A STUDY ON FACTORS INFLUENCING THE ADOPTION OF MOBILE PHONES AMONG THE FARMERS IN BANGLADESH

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CERTIFICATE

*This is to certify that the report entitled "**A STUDY ONFactors Influencing the Adoption of Mobile Phones among the Farmers in Bangladesh**"submitted to the Department of Agribusiness & Marketing, Sher-e-BanglaAgricultural University (SAU), Dhaka in partial fulfillment of the requirements for the degree of **MASTER OF SCIENCE**in **AGRIBUSINESS ANDMARKETING Department**embodies the results of a piece of bona fide research work carried out by **MD. KHAIRUZZAMAN, Registration No. 11-04538** under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.*

I further certify that such help or source of information, as has been availed of during the course of this investigation has duly been acknowledged.

Dated:----------
Place: Dhaka,Bangladesh

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Dedicated To

My Respectable

Parents and

Teachers

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ACRONYMS AND ABBREVIATIONS

ATU	Attitude Towards Use
AU	Actual Use
AVE	Average Variance Extracted
BI	Behavioral Intention
BIU	Behavioral Intention to Use
BTRC	Bangladesh Telecommunication Regulatory Commission
GDP	Gross Domestic Product
GPS	Global Positioning System
ICT	Information Communication Technology
MOA	Ministry of Agriculture
PC	Perceived Convenience
PEU	Perceived ease of use
PI	Peer Influence
PU	Perceived usefulness
SAAO	Sub-Assistant Agricultural Officer
SMS	Short Message Service
TAM	Technology Acceptance Model
VAS	Value Added Services

ABSTRACT

This paper examines the elements impacting the selection of mobile phone innovation among Farmers in Bangladesh. Electronic administrations are one significant measure for rural advancement and mobile phones are the ruling cellular technology; consequently understanding the reception of this innovation is significant. The paper utilizes interpretive way of thinking examining selection factors by methods for study information, member perception and related examinations on rustic Bangladesh and innovation acknowledgment. In view of various acknowledgment models from the writing, an applied Technology Acceptance Model (TAM) was created to break developed to analyze the arguments pertinent to a rural developing country setting. The most remarkable adjustment, contrasted with prior models, is that social impact assumes a greater job than innovation at beginning periods of appropriation. 'Tech-administration advancement' and 'tech-administration qualities' are presented as outside variables which influence the social aims of a person by means of perceived usefulness (PU) and perceived ease of use. With the help of TAM, I will select some factors those have effect on mobile phone using behavior and develop some hypothesis to justify their relation.

Key words:Mobile phone,Innovation,Technology Acceptance Model,Perceived Usefulness,Perceived Ease of Use

1.INTRODUCTION

1.1 Introduction

With its in excess of 160.8 million individuals [BangladeshEconomicReview], Bangladesh positions as the eighth most crowded nation in the world. Out of 29 million families, 89% are arranged in rural regions and 40.6% (15 million) represent rural agricultural families [Bangladesh Economic Review]. In spite of the fact that Bangladesh positions 145th out of 175 nations in the ICT Development Index in 2017, the infiltration rate of mobile phones is striking contrasted with other ICT instruments (for example PC, Internet and so forth.)

Mobile phone subscription rate increases day by day in Bangladesh. Ongoing examinations demonstrate that around 66% of the all population– two out of (under) three individuals, or if nothing else one for every family by and large – has a mobile phone (BTRC,2018). As the development of the Bangladeshi economy relies upon rural improvement, much consideration should be paid to the rural segment and the farmers who are the fundamental, yet one of the weakest actors in the economy (M.S. Islam, M. E. Uddin, and M.U. Rashid ,2007),(M. S. Islam and Å. Grönlund,2007). Through Mobile phone farmer's can store, access and share information anytime anywhere. In the viewpoint of this paper, convenient reception and suitable utilization of effectively and broadly accessible mobile phone innovation in agricultural tasks is one open door that may help in understanding the digital opportunities, improving rural efficiency and consequently add to diminishing urban-country imbalances. So, by using mobile phone a farmer can increase his efficiency as well as profitability from agricultural activities. From this study, we will identify and discuss about some factor's those have great effect on mobile phone adaptation among the farmers of Bangladesh. In this research paper, we included Peer Influence, Perception of Convenience and User Satisfaction. Because none of research done before with these variables. This is one of the main gaps to prepare this report.

1.2 Background of the Study

The ICT (Information and Communication Technology) use in the Agriculture ofBangladesh is notso rich. In 2003, Support to ICT, task force program launched by the Ministry of Agriculture (MOA BD). In Bangladesh, private sector operators are the main providers of ICTs (mobile phones, computers and internet, television channels, radio, and fixed-line telephony on a limited scale), whereas the state controls the fixed-line telephony and two national TV channels and 10 radio centers. The government also formulates and implements ICT policy. To disseminate ICT among the farmers mobile phone is really an important medium specifically in Bangladesh. As per the statistic of BTRC, the total number of mobile phone subscriptions has reached 133.16 million by November 2015. Therefore, Informative voice SMS, alerts to the farmer before natural disasters, weather forecast, seasonal activity information etc. can be sent through SMS in local language. The technology adoption process in rural settings through mobile phone can then potentially be transferable to other developing countries like Bangladesh, particularly those who share a similar socio-economic and technological background.

1.3 Significance of the Study

For sustainable development of agriculture and national economy to emphasis on ICT and its use in agriculture very important. In order to get entire agricultural services in the same boundaries we should introduce the "central e-agri support center". This can be an excellent initiative feature for agricultural revolution and economic development. Where all the e-features such as strong agricultural website, e-agri. library, e-agri product marketing, agri share marketing, agri loan facility and crop insurance support, e-agricultural extension services, agri database, Agri Call Centers, Bangla voice SMS and e-mail service, e-agri conferences & e-training service, overall agri. survey and monitoring team etc. can be included in "central e-agri. support center". Furthermore, different agri. apps, upcoming hi-fi technology can be launched in modern agricultural system. Agri. field survey and monitoring can be done by drone camera or wireless camera systems. ICT based agricultural education can also launch in agricultural sector by using different tools of ICT(such as mobile phone). The assurances of the effective and efficient use of information and communication technologies for analyzing, designing and implementing existing and innovative applications, we can divide agriculture in several areas.

These are:

- Weather Information
- Production and Cultivation Techniques
- Diseases and Insect Information
- Plant Nutrients and Water Usage
- Price Information
- Demands and Current Stock Information
- Educations and Health Information
- Government and Non-government Facilities

Through mobile phone a farmer can easy get above information by linking with ICT. In this paper, we will discuss about factors influencing the adoption of mobile phones among the farmers in Bangladesh so that how to provide useful services to the farmers community.

1.4 Objectives of the Study

This paper aims primarily to investigate the factors influencing the adoption of mobile phone technology among the farmers in Bangladesh. The underlying purpose of doing so is to allow a better understanding of how to provide useful services to the farmer's community. To do so, we focus on the following issues:

- To explore earlier theories and models on technology adoption and diffusion;
- To develop a conceptual research model based on the literature studies;
- To investigate empirically the factors relevant to rural Bangladesh; and
- To detail the model based on the empirical findings and hence suggest the factors with associated variables especially relevant to rural people in developing regions.

The findings from this study contribute to a larger picture of the technology adoption process in rural settings, specifically in Bangladesh. It can then potentially be transferable to other developing countries, particularly those who share a similar socio-economic and technological background.

1.5 Limitation

One limitation is our examination is obviously that we have not given any conventional testing of the TAM. We have given observational discoveries to approve the substance and its rationale dependent on moderately a little example size. Indeed, the present adaptation of TAM is a speculation which can be considered as the initial step of broadening the overarching TAM, extraordinarily fitted for provincial individuals in poor nations. For this situation, a conventional testing in a bigger example would be one bearing of future research. Carefully we are not summing up the outcomes, however despite everything we accept that the discoveries can be utilized, with alert, in different nations having comparative financial and mechanical settings.

Another limitation is data are collected from the respondents are not from same village. I have collected data from 3 villages. The respondent's number was only 80 and it was not sufficient. And the moderate effect based on TAM model is not tested.

