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Digital transformation of banking: Assessing mobile banking adoption in Nepal

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ABSTRACT

The purpose of study was to investigate the influence of perceived usefulness, perceived security, and perceived cost on behavioral intention to adopt mobile banking, which reflects the evidences from among the users of digital mobile banking services in Kathmandu, Nepal. The study fills a gap in the literature by examining the influencing factors for mobile banking adoption. This study adopted descriptive and casual correlational research design to test the hypotheses. The survey employed cross-sectional data using convenience-sampling technique, disseminated 607-structured questionnaire among the target respondents of Kathmandu municipality, Nepal, and received only 400 (65.89 percent) useful questionnaires. This study assessed the internal consistency with the value of Cronbach's alpha where the value of Cronbach's alpha for all constructs remained > 0.70 depicting the reliability for the analysis. Further, this study adopted descriptive statistics: frequency and percentage for the result of general information of respondents and correlation and regression analysis for testing association and impact in the study. The findings of the study showed that perceived usefulness and perceived security found positive association with behavioral intention to adopt mobile banking services, in Kathmandu, Nepal. Further, perceived cost found negative impact on behavioral intention for adoption of mobile banking services indicating inverse link between cost and mobile banking adoption. Thus, banking professionals may use this model to develop safe, practical, and easy-to-use mobile banking services to win trust of users and to boost mobile banking services. Similarly, the findings of the study extends benchmark to academics, policymakers, and others.

Contribution/Originality: The present study addresses a gap in the existing literature by investigating the effect of perceived usefulness, perceived security, and perceived cost on the behavioral intention to embrace mobile banking. The findings of this study provide insights into the Nepalese context.

1. INTRODUCTION

Digitalization has become indispensable in banking and financial institutions to flourish with competitive position in the market as customers seek a more simplified, personalized, and responsive banking experience. Innovative services and products including online payments, mobile banking, and robo-advisory have been made possible by the growth of mobile banking (Wu, Yu, & Lv, 2023). Importantly, smartphones are becoming indispensable devices in our daily lives. With a wide range of apps, devices are utilized for a number of tasks in addition to conversation, like

accessing social media, perusing the internet, watching videos, navigating, counting stars, making financial transfers, and more (Basar, Alptekin, Volaka, Isbilen, & Incel, 2019).

In addition, providing financial services through mobile devices and mobile communication technologies is the aim of mobile banking, which is a subset of electronic banking system. As clients are concerned, confidentiality, integrity, authentication, and non-repudiation are essential elements of success. Perceived usefulness can be achieved if users can access banking services whenever and wherever they choose, without needing to visit a financial and banking institutions or have a computer devices nearby. Moreover, currently, online access and other methods are primarily used to attain security m-banking determinant (Cano & Domenech-Asensi, 2011; Pousttchi & Schuring, 2004; Tiwari & Buse, 2007).

In particular, financial institutions are attempting to cut costs by closing their least important branches while also investing more in digital technologies like big data, cloud computing, smartphones, and high bandwidth. Consequently, technology has made it possible for banking to operate entirely online, negating the need for physical branches (Wang & Wu, 2024). Interestingly, modern banking is largely electronic and operates based on mobile technology. Almost everyone utilizes it in one way or another; usually through web services or mobile apps. Many recommended and used security measures, such SMS codes and mobile tokens, are available. The public is made to feel as though electronic security is handled (Wodo, Stygar, & Błaśkiewicz, 2021).

Specifically, online banking in the financial sector has evolved and been maintained by advances in virtual technology and mobile applications. Banks provide digital commerce via applications for unified payment interfaces. On smartphones, tablets, and various other mobile devices, these programs enable remote banking transactions. Global adoption of mobile banking methods and technologies has increased (Basu, Sebastian, & Kar, 2024). By contrast, customers' perceptions of the cost of services have a big influence. If users believe that a certain service is expensive, users may use it less frequently. The key determinant of a customer's willingness for adopting services of electronic banking was influencing factor to be considered useful and safe (Tiwari & Tiwari, 2020). In order to maintain and secure the customer base, banks must update their mobile banking systems, which have emerged as one of the key components and those consumers utilize most efficiently. Based on users' behavioral intentions to transfer funds, use credit or debit cards, and for other purposes, mobile devices update the services related to mobile banking usage.

