A Study on the Effectiveness of Payment Service Providers with its Future Prospects: A Case Study among the users in Kathmandu Valley

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ABSTRACT

This main objective of the study was to analyze the effectiveness of Payment Service Providers (PSPs) and examine the challenges to PSPs in Nepal with entrance of PSOs with Open Innovation such as Unified Payment Interface (UPI) and its future prospects among the users in Kathmandu valley (includes 3 districts: Kathmandu, Lalitpur, and Bhaktapur), Nepal. The research design was descriptive and analytical type; the research is based on mixed approach having both qualitative and quantitative data. Survey was conducted with total of 435 respondents, 405 respondents were selected using non random sampling for questionnaire. The collection of primary data were through unstructured interviews and structured questionnaire. The data was analyzed using the descriptive statistics and the regression technique. The results of statistics showed that there is rising trends and adoption of PSPs among the users in Kathmandu valley. The result of the ordinal regression analysis indicated that security concern (SC) showed a positive and insignificant influence on PSPs' performance since estimate or coefficient value of this is 0.13 with insignificant value of (p=0.308), whereas customer service (CS), low transaction fee & Merchant Discount Rate (LTFM) and cross-border peer to peer and peer to merchant transaction (CPTM) showed a positive and significant influence on PSPs' effectiveness having coefficient value of 0.434, 0.342 and 3.201 respectively with significant value of p=0.008, 0.004 & 0.000 respectively. However, interoperability and regulatory constraints showed a negative and insignificant influence on PSPs' effectiveness having coefficient value of -0.206 and -0.145 respectively with insignificant value of p=0.165 and 0.241 respectively. The result of second route indicated that cross-border peer to peer and peer to merchant transaction (CPTM) which is the key feature of UPI Nepal has the highest level of influence on PSPs' effectiveness with exponentiation of the B coefficient Exp(B) =24.548 shows UPI will set an ample challenge to the existing PSPs in Nepal. The research recommended that, PSPs need to enhance the customer service with offering low transaction and MDR. Also, diversifying their business across the border.

Keywords— Payment Service Providers (PSPs), Unified Payment Interface (UPI), Interoperability, Payment Service Providers (PSOs), Digital Payment

I. INTRODUCTION

The rapid growth of technology has empowered almost all sectors. ICT has revolutionized the entire finance sector with the introduction of digital payment system which has enabled us to perform transaction without using cash or cashless. A digital payment refers to the use of wireless communication technology and electronic gadgets to make the purchase of products and services more convenient. The number of transactions in terms of volume using wallets was 1,01,79,557 in FY 2019/20 which has reached to 1,48,84,701 in the FY 2021/22 and the transaction in terms of value using wallets was Rs. 10,222 (Million) in FY 2019/20 which has jumped to Rs. 14,660 (Million) in FY 2021/22 [16]. There is a global trend of consistent increase in mobile banking adoption during COVID-19.

The Payment Service Provider (PSP) is the institution which provides payment related service to beneficiaries and are operated after the issuance of license by NRB. At present there are total of 28 PSPs licensed by NRB till the Fiscal year 2020-21[16]. Since, the trend of digital payment is increasing globally, India, our neighbor country, has transformed the entire digital payment system with the introduction of Unified Payment System (UPI) by National Payments Corporation of India (NPCI). UPI is a system that powers multiple bank accounts into a single mobile application (of any participating bank), merging several banking features, seamless fund routing & merchant payments into one hood. Yet despite this enthusiasm and rapid growth, the Internet has been recognized as a difficult place to do serious business [19]. The rise of PSPs has highly contributed in the economy of the country contributing to reduce inflation rate and unemployment levels, increase foreign direct investment and government revenue, and ultimately raise economic growth.

At present, the situation of PSP industry is overcrowding due to existence of multiple players in market and saturating the situation, with the majority of them offering similar services and functions. Thus, with immense competition in the market among PSPs, it has been very essential to know the determinants and

measurement of their effectiveness so that PSPs can focus on these elements. In the mean time, NPCI International, in 17 February 2022, has joined hands with Gateway Payments Service Pvt Ltd, authorized Payment System Operators in Nepal to launch Unified Payment Interface (UPI) in Nepal.

With the rapid innovation and technological change, we need to ensure that the PSPs are effective enough to deliver the services as anticipated by its consumers and merchants. Therefore, this study analyze the effectiveness of PSPs and study the challenges to PSPs in Nepal with entrance of PSOs with Open Innovation such as UPI and its future prospects among the users of Kathmandu valley, Nepal. This study is conducted using ordinal regression and Spearman's correlation due to non-normal distribution of data to analyze the factor that influence the effectiveness of PSPs and challenges offered by UPI with its future prospects.