2. LITERATURE REVIEW

Technological development has been brought a great change in our life. A revolutionary changed has been occurred to our life style. Specially, the invention of mobile has been made our life easy. Adoption of mobile phone breaks out like a great turning in our life style. This trend has been also spread into the farmers. They are utilizing mobile in trading market information's, climate projection and business data. By the endowments of technology the farmers can directly contract with the brokers or agent to sell their product. In developing countries with the increase of mobile phone based social networking, it becomes to be a vital factor of agricultural development. This type of technology allowing better connectivity offers and benefits to the farmers. (Bayes et al., 1999, Donner, 2006) .farmer's those are not using mobile phone are facing many problems in getting market related information's as well as selling their products in comparison to farmers who use phone. Basically, in rural areas farmers cannot easily contract with an agriculturist to discuss about problems that they are facing. They mainly depend on their experience and collecting advice from their elders. This evident signifies that communications is the main problem faced by the farmers. (Duncombe,2011). Generally, the mobile phone featuring with internet facilities as well as their maintenance are costly. So, it's a great problem for farmers to use mobile phone for agricultural work. Moreover, there are some issues detected that the pattern to using mobile phone by this group is different and the scope to the access of market information is very low. (Ashraf et al., 2005, de Silva, 2008). In developing countries like Bangladesh rural community particularly farmers were facing various challenges in using ICT tools like mobile phone. Some of these are technical, financial, social and illiteracy. The main challenges in developing ICT programs in rural areas are the lack of interest in private sector entrepreneur and low quality service provided by the company.Most of the farmers have less technological knowledge which is a big problem in the development and use of technology. As the majority of the rural people are illiterate they cannot learn and run technological tools like mobile phone properly. (Samuel et al., 2005,). Technology adoption is the choice of a gathering or individual to utilize a development. Beal and Bohlen1956,express that people accept new ideas through a series of complex mental processes in which adoption is the final action. Rogers 1960 & 1995, indicates innovation dispersion in a worldwide point of view to coordinate a traditional ordinary dissemination bend which can be clarified by the demographic and psychographic qualities of the adopters. The factors influencing the behavior of an individual with respect to accepting and utilizing new innovation. Perceived usefulness (PU) is the key determinant of acceptance, meaning the user's subjective probability that using a specific application system will increase his or her job performance within an organizational context. Perceived ease of use (PEU) is the degree to which the user expects the target system to be free of effort. Together,

PU and PEU determine the Attitude (A) of an individual towards utilizing the framework. At long last with the impact of PU and Attitude, Behavioral Intention (BI) impacts the real utilization of the framework. Agricultural extension department working and running numerous extension programs numerous extension programs overcome the barrier in the adoption of technology in comparing with the less successive public sector extension programs (Akter et al., 2010)

2.1 Why mobile phone is important in Information *and* Communication Technology (ICT)?

A mobile phone is a cellular telephone with an integrated computer and other features not originally associated with telephones such as an operating system, web browsing, and the ability to run software applications. Mobile phone can be used by individuals in both a consumer and a business context, and are now almost integral to everyday modern life.

2.1.1 Popular uses

Many consumers use their mobile phones to engage with friends, family and brands on social media. Social media platforms such as Facebook, Instagram, Twitter and LinkedIn all have mobile apps that a user can download from their phone's app store.

These apps make it possible for mobile phoneusers to post personal updates and photos while on the go. Another common use for mobile phones is health and wellness tracking. The Health app for iOS, for instance, can keep track of sleep behavior, nutrition, body measurements, vital signs, mental health exercises and more.

Third-party wearable devices, such as smart watches, can connect with a mobile phoneto monitor an individual's health statistics, such as heart rate, and send information to be aggregated on the phone.

Mobile payment is another widespread use for mobile phones. Wallet features allow users to save credit card information on their phones to use when purchasing items at retail stores. Apps such as Apple Pay also enable users to pay other iOS users directly from their phones.

2.1.2 Important features

One of the most important elements of a mobile phone is its connection to an app store. An app store is a centralized portal where users can search for and download software applications to run on their phones. A typical app store offers thousands of mobile apps for productivity, gaming, word processing, note-taking, organization, social media and more.

The following are some of the other key features of a mobile phone:

- Internet connectivity.
- A mobile browser.
- The ability to sync more than one email account to a device.
- Embedded memory.
- A hardware or software-based QWERTY keyboard.
- Wireless synchronization with other devices, such as laptop or desktop computers.
- The ability to download applications and run them independently.
- Support for third-party applications.
- The ability to run multiple applications simultaneously.
- Touchscreen.
- Wi-Fi.
- A digital camera, typically with video capability.
- Gaming.
- Unified messaging.
- GPS.

If we can use these mobile phone features for agricultural purposes, it will be brought a great change in our agriculture sector.

2.1.3 Uses of mobile phone in different sectors of agriculture in Bangladesh

Through mobile phone farmer can easily connect with internet and thus they can perform various jobs which is related with agriculture. Mobile phones have been spreading fast among farmers and they are exchanging their marketing, weather and business information among each other. Farmers directly contact markets brokers and near cities for sell their product. Similarly farmers focus, search useful and up-to-date market information from social and business networks.

In the perspective of economic development mobile phone has effect on low income groups. Mobile phones have vital impact on agriculture where the use of mobile phone among poor farmers in developing countries could unexpected. The most vital aspect the mobile phone was the information about the market that was in past were very difficult for small farmers to obtained. Nowadays mobile phone has provided producers with information and knowledge on the correct market price, quantities, and availability of a particular product and technical advice. It could enable the producer to have direct communication with the buyer and to avoid the costs associated with intermediaries (Goggin& Clark, 2009).

The importance of access, accurate and timely information could provide a good benefit and enhance the capacity of the farmers (Asaba et al., 2006). In the terms of community development mobile phone has played a positive impact on poor farmers and their communities and mobile phone strengthen their position in the market chain. Mobile phone has provided access to facilitate active citizen participation in development (HRCA, 2001).

The mobile phones could help the farmers as well as traders to sell their fresh product in market quickly to avoid waste. This technology has also provided new approach and chance to farmers decide whether to accept the price offered by buyers by obtaining price information from other sources. Farmers' rate is expected to increase as information flow increases due to mobile phone network coverage and the size of the impact is larger in remote areas. When the mobile phone network was not available in Ghana traders were spent many day to fill the trucks of banana and beard the transport charges and could not get appropriate price from market. Now mobile phone has not only saved the transport charges of traders and farmers, but same time provide fresh banana in market and get good price (Smale&Tushemereiruwe, 2007).

The mobile phones have provided new approaches and thinking to the farmers for getting the information and sell their product in market with any bargaining to brokers. Before the mobile phones mostly farmers were depend on broadcasting media such as radio and television to get knowledge and information about crops. This time mobile phone technology has given quick communication and approach to community with their community. The educated farmers use Short Message Service (SMS) to get latest update

agricultural information such as marketing information that facilitate the farmer about making logical decisions (Murthy,2009).

The use of mobile phones as providing agricultural related information and it was showed that how mobile phone has been able to connect the farmers to market information on the specific time and provide accurate information from brokers and customers. The effect of mobile phone could measure in the term of increased or decreased their sell productivity (Mittal &Tripathi, 2008).

The importance of market information for the farmers could not deny for the economic and efficiency development. It was observed that mobile phones have provided timely and accurate information and by these farmers has increased their performance knowledge (Helmberger, Campbell et al. 1981). Mobile phone has provided new opportunities and access to farmers in different ways to communicate with market people and get latest information about commodities. It is no doubt that radio and television was also played an important role in diffusing information among different rural communities. Traditional media and new ICT have played a major role in diffusing information to rural communities (Munyua, 2000).

The pre- paid mobile system has also give new directions to farmers and they use text message to their customers for sell their product in good price mobile phones have saved the time, money and energy of farmers (Aloyce, 2005). Mobile phone technology has closed the distance and farmers get most important information within a time without any problems (Campbell, 2005). In Pakistan many studies showed that widely available information on usual market prices for seed cotton strengthened farmers' position when bargaining with traders (Lohano, Smith, & Stockbridge, 1998).

Information and communication technology could play an important and potential role in increase the reach of agricultural extension. in the terms of the Bangladesh where farmers explore the use of a voice message forum to provide interactive and access to appropriate and timely agricultural knowledge and information from experts by use of mobile phone. Now mobile phones are being adopted by rural communities in Bangladesh to get information about weather disaster as well as pesticides.

In remote areas farmers and small businesses could gain rapid access to market and get information about prices and commodity availability. By use of mobile phones farmers could save money and time consuming travelling. It also makes it possible to reach markets or new customers who would not be contactable without mobile phones (Wald &Koblo, 2008).