However, use of mobile banking services does not seem consistently adopted and its adoption is growing differently in different context (Thapa, Bhandari, & Pathak, 2021). Thus, the purpose of this research is to examine the effect of mobile banking services on behavioral intention for the use of mobile banking services among the banking sector customers in Kathmandu, Nepal. Further, remaing research work of this study has organized into following segments: second part of this paper contains literature review followed by theoretical foundation and empirical review. Next, section three describes the methods. Section four describes the presentation and results. Section five describes findings and discussion, section six describes the summary and conclusion of the study, and finally, section seven describes the limitations and future research.

2. LITERATURE REVIEW

2.1. Theoretical Foundation

2.1.1. Technology Acceptance Model (TAM)

There are many theories in the literature that attempt to explain how people utilize technology, and the most well known one is the Technology Acceptance Model (TAM). Davis, Bagozzi, and Warshaw (1989) introduced the model also known as Technology Acceptance Model (TAM) to describe a potential user's behavioral intention to use technological innovation. Interestingly, among many, it is the most well-known idea due to its clarity, simplicity, and suitability for a variety of it (Davis et al., 1989; King & He, 2006). Moreover, Fishbein, Ajzen, and Flanders (1975)

developed the Theory of Reasoned Action (TRA), a foundational concept for user adoption and IT usage that serves as the basis for most models.

Moreover, this model created to forecast how well users would accept new technology. It reveals that the discussion held on how consumers' impressions of technology have a big impact on its attitudes, intentions, and usefulness. The two elements of attitude—perceived utility and ease of use—affect intention to use. The degree to which an individual feels that using a certain technology boosts their productivity at work is known as perceived usefulness (Davis et al., 1989).

Suhartanto, Dean, Ismail, and Sundari (2020) demonstrated that customers who think mobile banking is significant are more inclined to embrace m-banking technologies. According to Ratten (2015) a client may consider technology helpful if they believe it fits well with their lifestyle.

According to Shin (2010) a multitude of approved dealers, simple management, quick payment services, and expedient payment processes are all factors that contribute to mobile banking's perceived ease of use. TAM, therefore, includes a single dependent variable called behavioral intention, which measures how much an individual has purposefully planned to do or not do specific activities in the future.

2.1.2. Unified Theory of Acceptance and Use of Technology (UTAUT)

The theories of technology adoption include the social cognitive theory, the theory of planned behavior (TPB), the model of PC usage (PCU), the motivational model (MM), the innovation diffusion theory (IDT), the theory of reasoned action (TRA), technology acceptance model (TAM), and empirically evaluated (SCT) (Venkatesh, Morris, Davis, & Davis, 2003). These theories forecast and describe user behavior by utilizing a range of separate components (Šumak, Polančič, & Heričko, 2010).

Ultimately, a comprehensive framework called the Unified Theory of Acceptance and Use was proposed by Venkatesh et al. (2003). The UTAUT designed as a model that offers most comprehensive acceptance representation of all the comparable theories. There are a number of elements that can directly influence behavioral intentions, including social influence, performance expectancy, effort expectancy, and facilitating conditions. In order to mitigate the impact of the previously listed key indicators on behavioral intentions and use behavior, important factors including gender, age, experience, and voluntariness of use are used (Šumak et al. (2010). The primary similarity between the TAM and UTUAT theories is that they evaluate the technology's usability and simplicity of use. Performance expectancy (PE) refers to the extent to which end users would benefit from utilizing technology for particular tasks.

In the context of the TAM model, PE is similar to perceived usefulness and it was highlighted by Oliveira, Faria, Thomas, and Popovič (2014) and identified it as the primary determinant impacting the decision to use mobile banking. As with perceived ease of use in the TAM model, effort expectancy (EE) describes how convenient customers' technology use is. According to Shaikh and Karjaluoto (2015) perceived utility and ease of use were found to be the two most commonly used characteristics in studies on the adoption of mobile banking, based on an examination of 55 papers on the topic.

