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# INVESTIGATION OF FACTORS FOR ADOPTING MOBILE COMMERCE IN A DEVELOPING COUNTRY

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## Abstract

The growth of mobile phones and the internet technologies have greatly improved access to information and encompassed the social and business world. From the Information and Communication Technology for Development (ICTD) perspective, researchers are interested in whether mobiles promote or enable economic growth or broader well-being. In developing countries, a successful model in one country cannot easily be replicated in another country. This study investigates the factors that may lead to adopting mobile commerce in a developing country in South Asia.

## Keywords

Mobile Phone, Internet, Developing Economy

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## I. Introduction

Access to information is key for communication and for controlling our environment to improve our lives. The growth of mobile phones and internet technologies have greatly improved the access to information and encompassed the social and business world. Mobile use may cross from personal over to commerce in some developing world households (Donner 2008). From the Information and Communication Technology for Development (ICTD) perspective, researchers are interested in whether mobiles promote or enable economic growth or broader well-being. The effects of mobile commerce or m-commerce have had mixed results so far. According to Jenson (2007), the arrival of mobiles brought significant reductions in the variability of price and amount of waste in the fishing system on Kerala coast of India. Although it may seem logical in emerging economies to provide financial services to people in poverty to help get them out of poverty, the operations of mobile money have its share of failures all over the world. The M-Pesa model in Kenya was a big success (Gajjala & Tetteh 2014), however the same model failed in South Africa (Mulligan 2014). This shows that you cannot replicate a successful M-Pesa model to other markets without paying attention to other social and technological factors. Each country has its own unique needs, and it is important to understand what will work before replicating models of mobile commerce. Research suggests that emerging technologies available in developed countries are adopted by developing countries at increased speed and also in innovative ways thus leading to economic growth as well as leading to further technology adoption (Chircu & Mahajan 2009). In the context of Nepal, m-commerce is in a nascent stage. Regulatory bodies would need to establish rules of conduct in order to foster the growth of m-commerce. It is no doubt that the remittance from abroad contributes a lot to the Nepalese economy. The successful adoption of mobile money and mobile commerce would be a great benefit for people and the economy.

The motivation for this research stems from a number of factors. There has been a huge growth of mobile phone users in Nepal and this growth surpasses the Personal Computer (PC) users. As per ITU (2022) Mobile cellular subscriptions in Nepal experienced significant growth over the years, starting from a mere 0.01 million in 2000 and reaching a peak of more than 59.6 million subscriptions by 2022. A large number of mobile phone users have access to the internet at a cheaper price than the PC users where the startup price is high due to the price of PCs. The rural areas of Nepal are instantly connected to the World Wide Web through their mobile phones. Mostly people are using their mobile phones to get on the Facebook nowadays; however, there is a great opportunity for growth of mobile commerce. Many have mobile phones with internet access, but they only use it for YouTube, Facebook, news and internet telephony with Skype and Viber. Parents always complain how hard it is getting for

her at the old age to go to the various companies for paying their utility bills. Still, like so many other Nepalese they go every month to pay their water, telephone, internet, and electricity bills which is easily two- or three-day chores. Although some of the utility companies have already started online or mobile payment there is cost involved to accessing those services. First, the users are not properly trained to use those mobile services. Second, the utility companies accept payment from customers who have accounts with only certain financial services. In many instances, being able to use the mobile services to pay the utility bills would mean changing financial institutions or opening an additional account. Third, there is lack of trust in adopting mobile commerce in Nepal as this is really a new phenomenon. Many of the mobile users now who have access to the internet have been online for the very first time, unlike in the US, where people got online first using a PC before using a mobile phone to get online. A bulk of mobile users are from the rural areas of Nepal who does not even have a bank account.

This study will have significant implication for widespread use of mobile commerce among both urban and rural users in Nepal. This study will fall under the purview of ICTD, which is one of the areas of research in Information Systems (IS) discipline. This research will be beneficial for Nepal since it will give insight and guidelines for the policymakers as well as companies to develop frameworks and strategies that will help the growth of mobile commerce in Nepal. The next section outlines the barriers to adoption of mobile commerce, followed by a case study of mobile money in Nepal. The following section shows an analysis using the framework to identify the important factors for mobile commerce adoption among both urban and rural users in Nepal. The last section will discuss the implications and conclusion of this study.