The mobile phone could provide help the cattle farmers to contact with veterinary officers for get the information about communicable diseases. This could change attitude and encourages new ways of thinking to cattle during calving which could reduce in stillborn calves. In the longer term this increases the income and welfare of the cattle farmers. Nowadays many farmers contact with metrological

department to get information about weather before start a pesticides in their crop (Duncombe, 2011).
The web-based system could use to disseminate information among farming communities via Short Message Service (SMS) and keep alert to farmers about weather, price and pesticides. In this context the mobile phone is one of the best sources to disseminate related information among the farmers. This method could benefit to farmers because farmer can purchase mobile phone easily than other communication tools. Mobile phone is a good medium to disseminate information to different layers of the society (May & Hearn, 2005)

We can identify some important issues from the above discussion-

1. Through mobile phones farmers can get information latest information about crops production and others information related with agriculture without travelling a long distance.
2. Farmer's can easily contract with agriculturist by calling 16123 to "Agriculture Information Service" operated by Govt. and can get solution of different problems associated with agriculture.
3. Through different mobile apps such as, KrishiBartalap, Fosholi,Krishibondhuetc farmers can easily collect precise information about agriculture.
4. Farmers can get contact with foreign agricultural technique which helps them to improve their capability.
5. Farmers can easily identify diseases of crops, animals, birds, fishes etc and can get treatment as well as preventive measures of these.
6. Mobile phone helps farmers to negotiate with traders and helps them to get more profit.
7. Mobile phone helps farmers to know about weather forecast. Thus they can save crops as well as can mitigate the lose causes by natural disaster.
8. Farmers get a package of information that is important to identify their needs and priorities change throughout the production cycle.
9. Mobile phone helps farmer to improve their production and business capability through build trustworthiness with trade partners.
10. The mobile phones help potential for lessening asymmetries of data among dealers and makers, bringing down exchange costs, and upgrading farmer's capacity to calibrate their production procedures to coordinate the accelerating rates of progress in consumer demand and marketing channels.

11. Through mobile phone farmers can create innovative partnership that helps to direct communicate with corporations and traders as well as improve their capability to supply product based on just-in-time or quality needs.

The level of usage of mobile phone spreading rapidly in developing countries for the purpose of business, education and agriculture development. Furthermore, there is a lack of signal of usage of mobile phones and infrastructure service delivery in different countries has a big issue mainly to the difficulty in measuring their social and economic impacts. However same time farmers use mobile phones and get the information about weather from different sources. Impact on development and identifying the sectors where further research is needed (Ahmed & Elder, 2009).

2.2 Reasons for Selecting Technology Acceptance Model (TAM)

Technology Acceptance Model (TAM; Davis, 1989) has been one of the most influential models of technology acceptance, with two primary factors influencing an individual's intention to use new technology: perceived ease of use and perceived usefulness. If a farmer thinks an older technology is not as too difficult to play or is not a waste of time will be unlikely to want to adopt new technology, while a farmer thinks an older technology as too difficult to play or a waste of time will be unlikely to want to adopt new technology. While TAM has been criticized on a number of grounds, it serves as a useful general framework and is consistent with a number of investigations into the factors that influence older adults' intention to use new technology (Braun, 2013). Many technology acceptance theories and models have been developed or used to study and evaluate the nature, use and adoption of Information Technology as it relates to information utilization and deployment. The main purpose of this study is to explore how the TAM can support Information Literacy research in a school environment. The TAM has been used by researchers worldwide to understand the acceptance of different types of information systems. The gap in the research of the Technology Acceptance Model (TAM) is discussed. Regardless of the wide application of the model in many areas (WannYih and Ching-Ching, 2015; Chung-Kuang, 2014; Teo, 2013; Sebetci and Aksu, 2014) focusing on on-line shopping behaviour, business intelligence system, teachers' intention to use technology respectively. In this study, the focus is on the use of the Technology Acceptance Model and how accessibility to modern technology can predicted by effective Information Literacy skill.

Based on the review of a number of theories pertinent to technology acceptance in general and mobile technology in particular, i have developed a conceptual research model for the research objectives as

stated. Rural Technology Acceptance Model incorporates most of the major and commonly used factors in a summarized fashion. In light of the survey of various hypotheses relevant to innovation acknowledgment as a rule and mobile technology, we have built up a calculated research model for the exploration destinations as expressed.

Positive attitudes towards mobile phone use increase with individual satisfaction with mobile phone use. Using the theories of innovation diffusion, many studies explored information system adoption problems(N. Lu and Swatman,2009),(V. Venkatesh,2000) and (H. Karjaluoto, J. Karvonen, M. Kesti, T. Koivumäki, M. Manninen, J. Pakola, A. Ristola, and J. Salo,2005). For example, Vishwanath and G. M. Goldhaber(2003), indicated that individual perceptions towards innovations in information technology can influence the adoption of information technology. Furthermore, Agarwal and Prasad (1998),presented a conceptual and operational definition of personal innovativeness and noted that personal innovativeness can moderate the effects of perceptions on information technology related adoption decisions. Therefore, the more prominent the utility an individual perceives dependent on past adoption conduct, the more prominent the readiness that individual risks in attempting an information technology innovation. Hence, the arrangement of inspirational frames of mind towards data innovation advancement increments with individual innovativeness towards the adoption of information technology.

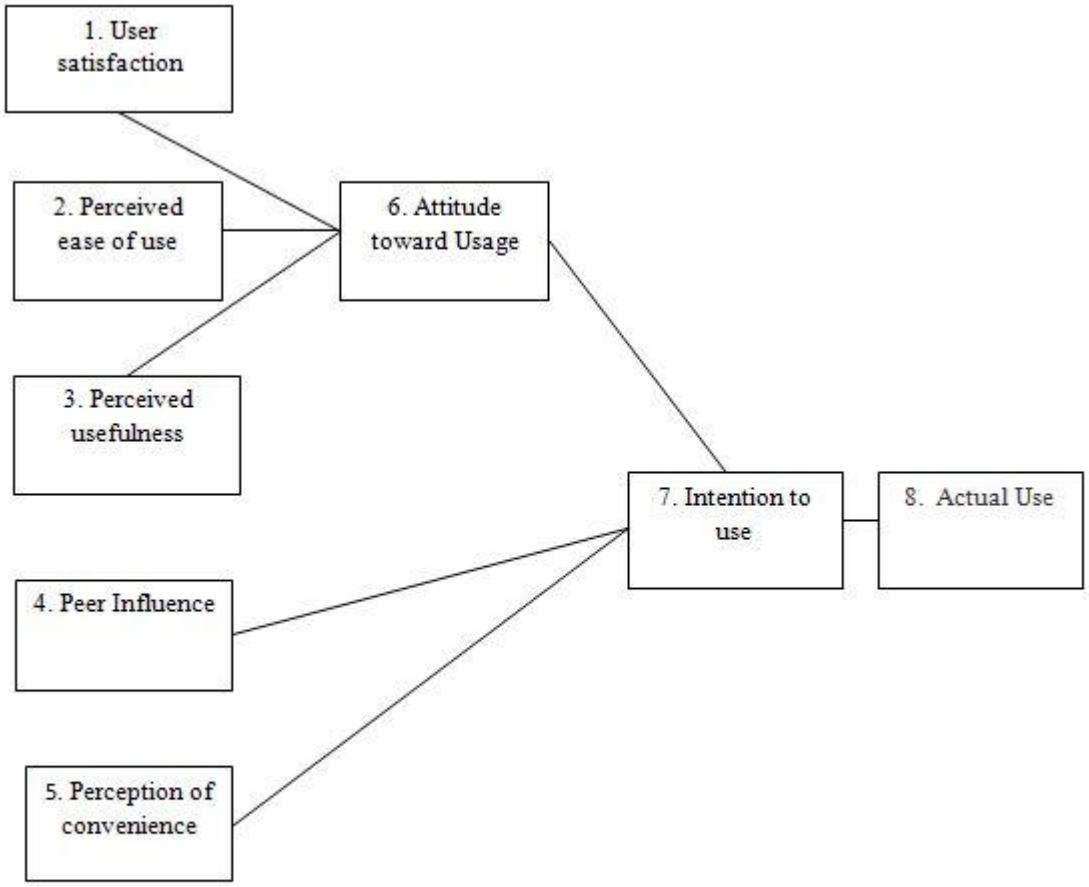

Figure I: Technology Acceptance Model (TAM)

2.3 User Satisfaction(US)

It is described as a "fulfillment of one's wishes, expectations, or needs, or the pleasure derived from this" (Oxford Dictionary), so signaling that satisfaction means a "filling or fulfillment up to a threshold of undesirable effects" (Oliver, 2010, p. 6). In other words, one may view satisfaction as "the consumer's fulfillment response" (p. 8) that is, a judgment that a product/service features or the product or service itself is providing a pleasurable level of fulfillment (Oliver, 2010). On the other hand, drawing on developments in the behavioral sciences, differing interpretations of satisfaction have emerged in marketing research, which consider a range of favorable and unfavorable responses. Hence, over time, researchers have moved away from the literal meanings of satisfaction to focusing on user experiences (Oliver, 2010).