2.2. Empirical Review

2.2.1. Perceived Usefulness (PU)

Perceived usefulness refers to how much a person believes using a technology would increase their productivity at work (Karahanna, Straub, & Chervany, 1999). Initial expectation of people while utilizing new technology, according to Saman (2018) is to determine whether the new application is beneficial. If new technologies do not benefit to people, it will consequently reject the technology. Individuals often utilize or do not use an application depending on how much they think it will improve their ability to do their jobs better (Davis, 1989). The empirical results demonstrated that behavioral intention to use mobile banking and perceived usefulness have a positive and substantial

association (Changchit, Lonkani, & Sampet, 2017; Hew, Leong, Ooi, & Chong, 2016; Patel & Patel, 2018; Talwar, Dhir, Khalil, Mohan, & Islam, 2020).

H_1: There is a significant impact of perceived usefulness on behavioral intention to adopt mobile banking.

2.2.2. Perceived Security (PS)

People become demotivated when they face risk. Risk is not a feature of the product; rather, it is a consumer's perception (Fain & Roberts, 1997). Customers may have security and privacy concerns about online purchases in general and mobile transactions in particular (Barnes & Corbitt, 2003). Due to the remote and impersonal nature of the online environment and the inherent unpredictability of using a global open infrastructure for transaction, risk has evolved into a crucial component of e-commerce. There are two sorts of uncertainty: behavioral uncertainty and environmental uncertainty (Pavlou, 2003). The empirical findings showed that perceived security and behavioral intention to use mobile banking are positively and significantly correlated (Changchit et al., 2017; Patel & Patel, 2018; Singh & Srivastava, 2018).

H_2: There is a significant impact of perceived security on behavioral intention to adopt mobile banking.

2.2.3. Perceived Cost (PC)

The extent to which an individual believes they possess the funds or assets necessary to utilize technology is known as the perceived cost. The idea that new technology is cost-effective supports this notion (Wang, Lin, & Luarn, 2006). Cost perception is the degree to which users anticipate incurring financial costs when utilizing a specific technology. The cost that consumers bear when utilizing mobile banking affects the uptake of this service (Bao, Ling, & Sun, 2012; Behl & Pal, 2016; Bharti, 2016). The research results demonstrated that the behavioral desire to use mobile banking is inversely correlated with perceived cost (Singh & Srivastava, 2018).

H_3: There is a significant impact of perceived cost on behavioral intention to adopt mobile banking.

2.2.4. Behavioral Intention (BI)

The desire and endeavor of a person to participate in fundamental activity considered as behavioral intention. The perceived usefulness, perceived security, and perceived cost of mobile banking services have a significant impact on users' behavioral intention (Meiranto, Farlyagiza, Faisal, Nur Afri Yuyetta, & Puspitasari, 2024; Upadhyay, Upadhyay, Abed, & Dwivedi, 2022).

2.2.4.1. Research Framework

This research conducted to analyze the behavioral intention to use the mobile banking service. Perceived usefulness, perceived security, and perceived cost remained the independent variables and behavioral intention considered as a dependent variable for this study. The study adopted following research framework:

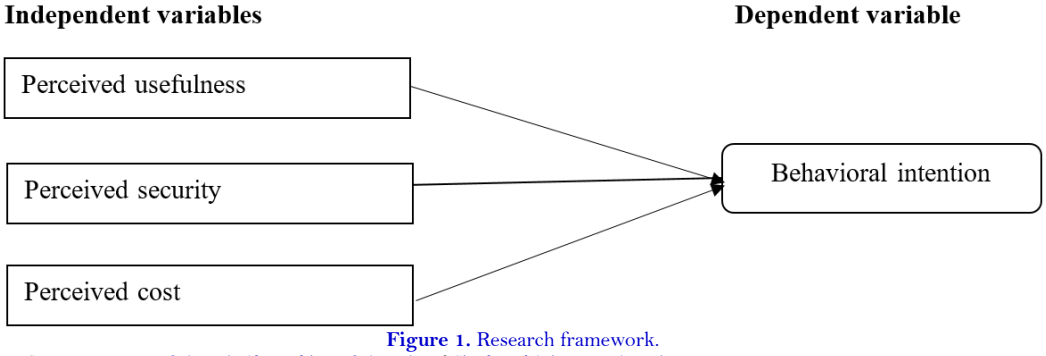

Figure 1. Research framework.
Source: Hew et al. (2016); Changchit et al. (2017) and Singh and Srivastava (2018).

