimes.co.jp/news/2016/09/02/business/apple-hopes-e-money-growth-cash-carrying-japan/#.WngD9FPwbq0 Accessed 08.16.18.

Kaya. (2018, May 13). The theory of stopping to use one thousand yen currency. *Sankei news.* Available at: https://www.sankei.com/column/news/180513/clm1805130001-n1.html Accessed 08.16.18.

Kim, C., Mirusmonov, M. & Lee, In. (2010). An empirical examination of factors influencing the intention to use mobile payment. *Computers in human behavior*, 26 (3), 310-322

Kobsa, A. (2001). Generic user modeling systems. *User modeling and user-adapted interaction*, 11(Nos1/2), 49-63

Kobsa, A. (2002). Personalized hypermedia and international privacy. *Communications of the ACM*, 45(5), 64-67

Legris, P., Ingham, J., & Cllerette, P. (2003). Why do people use information technology? A critical review of the technology acceptance model. *Information and management*, 40(3), 191-204

Liébana-Cabanillas, F., Sánchez-Fernández, J. & Muñoz-Leiva, F. (2014). Antecedents of the adoption of the new mobile payment systems: the moderating effect of age. *Computers in human behavior*, 35, 464-478

Lim, B., Lee, H., & Kurnia, S. (2006). *Why did an electronic payment system fail? A case study from the system provider's perspective*. Available at: www.collecter2006.unisa.edu.au/Paper%2011%20Benfamin%20Lim.pdf (accessed December 14, 2009)

Lin, C. & Nguyen, C. (2011). Exploring e-payment adoption in Vietnam and Taiwan. *The journal of computer information systems*, 51 (4), 41-52

Luarn, P., & Lin, H.H. (2005). Toward an understanding of the behavioral intention to use m-banking. *Computers in human behavior,* 21(6), 873-891

Lymperropoulos, C., & Chaniotakis, I.E. (2005). Factors affecting acceptance of the internet as a marketing-intelligence tool among employees of Greek bank branches. *International journal of the bank of marketing*, 23(6), 484-505

Mallat, N. (2007). Exploring consumer adoption of mobile payments- A qualitative study. *Journal of strategic information systems,* 16, 413-432

Matsukawa, S., & San, M. (2009). Japanese consumers as technology innovators. *University honors program*.

Md Johar, M.G., & Awalluddin, J.A.A. (2011). The role of the technology acceptance model in explaining the effect on the e-commerce application system. *International journal of managing information technology,* 3 (3)

Morimoto, T. (2018, January 29). Extensive electronic payment essential for revitalizing the economy. *Saga newspaper live*. Available at: http://www.saga-s.co.jp/articles/-/175028 Accessed 08.16.18.

Nikkei Asian Review (2017, March 07). *Japan expects a $283bn boost from the 2020 Tokyo Olympics*. Available at: https://asia.nikkei.com/Economy/Japan-expects-283bn-boost-from-2020-Tokyo-Olympics Accessed 08.16.18.

Oliveira, T., Thomas, M., Baptista, G. & Campos, F. (2016). Mobile payment: Understanding the determinants of customer adoption and intention to recommend the technology. *Computers in human behavior*, 61, 404-414

Özkan, S., Bindusara, G., & Hackney, R. (2010). Facilitating the adoption of e-payment systems: theoretical constructs and empirical analysis. *Journal of enterprise information management*, 23(3), 305-325.

Park, Y. & Chen, J. (2007). Acceptance and adoption of the innovative use of a smartphone. I*ndustrial management & data systems*, 107 (9), 1349-1365

Pham, T.T.T., & Ho, J.C. (2015). The effects of product-related, personal-related factors, and attractiveness of alternatives on consumer adoption of NFC-based mobile payments. *Technology in society*, 43, 159-172

Pikkarainen, T., Pikkarainen, K., Karfaluoto, H. & Pahnila, S. (2004). Consumer acceptance of online banking: An extension of the technology acceptance model. *Internet Research*, 14 (3), 224-235

Raja, J., Senthil Belmurgan, M., & Seetharaman, A. (2008). E-payments: problems and prospects. *Journal of internet banking and commerce*, 13 (1)