2.4 Perceived Usefulness (PU)

According to Davis (1989), the perceived usefulness of a system is defined as the extent to which individuals believe that using the new technology will enhance their task performance. There is extensive research in the Information Systems provides evidence of the significant effect of perceived usefulness on usage or adoption intention (Davis et al, 1989; Kim & Garrison, 2009; Khalifa&Shen, 2008). Therefore, perceived usefulness will influence user intention to accept or adopt mobile technology. Recently numbers of empirical studies have provided support that perceived usefulness is the primary predictor of mobile adoption and it captures the perceived benefits associated with using mobile (Wei et al., 2009;Khalifa &Shen, 2008; Kim & Garrison, 2009). This construct assess the extrinsic characteristics of mobile phone as well as shows how mobile phone can help the users to achieve task-related goals, such as effectiveness and efficiency (Wei et al., 2008). It is also believed that one who believes mobile phone to be useful and convenient will have positive attitudes towards using mobile phone.

2.5 Perceived Ease of Use (PEU)

According to Davis (1989), the perceived ease of use for a system is defined as the degree to which an individual believes that using a particular technology will be free of effort. The perceived ease of use has been incorporated as an important factor in adopting mobile phone (Davis, 1989; Li et al., 2007; Wei et al., 2009; Bhatti, 2007) Manyvprior empirical studies have demonstrated that perceived ease of use has a positive influence to adopt mobile phone (Wei et al., 2008; Khalifa&Shen, 2008; Kim & Garrison, 2009) Thus, perceived ease of use reflects the perceived efforts in using mobile phone (Khalifa&Shen, 2008). A number of empirical studies tested ease of use as a predominant determinant of intention to adopt (Agarwal and Karahanna, 2000). Some found that this construct exerting a mediation effect. It is one of the major behavioral beliefs influencing user intention to technology acceptance in both original and the revised TAM models. Furthermore, one who perceives mobile phone technology to be easy to use will have positive attitudes towards using mobile phone.

2.6 Peer Influence (PI)

Peer influence via interpersonal communications, either online or offline, has been acknowledged the important role in determining consumer's choices for decades. In general terms, when we speak of influence within a social network, we assume that controlling all other factors, there exists temporal dependence between the focal individual's behavior and her direct neighbors' previous behavior. For example, marketers increasingly realize to harness the power of social links between consumers to

complement traditional advertising strategy aiming at triggering viral adoptions through social contagion (W.J. Doll, G. Torkzadeh,1991).

2.7 Perceived Convenience (PC)

Perceived convenience is used as additional factors since; there are two kinds of convenience, which are product and service. A way to determine whether a product or service is convenient depends on time and effort (Berry, Seiders, &Grewal, 2002). Brown (1990) examined the convenience of a product or service by five dimensions including time, place, acquisition, use, and execution. Yoon and Kim (2007) also defined perceived convenience as a level of convenience toward time, place and execution that one perceives when using the system to complete a task. Based on the perspective provided by Yoon and Kim (2007), perceived convenience, in the present study, was defined as a level of convenience toward time, place and execution that one feels during the participation in blackboard learning management system.

2.8 Attitude Towards Use (ATU)

The system is defined as 'the degree of evaluative affect that an individual associate with using the target system in his job'. (Davis et al., 1989) have adjusted this definition to some degree. They contend that data frameworks will be valuable by and large in the event that they 'contribute to accomplishing the end-user's purpose. The most significant determinant of an individual's conduct is behavioral intention. Behavioral intention is characterized as the quality of one's aim to play out a predetermined conduct. A person's intention to perform a behavior is a combination of (1) the attitude towards performing the behavior and (2) his or her subjective norm. Attitudes can be defined as the positive or negative feelings a person has towards performing a target behavior. If a person perceives that the outcome from performing a behavior is positive, then he or she will have a positive attitude towards performing the behavior. Moreover, if an individual sees that the result from performing a behavior is negative, the individual will have negative mentalities towards playing out the behavior.

2.9 Behavioral Intention to Use (BIU)

Intention is simply defined as how hard persons are willing to try and how much determinations they are planning to use towards performing a behavior. Behavioral intention (BI) refers to "a person's subjective probability that he will perform some behavior (Fishbein and Ajzen, 1980). In addition behavioral intention is a function of three independent antecedents namely, consumers attitude, subjective norm and perceived behavioral control. Mobile phone adaptation among farmers highly depends on the behavioral intention of the farmers towards mobile phone.

2.10 Actual Use(AU)

Actual Use indicates user's perception towards use of mobile phone for their daily activities. Farmers use intention towards mobile phone depends on their expectation and out comes by using mobile phone. We can construct three antecedents with mobile phone: (1) user satisfaction with the IT; (2) extent of user confirmation; and (3) post-adoption expectations, represented by perceived usefulness.

Previous studies we do not find to use Peer Influence, Perception of Convenience and User Satisfaction in any one report in agriculture sector. So, our intention was to grow interest of the farmers about technology.

3. HYPOTHESIS DEVELOPMENT

3.1 The relationship between Perceived Usefulness and Attitude toward Usage

Perceived usefulness (PU) is the most referred to factors that impact the mentality and conduct expectations of an individual(F. D. Davis, 1989). This variable is likewise most critical in portable administration utilizations. These two elements are additionally most huge in versatile administration uses (Kargin and N. Basoglu, 2007). With respect to the utilization of mobile phones, Kwon and Chidambaram (2000), find that PU has significant effects on user's extrinsic and intrinsic motivations. Attitudes can be defined as the positive or negative feelings a person has towards performing a target behavior. If a person perceives that the outcome from performing a behavior is positive, then he or she will have a positive attitude towards performing the behavior. Moreover, if an individual sees that the result from performing a behavior is negative, the individual will have negative mentalities towards playing out the behavior. So, there are different a closest effect on these factors to adapt of mobile phone among the farmers.

H1: There has a significant positive influence on Perceived Usefulness and Attitude toward Usage

3.2 The relationship between Attitude toward Usage and Intention to use

Attitude toward Usage contends that data frameworks will be valuable by and large in the event that they 'contribute to accomplishing the end-user's purpose. A person's intention to perform a behavior is a combination of (1) the attitude towards performing the behavior and (2) his or her subjective norm. Attitudes can be defined as the positive or negative feelings a person has towards performing a target behavior. If a person perceives that the outcome from performing a behavior is positive, then he or she will have a positive attitude towards performing the behavior. Behavioral intention is characterized as the quality of one's aim to play out a predetermined conduct. In addition behavioral intention is a function of three independent antecedents namely, consumers attitude, subjective norm and perceived behavioral control. Mobile phone adaptation among farmers highly depends on the behavioral intention of the farmers towards mobile phone. So, there are different a closest effect on these factors to adapt of mobile phone among the farmers.

H2: There has a significant positive influence on Attitude toward Usage and Intention to use.

3.3 The relationship between Behavioral Intention to Use and Actual Use

Behavioral intention (BI) is defined as a person's perceived likelihood or "subjective probability that he or she will engage in a given behavior" (Committee on Communication for Behavior Change in the 21st Century, 2002).

BI is behavior-specific and operationalized by direct questions such as "I intend to [behavior]," with Likert scale response choices to measure relative strength of intention. Intention has been represented in

measurement by other synonyms (e.g., "I plan to [behavior]") and is distinct from similar concepts such as desire and self-prediction (Armitage& Conner, 2001). Ajzen (1991) argued that BI reflects how hard a person is willing to try, and how motivated he or she is, to perform the behavior. Actual Use indicates user's perception towards use of mobile phone for their daily activities. Farmers use intention towards mobile phone depends on their expectation and out comes by using mobile phone. We can constructs three antecedent with mobile phone : (1) user satisfaction with the IT; (2) extent of user confirmation; and (3) post-adoption expectations, represented by perceived usefulness. So, there are different a closest effect on these factors to adapt of mobile phone among the farmers.