II.   LITERATURE REVIEW

Digital Transformation is the changes that digital technology such as social media, mobile, analytics or embedded devices causes or influences in all aspects of human life [3]. Digital wallets provide a method for making payments electronically, enabling users to transfer funds between transaction accounts. When the digital wallet is based on mobile devices (e.g., smartphones, tablets) it is referred to as a mobile wallet [4]. It possible to improve effectiveness of PSPs which can be useful to other service industries to make strategies to increase effectiveness.

Nepal's first digital wallet e-Sewa was established in 2009 with licensed Payment Service Provider from Nepal Rastra Bank (Central Bank of Nepal) and an ISO 27001:2013 certified which is a subsidiary company of F1Soft International. The NRB continued its priority for the development of payments system in its Second Strategic Plan (2012-2016) aimed to promote efficient and effective payment system. The payment service providers should focus more in making the electronic payments services more user friendly, accessible and easier to attract users' attention. Policy makers should also give higher priority for making the electronic payment services more accessible, user friendly and widely acceptable in the markets, besides making them secure and trustworthy [27]. At present Fonepay has 250k+ Merchants who are using the Fonepay platform to sell goods & services and more than 20 Million consumers in Nepal [6]. Also, Government of Nepal developed Nepal Rastra Bank Act, 2002, with an objectives to develop a secure, healthy and efficient system of payment [10]. However, due to many players in the digital payment market providing the similar kind of service one must understand the fact that current presence

of PSPs does not satisfy and guarantee the effectiveness of PSPs.

The adoption of digital payment is rising more due to being user friendly, accessible, and easier to attract users' attention and higher positive attitude towards mobile banking as well as the perceived risk of COVID. The adoption of digital payment is accelerated at a high pace [8,9,10]. Various studies were conducted on identifying the adoption of digital payment using Technology Acceptance Model (TAM) which was introduced by Devis D. Fred in 1986 A.D. which deals more specifically with the prediction of the acceptability of an information system. It was developed based on the Theory of Reasoned Action (TRA), to test user acceptance and use of information systems. According to the theory, two personal belief perceived ease of use and perceived usefulness are affected by external factors and estimate the significance towards using a technology [21].

UPI (Unified Payment Interface) is a digital innovation with an instant payment option developed indigenously in India. UPI works on a technology known as Open API (Application Programming Interface) [13]. The conceptual structure of UPI is shown in figure 1.
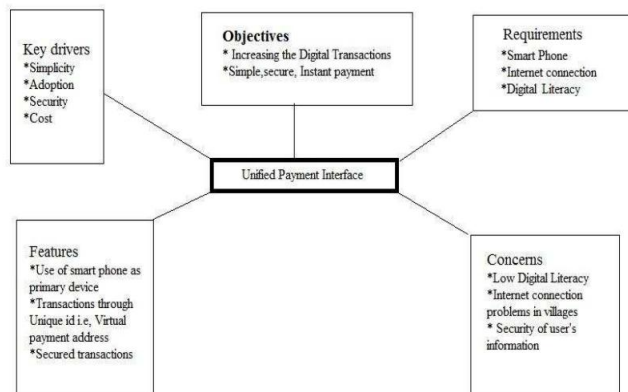

Figure 1: Conceptual Structure of Unified Payments Interface (Kakadel & Prof. Veshne., 2017) [13]

The six major parties directly involved with Internet Payment System: Financial Institutions including Banks and Non-Bank Financial Institutions (NBFI), Internet Payment Providers (IPS) or manufacturers, Merchants (vendors), Consumers, Regulators and Network Providers [22]. The figure 2 shows Six major parties in Internet Payment System.
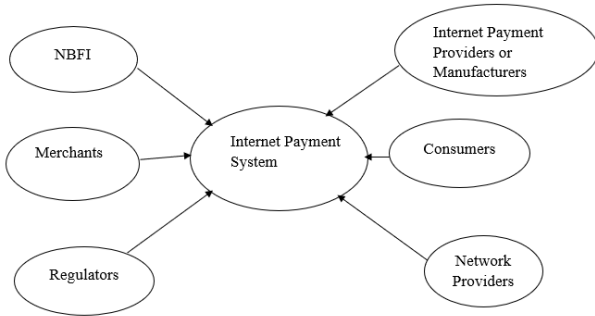
Figure 2: Six major parties in Internet Payment System[12]

Cost effective, convenient access, time saving, information accuracy, efficient services and security are the major concerns for effectiveness of Digital payment systems [28]. For finding the effective of Internet payment system they have identified the effectiveness criteria based upon the role of financial institutions, Merchants, Regulators, PSPs, Consumers and Network providers. The study found that consumers are more concerned with security and privacy, while regulatory bodies want to have the ability to trace transactions to prevent illegal usage. Merchants, as one might expect, wished to provide systems which consumers would want to use, while Internet payment service providers and network providers are most concerned with consistency [22].

