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Factors influencing consumers' adoption of mobile financial services in Tanzania

Amina Abdinoor[1] and Ulingeta O.L. Mbamba[1]*

*Corresponding author: Ulingeta O.L. Mbamba, General Management, University of Dar es Salaam, Dar es Salaam, United Republic of Tanzania
E-mail: mbamba@udbs.udsm.ac.tz

Abstract: This study aimed at assessing consumers' adoption of mobile financial services in Tanzania using Technology Acceptance Model. The study had the following objectives, to assess the individual awareness of mobile financial services; perceived usefulness; perceived benefits; and costs effects on adoption of mobile financial services. Random sampling technique was employed to select the sample for data collection. Two hundred participants were selected randomly from Dar es Salaam region particularly Kinondoni District. The sample included the users and non-users of mobile financial services. The study used primary data and regression model. The findings of this study show that mobile financial service adoption is positively related to individual awareness, perceived usefulness and perceived benefit but it is negative related to cost effects. Nevertheless, the study showed that demographic characteristics of respondents (sex, age and income level) are among the factors moderating adoption of mobile financial services. From the findings, this study highlights recommendation that service providers need to play a leading role in influencing individual awareness, perceived usefulness, and perceived benefit of mobile banking. However, cost effect has been found as one of the barrier to the intention to adopt mobile financial services in Tanzania. Service providers should consider affordability and availability of the financial services for the low-income segment in the society. These results can be extended to any developing country.

ABOUT THE AUTHORS

Amina Abdinoor was a graduate student in the University of Dar es Salaam who has interest on implications of implementing information and communication technologies in organizations.

Ulingeta O.L. Mbamba is a senior lecturer in the Department of General Management of the University of Dar es Salaam. Primarily, the author is working on research on the area of evaluation and role of information systems in organizational performance.

PUBLIC INTEREST STATEMENT

One factor for economic development of any country is its citizens' participation in the formal financial services. Despite a number of studies being done in the area of banking, the number of unbanked people is still high, especially in developing countries, which in one way or another impede economic development. Information and telecommunication technologies, especially mobile technologies that have been more accepted than other technologies, seem to provide solution but its adoption in banking activities has been a challenge. Acceptance and adoption of mobile banking technology is the key driver in determining the level of financial participations among the mobile banking users. This study has shown that factors influencing consumers' adoption of mobile financial services are the individual awareness; the perceived usefulness; the perceived benefits; and the cost effects. The first three factors have positive, while the last one has negative effects. These factors are moderated (make the strong or weak relationship) by age, sex, income level, and education level of users.

1. Introduction

The business environment has become dynamic and undergone rapid changes as a result of introduction of new technologies, innovations, and increased demand from customers. The introduction of mobile money had brought new challenges and opportunities for businesses and individuals. Riquelme and Rios (2010) argued that as technology develops; both financial institutions and consumers are taking advantages of efficiencies it brings along. As businesses become complex with changing conditions and unpredictable economic climate, innovation is inevitable for the businesses to remain competitive. One of the areas that have taken this advantage is mobile banking technology. Mobile banking can be defined as the capability of carrying financial transactions through mobile devices. Financial transactions include bank account statements generation, funds transfer, electronic payments, and information-based financial services (Drexelius & Herzig, 2001). Mobile banking is the expansion of mobile phone network in developing markets that provide an opportunity to operate virtual bank accounts through a mobile phone (Masamila, 2014).

Despite a number of studies being done in the area of banking, the number of unbanked people is still high (Burgess & Pande, 2005; Dupas, Karlan, Robinson, & Ubfal, 2016). One of the promising areas is the use of information and communication technology. In the banking case could be mobile banking where a number of users in developing countries have access to.

There were several banks in Tanzania until nationalization of 1967. In late 1980s, there was trade liberation which opened doors to private banks to operate. In 2006, the Banking and Financial Institutions Act came into operations. Currently, there are number of banks and financial institutions yet still one would wish their reach to citizens be expanded.

1.1. Statement of the problem

Today's emergence of mobile financial services is characterized by use of mobile phone technology for the easy access of financial services. Many individuals opt for mobile banking as a means for their daily transactions, though the adoption of mobile banking has been slower for the developing countries compared to developed countries. The level of adoption of mobile financial services in Tanzania is still low despite various initiatives being deployed by public and private sectors (National Council for Financial Inclusion, 2014). Bhanot, Bapat, and Bera (2012) argued that marginalized group of people in rural areas lack financial information and awareness of the most of financial services which can result in low-income group to be disadvantageous to the financial services. The report on factors influencing usage of new technologies in low-income households in Kenya, Nyambura et al. (2013) indicated that demographic factors (age, gender, marital status, education level and skills) have high influence on the usage of new technologies.

However, Chemingui and Ben lallouna (2013) reported that customers are motivated to use the service that is compatible with their needs and behavior. Also the intention to use will increase with the relative advantage provided. Nevertheless, Wessels and Drennan (2010) argued that perceived usefulness, perceived risk, cost, and compatibility affect consumer acceptance of mobile banking. Even though Mohammadi (2015) on mobile banking usage in Iran reported that system compatibility was the major determinant stirring customers' attitude on using mobile banking, resistance revealed as a negative determinant on both ease of use and usefulness.

Acceptance and adoption of mobile banking technology is the key driver in determining the level of financial participations among the mobile banking users. There are still factors holding back customers from acceptance of mobile banking (Nyambura et al., 2013). One of the things holding back, the adoption of mobile banking is the lack of awareness of what these services can be used for

(Tobbin, 2013). The concepts of banking and saving when promoting these services have not yet being communicated enough (Bhanot et al., 2012). Though many are aware of the services, they are not viewed as financial tool but as an alternative of sending money among both users and non-users. Also the relative advantage (perceived benefit), ease of use, usefulness, and the cost effect of mobile banking services seem as the factors hindering acceptance and adoption of mobile banking (Chemingui & Ben lallouna, 2013; Wessels & Drennan, 2010).

However, the literatures like Tobbin (2013), Bhanot et al. (2012), Nyambura et al. (2013), Chemingui and Ben lallouna (2013), Wessels and Drennan (2010) and Mohammadi (2015) may not sufficiently provide factors influencing consumers' adoption of mobile financial services that is specific for Tanzania but can be a stepping stone toward studies in Tanzania. Despite some studies on this area in Tanzania like Chale and Mbamba (2015) as well as Ally and Mbamba (2009), this study sought to fill this information gap by assessing the factors influencing consumers' adoption of mobile financial services in the context of developing country like Tanzania.