H3: There has a significant positive influence on Behavioral Intention to Use and Actual Use

3.4 The relationship between Peer Influence and Intention to use

Peer influence via interpersonal communications, either online or offline, has been acknowledged the important role in determining consumer's choices for decades. In general terms, when we speak of influence within a social network, we assume that controlling all other factors, there exists temporal dependence between the focal individual's behavior and her direct neighbors' previous behavior. Intention is simply defined as how hard persons are willing to try and how much determinations they are planning to use towards performing a behavior. Behavioral intention (BI) refers to "a person's subjective probability that he will perform some behavior (Fishbein and Ajzen, 1980). In addition behavioral intention is a function of three independent antecedents namely, consumers attitude, subjective norm and perceived behavioral control. Mobile phone adaptation among farmers highly depends on the behavioral intention of the farmers towards mobile phone. So, there are different a closest effect on these factors to adapt of mobile phone among the farmers.

H4: There has a significant positive influence on Peer Influence and Intention to use

3.5 The relationship between perceived ease of use and Attitude toward Usage

There are many researchers (e.g. Moon & Kim, 2001; Aladwani, 2002) who have studied the relationship between perceived ease of use and **Attitude toward Usage**, nonetheless, the relationship remains contradictory. For instance, Gefen and Straub (1997) discovered that the relationship was not significant in predicting e-mail acceptance as a technology, while others (e.g. Jantan, Ramayah& Chin, 2001; Moon & Kim, 2001) proved otherwise. In the context of mobile phone use or Internet use in agriculture, both are surmised to be closely linked as the argument is such that an Internet user who perceives that collecting information through Internet is effortless should in turn develop a tendency to perceive it as useful. Otherwise, Attitude toward Usage discusses. If a person perceives that the outcome from performing a behavior is positive, then he or she will have a positive attitude towards performing the behavior.

Moreover, if an individual sees that the result from performing a behavior is negative, the individual will have negative mentalities towards playing out the behavior. So, there are different a closest effect on these factors to adapt of mobile phone among the farmers.

H5: There has a significant positive influence on Ease of use and Attitude toward Usage

3.6 The relationship between Perception of convenience and Intention to use

Perceived convenience is used as additional factors since; there are two kinds of convenience, which are product and service. A way to determine whether a product or service is convenient depends on time and effort (Berry, Seiders, &Grewal, 2002). Brown (1990) examined the convenience of a product or service by five dimensions including time, place, acquisition, use, and execution. Yoon and Kim (2007) also defined perceived convenience as a level of convenience toward time, place and execution that one perceives when using the system to complete a task. In addition behavioral intention is a function of three independent antecedents namely, consumers attitude, subjective norm and perceived behavioral control.Mobile phone adaptation among farmers highly depends on the behavioral intention of the farmers towards mobile phone. So, there are different a closest effect on these factors to adapt of mobile phone among the farmers.

H6: There has a significant positive influence on Perception of convenience and Intention to use.

3.7 The relationship between User satisfaction and Attitude toward Usage

User satisfaction refers “filling or fulfillment up to a threshold of undesirable effects” (Oliver, 2010, p. 6). In other words, one may view satisfaction as “the consumer’s fulfillment response” (p. 8) that is, a judgment that a product/service features or the product or service itself is providing a pleasurable level of fulfillment (Oliver, 2010). On the other hand, drawing on developments in the behavioral sciences, differing interpretations of satisfaction have emerged in marketing research, which consider a range of favorable and unfavorable responses. And, Attitude toward Usage refers the degree of evaluative affect that an individual associate with using the target system in his job’. (Davis et al., 1989) have adjusted this definition to some degree. They contend that data frameworks will be valuable by and large in the event that they ‘contribute to accomplishing the end-user’s purpose. The most significant determinant of an individual's conduct is behavioral intention. Behavioral intention is characterized as the quality of one's aim to play out a predetermined conduct. A person’s intention to perform a behavior is a combination of (1) the attitude towards performing the behavior and (2) his or her subjective norm. Attitudes can be defined as the positive or negative feelings a person has towards performing a target behavior.So, there are different a closest effect on these factors to adapt of mobile phone among the farmers.

H7: There has a significant positive influence on User satisfaction and Attitude toward Usage

4. RESEARCH METHODOLOGY

This is an interpretive contextual investigation (G. Walsham, 1995) intending to explore the elements affecting selection of mobile phone innovation among the farmers in Bangladesh for a more extensive motivation behind offering a superior comprehension of how to give helpful data services to the rural communities in the creating locales as a major aspect of the procedure of in general rustic development. This approach is especially important to this investigation as it is aimed at producing an understanding of the context of the information system [i.e. using and adopting mobile phones, authors remark], and the process whereby the information system influences and is influenced by the context" (G. Walsham, 1995). Furthermore, the inductive thinking process in interpretive research provides a hypothesis with a goal not only to conclude a study but to develop ideas for further study (R. K. Yin, 2003).

This paper examines the circumstance by methods for a mix of qualitative and quantitative data(R. K. Yin, 2003).where the researchers are, as required, straightforwardly associated with the way toward gathering and analyzing the data. In this case one of the researchers was a passionate participant (A. D. Andrade, 2009)being resident closely familiar with the farmers in Bangladesh, a while the other one was a "distant observer". This participant observation approach with a "sense of detachment"(B. J. Oates, 2006) accomplished complete bits of knowledge about the social settings of the farmers in Bangladesh.

4.1 Data Collection

Secondary data was collected by methods for a literature search and by analyzing the contexts and existing hypotheses as exhorted by Walsham (1995), For this situation, both academic and general web engines were utilized. A "snowball" approach(B. J. Oates, 2006) for finding applicable papers was likewise utilized by checking the lists of references of the relevant papers found.

The questionnaires used had areas on demographics, personal situation, farming situation including methods and produce, information and market needs and habits, and views and preferences regarding media and communication technology. There were structured questions. I have used "likert scale" to collect data from farmers. To permit comparison, a few questions were identical across the overviews. In addition to the questionnaires, data was collected by the first author by means of observations, interviews and conversations with the farmers, and face to face discussions with the relevant actors in natural and formal settings. Northern part of the country is the main supplier for the agricultural products where Pabna is one of the importantdistricts for producing the agricultural products. As a result for the convenience and betterment of the study I have mainly selected sample area as Pabna District in Bangladesh. Data have been collected from 80 respondents and the response rate was 98%.To collect data the questionnaire

design divided into two sections. The first section consists of 29 questions of 8 variables. In, this study, data were analyzed with IBM SPSS 21.0 for conducting the descriptive analysis and the empirical test of the proposed research model and Partial Least Square (PLS) approach by using Smart-PLS (version: 2) software. Wong (2013), points out that major advantage of PLS-SEM is that it permits the use of formative measures, which differ considerably from the reflective measures.

4.2Data Analysis

4.2.1 Demographic and other Information

The demographic characteristics of the respondents (n=80) has been reported below the Table 1 show that 100% respondents are male. I have collected data only from the male farmer because generally male's work in agricultural activities. Without this, farmers those have completed graduation they are not actually full time farmer. They are generally engaged in job, business. They cultivate their own agricultural land by hiring labor. I have divided age group into 4 categories. Most of the farmers 30-50 years old that means we can say most farmers are belonging to middle age. The most of the farmers are illiterate or have little technical knowledge about agriculture. When I have collected data than I observed that all of them have no experience to participate in an interview. I have categorized farmers into 5 groups according their monthly income in BDT. The income of full time farmers are generally below 10 thousands and those have job or engaged other activities their income is more than fulltime farmers.

Table-I: Demographic Profile of the respondents

Demographic Information	Aspects	Frequency	Percentage (%)
Gender	Female	0	0%
	Male	80	100%
Age group :(Years)	20-30	16	20%
	30-40	38	47.5%
	40-50	17	21.25%
	50 above	9	11.25%
Education	No read or write	7	8.75%
	Read only	13	16.25%
	Read & Write only	9	11.25%
	I read up to Class…….	51	63.75%
Past experience	First time visitors	80	100%
	Repeat Visitors	0	0%

Income:(BDT)/Month	Less than 10 thousand	39	48.75%
	10-20thousand	20	25%
	20-30 thousand	17	21.25%
	30-50 thousand	4	5%
	50 thousand above	0	0%

4.3Model Assessment

Prior researchers proposed two steps analytical methods of SEM or PLS, which are

Step I: Assessment of the measurement model and Step II: Assessment of the structural model analysis of the Measurement Model.

