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Online Banking Transactions and Mere-Exposure Effect

Gayan Nayanajith, D. A.[1*], Damunupola, K.A. [2] and Ventayen, Randy Joy M. [3]
[1]*Doctoral Student, University of Kelaniya, Sri Lanka*
[2]*Senior Lecturer, Uwa Wellassa University, Sri Lanka*
[3]*Dean, College Business & Public Administration, Pangasinan State University, Philippines*

Abstract - *This study examines whether the online banking transaction values are being affected by the number of visits made to the bank by the customers in the context of Sri Lankan commercial banks. Simultaneously, study analyses the differences/similarities in online banking transaction values performed by the groups of customers; specifically, amongst the control group and the other groups. Respondents were the students of Uwa Wellassa University those who are possessing online banking services of the selected commercial banks. According to the number of visits made to the bank, four groups consisting of 20 each, were formed and 80 questionnaires were used for data analysis. Conceptual model was designed incorporating the psychological concept of mere-exposure effect. Non-parametric, Kruskal–Wallis test used for the analysis and it was followed by pair-wise and step-wise step-down methods alongside the trend analysis using Jonckheere-Terpstra test. Empirical results supported both the hypotheses, subsequently. Restricted sample selection owing to time constraints is a limitation. Nevertheless, incorporation of non - parametric tests and mere-exposure effect in relation to present research context could be noted as the originality of the research. Findings would be beneficial for online banking services providers and policy makers, the same. In conclusion, it is suggested to conduct researches in varied contexts in the field of technology adoption by integrating related variables, moderators and mediators.*

Keywords *– Internet banking, Mere exposure, Online banking, Sri Lanka*

INTRODUCTION

By the end of the first quarter of 2019, currency notes and coins in circulation amounted to Rs. 688 billion and cash persists as the most popular payment mode in retail payments in Sri Lanka [1]. Non-cash payments are being facilitated through both large value payment system known as Real Time Gross Settlement (RTGS) system and retail payment systems such as cheques, Sri Lanka interbank payment (slip) system, payment cards, mobile phone-based payment mechanisms, internet-based payment mechanisms, tele banking, postal instruments, mobile phone based e-money systems. RTGS System and Cheque Imaging and Truncation System (CITS) are among the systemically important payment systems of the country. Approximately 96.8 per cent of the total value of non-cash payments of the first quarter of 2019 was performed via RTGS system (90.9 per cent) and CITS (5.9 per cent). Cheque is considered as the widespread non-cash retail payment instrument in Sri Lanka which accounted for 64.8 per cent of the value of total non-cash retail payments in first quarter of 2019 [1]. Nevertheless, online banking transaction values have been increased significantly from (Rs. Bn) 983.8 in 2014 to (Rs. Bn) 2,939.3 in 2018 [1].

In view of the above facts it is obvious that, there is a greater potential for increase the adoption of electronically facilitated transactions, particularly in online banking context, considering the benefits to both the banks and customers.

Objectives of the Study

Primarily it was proposed to identify whether the online banking transaction values/figures are being affected by the number of visits made to the bank by the customers. Secondly, intended to examine the differences/similarities in online banking transaction values in between the control group (no bank visits during the month) and other groups.