## II. Barriers to adoption of mobile commerce

Internet users in Nepal are rising rapidly, based on recent posts on news portal, have reached 63 percent but this number is not backed by any research report of the authorities. One of the portals reports that at least 23 ISPs provide internet in Nepal. The urban areas have faster connection leading up to 4G while the rural areas only have slower connection, mostly 2G. The slower internet connection is one of the important barriers to adoption of mobile commerce in Nepal.

When it comes to use of information and communication inequality it is important to look at the multifaceted concept of access. Based on Dijk (1999), there are four kinds of access:

1. Mental access: lack of elementary digital experience caused by lack of interest, computer anxiety and unattractiveness of the new technology.
2. Material access: no possession of computers and network connections
3. Skills access: lack of digital skills caused by insufficient user-friendliness and inadequate education or social support.
4. Usage access: lack of significant usage opportunities or unequal distribution of them.

As applied to mobile commerce, the mental access can relate to various factors - anxiety of using mobile phones for commerce, anxiety due to lack of trust in financial service providers to honor the services conducted in mobile phones, lack of awareness of capability of mobile phones to conduct commerce. Material access relates to no possession of mobile phones. Skills access relate to lack of digital skills to conduct mobile commerce. Usage access relates to lack of significant usage opportunities for mobile commerce.

### A. Mental Access

Many opine that the problem of digital divide or information inequality will be solved when everyone possesses a computer or internet connection. The mental access problem not only covers the old people, illiterates and unemployed but also applies to other groups of consumers. Mental access may also be due to lack of trust in financial service providers in fulfilling the financial services conducted by using mobile phones (Tiwari et. al., 2021). Many in developing countries may view phones for their more normal uses as messaging, calling, social media and viewing YouTube videos and may lack the general awareness of the capability of mobile phones to conduct financial services. For instance, such a phenomenon was reported by Rehman (2013) in the context of Bangladesh.

### B. Material Access

Material access refers to lack of access to mobile phones. Although the material access of personal computers is quite lacking in Nepal, the access to mobile phones has been expanding rapidly, with some news portal reporting up to 63 percent of the population. Himalayan time (2020) reports that the number of mobile phones imported into Nepal has increased rapidly in recent years. In 2021, Nepal imported more than 9 million mobile phones, up from 5 million in 2020. This rapid growth in mobile phone imports is indicative of the growing demand for mobile phones in Nepal. (Himalayan Times, 2020). Similarly, Thapa et. al., (2020) noted that there is almost widespread adoption of mobile phones among medical student in Nepal. With falling prices of the technology, popularity of cheaper

android phones has led to the growth of mobile phones in Nepal. As most of the migrant workers are from the rural areas, when they return for vacation, one of the most popular gift items for their friends and relatives is the smartphone. The popularity of social media has also prompted consumers to adopt mobile phones.

### **C. Skills Access**

Skills access refers to the lack of digital skills required for mobile commerce. Many consumers are keen on using mobile phones for social media, messaging and calling and may lack the digital skills or knowledge for commerce. The lack of digital skills may affect the skills of operation of mobile phones for commerce. Sometimes this is viewed as a temporary phenomenon that would be solved shortly after acquiring a mobile phone. Aryansiah, K et. al. (2021) findings suggest a strong correlation between digital skills and electronic commerce. However, the lack of interest and necessity in using commerce may also hinder the adoption of mobile commerce (Fachrulamry, D. M. R., & Hendrayati, 2021). In urban areas, there is easy access to banks and financial service branches and for urbanites, there may be less incentive to set up an account for mobile commerce. However, for consumers in rural areas of Nepal, there is lack of easy access to bank and financial service centers and using mobile phones for financial services is a question of not having to travel long distance to access those services.