1.2. Objective and rationale of the research

The general objective is to assess the factors influencing consumers' adoption of mobile financial services in Tanzania. The specific objectives of this work were to assess:

a. the individual awareness of mobile banking on adoption of mobile financial services;

b. the perceived usefulness on adoption of mobile financial services;

c. the perceived benefits on adoption of mobile financial services; and

d. the cost effects on adoption of mobile financial services for mobile financial adoption.

This research came up with the model to help linking between individual awareness, perceived usefulness, perceived benefit, and cost effects on adoption of mobile financial services (Figure 1).

2. Literature review

This section provides relevant literatures related to this study. It discusses basic definitions, theoretical framework on factors influencing adoption of mobile financial services. Technology Acceptance Model (TAM) discussed giving full understanding based on other related studies which have used the model relevance to this study. It further discusses empirical framework based on the objectives of the research while relating to other authors of related studies. The section elaborates key issues on factors influencing consumers' adoption of mobile financial services from other countries and provide conceptual framework linking the different variables in the study.

Figure 1. The proposed conceptual framework.

Source: Created by literature review and informed by Technological Acceptance Model (TAM).
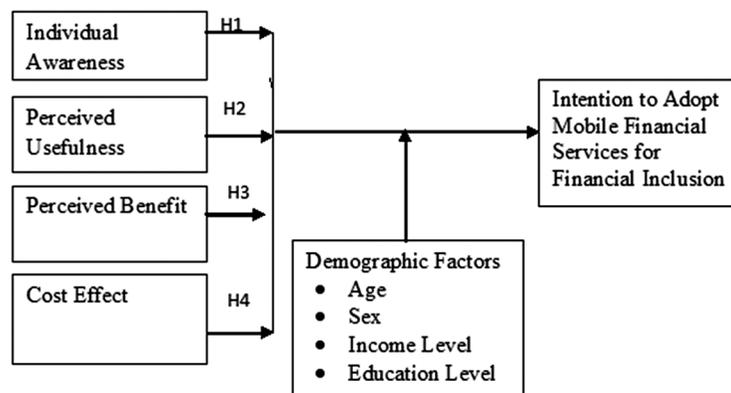
2.1. Basic definitions of terms

There are four main basic terms in this work. These are awareness, perceived usefulness, perceived relative advantage, and cost effect. Awareness is the degree to which a consumer is aware of electronic banking channels (Lee, Choi, Kim, & Hong, 2007). Individual awareness is the level of information consumer has on mobile banking.

Perceived usefulness as elaborated by Davis (1989) is the extent to which an individual perceive the usage of particular application will lead to achievement of certain objectives. This can be assessed through frequency of the service usage and the benefits gained by the individual depending on the service. Perceived relative advantage (benefit) is defined as the degree to which an innovation is perceived to be better than the idea it supersedes (Karayanni, 2003).

Luarn and Lin (2005) defined cost effect as the extent to which a person believes that using mobile banking will cost money, this has negative effect on intention to use mobile banking and its related technologies. The low-cost charges can ease the burden to the users hence the affordability of the service.

2.2. Theoretical perspective: Technology acceptance model

Innovation and adoption of new technologies have attracted so much attention in various literatures, and this has generated many models and theories which are believed to affect the adoption of an innovation. The model which illustrates acceptance and adoption of new technology is the TAM. The model has been used in many researches in developed countries, among of research studied on innovation are mobile banking and electronic banking.

TAM was developed by Davis (1989) to study the acceptance of technology by different individuals. It addresses both the perceived ease of use and the usefulness of technology. The perceived ease of application determines the attitude to adopt new technology. The attitude toward adoption will determine the individuals' future decision concerning adoption of new technology. When individuals come across new technology, a number of factors determine their decision about how and when they will use it. Those factors can be age, gender, experience, and voluntariness of use among individuals (Davis, 1989). The model helps in predicting the main determinants of consumers' behavioral intentions toward the use of new technology. The model provides the provision to add external variables as the determinants of perceived usefulness and perceived ease of use.

TAM is tailored and designed to explain how external variables likely to influence an individual's decision to use the new technology. The aim of this study is to assess factors influencing mobile financial services in mobile banking users. Mobile banking is the new technology especially in this context of developing countries; TAM illustrates that users develop perception about the usefulness and ease of use of various technologies which lead to the actual usage of the technology. Hence, the model is useful in giving the insight on adoption of new technology.

TAM has been widely applied to diverse set of technologies and users in different cultural and economic context. This model has been used in various research works especially those involving acceptance and adoption of new technology regardless of the environment in which the individual participants are originating (whether in urban or rural). Mohammadi (2015) used the model (TAM) in his study on mobile banking in Iran. Other researchers who used the model are Wessels and Drennan (2010) in Australia when they conducted their study on investigation of consumer acceptance of mobile banking. Tobbin (2013) in Ghana also used the model on the study toward a model of adoption in mobile banking by the unbanked and Riquelme and Rios (2010) conducted a study in Kuwait and used the model (TAM) in the Moderating effect of gender in the adoption of mobile banking. TAM was extended to TAM2 and unified theory of adoption and usage of technology commonly known as Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh, Morris, Davis, & Davis, 2003).

Despite a number of criticism on TAM, TAM still provides an important theoretical contribution toward understanding factors hindering the actual use of the system. TAM describes the relationship between the independent variables (perceived usefulness and perceived ease of use) and dependent variables (attitude, intention and actual use). Some of the criticism and extensions of TAM include Extended TAM known as TAM2 (Venkatesh & Davis, 2000), UTAUT (Venkatesh & Zhang, 2010) and others.

2.3. Empirical literature review

Factors influencing acceptance and adoption of mobile banking have been the area of focus to many studies. The common determinant factors are individual awareness, perceived usefulness, perceived benefit, and cost effect of mobile banking technology.

2.3.1. Individual awareness of mobile banking on adoption of mobile financial services

Bhanot et al. (2012) study focused on factors which affect financial inclusion of the marginalized and disadvantaged people in rural areas of northeast India. Findings of this study indicate that some factors can lead to financial inclusion to the marginalized groups on remote areas, which include among others financial information from various channels, education on financial issues, and awareness to the low-income individuals on rural areas.