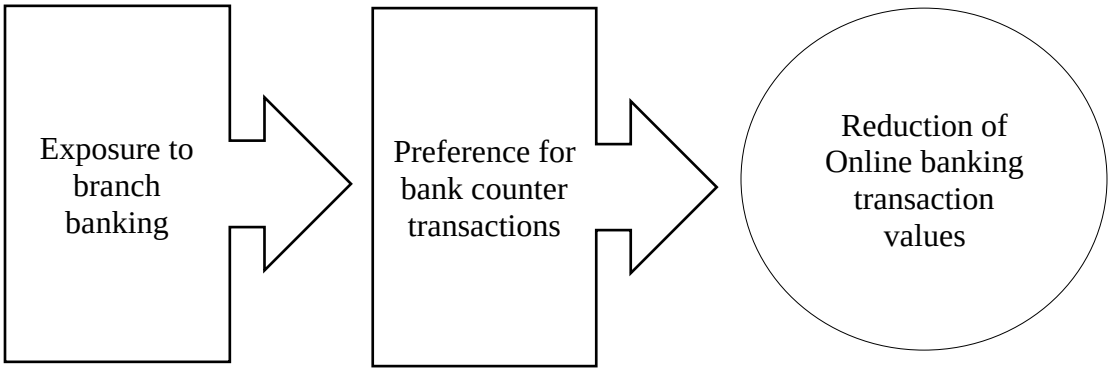
METHODOLOGIES

Deductive methodology and quantitative method have been followed. Respondents were the students of the Uwa Wellassa University (UWU). Enumerators have collected data through self-administered questionnaires from the respective respondents. Respondents totaling to 80 were consisted of 4 groups according to the number of visits made to the bank by them for a duration of a month. The first group (coded as 1) was a control group and had no visits to the bank at all, for a month; the second group had 1-3 visits to the bank per month; the third group had 4-6 visits to the bank per month; and the final group had 7 or more visits to the bank per month. The Non parametric Kruskal–Wallis test was used considering the-non normality and heterogeneity of data which have been demonstrated and further discussed in the subsequent analysis section. Kruskal–Wallis test is based on ranked data. Thus, required to simply order the scores (online banking transaction values in ten thousands) from lowest to highest, ignoring the group to which the score belongs, and then assign the lowest score a rank of 1, the next highest a rank of 2 and so on. Once ranked the data, assigned the scores back into their groups and simply add up the ranks for each group, as given in table 1. Kruskal–Wallis test statistic (H) has a special kind of distribution (chi-square distribution) and for this distribution there is one value for the degrees of freedom, which is one less than the number of groups (k – 1): in this instance 3. Test was followed up by pairwise comparison and stepwise step-down analyses. Trend in the data was scrutinized by using Jonckheere-Terpstra test.

Conceptual Framework

The mere-exposure effect is a psychological phenomenon by which people tend to develop a preference for things merely because they are familiar with them. In social psychology, this effect is sometimes called the familiarity principle. The results of a research using students those who were exposed to banner ads while reading an article, showed that each group exposed to the "test" banner, rated the ad more favorably than other ads shown less frequently or not at all. This research supports the mere-exposure effect [2]. A different study showed that higher levels of media exposure are associated with lower reputations for companies, even when the exposure is mostly positive [3]. A subsequent review of the research concluded that exposure leads to ambivalence because it brings about a large number of associations, which tend to be both favorable and unfavorable [4]. Exposure is most likely to be helpful when a company or product is new and unfamiliar to consumers. Based on this discussion and review of literature, following conceptual model was formulated for the study,

Figure 1: Conceptual model



Hypotheses of the Study

Adoption of e-services has been studied under different contexts and it has been recognized as a predominant research phenomenon [5] - [9]. Online banking services related studies have been performed in conjunction with various aspects such as, perceived ease of use, perceived usefulness, e-security, e-trust, website usability in relation to the adoption of such services [10] - [13]. Traditional banking via in person visits and online banking services utilization have been analyzed in detail by several researchers [14] [15]. Considering the aforesaid facts following hypothesis is proposed, $H_1$1- Online banking transaction values affect by the number of visits made to the bank by the customers

Another research study indicated that there is a relationship between cost per online transaction and the number of internet banking transactions which the customers perform [16]. Some researchers have noted that when the transaction values are less, it is better to use online banking [17]. Considering the aforesaid facts following hypothesis is proposed,

$H_1$2- Differences exist in online banking transaction values in between the control group (no bank visits during the month) and other groups.

RESULTS AND DISCUSSION

Data analysis conducted using SPSS 20 package and descriptive statistics have shown that population parameters are sufficiently being replicated by sample of the study. Summary pertaining to the ranked data for 4 groups has been depicted in table 1.