4.3.1 Step I: Assessment of the measurement

A PLS model is assessing the measurement properties actually to test item reliability, internal consistency and discriminate validity. Hair et al.(2016) prescribed that convergent validity can be cheeked by calculating outer loading. Outer factor loadings value above 0.07 or higher are preferred, for exploratory research design, lower thresholds are acceptable but values must not be lower than 0.600 (Henseler et al.,2009).The tested result showed that outer loading value is considered satisfactory except US3, PI3 and ATU2.Therefore, we left those three items for further analysis. Then again run PLS algorithm then get tested result as shown in Table II,composite reliability values for this study were satisfactory because all values over above 0.70. Recently, researchers used the composite reliability(CR) and Cronbach's Alpha for estimating reliability or internal consistency based on latent variables in PLS structural equation models (Wong,2013). Henseler et al. (2009) suggested that in experimental research,0.60 to 0.70 is considered acceptable values.The tested result showed that composite reliability(CR) value above 0.70.The calculated value CR (range from 0.840 to 0.981) and Cronbach's Alpha CA (range from 0.717 to 0.961) which are more than the accepted value.

Table II: Convergent validity and Reliability

Items	Cronbach's Alpha	Composite Reliability	AVE
Perceived usefulness	0.865	0.909	0.715
Actual Use	0.717	0.840	0.637
Attitude Toward Usage	0.787	0.874	0.699
Intention to use	0.938	0.961	0.890
Peer Influence	0.961	0.981	0.962
Ease of use	0.906	0.934	0.781
Perception of convenience	0.876	0.915	0.729
User satisfaction	0.950	0.968	0.910

Consequently, Convergent validity can also be checked by calculating Average Variance Extracted

(AVE).Ahleman(2010)recommended that each construct 's Average Variance Extracted (AVE) is 0.05 or higher are acceptable for evaluating convergent validity.AVE values our study stand from 0.637 to 0.962,which are more than 0.50. Therefore, both validity and reliability analyses suggest that these constructs are valid and reliable for further advance study.

Table III: Discriminant Validity and Correlations (Fornell-Larcker Criterion)

	Perceived usefulness	**Actual Use**	**Attitude Toward Usage**	**Intention to use**	**Peer Influence**	**Ease of use**	**Perception of convenience**	**User satisfaction**
Perceived usefulness	**0.846**							
Actual Use	0.499	**0.798**						
Attitude Toward Usage	0.645	0.625	**0.836**					
Intention to use	0.402	0.627	0.510	**0.944**				
Peer Influence	0.432	0.324	0.357	0.292	**0.981**			
Ease of use	0.680	0.404	0.511	0.400	0.358	**0.883**		
Perception of convenience	0.679	0.495	0.647	0.463	0.419	0.587	**0.854**	
User satisfaction	0.606	0.447	0.643	0.454	0.285	0.564	0.743	**0.954**

Hair,Black,Babin,Anderson and Tatham(2007) refers to discriminant validity is a measurement that verifies whether each construct is unique. Evaluating discriminant validity result for empirical study, the AVE for each construct should be greater than the squared correlations of the construct and other constructs in the model. Table III, showed that, their items all load higher on their own construct than on other constructs in the model..Therefore, discriminant validity result indicates that the further strength of discriminant validity presence our currently study. All correlation coefficients are the positive value and it more than 0.07 and significant at level 0.01.Moreover, it validates that the constructs met the criteria.

4.3.2 Step II: Assessment of the structural model

PLS have developed two nonparametric approaches to test the relationship between variables: either jackknife or bootstrap techniques (Goodhue et al., 2006). In this study, the bootstrap technique is used for data analysis. The result of our study reveal that tested the extended TAM model explain 51.7% of the variance in Attitude Toward Usage to use mobile phone adaptation, 29.6% of the variance in Intention to use to use mobile phone adaptation and 39.4% of the variance in Actual Use to use mobile phone

adaptation by the farmers. Wong (2013) noted that path coefficient valued at approximately 0.670 substantial, value around 0.333 average and values of 0.190 acceptable. On the other hand, in the extended model of our study has found that supported hypothesis 1, 3 and 7 are supported, others hypothesis 2, 4, 5 and 6 were found not supported. The summary of the study bootstrapping analysis presented in the table IV and presented the figure II PLS analysis results of the extended model.

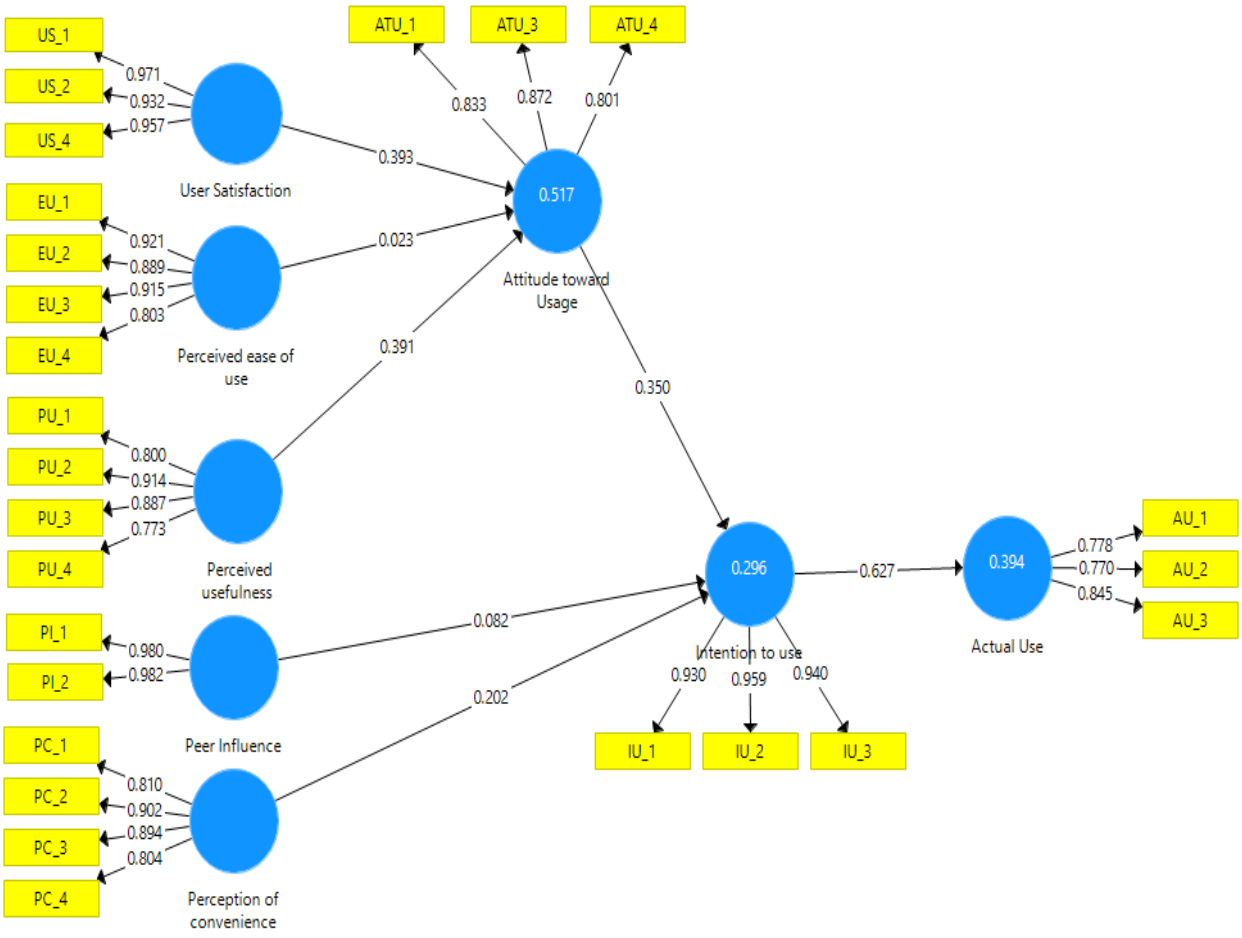

Figure II: Tested result of the proposed model

Table IV: Summary of Bootstrapping Results (Beta)

No.	Hypothesis Path	Path Coefficient(SD)	T Values	P Values	Result
1	Perceived usefulness ->Attitude Toward Usage	0.111	3.517	0.000	**Supported**
2	Attitude Toward Usage ->Intention to use	0.130	2.688	0.007	Not Supported
3	Intention to use ->Actual Use	0.057	10.984	0.000	**Supported**
4	Peer Influence ->Intention to use	0.109	0.754	0.451	Not Supported
5	Ease of use ->Attitude Toward Usage	0.110	0.211	0.833	Not Supported
6	Perception of convenience ->Intention to use	0.148	1.372	0.171	Not Supported
7	User satisfaction -> Attitude Toward Usage	0.110	3.577	0.000	**Supported**

P<0.05*(t>1.645) significant, P<0.1** (t> 1.96) very significant, P<0.001*** (t>2.58) extremely significant.