Laforet and Li (2005) as well as Tobbin (2013) discussed individual awareness as one of the factors that influence acceptance and adoption of mobile banking. Though there were differences on the findings between one study and the other concerning other factors blocking the respondents on financial information. Such factors are behavioral characteristics of individuals', convenience, ease to use, and education. Individual awareness is not the only factor mentioned by the studies above, Bhanot et al. (2012) also discussed financial education to the low-income individuals, distance to the banks and government contribution as the factors influencing mobile banking adoption; however, Chen (2013) argued that apart from individual awareness, behavioral characteristics of individuals have contribution to the adoption of mobile banking.

It is hypothesized that given demographic factors, *individual awareness of mobile financial services has influence to the adoption of mobile financial services.*

2.3.2. Perceived usefulness of mobile banking on adoption of mobile financial services

Mohammadi (2015) evaluated mobile banking usage in Iran. The questionnaires were administered randomly through private emails to 410 students' member in Facebook and LinkedIn. The findings of this study showed that system compatibility was the major determinant stirring customers' attitude on using mobile banking. Perceived usefulness arbitrates the relationship between ease of use and customers' attitude toward usage of mobile banking. Though youth are normally the ones easy to adopt new innovation but most of the people who use mobile banking are middle-aged individuals with income.

Nyambura and Waema (2013) conducted a study on development outcomes of the Internet and mobile phones use in Kenya, households' perspectives. This paper examined the acceptance of the Internet and mobile phones for improvement and sometimes impediment of various conditions of development conveying radical changes to Kenyan households in the last couple of years. The findings of this study showed that a high value is attached to the new technologies and in particular mobile phones which informs that new technologies facilitate some capabilities and limit others bringing to diverse development outcomes. Other factors like social, economic, knowledge ,and status of individuals contribute on development of new technologies and their outcomes.

Wessels and Drennan (2010) as well as Laforet and Li (2005) also discussed on perceived usefulness as one of the determinant on adoption of mobile banking technology. Other determinant mentioned was perceived ease of use for the new technology. However, Nyambura et al. (2013) included

other factors apart from perceived usefulness, those factors are social, economic, knowledge, and status of individuals to the acceptance and adoption of new technology.

It is hypothesized that given demographic factors, *perceived usefulness of mobile financial services has positive influence to the adoption of mobile financial services.*

2.3.3. Perceived benefit of mobile banking on adoption of mobile financial services

Chemingui and Ben lallouna (2013) conducted a study on the resistance, motivations, trust, and intention to use mobile financial services in Tunisia. This research paper determined factors which could lead customers to resist adoption of new technology and the motivational factors which could lead to the intention of using mobile financial services. The results showed that there were some barriers to the intention to use mobile financial services on adoption of mobile banking. The major barrier was tradition, here customers showed some resistance on changing their habits and behaviors by allowing interaction with service providers through mobile servicers and the offers provided. Other barriers are usage, value, and risk on mobile banking adoption. This revealed that customers are motivated to use the services which are compatible with their needs and behaviors; another thing is if they can get the opportunity to try the product or service, the emotional enjoyment when using the service and also the way they perceive the word quality which has positive impact on increasing customers' confidence on the service.

Thakur (2014) conducted a study on what keeps mobile banking customers loyal. This study was conducted in Mumbai, India. The purpose of the study was to see if customer satisfaction and loyalty are the concepts which interfere on one another on the framework of mobile banking. The emphasis on these concepts is of paramount as banking in mobile phones is concerned in order to reach many customers. The data collection method used was questionnaires targeted to individuals who had used mobile banking previously. These questionnaires were administered online by mailing electronic hyperlink to the respondents. Five hundred responses were received in which only 433 were valid questionnaires for the data analysis. The findings revealed that customer satisfaction from mobile banking established from the earlier use of mobile banking has a positive effect on a customer loyalty. Meanwhile, mobile interface usability and service constitute a positive effect on customer satisfaction. Customer satisfaction and loyalty are not only goals aimed by managers. There are other goals depending on organizational objectives, for instance innovation associated with introduction of new technology and the perceived behavior by the customers.

Chen (2013)as well as Laforet and Li (2005) also supported perceived benefit as the factor that can influence acceptance hence adoption of mobile banking. The data collection methods used were different. Generally, studies above showed perceived benefit was not the only factor that leads to acceptance and adoption of mobile banking technology. Chemingui and Ben lallouna (2013) also showed compatibility, triability, and system quality as other factors influencing adoption of mobile banking technology. On the other hand, Thakur (2014) revealed that customer satisfaction from mobile banking established from earlier use has a positive effect on customer loyalty hence continuous usage of mobile banking technology.

It is hypothesized that given demographic factors, *perceived benefit of mobile banking has positive influence to the adoption of mobile financial services.*

2.3.4. Costs effect on adoption of mobile financial services for mobile finance

Ishengoma (2011) conducted a study on Analysis of mobile banking for financial inclusion in Tanzania, (Kibaha District Council). This research paper determined the financial inclusion of mobile banking. The purpose of this study was to determine the usage of mobile banking, the behavior of mobile users to mobile banking services, also to find the magnitude in which the service had delayed financial development and evaluation of service successes and the costs associated with mobile services. The data collection methods used were questionnaires and Interviews. The findings of this study observed that 79 percent of population was using mobile banking services. Most of the users'

witnessed that the service helped them access financial services in an easy way. The study also observed that illiterate respondents were facing difficulty in using technology compared to literate users. The mobile banking service costs showed the divergence and it was not clear to the researcher, and recommended for further studies. Respondents whom were not registered in any of mobile banking services showed interest to use as a result of expected and perceived usefulness of technology in financial accessibility at an easy way.

Wessels and Drennan (2010) also discussed about cost effect as the factor that determine the acceptance and hence adoption of mobile banking. Nevertheless, Ishengoma (2011) also observed that illiteracy among respondents contribute to the resistance on mobile banking technology acceptance, hence low adoption on mobile banking technology.