Table 1 - Summary pertaining to the ranked data for 4 groups

	No visits (code 1)	1-3 visits (code 2)	4-6 visits (code 3)	7 or more visits (code 4)
Total-Ranks	927	883	883	547
Avg.-Ranks	46.35	44.15	44.15	27.35

Initially, exploratory analysis was performed on data of which the output is given in table 2 & 3. The first table shows that the Kolmogorov–Smirnov test was not significant for the group coded as 1; control group ($D(20) = .181$, $p > .05$) while the Shapiro–Wilk test is significant and this test is more accurate than the Kolmogorov–Smirnov test. All other data for the other 3 groups were significantly different from normal. The second table shows the results of Levene's test. The assumption of homogeneity of variance has been violated, $F(3, 76) = 5.12$, $p < .01$, and this is shown by the fact that the significance of Levene's test is less than .05. As such, these data are not normally distributed, and the groups have heterogeneous variances.

Table 2 – Tests of Normality

	Number of visits to Bank Per Month	Kolmogorov-Smirnova			Shapiro-Wilk		
		statistic	f	sig.	statistic	f	sig.

Value of Transactions (in Ten Thousands)	No visits during the month	181	0	085	805	0	001
	1-3 visits per month	207	0	024	826	0	002
	4-6 visits per month	267	0	001	743	0	000
	7 or above visits per month	204	0	028	912	0	071

a. Lilliefors Significance Correction

Table 3 - Test of Homogeneity of Variance

		Levene Statistic	df1	df2	Sig.
Value of Transactions (in Ten Thousands)	Based on Mean	5.117	3	76	.003
	Based on Median	2.860	3	76	.042
	Based on Median and with adjusted df	2.860	3	58.107	.045
	Based on trimmed mean	4.070	3	76	.010

The normal Q-Q plots illustrates deviations from normality quite clearly for 4 groups as the dots deviate from the diagonal line, figure 2

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Figure 2a – The normal Q-Q plots for 4 groups

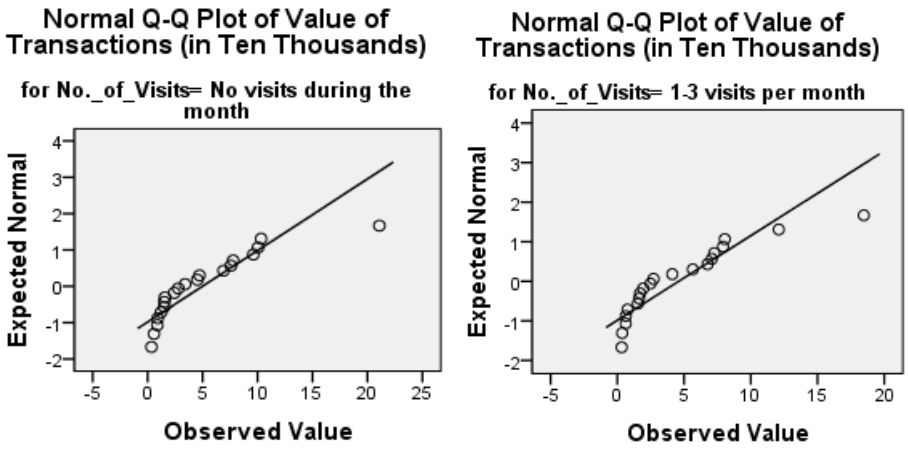
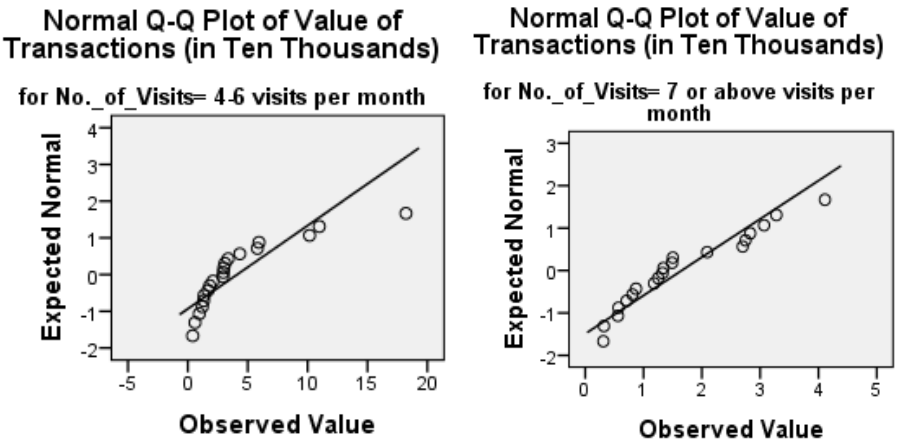


Figure 3 shows the test statistic, H, for the Kruskal–Wallis test its associated degrees of freedom (in this case study had four groups, so the degrees of freedom is 4−1, or 3) and the

significance [18]. The crucial thing to look at is the significance value, which is .034; because this value is less than .05, enabling to conclude that the number of visits made per month does significantly affect online banking transaction values, supporting the first hypothesis.