### **D. Usage Access**

Usage access refers to the lack of significant usage opportunities of mobile commerce. Van Dijk (1999) argues that when the problems of mental and material access have been solved, wholly or partially, the problems of structurally different skills and uses come to fore. The digital skills not only refer to operate mobile phones but also as the skill to search, select, process, and apply information from various sources and the ability to strategically use the information for one's benefits. A usage gap may appear, whereas some parts of the population are systematically using and benefiting from advanced technology, while other parts are only using basic digital technologies for simple applications with a relatively part of entertainment. Mobile phones these days are as powerful as personal computers and are capable of performing multiple functions. Even though the rate of adoption of mobile phones are growing in Nepal, the rates for internet- affordability access has not come down significantly to boost the internet usage using mobile phones (Shrestha and Adhikari, 2017).

## **III. Case study: Mobile Money in Nepal**

The penetration of mobile phones has been quite rampant even in developing countries whereas a third of people have mobile phones but only 14 percent have bank accounts. Mobile money uses mobile phones as the platform for delivery of financial services such as deposits, withdrawals, money transfers to customers in remote rural areas where there are no other mainstream banking services. It is to be noted that although mobile money has been successful in countries like Kenya and Philippines, it has not been successful in other countries. This may be due to the fact better understanding of the needs and wants of the customers have to be satisfied. The data shows that there are 8.5 bank branches in Nepal per 1000 people while this figure is 13 in India and 32 in the US. The Mobile Money for Poor (MM4P) program by UN Capital Development Fund (UNCDF) helps build inclusive digital financial sectors such that sustainable institutions in a well-regulated environment provide a wide range of services. MM4P uses a market development approach and partners with policymakers, regulators, providers, distributors and the users of digital finance. In Nepal, MM4P was launched in 2012, have helped many Nepalese access digital financial services. MM4P strives to get 15 percent of the adult population to become active users of digital financial services by 2019. MM4P has partnerships with private sector companies such as Prabhu group and IME.

Based on the feedback received from financial service providers in Nepal, market segments were mainly: 1) Remittance, 2) Business to business, 3) Government employees supporting family from remote location. A migrant worker based in the Middle East, Malaysia or Korea can send money to support his/her family in Nepal or pay for the school fees so the recipient no longer has to travel a distance to collect the money and pay the school fees. A local business uses financial services to order goods from its suppliers and uses the financial services for payments. Many government employees are stationed far away from their home who need to use the financial services to support their families. MM4P is working with large remittance companies to provide digital financial products to the customers. They are also working with mobile phone operators to create partnerships with banks and cooperatives. This encompasses training agents who are used to selling phone minutes to explain other financial products, essentially creating a one-stop shop for different products and services.

### **A. Analysis**

Based on the report by Statista (2017), 19.7% of the population of Nepal use the internet and there are 110.8 mobile cellular subscriptions per 100 people in 2016. The fixed broadband subscriptions per 100 inhabitants is 0.8 in 2016. The average per capita GDP in Nepal has amounted to \$799 in 2016. Table 1 shows the data reported by International Telecommunications Union (ITU). In 2016, over 32 million people have mobile-cellular telephone subscriptions. In the same year, mobile-cellular telephone subscriptions per 100 inhabitants are shown as 110.83.

The total population of Nepal in 2020 was 29.3 million and 30.5 million in 2022. This shows a remarkable increase in mobile-cellular telephone subscriptions over the years. More than 100 subscriptions per 100 inhabitants suggest that subscribers may be using more than 1 line for various purposes. As the number of people using mobile phones has increased over the years, there should be more people using the internet as most users use their smartphones to access the internet services. The above rate of 19.7% of the population of Nepal using the internet seems low as compared to the number of people who have mobile-cellular subscriptions. One of the reasons for the discrepancy in the lower number of internet users could be that the access cost to internet is still high in Nepal. Table 2 shows the mobile service providers operating in Nepal. Nepal Telecom is the government held telephone subscriber and there are Ncell, STPL, NSTPL, UTL and STM from the private sector (details in table 2).