It is hypothesized that *given demographic factors, costs of mobile banking services has negative influence to the adoption of mobile financial services.*

2.3.5. Research gap and conceptual framework
Findings from studies above vary from each other even though they all indicate factors influencing acceptance and adoption of mobile financial services and their implications on mobile banking subscribers. Individual awareness, perceived usefulness, perceived benefit, and cost effect are the major factors discussed on these studies. Findings showed the relationship between acceptance and adoption of mobile banking systems and the technology involved. This study investigated on factors influencing consumers' adoption of mobile financial services in Tanzania. Tanzania is the developing country in which majority of the population are poor and marginalized, living in both urban and rural part of the country. The study concentrated on individual users and non-users of mobile financial services in Tanzania.

The conceptual framework of this study based on a thorough review of both theoretical and empirical literatures intended to assess the relationship that exist between individual awareness, perceived usefulness, perceived benefit, cost effect and the acceptance and adoption of mobile financial services. Theoretical literature review showed that perceived usefulness and perceived ease of use determine the attitude toward acceptance and adoption of new technology. Furthermore, individual awareness on mobile banking can influence acceptance and adoption of mobile financial services. Moreover, perceived usefulness is one of the factors determine the acceptance and adoption of mobile financial services. Perceived benefit by the mobile banking users has the influence on acceptance and adoption of mobile financial services while the cost effect of mobile banking determine the acceptance and adoption of mobile financial services. In summary, these concepts derived above, based on thorough literature review, can be depicted as in Figure 1.

3. Methodology
The research was primarily quantitative. The nature of the study is an explanatory. In this study the researcher used quantitative approach, in which the data collected were subject to vigorous quantitative analysis in a formal way as the study is designated to assess the factors influencing consumers' adoption of mobile financial services. Sample of 200 participants selected randomly from Dar es Salaam region particularly Kinondoni District, Dar es Salaam, Tanzania. The sample comprised the users and non-users of mobile financial services.

Probabilistic sampling technique has been used specifically the random sampling technique being employed to select the sample for data collection on awareness, perceived usefulness, perceived benefit, and cost effect of mobile financial services. The sampling frame of this study consists mobile banking users in Dar es Salaam region. This sampling frame has been selected randomly at bank gates and mobile money vendors in the region.

Table 1. Reliability test results		
Scale	**Cronbach's alpha**	**Number of items**
Individual awareness	0.988	5
Perceived usefulness	0.991	5
Perceived benefit	0.987	5
Cost effects	0.983	5

Source: Author Computation Survey Data.

The study attempted to use primary data only. The field survey has been conducted and the data were collected using questionnaires which were distributed randomly to mobile phones subscribers, who have and those who don't have mobile banking services in Dar es Salaam region at Kinondoni District.

3.1. Data quality

Reliability refers to the magnitude to which measurement of data in the questionnaires is free from errors, consistent and produces the stable results despite the test taker, administrator, or condition under which the test is administered (Saunders, Philip, & Andrian, 2009). Internal consistency includes correlating the response to each question in the questionnaire with the others (Saunders et al., 2009). There are different methods on calculating internal consistency whereby Cronbach's alpha known to be the most frequently used method. For this study, the data were tested for its reliability using SPSS software in which the Cronbach's coefficient (Alpha) has been calculated. The level of Alpha in this study is 0.9 which is in line with the rule of thumb that the proposed level of reliability is normally above 0.7 while others put at 0.8 (Cronbach & Richard, 2004). Table 1 presents the Cronbach alpha values for all predictor variables.

Validity is the magnitude to which the questions really measure the presence of the variable one aims to measure (Saunders et al., 2009). The validity of the data in the research study has been assured by assessing questions in the questionnaires for their clarity through various professionals in this field of study. Also some few copies of questionnaires were distributed to the respondents for pre-testing in order to test understandability of the questions and correct misconceptions that might appear. This test ensured that the questionnaire was appropriate and understandable. Hence, the collected data were valid for this study since construct variables are assumed to be factual and the review studies were dealing with the subjects which the researcher wished to address. Nevertheless, these steps assisted the study to establish correct operational measures for the variables and bring credible relationship.

3.2. Data analysis

This study used the regression analysis model. The regression analysis model was applied to predict the values of a criterion variable given the values of one or more predictor variables by calculating a regression equation (Saunders et al., 2009). Regression analysis has few assumptions which should be met before calculating regression equation. The research used assumption of regression analysis as proposed by Saunders et al. (2009).

The coefficient of determination r^2 can be a portion of how good a predictor of the regression equation is probable to be (Saunders et al., 2009). If it is an ideal predictor then the coefficient of determination will be 1. The coefficient of multiple determination (R^2) signifies the unit of measurement of goodness of fit for estimated multiple regression equation (Saunders et al., 2009).

The model of the equation in this study will be:

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + \mu_i$$

where y is adoption of mobile financial services, X_{1i} is Individual Awareness, X_{2i} is Perceived Usefulness, X_{3i} is Perceived Benefit, X_{4i} is Cost Effects, μ_i is Error estimation, Y variable is Criterion variable while X_s are predictor variables.

4. Data analysis and research findings

For the purposes of this study, characteristics of the respondents were categorized in terms of the gender, age, level of education, occupation, income level, and marital status as described in the following sections.

4.1. Sample characteristics

Table 2 presents sample characteristics in terms of sex, income levels, education levels, occupation, and age group. The results show that slightly more than half of the respondents were males (53%) as compared to females (47%). This implies that there were fair distribution among respondents

Table 2. Sample characteristics		
	Frequency	**Percent**
Sex		
Male	106	53
Female	94	47
Total	200	100
Income level (Tshs)		
Very low income	8	4
Low income	31	15.5
High end of low income	77	38.5
Lower middle income	51	25.5
Middle income and above	33	16.5
Total	200	100
Education level		
No formal education	1	0.5
Up to primary	44	22
Secondary	48	24
Above secondary	107	53.5
Total	200	100
Occupation		
Government employee	40	20
Private business	135	67.5
Student	25	12.5
Total	200	100
Age		
18 to 30 years	54	27
31 to 40 years	61	30.5
41 to 50	51	25.5
Above 50	34	17
Total	200	100

Source: Author Computation Survey Data.