Figure 2b – The normal Q-Q plots for 4 groups



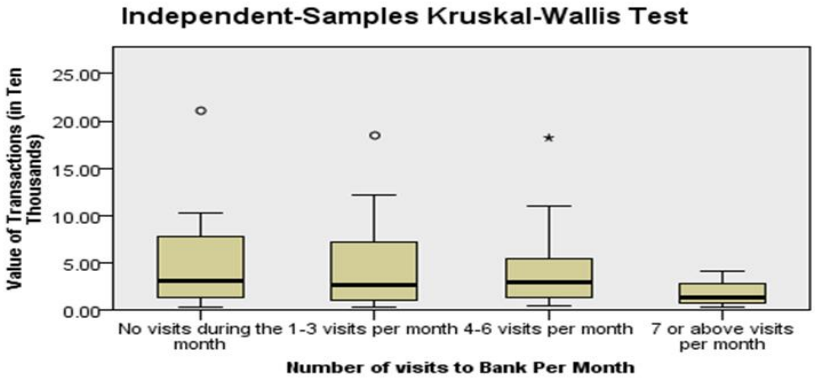
Similar to one-way ANOVA, though, this test tells us only that a difference exists; it doesn't tell exactly where the differences exist.

One way to see which groups differ is to look at a boxplot of the groups (figure 4). The first thing to note is that there are some outliers (note the circles and asterisks that lie above the top whiskers) – they are the respondents who produced a particularly rampant amount of online transaction volumes. Using the control as the baseline, the medians of the first three groups seem quite similar; however, the median of the group which visited 7 or more times to the bank, does seem a little lower, so perhaps this is where the difference lies. However, these conclusions are subjective and follow up tests were necessitated.

Figure 3 - Independent-Samples Kruskal-Wallis Test

Hypothesis Test Summary				
	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Value of Transactions (in Ten Thousands) is the same across categories of Number of visits to Bank Per Month.	Independent-Samples Kruskal-Wallis Test	.034	Reject the null hypothesis.
Asymptotic significances are displayed. The significance level is .05.				

Figure 4 – Box plot related to Kruskal-Wallis Test output



Total N	80
Test Statistic	8.659
Degrees of Freedom	3
Asymptotic Sig. (2-sided test)	.034

1. The test statistic is adjusted for ties.

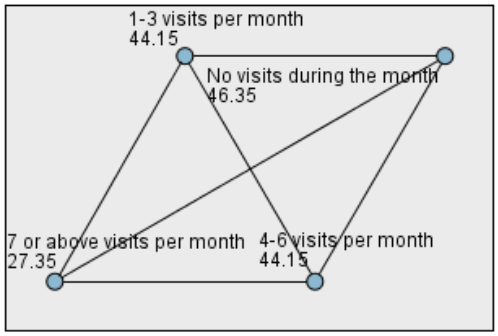
Kruskal-Wallis test results could be followed up by two ways in SPSS. When performing the test researcher can select either 'All pairwise' or 'Stepwise step down' in the drop-down list available under 'Multiple comparisons'. Primarily, pairwise comparison has been performed. Output of the analysis is given under figure 5.

The average rank within each group is given by the diagram at the top, as an example, the average rank in the 7 & above visits group was 27.35, and for the no visit group was 46.35. Differences between groups were also being highlighted by this diagram as well, by using a different colored line to connect them. However, here all the connecting lies are black as there were no significant differences between groups.