The Figure 1 depicts the research framework that reflects a structured model, which outlines the key variables relevant to research study. The research employed independent variables: perceived usefulness, perceived security, and perceived cost and investigated its impact on behavioural intention to adopt mobile banking as a dependent variable.

3. METHODS

The main purpose of this research was to examining the impact of factors relating to perceived usefulness, perceived security, and perceived cost on behavioral intention for using the services relating to mobile banking in Kathmandu, Nepal. This study used a causal-relational and descriptive research approach to investigate the research hypotheses and accomplish the research objective. The population for the study were the respondents using mobile banking services from Kathmandu Metropolitan city, Nepal. The cross-sectional data based on structured questionnaire through convenience sampling was collected. Out of 607 questionnaire distributed among the targeted respondents, received only 400 (65.89 percent) useful questionnaire. The questionnaire was developed in two different segments consisting first part as demographic information of respondents and second part of it integrated opinion survey through Likert scale item based on each construct. The statistical tools adopted for descriptive statistics were frequency and percentage for demographic information. Similarly, study employed correlation and regression analysis for inferential analysis in this research. Further, the reliability test conducted in this study using Cronbach's alpha.

Table 1. Cronbach alpha.

Variables	Cornbach alpha
Perceived usefulness	0.941
Perceived cost	0.838
Perceived security	0.807
Behavioral intention	0.933

The Table 1 shows that the Cronbach's alpha values for perceived usefulness, perceived cost, perceived security, and behavioral intention are 0.941, 0.838, 0.807, and 0.933 respectively. As the Cronbach's alpha value is more than 0.70, it indicates that internal consistency has been identified and the data is reliable.

3.1. The Model Specification

The model specification for the multiple regression model in the study developed as follows:

$$BI = \alpha + \beta_1 PU + \beta_2 PS + \beta_3 PC + e \ldots\ldots i$$

Where,

BI= Behavioral Intention to adopt mobile banking.

PU= Perceived usefulness.

PS= Perceived security.

PC= Perceived cost.

e = Error term.

4. PRESENTATION AND RESULT

4.1. Descriptive Statistics

The descriptive statistics Table 2 depicted that the 400 respondents participated in the survey were majority of female (52.00 percent) and least were male (48 percent). Similarly, age group of respondents between 26 to 35 years were leading proportion (54.50 percent) and age group between 36 above were least portion of participants (13.00 percent). Moreover, mainly the married category of respondents (52.50 percent) participated in the survey and unmarried participants were (47.50 percent). Majority of respondents in the survey (42.30 percent) were as major portion of participants and least were intermediate (22.30 percent) level of educational background. Participants

working in non-banking sector (52.80 percent) were major portion and least were unemployed (24.00 percent). Income status above 600001 above (22.30 percent) were the leading income group of respondents and least were income group between 45001 to 60000 (14.20 percent).

Table 2. Demographic characteristics of respondents.

Demographic variables	Classification	Frequency	Percent
Gender of respondents	Male	192	48
	Female	208	52
	Total	400	100
Age of respondents	15-25	130	32.5
	26-35	218	54.5
	36 and above	52	13
	Total	400	100
Marital status of respondents	Married	210	52.5
	Unmarried	190	47.5
	Total	400	100
Education of respondents	Up to intermediate	89	22.3
	Bachelors	169	42.3
	Masters and above	142	35.5
	Total	400	100
Occupation of respondents	Employed-banker	93	23.3
	Employed-non-banker	211	52.8
	Unemployed	96	24
	Total	400	100
Income level of respondents	Less than 15000	83	20.8
	15001 to 30000	88	22
	30001 to 45000	83	20.8
	45001 to 60000	57	14.2
	60001 and above	89	22.3
	Total	400	100

4.2. Use of Mobile Banking Application

The Figure 2 shows that the majority of respondents (96.00 percent) found using mobile banking application and only (4.00 percent) of participants found with no use of mobile banking application.