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both sexes, thus sample represents population anticipated. The largest proportion of respondents have income less than 1 million Tanzania shillings which is approximately 84% of the whole respondents. Therefore, the sample selected represented the targeted population of low-income earners as anticipated. The majority of respondents are those with above secondary school education (53.5%) which accounts more than half of all respondents followed by respondents who have secondary education (24%) and primary education (22%) while only 0.5% has no formal education. The majority being from private businesses which forms 67.5% of the whole sample followed by government employees (20%) and lastly by students (12.5%). Majority of the respondents fell under private businesses hence the sample represented the population as anticipated because the study targeted the normal citizens whom can be benefited with mobile financial services. The results in the table indicates that 27% of the respondents aged between 18 to 30, 30.5% from 31 to 40 and 25.5% from 41 to 50 and 17% aged above 50 years. This also shows that approximately half of respondents (58%) were aged below 40 years.

As shown in Table 2, most respondents are young and of middle aged which implies that respondents are true representation of the population which can adopt easily the new technology. The table revealed that majority of the respondents has occupation with minimum monthly income in which the researcher was targeting in order to find out if they use mobile financial services. Therefore, the sample selected was a true representation of the population in which the researcher anticipated.

4.2. Hypothesis testing

This study has four hypotheses which were derived from literature review and proposed framework. The actual data from the field research validated the claims. The researcher used regression model to determine relationship between adoption (dependent variable) and influence of individual awareness, perceived usefulness, perceived benefit and cost effect (Independent variables). Four hypotheses H1, H2, H3, and H4 were tested to answer the relevant questions, respectively.

The results show that individual awareness, perceived usefulness, and perceived benefit have positive influence on adoption of mobile financial services while cost effect has negative influence on adoption of mobile financial services. Each factor was measured by various parameters which were predictors used to measure their effect on adoption of mobile financial services.

Results from Table 3 show that the model summary results indicated there is a strong relationship between individual awareness, perceived usefulness, perceived benefit, cost effect, and adoption of mobile financial services. The model predicted the value of the dependent variable which is equal to 0.912. The R^2 and adjusted R^2 values of 0.832 and 0.829, respectively, both indicated that there was a high degree of goodness of fit of the regression model. It also means that over 83 percent of variance in the dependent variable (adoption of mobile financial services) can be explained by the regression model. The remaining around 17 percent is accounted for by other variables not explained by the model. From these results, as a rule of thumb, the researcher concluded that since the model fits the data well because adjusted R^2 value showed to estimate the data well, then, the model fits the population. The analysis also showed that the value of Durbin–Watson was 1.839 which is generally acceptable. Therefore, the results on Durbin–Watson for this study shows there is statistical evidence that the error terms are not positively auto correlated.

Table 3. Model summary				
R	**R^2**	**Adjusted R^2**	**Std. Error of the estimate**	**Durbin–Watson**
0.912[a]	0.832	0.829	0.567	1.839

Source: Author Computation Survey Data.

[a]Predictors: (Constant), Cost_Effect, Perceived_Usefulness, Perceived_Benefit, Individual_Awareness.

[b]Dependent variable: Mobile banking adoption.

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Table 4. ANOVA results					
	Sum of squares	**Df**	**Mean square**	**F**	**Sig.**
Regression	302.509	4	75.627	235.645	0.000[a]
Residual	60.978	190	0.321		
Total	363.487	194			

Source: Author Computation Survey Data.

[a]Predictors: (Constant), Cost_Effect, Perceived_Usefulness, Perceived_Benefit, Individual_Awareness.

[b]Dependent variable: Mobile banking adoption.

Results of analysis of variance (ANOVA), the usefulness of the model, of this regression model are as shown in Table 4. Thus, it was concluded that the model accounted for most of variations in the dependent variable. The F result was 235.645 with significance of 0.000. Therefore, a significant relationship was present between perceived benefit and adoption of mobile financial services. All t-test results for the regression coefficient for the independent variables had significance level of 0.01. The probability result occurring by chance was less than 0.05. This means that the regression coefficients for these variables were both statistically significant at the $p < 0.05$ level.

Table 5 shows the results of the coefficient values of the independent variables which determine the rate at which the value of the respective dependent variable will change per unit of value of the respective independent variable.

Individual awareness variable (β_1) has the value 0.176. This implies that for every unit change in the degree of individual awareness there is 0.176 times change in the adoption of mobile financial services in the same direction either increase or decrease. Since the coefficient is the positive value, then the relationship between the two variables is positive. It means that an increase in the degree of individual awareness will result in the increase in the adoption of mobile financial services by multiple of a coefficient value. This will conversely apply for the decrease. Chen (2013) concluded on his study that brand awareness to potential users is something very crucial; therefore financial services which use mobile banking technology should communicate the services offered using different channels and styles compatible with potential users, hence adoption of new technology become easier to the users also Laforet and Li (2005) as well as Tobbin (2013) discussed individual awareness as one of the factors that influence acceptance and adoption of mobile banking. Therefore, hypothesis one is confirmed.

Perceived usefulness variable (β_1) has the value 0.232. This implies that for every unit change in the degree of perceived usefulness there is 0.232 times change in the adoption of mobile financial services in the same direction either increase or decrease. Since the coefficient is the positive value, then the relationship between the two variables is positive. It means that an increase in the degree

Table 5. Results of the coefficients value					
	Unstandardized coefficients		**Standardized coefficients**	**t**	**Sig.**
	B	**Std. Error**	**β**		
(Constant)	1.074	0.257		4.175	0.000
Individual_Awareness	0.172	0.089	0.176	1.931	0.055
Perceived_Usefulness	0.218	0.083	0.232	2.638	0.009
Perceived_Benefit	0.431	0.084	0.417	5.106	0.000
Cost_Effect	−0.209	0.044	−0.171	−4.686	0.000

Source: Author Computation Survey Data.

Dependent variable: Mobile banking adoption.

of perceived usefulness will result in the increase in the adoption of mobile financial services by multiple of a coefficient value. This will conversely apply for the decrease. Wessels and Drennan (2010) as well as Laforet and Li (2005) are among the researchers discussed perceived usefulness as one of the determinant on adoption of mobile banking technology. Therefore, hypothesis two is confirmed.