III. RESEARCH FRAMEWORK

3.1 Proposed Effectiveness Factors, and the Research Hypotheses

The research model consists of the two variables dependent and independent as shown in figure 3. Utilizing the proposed framework, this study proposes six independent variables and one dependent variable. Security Concern (SC), Interoperability (IO), Customer Service (CS), Low Transaction Fee and Merchant discount Rate (LTFM), Regulatory Constraints (RC) and Cross-Border Peer to Peer and Peer to Merchant Transaction (CPTM) as independent variables that determine the consumer's and merchant's perceptions towards the effectiveness of PSPs. The proposed model is illustrated in Figure 3.
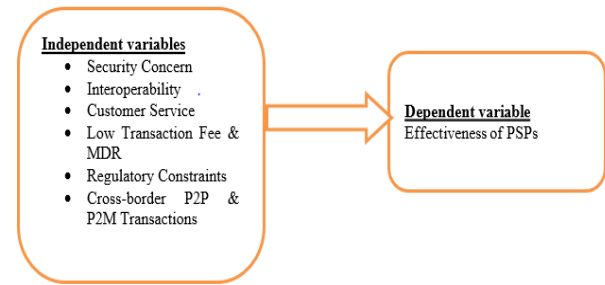

Figure 3: Proposed research model for effectiveness of PSPs

3.1.1 Security Concern (SC)

security factors are one of the important and prominent factors that would affect the consumer's attitude to use mobile wallet services [24]. There is no solution to control over cyber-crime but suggests minimizing these crimes by taking various security measures [20]. Mobile wallet providers must provide high level security measures, provide guidelines and create awareness time to time so that the fear from vulnerabilities and threads can't be attack by hackers [16]. Therefore, the following hypothesis was formulated:

H1: Security Concern has a significant positive effect on effectiveness of PSPs

3.1.2 Interoperability (IO)

Interoperability is a characteristic of a product or system to work with other products or systems. While the term was initially defined for information technology or systems engineering services. a robust environment of interoperability in payments systems benefits all participants in the payments ecosystem. End users, including consumers, merchants, governments, and other types of enterprises, find it easier to make and accept payments [3]. Interoperability features ends the burden of downloading various apps for different wallets in mobile which saves the memory of mobile phone as well as time of the consumer. Hence, the following hypothesis was formulated:

H2: Interoperability has a significant positive effect on effectiveness of PSPs.

3.1.3 Customer Service (CS)

Customer service is the team of people who provide help when customers have trouble with a company's products or services. customer service quality directly affects satisfaction and satisfaction directly affects the positive behavioral intentions and overall effectiveness [2]. Satisfaction and loyalty are not surrogates for each other. It is possible for a customer to be loyal without being highly satisfied (e.g., when there are few other choices) and to be highly satisfied and yet not be loyal

(e.g., when many alternatives are available) [21]. Therefore, the following hypothesis was formulated:

H3: Customer Service has a significant positive effect on effectiveness of PSPs.

3.1.4 Low Transaction Fee & MDR (LTFM)

Transaction fee refers to amount that is charged by the payment service provider to transfer any amount to the receiver whereas MDR is a fee paid by merchants to Service providers for processing payments which is calculated as a percentage of the transaction. consumers do not consider payment a service but instead they see it as "a necessary evil". Low transaction fees, ease of use, guaranteed delivery are therefore 'dissatisfiers' rather than order winners. For mobile payment providers this means that it is important not to promote payment as a product in itself but as an enabler of new value adding services [5]. Therefore, following hypothesis was formulated:

H4: Low Transaction Fee & MDR has a significant positive effect on effectiveness of PSPs.

3.1.5 Regulatory Constraints (RC)

Regulatory framework, reliability and traceability are the major criteria for identifying the effectiveness of Internet payment system. They need to collect information about transactions in terms of managing customs duties and taxes. Regulators should act as facilitators rather than controller to increase the effectiveness of Payment service providers. Their dilemma is how to encourage the development of efficient Payment Service Providers while also being able to protect the public interest [22]. Therefore, following hypothesis was formulated:

Therefore, the following hypotheses were formulated:

H5a: Regulatory Constraints has a significant positive effect on effectiveness of PSPs.

3.1.6 Cross-Border P2P & P2M Transaction (CPTM)

Real time cross-border transaction refers to transfer of money digitally from PSPs of one country to PSPs of another country. According to the press release by Gateway payment Services, payment service provider licensed under Nepal Rastra bank, dated 2078/11/05 BS and information released by NPCI International on 17 February 2022, have announced that they are introducing UPI Nepal with Cross-border transaction facility. It means Nepalese can transfer money from Nepalese PSPs to Indian PSPs and vice-versa.