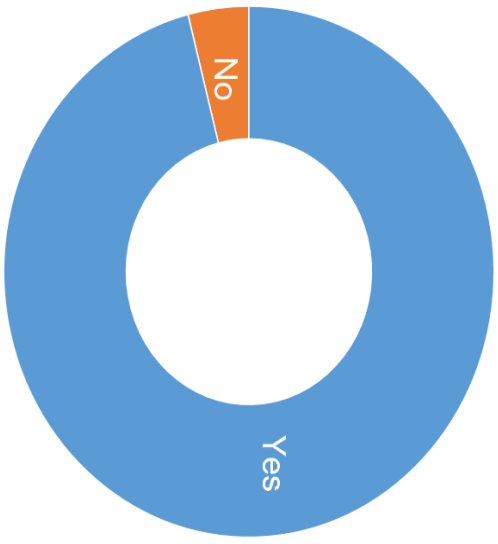

Figure 2. Use of mobile banking application.

4.3. Frequency for Use of Smart Mobile Banking Service

The Figure 3 reflects that participants as the majority of respondents (74.30 percent) frequently used their smart mobile banking services. Similarly, second group of respondents (15.00 percent) used smart mobile banking services occasionally. Moreover, respondents participated in the survey (8.50 percent) were in the category of using smart mobile banking services rarely used. Least portion of respondents (2.30 percent) never used the smart mobile banking services.

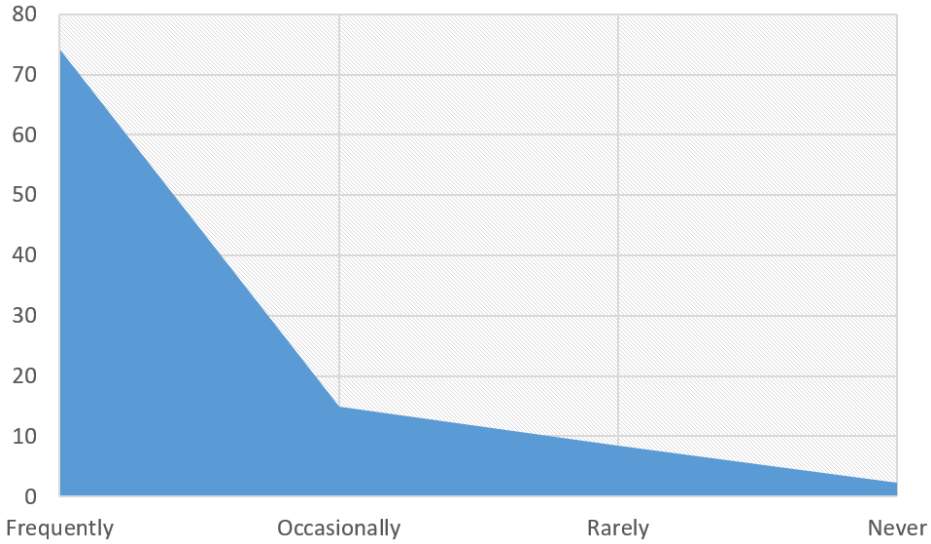

Figure 3. Frequency for use of smart mobile banking service.

4.4. Reason for Using Mobile Banking

The Figure 4 reflects that majority of respondents (55.30 percent) used the mobile banking services to perform their regular transaction. Further, second largest group of participants (20.00 percent) used their mobile banking to monitor transaction through the mobile application. Similarly, the groups of respondents (18.50 percent) used the mobile banking services to make payment for utility services. Least of the participants (6.25 percent) used their mobile banking for the view of bank statements.