Perceived benefit variable (β_1) has the value 0.417. This implies that for every unit change in the degree of perceived benefit there is 0.417 times change in the adoption of mobile financial services in the same direction either increase or decrease. Since the coefficient is the positive value, then the relationship between the two variables is positive. It means that an increase in the degree of perceived benefit will result in the increase in the adoption of mobile financial services by multiple of a coefficient value. This will conversely apply for the decrease. Chemingui and Ben Iallouna (2013) argued that, the intention of using mobile financial services will increase with relative advantages provided. Also Chen (2013) as well as Laforet and Li (2005) supported perceived benefit as the factor that can influence acceptance hence adoption of mobile banking. Therefore, hypothesis three is confirmed.

Cost effect variable (β_1) has the value of −0.171. This implies that for every unit change in the degree of cost effect there is −0.171 times change in the adoption of mobile financial services in the opposite direction either increase or decrease. Since the coefficient is the negative value, then the relationship between the two variables is negative. It means that an increase in the degree of cost effect will result in the decrease in the adoption of mobile financial services by multiple of a coefficient value. This will conversely apply for the decrease. Nevertheless, Luarn and Lin (2005) supported that costs have negative effect on intention to use mobile financial services. Also Cruz, Neto, Munoz-Galego, and Laukkanen (2010) revealed that cost burden is a concern on using mobile banking. Therefore, hypothesis four is confirmed.

4.3. Demographic characteristics and adoption of mobile financial services

In order to check whether or not Demographic characteristics of respondents (sex, income level and age) analysis was done on these categories separately as depicted on Tables 6 to 8 for their influence on adoption of mobile financial services.

4.3.1. Mobile banking adoption by sex of respondents

Table 6(a–c) shows results on adoption of mobile banking by sex of respondents, the model summary results indicated that for both cases, model fits (adjusted R^2) are more than four-fifths and all models were significant (from ANOVA tests). Individual Awareness was not significant for males, while perceived benefit was not significant for females. Perceived usefulness was not significant for both cases separately, while cost effect had negative effects to both females and males. It can be therefore concluded that sex has effects on the adoption of mobile banking.

4.3.2. Mobile banking adoption by income level

Table 7(a–c) shows results on adoption of mobile banking by income levels of respondents. The model summary results indicated that model is good in predicting low-income earners than others. This is due to non-availability of any good alternative for this group to be served with others schemes despite its failure in Durbin Watson value. The model has very low predicting ability for middle income as these have other ways of utilizing banking services (0.103). Models are significant for Low Income, High end of Low income; and Lower Middle Income; while not significant for Middle income and above. The created models show that costs have negative effects on all income levels. It can be concluded that low-income earners benefit more from these listed factors than middle-income earners.

4.3.3. Mobile banking adoption by age of respondents

Table 8 shows results on adoption of mobile banking by age of respondents, the model summary results indicated that middle-aged group (31 to 50 years) showed stronger relationship on adoption

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Table 6. Effects of sex on adoption

a. Model summary

Sex	R	R²	Adjusted R²	Std. Error of the estimate	Durbin–Watson
Male	0.906[a]	0.821	0.814	0.575	1.889
Female	0.930[b]	0.865	0.859	0.515	2.153

b. ANOVA results of sex

Sex		Sum of squares	df	Mean square	F	Sig.
Male	Regression	150.201	4	37.550	113.641	0.000[a]
	Residual	32.712	99	0.330		
	Total	182.913	103			
Female	Regression	146.248	4	36.562	138.000	0.000[b]
	Residual	22.785	86	0.265		
	Total	169.033	90			

c. Results of the coefficients value of sex

Sex		B	Std. Error	Standardized Coefficients β	t	Sig.
Male	(Constant)	0.960	0.343		2.798	0.006
	Individual_Awareness	−0.043	0.126	−0.043	−0.340	0.734
	Perceived_Usefulness	0.228	0.122	0.244	1.862	0.066
	Perceived_Benefit	0.658	0.125	0.638	5.259	0.000
	Cost_Effect	−0.175	0.061	−0.143	−2.882	0.005
Female	(Constant)	1.561	0.368		4.243	0.000
	Individual_Awareness	0.436	0.118	0.463	3.698	0.000
	Perceived_Usefulness	0.166	0.105	0.178	1.577	0.119
	Perceived_Benefit	0.132	0.110	0.129	1.198	0.234
	Cost_Effect	−0.293	0.062	−0.247	−4.701	0.000

Source: Author Computation Survey Data.

Predictors: (Constant), Cost_ Effect, Perceived_ Benefit, Individual_ Awareness.

Dependent variable: Mobile Banking Adoption.

of mobile financial services compared to old-aged group (above 50 years) and younger aged group (18 to 30 years). The analysis also showed that the value of Durbin–Watson showed no auto correlation for all age groups, which is good indicator for the analysis. Results of Analysis of Variance (ANOVA) of this regression model are as shown in Table 8. The output for regression displays influence of all age groups. This means that the probability of these results occurring by chance was less than 0.0005. Therefore, the relationship was present between all age groups respondents and adoption of mobile financial services.

Table 8(c) shows the results of the coefficient values of the independent variables which determine the rate at which the value of the respective dependent variable will change per unit of value of the respective independent variable. For respondents aged between (18 to 30 years), only perceived benefit showed influence on adoption of mobile banking while other factors (perceived usefulness, cost effect and individual awareness) were not significant for those aged group respondents. For respondents aged between (31 to 40 years), individual awareness and cost effect showed influence on adoption of mobile banking while other factors (perceived usefulness, perceived benefit) were not significant for those aged group respondents. For respondents aged between (41 to 50 years), individual awareness, perceived usefulness, and cost effect showed influence on adoption of mobile banking while other factor (perceived benefit) was not significant for those aged group respondents. However, respondents aged above 50 years, only individual awareness showed