Year	Mobile-cellular telephone subscriptions	Mobile-cellular telephone subscriptions per 100 inhabitants
2000	10,226	0.04
2001	17,286	0.07
2002	21,881	0.09
2003	81,867	0.33
2004	116,778	0.46
2005	227,316	0.89
2006	1,157,102	4.46
2007	3,268,895	12.47
2008	4,200,000	15.86
2009	5,597,880	20.93
2010	9,195,562	34.03
2011	13,354,477	48.87
2012	16,608,622	60.07
2013	21,362,289	76.33
2014	23,021,340	81.28
2015	27,516,055	96.02
2016	32,120,305	110.83
2017	36,094,096	124.82
2018	39,225,141	135.44
2019	42,996,749	149.46
2020	47,640,592	166.82
2021	53,402,928	186.92
2022	59,680,755	210.19

**Table 1 Mobile-Cellular Subscriptions Over the Years**

The number of mobile-cellular telephone subscriptions in Nepal has increased rapidly in recent years, from 0.04 in 2000 to 210.19 in 2022. This growth is due to the increasing affordability of mobile phones, the expansion of mobile network coverage, and the growing demand for mobile internet services. The growth of mobile-cellular telephone subscriptions has had a number of positive impacts on Nepal, including improved communication and connectivity for people in rural areas, the creation of new jobs in the telecommunications sector, and the promotion of economic development. However, it has also had some negative impacts, such as an increase in cybercrime and the spread of misinformation. Overall, the growth of mobile-cellular telephone subscriptions has been a positive development for Nepal, but it is important to be aware of the potential negative impacts of this growth and to take steps to mitigate them.

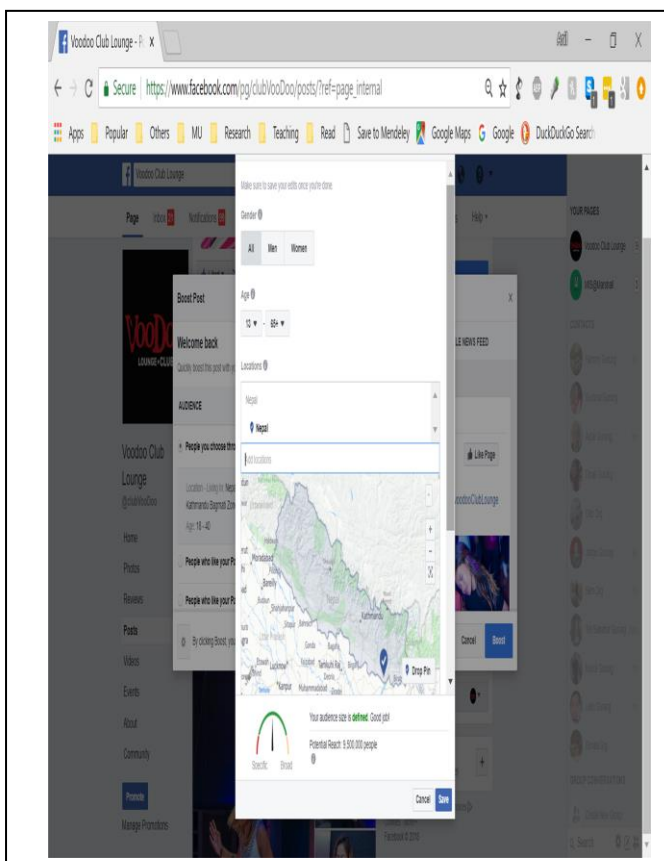
Operator	Technology	Subscribers (in millions)	Ownership
NTC (Nepal Telecom)	CDMA, EV-DO 900 MHz GSM, GPRS 900/2100 MHz UMTS, HSDPA, HSPA+ WiMAX	15.38	Nepal Door- Sanchar Company Ltd.
NCELL	GSM-900/1800 2100 MHz UMTS, HSDPA	14.34	Axiata Group Berhad
STPL	GSM 900/1800 GPRS 900/2100	1.45	Smart Telecom Pvt. Ltd
NSTPL	GSM 900/1800	0.38	Nepal Satellite Telecom Pvt. Ltd.
UTL	WLL/LMS	0.54	United Telecom Limited
STM (CG Telecom)	PSTN/GSM	0.003	CG Comm. P.L, STM Telecom Sanchar P.L

**Table 2: mobile phone service operators**

Table 2 shows the mobile operators in Nepal as of February 2023. The mobile telecommunications market in Nepal is dominated by two large operators, NTC and NCELL. NTC is the market leader with a subscriber base of 15.38 million, followed by NCELL with 14.34 million subscribers. STPL is the third largest operator with 1.45 million subscribers. The other three operators in the table, UTL, STM, and CG Telecom, are all relatively small players in the market. The market is still very competitive, with NTC and NCELL competing for the top spot. STPL is also growing its subscriber base, but it is still a relatively small player in the market. The other three operators in the table are likely to face challenges in competing with the larger operators. The competition in the mobile telecommunications market is likely to benefit consumers by driving down prices and improving services.