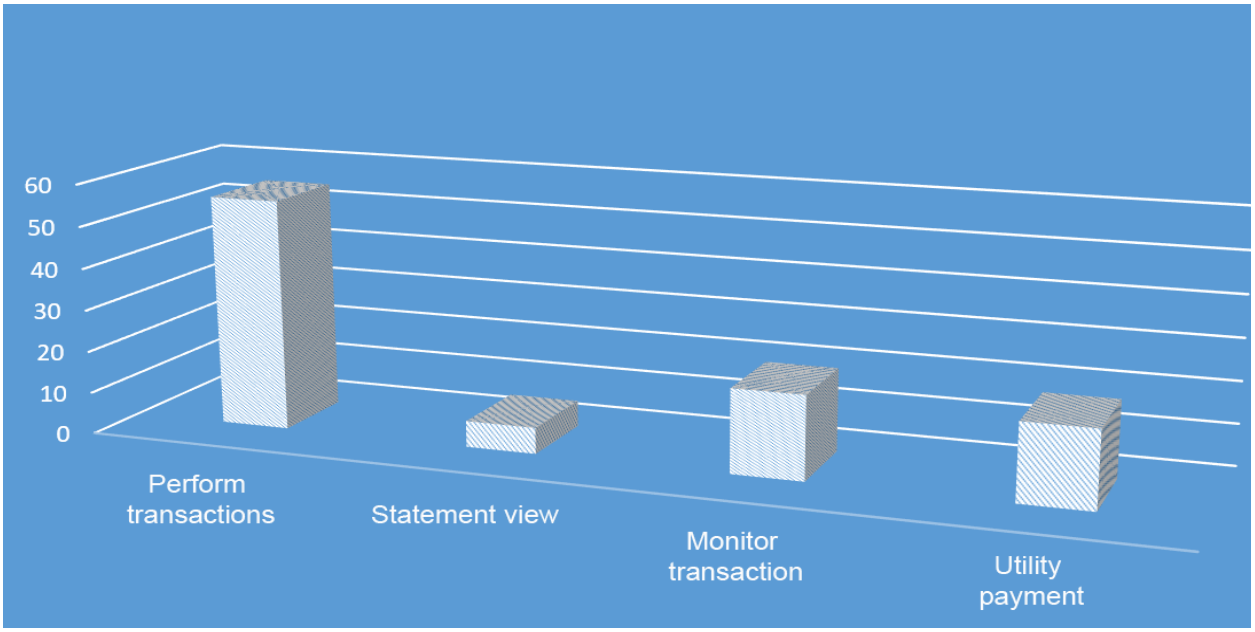

Figure 4. Reason for using mobile banking.

4.5. Correlation Analysis

The purpose of this analysis was to examine the relationship between the dependent variable, behavioral intention, and the independent variables, perceived usefulness, perceived security, and perceived cost, using Pearson's correlation analysis.

Table 3. Correlations analysis.

Variables	1	2	3	4
Behavioral intention	1.00			
Perceived usefulness	0.782**	1.00		
Perceived security	0.413**	0.440**	1.00	
Perceived cost	-0.251**	0.331**	0.543**	1.00

Note: **. Correlation is significant at the 0.01 level (2-tailed).

Table 3 presented the results of the correlation analysis using Pearson's correlation coefficient, which illustrates how the independent and dependent variables are related. Perceived usefulness had a strong association (correlation value of 0.782), indicating a positive relationship between perceived usefulness and behavioral intention to use mobile banking. Additionally, the correlation value for perceived security was 0.413, indicating that behavioral intention to adopt mobile banking services and perceived security found positively correlated. The relationship between behavioral intention and perceived cost, however, found negatively correlated (correlation value -0.251). That is, as cost for the mobile banking service declines, more users are willing to adopt mobile banking as a behavior.

4.6. Regression Analysis

The impact of perceived cost, perceived security, and perceived usefulness on behavioral intention investigated in this study using linear regression analysis. Therefore, the independent variables are PU (perceived usefulness), PS (perceived security), and PC (perceived cost). The dependent variable is BI (behavioral intention). The regression model adopted for the study is $= \alpha + \beta_1 PU + \beta_2 PS + \beta_3 PC + e \ldots . i$.

Where,

BI= Behavioral Intention to adopt mobile banking.

PU= Perceived usefulness.

PS= Perceived security.

PC= Perceived cost.

e = Error term.

Table 4. Regression analysis.

Variables	Unstandardized coefficients		t	Sig.	R square	F value	P value
	(B)	Std. error					
(Constant)	0.310	0.134	2.316	0.021	0.739	158.652	0.000
PU	0.321	0.043	7.381	0.000			
PS	0.060	0.036	1.675	0.095			
PC	-0.123	0.034	-3.582	0.000			

Note: Dependent variable: BI (Behavioral intention).
Predictors: (Constant), PU, PS, PC.
PU = Perceived usefulness, (PS = Perceived security, and PC = Perceived cost).