Renaud, K., &Biljon, J.V. (2008). Predicting technology acceptance and adoption elderly: A qualitative study. *In ACM international conference proceeding series; Proceedings of the 2008 annual research conference of the South African institute do computer scientists and information technologists on IT research in developing countries: Riding the wave technology*, 338, 210-219

San-Martin, S., & Lopez-Catalan, B. (2013). How can a mobile vendor get satisfied customers? *Industrial management and data systems*, 133(2), 156-170

Sathye, M. (1999). Adoption of internet banking by Australian consumers: an empirical investigation. *International journal of bank marketing*, 17(7), 324-334

Schier, G.P., Shilke, O, & Wirtz, W.B. (2010). Understanding consumer acceptance of mobile payment services: An empirical analysis. *Electronic commerce research and applications*, 9 (3), 209-216

Shin, Y. Y. & Fang, K. (2004). The use of a decomposed theory of planned behavior to study Internet banking in Taiwan. *Internet Research*, 14 (3), 213-223

Sonia San-Martin, S., Lopez-Catalan, B., & Ramom-Jeronimo, M.A. (2012). Factors determining firms' perceived performance of mobile commerce. *Industrial management and data systems*, 112(6), 946-963

Statista. (2015). Mobile payment transaction volume 2010-2017. *The statistics portal*. Available at: http://www.statista.com/statictics/226530/mobile-payment-transaction-volume-forecast/ Accessed 08.16.18.

Su, S.P., Tsai, C.H., Chen, Y.K. (2012). Applying the technology acceptance model to explore intention to use telecare system in Taiwan. *13th ACIS international conference*

Teo, A.C., Tan, G.W.H., Ooi, K.B., Hew, T.S., & Yew, K.T. (2015). The effects of convenience and speed in m-payment. *Industrial management & data systems*, 115(2), 311-331

Teoh, W., Chong, S., Lin, B., & Chua, J. (2013). Factors affecting consumers' perception of electronic payment: An empirical analysis. *Internet Research*, 23 (4)

Tsiakis, T., & Sthephamides, G. (2005). The concept of security and trust in electronic payments. *Computers and security*, 24(1), 10-15

Venkatesh, V., & Bala, H. (2008). Technology acceptance model 3 and a research agenda on interventions. *Decision Sciences*, 39(2), 273-315

Venkatesh, V., & Morris, M. G. (2000). Why don't men ever stop to ask for directions? Gender, social influence, and their role in technology acceptance and usage behavior. *MIS Quarterly*, 247 (1), 115-139.

Venkatesh, V., &Davis, F.D. (2000). A theatrical extension of the technology acceptance model: Four longitudinal field studies. *Management Science*, 46(20, 186-204

Wang, Y.S., Wang, Y.M., Lin, H.H., & Tang, T.I. (2003). Determinants of user acceptance of internet banking: an empirical study. *International journal of service industry management*, 14(5), 501-519

Wróbel-Konior, S. (2017). What Is an E-payment System? *Securion Pay*. Available at: https://securionpay.com/blog/e-payment-system/ Accessed 08.16.18.

Yousafzai, S.Y., Pallister, J.G., & Foxall, G.R. (2003). A proposed model of e-trust for electronic baking. *Technovation,* 23(11), 847-860

Z'xent Pro. (2018, June 24). *Featured [fin tech] Japan proposing cashless payments*. Available at: http://business-japan.jp/2018/06/24/japan-proposing-cashless-payments-for-the-coming-olympics/ Accessed 08.16.18.

Zhou, T. (2011). An empirical examination of initial trust in mobile banking. *Internet Research*, 21(5), 527-540

Zmijewska, A., Lawrence. E., Steele. R., Dahlberg. T., Guo. J. & Ondrus,, (2004). Towards an understanding of factors influencing user acceptance of mobile payment systems. *Proceedings of the IADIS international conference*, 2

Appendix Survey Instrument for E-Payment (Japan)

I. Benefit Issues

		Disagree				Agree
B1	I save time through the use of an e-payment system	1	2	3	4	5
B2	I save money using an e-payment system	1	2	3	4	5
B3	E-payment systems are convenient for me	1	2	3	4	5
B4	The billing and transaction process is accurately handled	1	2	3	4	5
B5	A traditional payment system is faster than an e-payment system	1	2	3	4	5
B6	E-payment helps me keep track of my bank account	1	2	3	4	5