Similarly, all the possible comparisons are shown by the underneath table. There are six such comparisons as given. The different between the mean ranks of those groups, is the test statistic in each of the cases. For 7 & above Vs 1-3 visits, this will be 44.15-27.35=16.80 and so on. By dividing by their standard errors, these test statistics are converted into z scores. And these z scores have exact p values associated with them. As an example, 7 & above Vs 1-3 visits comparison has a z score of 2.286 and the exact p value for this z is .022. Column labelled *Adj. Sig.* contains p values adjusted for the number of tests and in this case none of the values are significant. Hence, it is noted that, in spite of the significant overall effect, significant difference in online transaction values due to different number of branch visits, has not been indicated as per specific comparisons between groups. Nevertheless, according to the mean ranks, it is demonstrated that, visiting the branch 7 times or more than that, lowers the online transaction values in comparison to no visits during a month, even though this comparison is non-significant.

Figure 5 – Pair-wise analysis output

Pairwise Comparisons of Number of visits to Bank Per Month



Each node shows the sample average rank of Number of visits to Bank Per Month.

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
7 or above visits per month-1-3 visits per month	16.800	7.348	2.286	.022	.133
7 or above visits per month-4-6 visits per month	16.800	7.348	2.286	.022	.133
7 or above visits per month-No visits during the month	19.000	7.348	2.586	.010	.058
1-3 visits per month-4-6 visits per month	.000	7.348	.000	1.000	1.000
1-3 visits per month-No visits during the month	2.200	7.348	.299	.765	1.000
4-6 visits per month-No visits during the month	2.200	7.348	.299	.765	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Similarly, in this study, Kruskal-Wallis test has been followed up by using the stepwise step-down procedure as well in which, comparison of groups as against every other group is not being done. Hence, there is no strict adjustment of p values as there are no so many tests on the same data. Figure 6 depicts the output of the test captioned as homogeneous subsets. Output shows the clustering of homogeneous groups together in the same column of the resulting table with differences shown using the colour codes. According to column 1, it is noted that 7 or above visits to the bank during a month clusters individually, meaning that there is a significant difference against the 1-3 visits group. Subsequently, 1-3 visits group is moved into column 2 subset and compared to 4-6 visits group where there is no significant difference and again compared to no visits group which also shown no significance. in reality other than 7 or above visits group, other 3 groups are homogeneous as per the table and the pertinent p value is .943 showing non significance. Hence, it could be noted that visiting 7 or above times per month to the bank seems to reduce the online transaction volumes significantly compared to all other 3 groups and

those groups had no significant effect on online transaction volumes, supporting the second hypothesis.

Figure 6 – Step-wise step-down analysis output

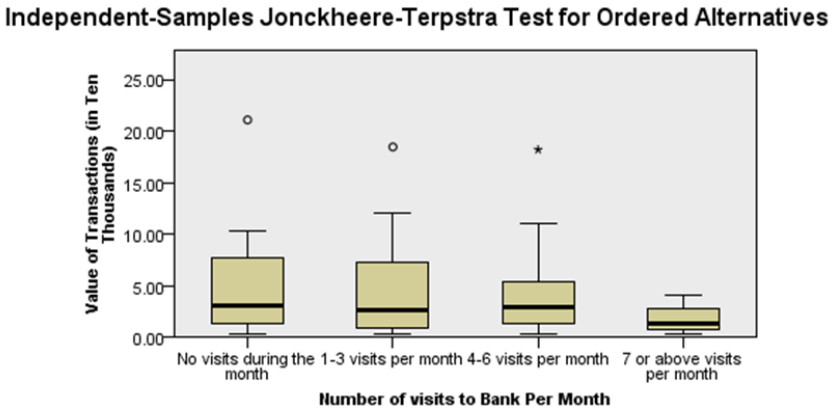
Homogeneous Subsets based on Value of Transactions (in Ten Thousands)			
		Subset	
		1	2
Sample[1]	7 or above visits per month	27.350	
	1-3 visits per month		44.1
	4-6 visits per month		44.1
	No visits during the month		46.3
Test Statistic		.[2]	.1
Sig. (2-sided test)		.	.9
Adjusted Sig. (2-sided test)		.	.9
Homogeneous subsets are based on asymptotic significances. The significance level is .05.			
[1]Each cell shows the sample average rank of Value of Transactions (in Ten Thousands).			
[2]Unable to compute because the subset contains only one sample.			