5. FINDINGS

This section has discussed the results of the proposed research model presented in Figure I by extending TAM model. The major aim of this study investigates the factors influencing on the usages behavior of mobile phone adaptation by farmer.

In the following, we present and discuss our exact findings, observations, and related studies on the farmers in Bangladesh using the factors as discussed.

In this study, the research result supports the hypothesis H1 states that effect of Perceived usefulness on Attitude Toward Usage was significant and strong and that definitely reflects the perceived benefits obtained from phone adaptation by farmers. The relationship between Perceived usefulness and Attitude Toward Usage has supported the cases of extending model(β=0.111, p=0.000).This study suggests that farmers attitude toward usage affects positive effects towards mobile phone adaptation by farmers .The result indicates that Perceived usefulness has **supported** as well as a positive and extremely significant relationship on Attitude Toward Usage of mobile phone adaptation by farmers.

In this study, the research result not supported the hypothesis H2 states that effect of Attitude Toward Usage on Intention to use was not supported so there is no definite relationship between Attitude Toward Usage and Intention to use towards mobile phone adaptation by farmers. The relationship between Attitude Toward Usage and Intention to use has not supported the cases of extending model (β=0.130, p=0.007).This study suggests that farmers attitude toward usage affects negative effects towards mobile phone adaptation by farmers .The result indicates that Attitude Toward Usage has not significant relationship on Intention to use of mobile phone adaptation by farmers.

Again, the research result supports the hypothesis H3 states that effect of Intention to useon Actual Use was significant and strong and that definitely reflects the perceived benefits obtained from phone adaptation by farmers. The relationship between Intention to use and Actual Use has supported the cases of extending model(β=0.057, p=0.000).This study suggests that farmers Actual Use affects positive effects towards mobile phone adaptation by farmers .The result indicates that Intention to use has **supported** as well as a positive and extremely significant relationship on Actual Useof mobile phone adaptation by farmers.

Again, the research result not supported the hypothesis H4 states that effect of Peer Influence on Intention to use was not supported so there is no definite relationship between Peer Influence and Intention to use towards mobile phone adaptation by farmers. The relationship between Peer Influence and Intention to use has not supported the cases of extending model (β=0.130, p=0.007).This study suggests that farmers Peer Influenceaffects negative effects towards mobile phone adaptation by farmers .The result indicates that

Peer Influence has not significant relationship on Intention to use of mobile phone adaptation by farmers.

Again, the research result not supported the hypothesis H5 states that effect of Ease of use on Attitude Toward Usage was not supported so there is no definite relationship between Ease of use – and Attitude Toward Usage towards mobile phone adaptation by farmers. The relationship between Ease of use and Attitude Toward Usage has not supported the cases of extending model (β=0.110, p=0.833).This study suggests that farmers Ease of useaffects negative effects towards mobile phone adaptation by farmers .The result indicates that Ease of use has not significant relationship on Attitude Toward Usage of mobile phone adaptation by farmers.

Again, the research result not supported the hypothesis H6 states that effect of Perception of convenience on Intention to use was not supported so there is no definite relationship Perception of convenience and Intention to use towards mobile phone adaptation by farmers. The relationship between Perception of convenience and Intention to use has not supported the cases of extending model (β=0.148, p=0.171).This study suggests that farmers Perception of convenience affects negative effects towards mobile phone adaptation by farmers .The result indicates that Perception of convenience has not significant relationship on Intention to useof mobile phone adaptation by farmers.

Finally, the research result supports the hypothesis H7 states that effect of User satisfaction on Attitude Toward Usage was significant and strong and that definitely reflects the perceived benefits obtained from phone adaptation by farmers. The relationship between User satisfaction and Attitude Toward Usage has supported the cases of extending model(β=0.110, p=0.000).This study suggests that farmers User satisfaction positive effects towards mobile phone adaptation by farmers .The result indicates that User satisfaction has **supported** as well as a positive and extremely significant relationship on Attitude Toward Usage of mobile phone adaptation by farmers.

A. Facilitating Conditions and Technology-service Attributes

According to Bangladesh Telecommunication Regulatory Commission (BTRC), stands at 156 million at the beginning of 2019 to be compared with a mere 85 million (GSMA, 2017).This quick development began in 1997 with the abolishing of the monopoly enjoyed by a company,Citycell, which uses CDMA technology. Under this monopoly, the cost of a mobile subscription was more than USD 1500 and network coverage was limited to only three metropolitan areas – Dhaka, Chittagong and Rajshahi. GrameenPhone (GP, “the village phone”) came into the market with their GSM innovation directly after the abolishment of the monopoly and inside six years of activity it turned into the principal administrator in Bangladesh to arrive at one million subscribers. The quick growing network, cheap fees and subscriptions, adaptable innovation and payment options (e.g. GSM vs CDMA, prepaid vs postpaid service) and offering many

Value Added Services (VAS) have quickly made GP a market leader. In this manner, the substantial competitive pressure among the six market players has prompted diminished subscription cost.

B. Tech-service Promotion and Social Influence

The presence of sufficient awareness is one basic achievement factor for acceptance. For example, we found in our 2019 study that fewer than 10 % of the farmers had heard about the presence of the government supported web-based agriculture market information service (www.dam.gov.bd). Whether or not the service was useful to farmers or not, obviously government had failed to promote its reality among the farmers.

C. Education

Although the fact that the selections of handsets and operators are distinct to one another, they are typically marketed together and regularly obtained simultaneously. The above findings recommend that for the both handsets and operators, social impact is a higher priority than the media impact. We also found that 63.75% % of the farmers (Table I) in our sample have institutional education but which is not so effectible to adopt mobile phone, which matches the percentage of farmers being impacted by media while subscribing and purchasing the phones. Actually, it has been seen that media impact is strong among the early adopters who are obviously a greater amount of risk takers. In actuality in rural Bangladesh, this group also acts as referents to others having less or no education. As discussed in the literature review,'' individual factors" is a significant impacting some portion of mobile phone reception in a country setting. Actually, how the outside variables are affecting upon an individual relies upon the individual factors which are included individual and demographic characteristics, and degree and sort of social impacts. There is a lack of literature describing to what extent women are mobile phone subscribers and users.The authors of this paper didn't survey the gender ratio of mobile phone use in rural villages, yet a general perception is that it is for the most part dominated by men.

D. Culture

Almost 90% of Bangladesh's population has a similar language, culture and religion. Accordingly, we didn't locate any observable characteristics or activities that can recognize theadopters from the non-adopters as far as their predominant human culture.A interpretation of this perception could be the social homogeneity at the national level and financial homogeneity at the country level. According to Khan et al. (1986),"except for the [small] tribal areas in the Chittagong Hill Tracts, Bangladesh is a homogeneous country in which all rural areas are generally similar".

6. PROBLEMS FACED IN USING MOBILE PHONE BY THE FARMERS

It was indicated that illiteracy is one of the big problems among rural farmers to use smart phone most of the farmers do not have any knowledge and informationabout how to utilize their touch screen and enter the digits. Similarly, farmers do not use mobile for getting the latest information about advertising, climate and utilization of legitimate pesticides in their field. Farmers can utilize the SMS and voice message delivery system to get the information regarding agriculture and conveyance framework to get the data with respect to agribusiness issues and issues in various regions. It is easy to use for the farmer, but same time illiterate farmers are not using this service while it is possible that this problem can be solved through training the farmers about use of mobile phones and SMS. While, other issues were additionally distinguished for example, significant expense of support, poor system and deficient expertise for its activity.