UPI is real-time payments (RTP) systems, providing simplicity, safety, and security in person to person (P2P) and person to merchant (P2M) transactions in India. Hence, the following hypothesis was formulated:

H6: Cross-border P2P & P2M Transactions has a significant positive effect on effectiveness of PSPs.

IV. METHODOLOGY

These This study followed a quantitative and qualitative approach-based data analysis to examine the effectiveness of PSPs. The participants were consumers and merchants at different education levels, age and gender in the Kathmandu Valley, Nepal. Data was collected using a questionnaire designed in two parts, a total of 32 questions among which first part consists of 5 questions related to demography and the second part is the main component of the questionnaire which consists of 27 questions to investigate the constructs SC, IO, CS, LTFM, RC and CPTM of dependent variable on a five-point Likert scale ranging from 1 as "Strongly Disagree" to 5 as "Strongly Agree". The descriptive and regression analysis of the obtained data was accomplished with the help of the Statistical Package of Social Science (SPSS) software (version 25.0) from IBM.

4.1 Data Collection and Sample Size

In this research a structured and self-reported questionnaire was used for collecting data. Since purposive sampling approach was employed when the participants were easily accessible and were ready to be involved in the research, employing purposive sampling technique 435 questionnaires were circulated via digital medium (web-based survey using social network, e-mail and messaging application) as well also physically who were part of the study sample. Out of 435 selected participants, 405 participants responded with completely filled valid form giving a response rate of 93.10 percent. Sample size of 384 can be considered to be an acceptable but for more reliability 405 sample size were taken for an approximate population up to 1,000,000 [15].

V. RESEARCH FINDINGS

5.1 The Demographic Data

Out of the 384 respondents Most of respondent 175 (43.2%) were under 25, 200 (49.4%) were between 26-30, 24 (5.9%) were between 31-35, 6 (1.5%) were between 36-40. According to the analysis majority of respondents were of age between 26-30 which indicates that youngsters from 26 to 30 age group are the major decision makers. 226 (55.8%) of respondents were from Kathmandu district, 123 (30.37%) of respondents were from Lalitpur district and 56 (13.83%) of respondents were from Bhaktapur district., 221 (54.6%) were having bachelor's degree, 95 (23.5%) were having master's degree and below 84 (20.7) were intermediate and below and 5 (1.2%) were having M. Phill/Ph. D degree. Most of the respondent 258 (63.7%) were job holder, 112 (27.7%) were student, 35 (8.6%) were self-employer. 201 (49.6%) were earning monthly income of Rs. 20000 and below, 100 (24.7%) were earning monthly Rs. 21000-40000, 38

(9.4%) were earning monthly income of Rs.41000-Rs.60000, 34 (8.4%) were earning monthly income of Rs.61000-Rs.80000 income level and 32 (7.9%) were earning monthly income of above Rs.80000. Table 1 presents the complete demographic data of the respondents.

Table 1: Demographics Data of the Study Sample

Characteristics	Answer	Frequnecy	Percent(%)
Gender	Male	283	69.9
	Female	122	30.1
	Total	405	100
Age	Under 25	175	43.2
	26-30	200	49.4
	31-35	24	5.9
	36-40	6	1.5
	Total	405	100
District	Kathmandu	226	55.80
	Lalitpur	123	30.37
	Bhaktapur	56	13.83
	Total	405	100
Education	Intermediate and Below	84	20.7
	Bachelor Degree	221	54.6
	Master Degree	95	23.5
	M. Phil/ Ph. D Degree	5	1.2
	Total	405	100
Occupation	Self-employer	35	8.6
	Student	112	27.7
	Job-Holder	258	63.7
	Total	405	100
Income	Rs. 20000 & below	201	49.6
	Rs. 21000-Rs. 40000	100	24.7
	Rs. 41000-60000	38	9.4
	Rs. 61000-80000	34	8.4
	Above 80000	32	7.9
	Total	405	100

Table 2: Result of Reliability Analysis

Reliability Statistics	
Cronbach's Alpha	N of Items
0.893	25

Variables	Item	Cronbach's Alpha
Security Concern	SC1	0.707
	SC2	
	SC3	
Interoperability	IO1	0.729
	IO2	
	IO3	
	IO4	
Customer Service	CS1	0.705
	CS2	
	CS3	
Low Transaction Fee and MDR	LTFM1	0.701
	LTFM2	
	LTFM3	
Regulatory Constraints	RC1	0.715
	RC2	
	RC3	
Cross-border Peer to Peer & Peer to Merchant Transactions	CPMT1	0.752
	CPMT2	
	CPMT3	
	CPMT4	
Effectiveness of PSPs	EP1	0.834
	EP2	
	EP3	
	EP4	
	EP5	
	EP6	

5.2 Reliability

Cronbach alpha, one of the most commonly used test, is used in this study to determine internal consistency of a study to test reliability. The study will be more reliable when the Cronbach's alpha values will be higher. Reliability score that ranges from 0.7 and higher is considered as acceptable. [11] which is shown in Table-2. In order to examine the data collection instrument, all variables of the research model have been evaluated for reliability. Cronbach alpha greater than 0.7 is regarded as reliable. Thus, the data taken in the study was reliable and has a good consistency [11].