Table 7. Effects of income on adoption

a. Model summary of income level

Income level	R	R^2	Adjusted R^2	Std. error of the estimate	Durbin–Watson
Low income	0.966[b]	0.933	0.923	0.388	1.280
High end of Low income	0.936[c]	0.876	0.869	0.536	1.990
Lower Middle Income	0.862[d]	0.743	0.721	0.659	1.864
Middle income and above	0.464[c]	0.215	0.103	0.568	2.447

b. ANOVA results of income level

Income level		Sum of squares	df	Mean square	F	Sig.
Low income	Regression	54.796	4	13.699	91.016	0.000[b]
	Residual	3.913	26	0.151		
	Total	58.710	30			
High end of low income	Regression	137.984	4	34.496	120.153	0.000[c]
	Residual	19.523	68	0.287		
	Total	157.507	72			
Lower middle income	Regression	57.713	4	14.428	33.229	0.000[d]
	Residual	19.973	46	0.434		
	Total	77.686	50			
Middle income and above	Regression	2.477	4	0.619	1.918	0.135[c]
	Residual	9.038	28	0.323		
	Total	11.515	32			

c. Results of the coefficients value of income level

Income level		Unstandardized coefficients		Standardized coefficients	t	Sig.
		B	Std. Error	β		
Low income	(Constant)	1.326	0.662		2.001	0.056
	Individual_Awareness	0.372	0.206	0.343	1.807	0.082
	Perceived_Usefulness	0.415	0.177	0.399	2.348	0.027
	Perceived_Benefit	0.038	0.157	0.033	0.243	0.810
	Cost_Effect	−0.271	0.107	−0.240	−2.525	0.018
High end of Low income	(Constant)	1.351	0.396		3.409	0.001
	Individual_Awareness	0.142	0.148	0.144	0.959	0.341
	Perceived_Usefulness	0.332	0.173	0.329	1.921	0.059
	Perceived_Benefit	0.301	0.171	0.279	1.761	0.083
	Cost_Effect	−0.269	0.065	−0.253	−4.125	0.000
Lower Middle Income	(Constant)	0.797	0.746		1.068	0.291
	Individual_Awareness	0.047	0.209	0.051	0.225	0.823
	Perceived_Usefulness	0.184	0.185	0.207	0.997	0.324
	Perceived_Benefit	0.581	0.183	0.600	3.184	0.003
	Cost_Effect	−0.099	0.145	−0.059	−0.682	0.499
Middle income and above	(Constant)	2.670	1.404		1.902	0.067
	Individual_Awareness	0.183	0.220	0.141	0.829	0.414
	Perceived_Usefulness	0.084	0.186	0.079	0.449	0.657
	Perceived_Benefit	0.345	0.198	0.314	1.747	0.092
	Cost_Effect	−0.414	0.209	−0.350	−1.979	0.058

Source: Author Computation Survey Data.

Predictors: (Constant), Cost_ Effect, Perceived_Usefulness, Perceived_Benefit, Individual_Awareness.

Dependent Variable: Mobile Banking Adoption.

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Table 8. Effects of age on adoption

a. Model summary of age

Age	*R*	*R²*	Adjusted *R²*	Std. error of the estimate	Durbin–Watson
18 to 30 years	0.583[a]	0.340	0.286	0.623	2.074
31 to 40 years	0.943[b]	0.889	0.881	0.492	1.938
41 to 50	0.952[c]	0.907	0.898	0.477	2.148
above 50	0.936[d]	0.875	0.857	0.469	1.969

b. ANOVA results of age

Age		Sum of squares	d*f*	Mean square	*F*	Sig.
18 to 30 years	Regression	9.766	4	2.441	6.298	0.000[a]
	Residual	18.994	49	0.388		
	Total	28.759	53			
31 to 40 years	Regression	106.447	4	26.612	110.158	0.000[b]
	Residual	13.287	55	0.242		
	Total	119.733	59			
41 to 50	Regression	97.322	4	24.330	106.786	0.000[c]
	Residual	10.025	44	0.228		
	Total	107.347	48			
Above 50	Regression	41.573	4	10.393	47.349	0.000[d]
	Residual	5.927	27	0.220		
	Total	47.500	31			

c. Results of the coefficients value of age

Age		Unstandardized coefficients		Standardized coefficients	*t*	Sig.
		B	Std. Error	*β*		
18 to 30 years	(Constant)	1.349	0.867		1.556	0.126
	Individual_Awareness	−0.232	0.160	−0.205	−1.446	0.155
	Perceived_Usefulness	0.132	0.173	0.108	0.764	0.448
	Perceived_Benefit	0.703	0.150	0.598	4.686	0.000
	Cost_Effect	−0.019	0.107	−0.021	−.175	0.862
31 to 40 years	(Constant)	2.093	0.425		4.923	0.000
	Individual_Awareness	0.374	0.165	0.370	2.264	0.028
	Perceived_Usefulness	0.194	0.132	0.207	1.471	0.147
	Perceived_Benefit	0.123	0.173	0.119	0.707	0.482
	Cost_Effect	−0.366	0.069	−0.332	−5.269	0.000
41 to 50	(Constant)	1.276	0.500		2.549	0.014
	Individual_Awareness	0.516	0.184	0.483	2.813	0.007
	Perceived_Usefulness	0.315	0.134	0.307	2.343	0.024
	Perceived_Benefit	0.006	0.183	0.005	0.031	0.975
	Cost_Effect	−0.271	0.085	−0.219	−3.196	0.003
Above 50	(Constant)	0.118	0.557		0.212	0.834
	Individual_Awareness	0.398	0.198	0.443	2.004	0.055
	Perceived_Usefulness	0.363	0.236	0.414	1.539	0.135
	Perceived_Benefit	0.085	0.174	0.093	0.486	0.631
	Cost_Effect	−0.004	0.103	−0.004	−0.042	0.967

Source: Author Computation Survey Data.

Predictors: (Constant), Cost_Effect, Perceived_Benefit, Perceived_Usefulness Individual_ Awareness.

Dependent Variable: Mobile Banking Adoption.

influence on adoption of mobile banking while other factors (perceived usefulness, perceived benefit, and cost effect) were not significant for those respondents. It can therefore be concluded that age has moderating effects on the adoption of mobile banking.

5. Findings implications for study

5.1. Findings on research objectives
Four specific objectives concerning the consumers' adoption of mobile financial services were formulated after an extensive literature review. The findings were compared with research objectives to assess whether the study achieved the set objectives. The discussions are as follows:

Objective 1: To assess the individual awareness of mobile banking on adoption of mobile financial services.

The results of the study on consumers' adoption of mobile financial services revealed that individual awareness was significantly related factor affecting consumers' adoption intention on mobile banking in Tanzania. This confirms the importance of individual awareness in explaining adoption of new technologies, if mobile banking is to be accepted by the users, service providers must ensure that consumers are aware about the benefits, received enough information, the service are compatible to their needs also consumers must have positive perception about the services offered. These findings are consistent with the previous studies on adoption of mobile banking (Bhanot et al., 2012; Chen, 2013; Laforet & Li, 2005; Tobbin, 2013). Therefore, the study confirmed the objective the way it was stated.