To dig deeper to find the number of internet users in Nepal, we conducted a test on Facebook which is definitely one of the most popular websites in the world with 2.19 billion monthly active users. Here are the details of the steps in finding out the total Facebook users in Nepal:

1. Visit a business page on Facebook.
2. Click on “Create an Ad” button or select a post to boost.
3. Create an advertising campaign for your selected post.
4. Choose the location as “Nepal”
5. Age: 13-65+
6. In June 2023, when we tested, under Audience Definition, the potential reach was listed as 9.5 million as shown in Figure 1.



**Figure 1. Finding Total Facebook Users in Nepal**

The potential reach given by the Facebook after including all the demographics should reflect the total number of the Facebook users of Nepal. We have to caution that the number may not be 100% accurate, however, it gives us a reasonable estimate about the number of Facebook users from Nepal. We are using the 9.5 million number of potential Facebook users, with caution, to provide an estimate of internet users in Nepal. For the total population of 30.5 million, the estimated number of 9.5 million comes to around 31% or roughly one third of the population of Nepal in 2022.

A lower number of internet users as compared to the number of mobile users in Nepal can be accounted to a number of reasons. Using the framework of Dijk (1999), mental access problem may account for lower number of internet users because only a portion of the users are aware and has the knowledge to access the internet using their mobile phones as shown by 31% being active on the Facebook. As for the material access problem it is not clear if this problem persists because the number of 100 inhabitants with mobile cellular subscription is 110. This indicates there is a higher rate of adoption of mobile cellular services. As for the skills access problem, it seems to suggest that substantial problems may exist. In rural areas, use of MM4P program is targeted so that consumers who do not have access to financial services can get

access to financial services using the mobile phone. In urban areas, there is no dearth of financial service centers where one can go to access the financial services. However, when users become aware of the convenience of mobile commerce there is bound to be higher adoption of these services provided the financial service providers are able to better package to the services to suit the needs of both urban and rural users. As for usage access, the problem may exist because of the higher cost of internet access using mobile phones. When the digital skills of the users are developed, we can expect higher use in mobile commerce. The very high number of mobile services subscriptions among Nepalese users provides opportunities for mobile commerce providers to offer various kinds of services, as mobile banking, mobile commerce, location advertising etc. If telecom providers can work closely with financial companies to come up with schemes and ideas to lower the cost of internet access for mobile users, it will be beneficial for all the stakeholders.

## Conclusion

The purpose of this study was to investigate the factors that may lead to adopting mobile commerce in a developing country in South Asia. We used the framework of Dijk (1999) to identify mental access, material access, skills access and usage access to identify the potential barriers for the adoption of mobile commerce. Based on data from secondary sources, we reported the figures on internet access, mobile cellular subscriptions and internet users. A case study of mobile money was discussed to highlight the role of the development sector to facilitate the growth of mobile commerce among the consumers in the rural area who may lack easier access to financial services. In lack of official count of internet users, we used the potential reach of the Facebook advertisements in Nepal. The study's value lies in its practical implications" To "The value of the study depends on its practical implications. Policymakers and practitioners can employ these findings to craft strategies that navigate the balance between accessibility and risk management in the domain of mobile commerce. This underscores the study's potential to guide decisions that enhance the positive impact of mobile commerce while addressing its challenges. Moreover, this study provides a foundation for future research, enabling a deeper understanding of access dimensions and fostering sustainable mobile commerce growth in developing contexts. In future studies in this stream, researchers can study the skills access and usage access of the rural and urban users, study the factors that may lead to higher adoption of mobile commerce and develop strategies for the growth of mobile commerce.

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