5.3 Normality Test

The researcher should check whether the data, to be analyzed, represent the symmetrical distribution or not, before applying any parametric test. For that, some conditions are to be checked. If all the conditions are fulfilled, one can go for parametric test to check the hypotheses of the research, otherwise non-parametric test should be used for the same [23]. The table 3 shows two tests Kolmogorov-Smirnov and Shapiro-Wilk. if the data are normally distributed Linear Regression and Pearson Correlation method is used or else Ordinal Regression and Spearman Rank Correlation is used to analyze and interpret Likert Scale questionnaire response [12].

Table 3: Normality Test

Tests of Normality						
	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
EP	0.137	405	0.000	0.936	405	0.000
SC	0.277	405	0.000	0.762	405	0.000
IO	0.152	405	0.000	0.940	405	0.000
CS	0.170	405	0.000	0.932	405	0.000
LTFM	0.128	405	0.000	0.954	405	0.000
RC	0.120	405	0.000	0.961	405	0.000
CPTM	0.106	405	0.000	0.923	405	0.000

Since, for the data greater than 50, Kolmogorov-Smirnov test of normality is considered. For the result the Null hypothesis is the data follows normal distribution. So, if the value of alpha is greater than 0.05 at 95% confidence interval the null hypothesis is accepted but here all the variables have alpha value less than 0.05 so the alternate hypothesis is accepted which is the data follows non-normal distribution. Shapiro-Wilk test is the most powerful test of distribution whereas Kolmogorov-Smirnov test is the least powerful test. However, the power of Shapiro-Wilk test is still low for small sample size. It is recommended that the graphical techniques be combined with formal normality test and inspection of shape parameters such as skewness and kurtosis coefficients [25].

Table 4: Normality Test

		Absolute Value			Absolute Value
EP			LTFM		
	Skewness	-0.19058		Skewness	-2.42618
	Kurtosis	1.682552		Kurtosis	-1.59491
SC			RC		
	Skewness	-15.8589		Skewness	-3.45724
	Kurtosis	16.13755		Kurtosis	-1.22313
IO			CPTM		
	Skewness	-4.04645		Skewness	-5.23558
	Kurtosis	1.620622		Kurtosis	4.040891
CS					
	Skewness	-3.22552			
	Kurtosis	-1.47445			

For Skewness and Kurtosis, an absolute value of the score greater than 1.96 or lesser than -1.96 is significant at $P < 0.05$, while greater than 2.58 or lesser than -2.58 is significant at $P < 0.01$, and greater than 3.29 or lesser than -3.29 is significant at $P < 0.001$. In small samples, values greater or lesser than 1.96 are sufficient to establish normality of the data. However, in large samples (200 or more) with small standard errors, this criterion should be changed to ± 2.58 [26]. Since, the table 4 shows all the absolute values falls out of the range of ± 2.58 so the data follow non-normal distribution. Hence, Spearman Rank Correlation and Ordinal Regression is used to analyze and interpret Likert Scale questionnaire response [7].

5.3 Rising Trends and Status of Adoption of PSPs

The number of transaction or volume and value or amount of transaction through PSP is shown in the figure 4 and 4 [1].
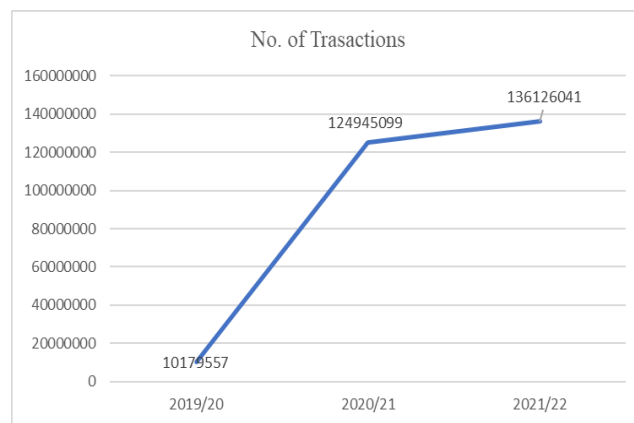