Objective 2: To assess the perceived usefulness on adoption of mobile financial services.

The results revealed that there is positive influence of perceived usefulness on consumers' adoption of mobile financial services in Tanzania. This confirms the importance of perceived usefulness in explaining adoption of new technologies. If mobile banking is to be accepted by the users, service providers must ensure that the service is flexible, save time, easier, and efficient compared to the traditional banking method. These findings are consistent with the previous studies on adoption of mobile banking (Mohammadi, 2015; Ndung'u & Waema, 2011). Therefore, perceived usefulness has positive influence on adoption of mobile financial services.

Objective 3: To assess the perceived benefits on adoption of mobile financial services.

Perceived benefit was found to have a significant influence on consumers' adoption of mobile financial services. If mobile banking is to be accepted by the users, service providers must ensure that the service is more convenient, save time and effort, and offer more privacy compared to the traditional banking method. The results were consistent with past studies findings (Chemingui & Ben lallouna, 2013; Chen, 2013; Laforet & Li, 2005; Thakur, 2014) which suggested that there is a significant influence of perceived benefit on adoption of mobile banking. Therefore, perceived benefit has positive influence on adoption of mobile financial services.

Objective 4: To assess costs effects on adoption of mobile financial services.

The results of this study show the significant influence of cost effect on consumers' adoption of mobile financial services. If mobile banking is to be accepted by the users, service providers must ensure that the service is of less expensive to use compared to the traditional banking method; on one hand this argument is supported by Luarn and Lin (2005) and on the other hand Cruz et al. (2010) revealed that cost burden is a concern to consumers on adoption of mobile banking. Other past studies also showed the same results on adoption of mobile banking (Ishengoma, 2011; Tobbin, 2013; Wessels & Drennan, 2010). Therefore, cost effect has negative influence on adoption of mobile financial services.

All the objectives of this study have been achieved. The study verified empirically that individual awareness, perceived usefulness, perceived benefit, and cost effect influence consumers' adoption of mobile financial services.

5.2. Implication for the TAM

The study revealed that perceived usefulness is positively related to the adoption of mobile financial services, this confirms to traditional TAM. All factors for adoption of mobile banking studied relate directly to the new technology and its uses. The study used TAM, based on this model it has been found that not only perceived usefulness and perceived ease of use have influence on adoption of new technology but also individual awareness, perceived benefit, and cost effect showed impact on insuring acceptance hence adoption of new technology. These findings are consistent with previous literatures on acceptance and adoption of new technologies.

5.3. Significance of the results

The research has shown that the individual awareness of mobile banking on adoption of mobile financial services; the perceived usefulness on adoption of mobile financial services; the perceived benefits on adoption of mobile financial services; and costs effects on adoption of mobile financial services for mobile financial adoption are important in the adoption of mobile finance. It is important that banks and financial institutions as well as policy-makers in banking issues to look into these four factors for successful implementation of their banking products.

6. Conclusion and recommendations

6.1. Conclusion on research problem

This study studied factors influencing consumers' adoption of mobile financial service. Acceptance and adoption of mobile banking technology is the key driver in determining the level of mobile banking in the mobile banking users. There are still factors holding back customers from acceptance of mobile banking (Nyambura et al., 2013). One of the things holding back the adoption of mobile banking is the lack of awareness of what these services can be used for (Tobbin, 2013). The concepts of banking and saving when promoting these services have not yet being communicated enough as argued by Bhanot et al. (2012). Though many are aware of the services, they are not viewed as financial tool but as an alternative of sending money among both users and non-users. Also the relative advantage (perceived benefit), ease of use, usefulness, and the cost effect of mobile banking services seem as the factors hindering acceptance and adoption of mobile banking (Chemingui & Ben lallouna, 2013; Wessels & Drennan, 2010).

The findings of this study were consistent with the previous literatures and sought to fill this information gap by assessing the factors influencing consumers' adoption of mobile financial services in the context of developing country like Tanzania and the results indicated that individual awareness, perceived usefulness, and perceived benefit have positive influence on adoption of mobile financial services while cost effect has negative influence on adoption of mobile financial services. This work provided empirical evidence on the relevance of these factors in adoption of mobile banking services.

Despite differing effects of predictor variables, the cost effect has negative consequences in all tested categories. It is important to take into considerations costs as they impede adoption.

The work has also been able to show that several factors may mediate the relationship adoption based on the four identified predictor variables. These mediating variables are age income and sex of respondents. It is important when adoption of mobile banking is propounded, these factors must be taken into conclusion. From this study, it has been shown that the higher the income the higher is the predictive ability of the predictor factors and at the same time the higher the autocorrelations of variables (Table 7(a)). Furthermore, the model becomes not statistically significant as income increases.

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Also, as age of the users increases, the adoption factors effect also increases. Adoption will be higher for aged people than young ones. At young ages, benefits seem to be more important, not to higher ages. Furthermore, awareness is relevant to old-aged people but not relevant for young ones. Cost effects are statistically significant in young and old ones but not middle-aged people. Cost effects are important to low income but not other incomes. Usefulness is important for low income. Benefits seem to be important for low income. The model has more predictive power in females than males. Individual Awareness and Perceived Usefulness are not statistically important for males, while Perceived Usefulness and Perceived Benefit are not statistically significant for females.

6.2. Limitations of the study and areas for further research
Future studies can build upon this study through replication across samples from different parts of Tanzania especially rural areas as well as users from different social classes. This will further validate the measurement scales adapted and used in this study and may also improve the proposed model.

The future work may dwell on identifying more predictor, moderating, and mediation variables. Moreover, questions on questionnaires should be structured to prevent respondents not to be biased by trying to guess the researchers' intentions. The words in each construct on the likert scale must be different to avoid confusion.

Author details
Amina Abdinoor[1]
E-mail: amina.abdinoor@yahoo.com
Ulingeta O.L. Mbamba[1]
E-mail: mbamba@udbs.udsm.ac.tz
ORCID ID: http://orcid.org/0000-0002-0836-8737
[1] General Management, University of Dar es Salaam, Dar es Salaam, United Republic of Tanzania.

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