Table 4 of regression analysis shows that beta coefficient for perceived usefulness is positive. Further, one unit change in perceived usefulness brings the change in behavioral intention to adopt mobile banking by 0.321 unit. It demonstrates that behavioral intention to utilize mobile banking is positively influenced by perceived usefulness, i.e., higher perceived usefulness corresponds to higher behavioral intention to use mobile banking services. Similarly, the beta coefficient for perceived security showed the positive impact on behavioral intention in adopting services related to mobile banking. One unit change in perceived security brings the 0.060 unit change in behavioral intention for use

of mobile banking services. It means higher perceived security enhances the use of services relating to mobile banking. Finally, the beta coefficient for perceived cost showed the negative impact on behavioral intention to adopt mobile banking, which means one unit change in perceived cost, brings the change in behavioral intention by -0.123 in inverse way. It means that higher the perceived cost, lower would be the willingness to use services of mobile banking as behavioral intention and vice versa.

5. FINDINGS AND DISCUSSION

The study aimed to investigate how behavior intention to embrace mobile banking was influenced by perceived cost, perceived security, and perceived usefulness. The results of survey showed that behavioral intention to adopt mobile banking services among the users of Kathmandu, Nepal significantly influenced by perceived usefulness. This result is consistent with Changchit et al. (2017); Patel and Patel (2018); Talwar et al. (2020) and Hew et al. (2016). Similarly, perceived security found positive influence on the behavioral intention to embrace mobile banking services. It reveals that better security associated with mobile banking services, help to enhance the positive behavioral intention to adopt mobile banking services. This result is in line with Changchit et al. (2017); Patel and Patel (2018) and Singh and Srivastava (2018). Finally, the behavioral intention of adopting mobile banking found negatively impacted by perceived cost. It shows that higher the cost of mobile banking services, lower would be the behavioral intention to adopt mobile banking services among the users of Kathmandu, Nepal. This finding is in direction with Singh and Srivastava (2018). The findings of the study revealed that the higher usefulness associated with mobile service enhances the positive behavioral intention to adopt mobile banking services among the users in Kathmandu, Nepal. Similarly, better security aligned with mobile banking services show the positive supports to adopt mobile banking services willing to use more benefits using the digital path for the effective banking services. However, the users of mobile banking services depicted unwillingness to use the mobile banking services when its cost increases. It shows that the uses of mobile banking services in Kathmandu prefer nominal cost for its operation.

6. SUMMARY AND CONCLUSION

The purpose of the survey was to test the hypotheses and answer the research questions examining the impact of perceived usefulness, perceived security, and perceived cost on behavioral intention to adopt mobile banking services among the users of Kathmandu, Nepal. Similarly, survey attempts to fill up the research gap. Therefore, three independent factors used in this study: perceived cost, perceived security, and perceived usefulness. Further, the dependent variable of the study was behavioral intention to for using services of mobile banking. Thus, results from study can conclude that there was a positive correlation and influence between behavioral intention and perceived usefulness. This implies that in order to increase the number of people using mobile banking, the banking industries must improve the usefulness of mobile banking services. Further, behavioral intention to use mobile banking found strongly correlated with perceived security. It indicates that greater security and security features incorporated into mobile banking services encourage its more adoption. Similarly, a negative correlation observed between the variables of behavioral intention and the perceived cost of mobile banking services. It shows that occurring higher cost in mobile banking minimizes its use. The conclusion from this evidence reflects that in order to maximize the benefits of mobile banking, service providers must minimize costs associated with their offerings.

7. LIMITATION AND FUTURE RESEARCH

The current research pursued a particular path using cross-section data adopting purposive sampling, descriptive and casual relational research approach for the study. The further research can be conducted using longitudinal study, comprising different other methodological aspects and including more data. Further research can take place in different context extending the other influencing factors as leading variables.

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Transparency: The authors state that the manuscript is honest, truthful, and transparent, that no key aspects of the investigation have been omitted, and that any differences from the study as planned have been clarified. This study followed all writing ethics.
Competing Interests: The authors declare that they have no competing interests.
Authors' Contributions: Conceptualization, methodology, analysis, P.B. L.; data collection, S.C.; writing – original draft, P.B.L., R.S., B.D.L., & S.C.; writing – review & editing and supervision, P.B.L. B.D.L, M.K. & R.S. All authors have read and agreed to the published version of the manuscript.

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