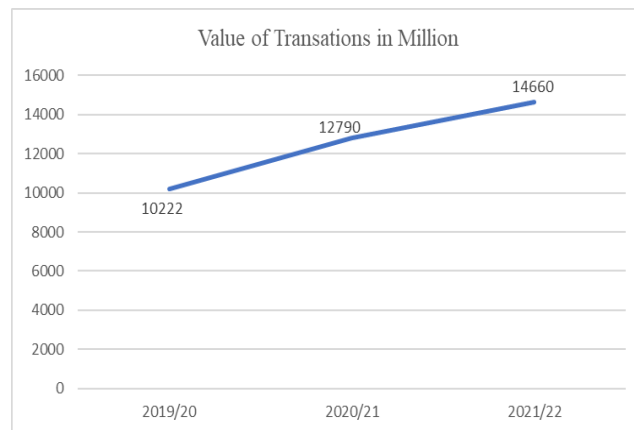**Figure 4:** No. of Transactions using PSP [16]

Figure 5: Value of Transactions in Million [16]

The Figure 4 and 5 shows Compound Annual Growth Rate (CAGR) of 20.83% in terms of transaction volume and CAGR of 19.75% in terms of transaction value of digital payment. Furthermore, the table 4 shows almost 90% of the respondent have used the digital payment systems every day or once a week or once a

month, with above 83% of them have used digital payment system 1-2 years or above two years.

Table 4: Usage Frequency and Usage Durstion of PSPs

Usage Frequency			Usage Duration		
	Frequency	Percent		Frequency	Percent
Everyday	135	33.3	1-3 Months	45	11.1
Few Times a week	122	30.1	3-6 Months	11	2.7
Few Times a month	106	26.2	6-12 Months	11	2.7
At least once a month	2	0.5	1-2 Years	117	28.9
Only for special occasion	25	6.2	Above 2 Years	221	54.6
Few Times a year	15	3.7	Total	405	100.0
Total	405	100.0			

Source: Research Data, 2022.

5.4 Structural Model Evaluation

Figure 5 structural modelling which represents all the variables including dependent and independent.
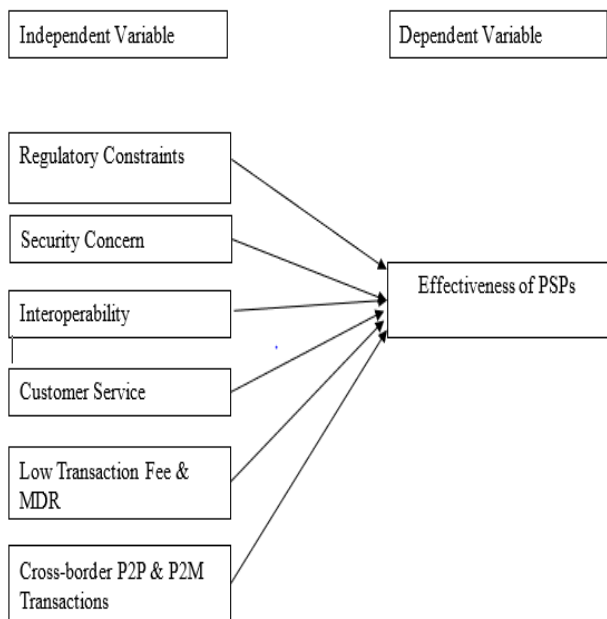
Figure 4: Research Model

Table 5 shows the calculated R Square values for each independent variables. R-squared measures the amount of variation in the data that is explained by the model.

To analyze the various hypothesized associations in the developed model. Table-7 shows the relationship, estimate coefficient, p- value and decision. Hypothesis to be significance the 0.05 significance level (i.e., $p < 0.05$).

Table 5: R^2 of the Independent Variable

Construct	R^2
Security Concern	0.082
Interoperability	0.104
Customer Service	0.160
Low Transaction Fee and MDR	0.194
Regulatory Constraints	0.130
Cross border P2P & P2M Transaction	0.577

The predictive power of the research model is determined by the R-square value of the dependent variables [9]. In this model it was found ranging 0.577 to 0.082, it signifies that predative power of this model is moderate.

VI. DISCUSSION

Spearman Rank Correlation and Ordinal Regression is used to analyze the data collected from 405 respondents due to non-normal distribution of data. Correlation measures the strength of the relationship between two variables which is represented in Table 7 where the value of correlation coefficient which is equals to 0.6 indicates a moderate positive relationship and value equals to 0.8 indicates a fairly strong positive relationship, while R-squared measures the amount of variation in the data that is explained by the model. A summary of correlation of variables using Spearman Rank correlation and the hypotheses testing results using Ordinal regression is shown in Table 8.