However, it was expressed that due to lack of knowledge and information about the agriculture marketing information of selling their product most of the farmers sell their product at lower price in developing countries such as Bangladesh. Farmer's link with different sources likes as brokers, processors and merchants farmers sell their agricultural products to buyers at wholesale price.

While after getting the product at low price, brokers and purchasers resell the products to processors at higher price. Therefore, mobile phones are one the bestsource to communicate legitimately with market and get latest information of their product and sell it at good price.

These days farmersare using different methods and technologies to increase their productivity, profitability and attempting to decrease conventional strategies .In the perspective of the China in the growth of economy farmers are also playing an important role in the contribution of Gross Domestic Product (GDP) of the country. To improve and increase the agriculture produce farmers are accessing and getting more information from different wellsprings of innovations like an internet mobile phone and for find location usingGlobal Positioning System (GPS). Furthermore, china hasinvested lot of amount on information communication technologies to provide best opportunities to farmers and spread more information around the country.

It was demonstrated that ICT has played a significant job in different parts of the general public and has expanded the data framework in various networks.Data innovation in farming additionally increasingly well known where farmers can without much of a stretch get most recent data of climate by utilizing web and legitimately check the market data of various harvests. In creating nations for example, Pakistan India, Bangladesh and South African nations agribusiness is a significant patron of economy also, the Gross Domestic Product (GDP). These days ranchers are progressively mindful about correspondence innovation

apparatuses, for example, PC, Internet and cell phone and improving their living standard. Mobile phones havediminished the expense of costs in country individuals. Be that as it may, it was demonstrated that cell phone has given unique openings, information and data with respect to distinctive rural issues, issues and its answers for agribusiness advancement and information among farmers.Moreover, cell phone use in rural augmentationadministrations has given data of market, climate, transport and farming practices to speak with related division.

From above discussion we can find some problems towards adaptation of mobile phone among the farmers of Bangladesh-

- Lack of technological knowledge such as browsing internet
- Most of the farmers are unwilling to gather information from mobile or internet because they generally take decision from their experience as well as their elder's advice.
- Most of the farmers are unaware about Agriculture Information Service
- Farmers generally use mobile for only for calling and recreational purposes. They have less interest in using mobile phone for agricultural purposes.
- The price of smart phone as well as voice call rate and internet pack is high. So, it's a great barrier for adaptation of mobile phone among farmers.
- Most farmers are illiterate or have little academic knowledge. So, they are not able to browse internet or apps.
- Most of the farmers don't know the dialing number of "Agriculture Information Service", so they are depriving from this service provided by Govt.

7. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

7.1 Summary

Technological development has been brought a great change in our life. A revolutionary changed has been occurred to our life style.Adoption of mobile phone breaks out like a great turning in our life style. This trend has been also spread into the farmers. If we encourage them to use mobile phone to the agricultural activities; it will bring revolution in our productivity. Because through mobile phone farmers can easily collect data which are essential for increase productivity. For this study I have used the Technology Acceptance Model (TAM; by Davis in 1989) . I have identified 8 factors those have impact on mobile phone adaptation among farmers as well as I have developed 7 hypothesis and justified those hypothesis. Some of them are supported the hypothesis and some of them are not supported the hypothesis. Those hypothesis are supported have significant impact on mobile phone adaptation among farmers and those hypothesis are not supported have no significant impact on mobile phone adaptation among farmers.

7.2 Conclusion

This paper has explored earlier theories and models on technology adoption and diffusion and summarized them into a conceptual research model, which has not been done before so comprehensively. We have detailed and rationalized the factors by means of empirical data and studies related to rural Bangladesh. The conceptual model populated with some factors as presented here can be useful for policy makers, service and technology designers and marketers, and researchers having particular interest to serve rural communities in developing regions. The inclusions of two new external factors – tech-service promotionand tech-service attributes – may be of special interest for the researchers devoted to technology acceptance and diffusion models. In this paper I have used Technology Acceptance Model (TAM; by Davis in 1989) and added some variable with this.Through this model I tried to explain factors those affected mobile phone adaptation among farmers of Bangladesh as well as present condition of Bangladesh towards mobile phone adaptation among farmers.

7.3 Recommendations

- Most of the farmers are unaware about Agriculture Information Service. So, Govt. should take initiatives so that each people of Bangladesh can know about different services provide by Govt.
- Most of the farmers are unwilling to gather information from mobile or internet because they generally take decision from their experience as well as their elder's advice. By running different project, programs or by the help of different NGO's we can solve this problem
- Government should take initiatives to ensure proper electricity supply in village area and provide subsidy to easily purchase of mobile phone by the farmers
- Increased use of mobile phone can be ensured better solution to pest attack, proper marketing and earning more from the existing facilities.
- Government field level extension agents for instance Sub-Assistant Agricultural Officer (SAAO) should encourage and assist the farmers to use mobile phone in not only receiving but also sending information on agriculture.
- I recommend mobile phones companies to establish a wider, affordable and effective service or product offering instant market prices and additional, relevant market information.
- Govt. should take initiatives so that farmers can easily access to internet.

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Appendix: Include Questionnaires

Factors Influencing the Adoption of Mobile Phones among the Farmers in Bangladesh

This survey is a part of M.Sc. degree of "Agribusiness & Marketing dept." according to the supervision of **Dr. Mohammad Abdullah Mahfuz**, Associate Professor, Department of Marketing, Jagannath University, Dhaka.

INTERVIEW SCHEDULE

SI. No.:..... **Date:.....**

Name of the respondent: ..... Village .....

Thana / Upazilla ..... Post Office:.....

District: .....

<u>Direction:</u> Please check ( ) and rate yourself honestly based on what you actually observe ,give the statements using the scale: 5-Over satisfied; 4-Satisfied; 3-Neutral; 2-Dissatified; 1-Very Dissatisfied.

No.	Variables name	1	2	3	4	5
1	**User satisfaction**					
	The mobile phone services provide the precise information I need in agriculture.					
	The information content of the mobile phone services meets my need.					
	The mobile phone services provide reports that seem to be just about exactly what I need in agriculture.					
	The mobile phone services provide sufficient information about agriculture.					
2	**Ease of use**					
	Learning how to use mobile phone is easy					
	Mobile phone is clear and understandable to use					
	I find mobile phone easy to use					
	It would be easy for me to become skillful at using mobile phone services.					
3	**Perceived usefulness**					
	Using mobile phone helps me accomplish things more quickly					
	Using mobile phone makes my life easier					
	I find mobile phone useful in my life					
	Using mobile phone services would improve my productivity in gathering information about agriculture.					
4	**Peer Influence**					
	My peers / colleagues / friends thought that I should use mobile phone services for gathering information about agriculture.					
	People I knew thought that using mobile phone services in agriculture was a good idea.					
No.	**Variables name**	**1**	**2**	**3**	**4**	**5**

	People I knew influenced me to try out mobile phone services for gathering information about agriculture.					
5	**Perception of convenience**					
	I will perform my job any place with the use of a mobile phone					
	Using a mobile phone gives me convenience in performing agricultural work.					
	I find a mobile phone convenient for my work					
	Using a mobile phone enables me to accomplish my job at a time that is convenient for me					
6	**Attitude Toward Usage**					
	Using mobile phone services would be a good idea in agriculture.					
	Using mobile phone for gathering information about agriculture would be a foolish idea.					
	I like the idea of using mobile phone services for gathering information.					
	Using mobile phone services would be a pleasant experience.					
7	**Intention to use**					
	I intend to use mobile phone services in the near future (i.e. next 3 months).					
	It is likely that I will use mobile phone services in the near future (i.e. next 3 months).					
	I expect to use mobile phone services in the near future (i.e. next 3 months).					
8	**Actual Use**					
	If mobile phone be available I will actual use of it					
	If mobile phone is not available I will ask from managers or Supervisor to take it					
	According to the IT's benefits I'll use it to perform my job duties					

Demographic Information

Gender	**Age group :(Years)**	**Education**
1. Female 2. Male	1. 20-30 2. 30-40 3. 40-50 4. 50 above	1. No read or write 2. Read only 3. Read & Write only **4. I read up to Class……..**
Past experience: 1. First time visitors 2. Repeat Visitors	**Income:(BDT)/Month** 1. Less than 10 thousand 2. 10-20thousand 3. 20-30 thousand 4. 30-50 thousand 5. 50 thousand above	

Thank you for your nice cooperation.