In order to test for trends, Jonckheere-Terpstra test was performed. This tests for an ordered pattern to the medians of the groups. As such, it was expected that groups that are comparing produce a meaningful order of medians which means the more visits a customer makes the less the online transaction values. In this study, groups were coded as 1 = no visits per month, 2 = 1-3 visits and the similar manner till 4 enabling to test whether online transaction values are increasing or decreasing across the groups. Figure 7 and figure 8 depict the output of the Jonckheere-Terpstra test selecting the smallest to largest option which test whether first group differs from the second and that from the third and so on until the last group. Hypothesis test summary table indicates that as per p value of .013 to reject null hypothesis, which is the distribution of value of transactions is the same across categories of number of visits to bank per month. output shows the test statistic, *J*, is 912 of which the z score is -2.475 and p value is .013. This indicates a significant trend in the medians; as the value of the coding variable gets bigger, the medians get smaller.

Figure 7 - Jonckheere-Terpstra test output

Hypothesis Test Summary				
	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Value of Transactions (in Ten Thousands) is the same across categories of Number of visits to Bank Per Month.	Independent-Samples Jonckheere-Terpstra Test for Ordered Alternatives	.013	Reject the nu hypothesis.
Asymptotic significances are displayed. The significance level is .05.				

Figure 8 - Jonckheere-Terpstra test output



Total N	80
Test Statistic	912.000
Standard Error	116.333
Standardized Test Statistic	-2.476
Asymptotic Sig. (2-sided test)	.013

Consequently, it was proposed to identify the effect sizes for comparison and calculated the effect sizes pertaining to the pairwise test that was used to follow up the main analysis (table 4). Effect size was computed by dividing z from the square root of N, where the z score was taken from the column captioned as std. test statistic in the pairwise comparisons table and N was 40 as it is being compared of 2 groups consisting of 20 each. Table 8 proposes that the effect sizes were small to medium for 7 or more visits to bank compared to other groups separately despite the non-significance in pairwise comparisons. As shown, all other comparisons indicated very small effect sizes which are less than .1. Following the same equation, effect size related to Jonckheere-Terpstra test's figures, could be calculated, where z = -2.476, square root of N (80) = 8.94 and the r reports as -.28.

Table 4 – Effect sizes

Comparison	z	Square root of N	r
7 or more Vs 1-3	2.286	6.32	.362
7 or more Vs 4-6	2.286	6.32	.362
7 or more Vs No	2.586	6.32	.409
1-3 Vs 4-6	0.000	6.32	.000

1-3 Vs No	0.299	6.32	.047
4-6 Vs No	0.299	6.32	.047

CONCLUSIONS

Online banking transaction values were significantly affected by visits made to the bank, H (3) = 8.66, P = .034. Subsequent pairwise comparisons noted an adjusted p value close to .05 (p = .058) for the difference between transaction values when customers visit 7 or more times compared to no visit although other pairwise comparisons have shown p values above .05 where the p values were largely away from .05 value as against the p value of .058. Consequent step down follow up analysis demonstrated that if visits made to bank are 7 or above per month, then it significantly reduces the online transaction values in comparison to no visits. Nevertheless, visiting the bank less than 7 times per month has no significant effect on online banking transaction values, p = .943. In addition, Jonckheere-Terpstra's test has indicated a significant trend showing that when more visits made to the bank, the median online transaction values are being reduced, J = 912, z = -2.48, p = .013, r = -.28.

Hence, it could be noted that empirical evidences have supported both the hypotheses signifying the impact of customer visits to banks towards online banking transaction values and shown that seven or more visits during a month will significantly affect transaction values conducted using the online banking; although number of visits less than that will not significantly affect online transaction values as such. Hence, online bank services providers could make the customers aware and offer facilities to utilize online banking services by way of customer awareness programs and time to time online banking service promotions in view of enhanced customer interactions, familiarization and awareness intended for formation of positive customer attitudes towards frequent and continuous usage of online banking services. Restricted sample selection owing to time constraints is a limitation. Nevertheless, incorporation of non -parametric tests and mere-exposure effect in relation to present research context could be noted as the originality of the research. Findings would be beneficial for online banking services providers and policy makers, the same. In conclusion, it is suggested to conduct researches in the field of online banking by integrating related variables, moderators and mediators in line with various models and theories pertinent to the particular research notion.