Table 7: Spearman Rank Correlation Matrix

Variables		EP	SC	IO	CS	LTFM	RC	CPTM
EP	Correlation Coefficient	1						
	Sig. (2-tailed)							
	N	405						
SC	Correlation Coefficient	.388**	1					
	Sig. (2-tailed)	0						
	N	405	405					
IO	Correlation Coefficient	.379**	.228**	1				
	Sig. (2-tailed)	0	0					
	N	405	405	405				
CS	Correlation Coefficient	.396**	.488**	.492**	1			
	Sig. (2-tailed)	0	0	0				
	N	405	405	405	405			
LTFM	Correlation Coefficient	.425**	.297**	.452**	.471**	1		
	Sig. (2-tailed)	0	0	0	0			
	N	405	405	405	405	405		
RC	Correlation Coefficient	.380**	.351**	.328**	.554**	.315**	1	
	Sig. (2-tailed)	0	0	0	0	0		
	N	405	405	405	405	405	405	
CPTM	Correlation Coefficient	.784**	.383**	.431**	.321**	.374**	.451**	1
	Sig. (2-tailed)	0	0	0	0	0	0	
	N	405	405	405	405	405	405	405

Notes: *The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.*

6.1 Relationship between Independent and Dependent Variables

The result reveals that the value of correlation coefficient between the variables. The possible range of values for the correlation coefficient is -1.0 to 1.0. In other words, the values cannot exceed 1.0 or be less than -1.0. From the above table the value of correlation coefficient of each independent variables with dependent variable lies in the range from 0.784 to 0.379 with CPTM having the highest coefficient value and IO having the lowest.

6.2 Relationship between Independent Variables

The above Table 7 shows that independent variables RC and CS has the highest value of Correlation coefficient i.e. 0.554 whereas the variables IO and SC has the lowest value of 0.228.

6.3 Testing of Hypothesis

The Table 8 shows the testing of the hypotheses using Ordinal regression since the data are not normally distributed. Three out of six hypotheses were supported. In that, the hypotheses H3, H4 and H6 were supported, while hypotheses H1, H2, H5 found to be not supported from proposed model.

Table 8: Result of Hypothesis via Ordinal Regression

Model	Estimate	Std. Error	df	Sig.
SC	0.13	0.128	1	0.308
IO	-0.206	0.149	1	0.165
CS	0.434	0.164	1	0.008
LTFM	0.342	0.122	1	0.004
RC	-0.145	0.124	1	0.241
CPTM	3.201	0.203	1	0
Dependent Variable: EP				

The negative estimate or coefficient are interpreted as the values of independent variable increases, there is decreased probability of falling at a higher level on the dependent variable. Positive estimate or coefficient are interpreted as value rise in the independent variable there is an increased probability of falling at greater level on dependent variables. Log odds tell us how likely it is that something particular will happen.

According to the study findings, (Estimate= 0.13, P > 0.05) there was positive insignificance relation between security concern and effectiveness of PSP, it means the security concern security concern could not significantly influence the effectiveness of PSPs. (Estimate= -0.26, P>0.05) there was negative insignificant relation between interoperability and effectiveness of PSPs, it means that for every one unit increase in interoperability, there is a predicted decrease of 0.26 in the log odds of being on a higher level of effectiveness of PSPs. (Estimate=0.434, P<0.05) there was positive and significant relation between customer service and effectiveness of PSPs, it means that every one unit increase in customer service, there is a predicted increase of 0.434 in the log odds of being at a higher level of effectiveness of PSPs. (Estimate= 0.342, P<0.05) there was positive and significant relation between low transaction fee and MDR, it means that every one unit increase in low transaction fee and MDR, there is a predicted increase of 0.342 in the log odds of being at a higher level of effectiveness of PSPs. (Estimate= -0.145, P<0.241) there was negative insignificant relation between regulatory constraints and effectiveness of PSPs, it means that for every one unit increase in regulatory constraints, there is a predicted decrease of 0.241 in the log odds of being on a higher level of effectiveness of PSPs. (Estimate = 3.201, P<0.05) there was positive and significant relation between cross-border peer to peer & peer to merchant transaction and effectiveness of PSPs, it means that every one unit increase in cross-border peer to peer & peer to merchant transaction, there is a predicted increase of 0.434 in the log odds of being at a higher level of effectiveness of PSPs. The summary of the Hypothesis is shown in the Table 9.

Table 9: Hypothesis Result Summary

Hypotheses No.	Statement	Result
H₁	Security Concern has a significant positive effect on effectiveness of PSPs.	Reject
H₂	Interoperability has a Significant positive effect on effectiveness of PSPs.	Reject
H₃	Customer Service has a significant positive effect on effectiveness of PSPs	Accept
H₄	Low Transaction Fee & MDR has a significant positive effect on effectiveness of PSPs	Accept
H₅	Regulatory Constraints has a significant positive effect on effectiveness of PSPs	Reject
H₆	Cross-border P2P & P2M Transactions has a significant positive effect on effectiveness of PSPs	Accept

6.3 Second Route Result

The key difference between route-one and route two result is the Exp (B) column. The Exp(B) column contains odd ratios reflecting the multiplicative changes in the odds being in a higher category on the dependent variable for every one unit increase on the independent variable holding the remaining independent variables constant. The Table 10 shows the route two result of the model.