II. Trust Issues

		Disagree				Agree
T1	I trust an e-payment system to protect my privacy	1	2	3	4	5
T2	I believe using e-payment systems will not lead to transaction fraud	1	2	3	4	5
T3	Confidential information is delivered safely to customers	1	2	3	4	5
T4	I feel the risk associated with e-payment systems is low	1	2	3	4	5
T5	I would recommend e-payment systems to others	1	2	3	4	5

III. Security Issues

		Disagree				Agree
S1	No one can get access to my data without permission	1	2	3	4	5
S2	E-payment technologies are effective in determining whether a particular user is authorized to take specific actions (for example, login) or not.	1	2	3	4	5
S3	Advances in security technology provide for safer e-payment systems	1	2	3	4	5
S4	I will stop using the e-payment system if I hear of a security breach	1	2	3	4	5
S5	Matters of security have a significant influence on me in using an e-payment system	1	2	3	4	5

IV. Ease of Use

		Disagree				Agree
EU1	The structure and contents of an e-payment web site are easy to understand	1	2	3	4	5
EU2	Learning to use an e-payment is easy	1	2	3	4	5
EU3	Using an e-payment system is not complicated	1	2	3	4	5
EU4	Using an e-payment system does not require a lot of mental effort	1	2	3	4	5
EU5	I feel e-payment systems are user friendly	1	2	3	4	5

V. Perceived Quality

		Disagree				Agree
PQ1	E-payment web sites usually provide sufficient useful information	1	2	3	4	5
PQ2	E-payment web sites usually provide accurate information	1	2	3	4	5
PQ3	E-payment web sites usually provide up-to-date information	1	2	3	4	5
PQ4	E-payment web sites usually provide information relevant to my needs	1	2	3	4	5

VI. Self-Efficacy

		Disagree				Agree
	I would be confident in using an e-payment system					
PE1	Even if there is no one around to show me how to use it	1	2	3	4	5
PE2	Even if I have never used a system like it before	1	2	3	4	5
PE3	If I have only the online instructions for reference	1	2	3	4	5
PE4	If I have only the manual and instructions for reference	1	2	3	4	5
PE5	If someone would help me get started	1	2	3	4	5
PE6	If I can find someone to help me if I get stuck	1	2	3	4	5
PE7	If I have sufficient time to learn it	1	2	3	4	5

VII. Usage Issues

1. Which device(s) do you use for your e-payment? (Check all that applied)
_____ Desk- top computer
_____ Notebook computer
_____ Tablet computer
_____ Smart phone

2. How often do you use e-payment?
approximately ___ times per week (please fill a number in the blank)

3. Approximately, how much money you spend via e-payment per month? (in USD)
_____ 100 >
_____ 101 – 200
_____ 201 – 400
_____ 401 – 800
_____ 801 – 1,200
_____ 1,201 – 2,400
_____ 2,401 <

4. Approximately, what percentage of your monthly expenses was paid via e-payment?
_____ %

5. How frequently do you purchase the following using e-payment systems?

	Never	Rarely	Sometimes	Frequently	Very Frequently
Electronics	1	2	3	4	5
Books	1	2	3	4	5
Travel	1	2	3	4	5
Entertainment	1	2	3	4	5

Clothes	1	2	3	4	5
Dining	1	2	3	4	5
Groceries	1	2	3	4	5
Services	1	2	3	4	5
Pay Bills	1	2	3	4	5
Other	1	2	3	4	5

6. Please rate the level of difficulty that each of the following cause you when using e-payment.

	Not Difficult				Very Difficult
Internet access and/ or speed	1	2	3	4	5
Mobil data plan	1	2	3	4	5
Web page confusion or unfriendly	1	2	3	4	5
Virus or safety issue	1	2	3	4	5
Security issue	1	2	3	4	5

7. How old are you?
_____ years old

8. Do you work?
__ Yes, I work full time
__ Yes, I work part time
__ No, I do not work

9. Are you a student?
___ Yes, I am a full time student
___ Yes, I am a part time student
___ No, I am not a student

10. Do you have easy access to internet via your computer or smart phone?
___ Yes
___ No

11. Do you have easy access to data plan via your smart phone?
___ Yes
___ No

12. Are you a
___ Female
___ Male