REFERENCES

[1] Central Bank of Sri Lanka, 2019, *'Payment bulletin 2019, first quarter 2019'*.

[2] Fang, X., Singh, S., & Ahluwalia, R. (2007). An examination of different explanations for the mere exposure effect. Journal of consumer research, 34(1), 97-103.

[3] Fombrun, C., & Shanley, M. (1990). What's in a name? Reputation building and corporate strategy. Academy of management Journal, 33(2), 233-258.[4

[4] Brooks, M. E., & Highhouse, S. (2006). Familiarity breeds ambivalence. Corporate Reputation Review, 9(2), 105-113.

[5] Gayan Nayanajith, D. A. & Damunupola, K. A. (2019a) " E-Service Trustworthiness and Adoption of Online Banking in the Presence of a Moderator: A Relational Study", Journal of Environmental Science, Computer Science and Engineering & Technology, Vol.8 Issue:4, pp.265-289, DOI: 10.24214/jecet.B.8.4.26589.

[6] Gayan Nayanajith, D. A. & Dissanayake, D. M. R. (2019) "E-Banking Adoption in the Context of Innovation

and E-Service Quality: A Review on Concepts and Practices", Journal of Environmental Science, Computer Science and Engineering & Technology, Vol.8 Issue:3, pp.208-221, https://doi.org/10.1108/02652320310457776

[7] Gayan Nayanajith, D.A. (2019). 'Relationship of Innovation Characteristics on Adoption of Consumer E-Banking in the Context of Top Three Private Commercial Banks in Sri Lanka', ICBI 2019, Kelaniya, 17 October, viewed 21 September 2019, < http://conf.kln.ac.lk/icbi2019/>

[8] Nayanajith, G., & Damunupola, K. A. (2019a). Effects of Subjective Norms and Security on Online Banking Adoption: Multilevel Linear Model Analysis. Asian Journal of Multidisciplinary Studies, 2(1).

[9] Nayanajith, G., & Damunupola, K. A. (2019b). Relationship of Perceived Behavioral Control and Adoption of Internet Banking in the Presence of a Moderator. Asian Journal of Multidisciplinary Studies, 2(2).

[10] Nayanajith, G., Damunupola, K. A., & Ventayen, R. J. (2019a). User Intentions and Actions Towards Adoption of Technology Based Self-Service Banking Services: A MANOVA Analysis. Southeast Asian Journal of Science and Technology, 4(1).

[11] Nayanajith, G., Damunupola, K. A., & Ventayen, R. J. (2019b). Relationship of Perceived Trust and Perceived Ease of Use on Adoption of Computer Aided Learning in the Context of Sri Lankan International Schools. Southeast Asian Journal of Science and Technology, 4(1).

[12] Nayanajith, G., Damunupola, K. A., & Ventayen, R. J. (2019c). Impact of Innovation and Perceived Ease of Use on E-Learning Adoption. Asian Journal of Business and Technology, 2(1).

[13] Nayanajith, G., Damunupola, K. A., & Ventayen, R. J. (2019d). Website Usability, Perceived Usefulness and Adoption of Internet Banking Services in the Context of Sri Lankan Financial Sector. Asian Journal of Business and Technology, 2(1).

[14] Sharma, S. (2016). A detail comparative study on e-banking VS traditional banking. International Journal of Advanced Research, 2, 302-307.

[15] Sekhon, H., Yap, K. B., Wong, D. H., Loh, C., & Bak, R. (2010). Offline and online banking–where to draw the line when building trust in e-banking?. International Journal of Bank Marketing.

[16] Xue, M., Hitt, L. M., & Chen, P. Y. (2011). Determinants and outcomes of internet banking adoption. Management science, 57(2), 291-307.

[17] McKay, C., & Pickens, M. (2010). Branchless Banking 2010: Who's Served? At What Price? What's Next? (Vol. 66). CGAP Focus Note.

[18] Field, A. (2013). *Discovering statistics using IBM SPSS statistics*. sage.