Table 10: Second Route Result

Model	B	Std. Error	df	Exp(B)
SC	0.13	0.12	1	1.139
IO	-0.206	0.1534	1	0.814
CS	0.434	0.162	1	1.544
LTFM	0.342	0.133	1	1.408
RC	-0.145	0.1167	1	0.865
CPTM	3.201	0.2203	1	24.548
Dependent Variable: EP				

- Exp(B) an odd ratio >1 suggests increasing probability of being in a higher level on the dependent variable as values on an independent variable increase.
- Exp(B) an odd ratio <1 suggests decreasing probability with increasing values on an independent variable.
- Exp(B) an odd ratio = 1 suggests no predicted change in the likelihood of being in a higher

category as values on an independent variable increases.

The above Table 10. indicates that the odds of being in a higher level on effectiveness of PSPs increases by 1.139, 1.544, 1.408 and 24.548, for every one unit increase in SC, CS, LTFM and CPTM respectively whereas Exp(B)= 0.814 of IO and Exp(B) = 0.865 of RC indicates a decreasing probability of being in a higher level on the employee performance as value increases on IO and RC respectively.

VII. CONCLUSION

The aim of this research is to examine the recent trends and adoption of PSPs and to analyze the factors that influence the effectiveness of PSPs in Kathmandu valley along with its future prospects. This study also aims to explore the challenges that to PSPs with the entrance of Unified Payment Interface (UPI) in Nepal. Digital payment system is changing perception and way of transaction with technology and innovation. Using digital tools in payment systems makes various sectors more interesting, easy to access, creative, effective, and productive which are responsible for the economic growth of nation.

Firstly, findings of the study concludes there is rising trends and adoption of PSPs among the users in Kathmandu valley. Secondly, Out of the 6 hypothesized associations in the research model, 3 supported hypotheses presented relationships between dependent and independent variables of the model. The study concluded that the effectiveness of PSPs would increase if the PSPs enables Cross-border Peer to Peer & Peer to Merchant Transactions feature with real time 365*24*7 customer service and reducing the Transaction Fee & Merchant Discount Rate (MDR) to least possible. However, consumers and merchants does not found security, interoperability as important factor for determining effectiveness of PSPs and the study concluded that the one of the major player i.e. regulatory body should facilitate the operation of PSPs rather than only controlling them by minimizing the constraints. The study revealed that E-sewa is the most popular brand among other PSPs.

Thirdly, the route two result shows Cross-border Peer to Peer & Peer to Merchant Transactions has highest Exp(B) value of 24.548 concluding that this variable is reflecting the highest multiplicative changes on dependent variable compared to all other ones. Since, the entrance of Unified Payment Interface (UPI) will enable a feature of Cross-border Peer to Peer & Peer to Merchant Transactions in Nepal which shows the high probability that the PSPs in Nepal can face hard challenges with entrance of PSOs with Open Innovation such as UPI. Hence, the future landscape of digital wallets can be

diversification or partnership and penetration. The outcomes of the study offers that Cross-border Peer to Peer & Peer to Merchant Transactions highly influence the effectiveness of PSPs and none of the PSPs have such feature at present. In such situation the entrance of Unified Payment Interface (UPI) will create a threat in the PSP industry. Furthermore, the PSPs should focus on enhancing the customer service and offering low Transaction Fee & Merchant Discount Rate (MDR).

Since, PSP industry outlook also depend on regulatory policies, both the parties i.e. PSPs and regulatory body need to actively work to design more facilitating policy frameworks. The market potential of the PSPs is huge and still many sectors are unexplored. There is still huge market potential in tier 2 and 3 cities

RECOMMENDATION

Further studies can be carried out in different areas which has been listed below:

i. Research can also be carried out for study of effectiveness of different industries in Nepal such as Manufacturing Industry, Banking Industry, E-commerce business, Hotel and restaurants and so on.
ii. Further, large sample size could be taken for the purpose of the study.
iii. Further study can be conducted to identify the effectiveness of the PSPs based upon the researched indicators.
iv. This study is based on Kathmandu Valley thus, further it can be conducted in other cities as well as rural areas of Nepal
v. Also, this study is based on Aaker's Model, further models prescribed by Keller or others can be taken into consideration.
vi. Further research can add additional variables variables in the current framework.
vii. Current study is based on convenient sampling; further other forms of sampling technique can be included for the collection of data.

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