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Discussion on Fintech Adoption Research

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Introduction- Financial industry including its services and deliveries have witnessed rapid transformation in the recent years due to advancement in technological tools. The reasons are not far-fetched, as there are needs for readily available services that are fast, convenient and more efficient. More also, the combination of the financial services and technology has deepened financial inclusion at ease. Aside alternative digital channels provided by traditional banks to deliver fintech-like services, the common Fintech brands are Stripe (U.S), Coinbase (US), Monzo (UK), Revolut (UK) Flutterwave (Nigeria), Paystack (Nigeria), Lendingkart (India), Instamojo (India),Lufax (China), WeLab (China), Yoco (South Africa) and Zoona (South Africa).

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Discussion on Fintech Adoption Research

Tewogbade Shakir

I. Introduction

Financial industry including its services and deliveries have witnessed rapid transformation in the recent years due to advancement in technological tools. The reasons are not far-fetched, as there are needs for readily available services that are fast, convenient and more efficient. More also, the combination of the financial services and technology has deepened financial inclusion at ease. Aside alternative digital channels provided by traditional banks to deliver fintech-like services, the common Fintech brands are Stripe (U.S), Coinbase (US), Monzo (UK), Revolut (UK) Flutterwave (Nigeria), Paystack (Nigeria), Lendingkart (India), Instamojo (India),Lufax (China), WeLab (China), Yoco (South Africa) and Zoona (South Africa)..

Fintech is the deployment of technology to aid financial transactions such as payments, transfers and lending. They make financial services easier to use, cheaper in most cases, reliable and within consumers reach.

Basically, adoption of Fintech will depend on degree of perceived benefits and perceived risk. Fintech services are readily adopted when the perceived benefits are greater than the perceived risk. Perceived benefits and perceived risks have been classified to different numbers by various researchers under various theories such as Technology Adoption Model (TAM), Elaboration likelihood Model (ELM), Unified Theory of Acceptance and Use of Technology (UTAUT), Theory of Reasoned Action (TRA) and Diffusion of Innovation Theory. Typical fintech adoption research will be carried out utilizing benefits such as ease of use, usefulness of services, financial/economic benefit such as pricing, social influence, speed of transaction (seamless) and convenience. Also, perceived risk is often considered under financial risk (loss of fund), regulatory risk (uncertainty in case of legal issues), security and privacy (how secured and vulnerable is the fintech platform and exposure of personal information) and operational risk (failure in system, processes). Combining the benefits and risks, benefit-risk system (valence level) is drawn to show level of Fintech adoption. Aside perceived risks, others mitigants in Fintech adoption is trust and fintech brand. Fintech adoption research is quantitative in approach while relationship among variables is explore numerically. Investigative hypotheses is developed along the research focus and they will be tested to show significant and non-significant relationships.

Such investigative research does the following:

1. Confirm the rate at which Fintech services are adopted.
2. Identify differences between variables that influence the behaviour of fintech adoption.
3. Give full consideration to effect of perceived benefits and risks as they set disparity.
4. Bias in adoption of fintech services (payments, microlending, wealth management, insurance, health service, account opening and investments) at the expenses of others.
5. Ascertain constraints faced by financial consumers while they are using Fintech services.

II. Literature Review and Theoretical Background

As noted by Alt et al 2018, fintech exist when financial services are combined with delivering technologies. The overall aim is to coordinate activities and processes in a standardize manner such that intended financial tasks are performed efficiently. Many theories have been applied to justify adoption of Fintech among financial consumers such as Theory of reasoned action (TRA), Technology Acceptance Model (TAM), Diffusion Theory and Unified Theory of Acceptance and Use of Technology (UTAUT). Most researchers in the recent years focus more on UTAUT which has more power to absorb complex research questions and objectives. Review will be made of TAM model as one of the theories which were combined to invent UTAUT. Also, TRA, Theory of Planned Behaviour TPB and Theory of Perceived Risk are often integrated to justify constructs used for perceived risks in some research hypotheses. Diffusion Theory is itemized to actually reveal different levels of technology adopters and justify why everybody will not adopt technology at the same time. This can be used to study adoption behaviour and pattern.

a) *Technology Acceptance Model (TAM)*

The theory was developed by Fed Davis in 1989 in his doctoral thesis at MIT. TAM has been judged as the most widely used theory in Information System to back adoption of various innovation and invention in Financial Technology. The popularity and widely acceptance of the theory is due to the fact that the theory was particularly invented to study adoption and implementation of technology that financial transactions relied on. The whole system of the model is unambiguous and simple to use. Dave in his TAM

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theory, itemized system uses as feedback that is supported by motivation from the users where this motivation further depends on stimulus from the environment.

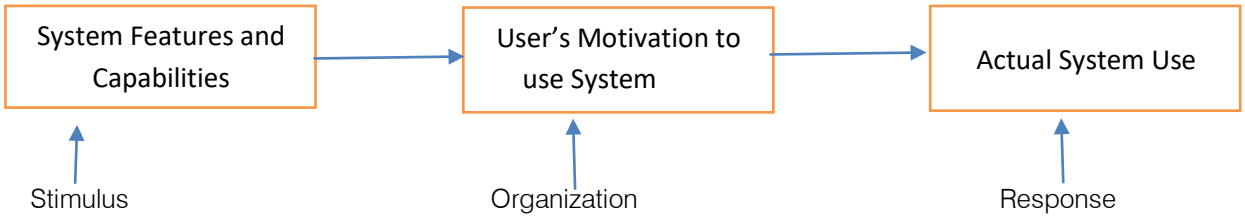

Figure 1: Background graphics depicting TAM (Davis, 1985)

Motivation from user is divided to three which are

1. Perceived Ease of Use (PEOU) – level at which individual financial users expect the target system is used effortless
2. Perceived Usefulness (PU) – belief by user that making use of the new system will enhance his/her performance and value will be delivered
3. Attitude toward using the system

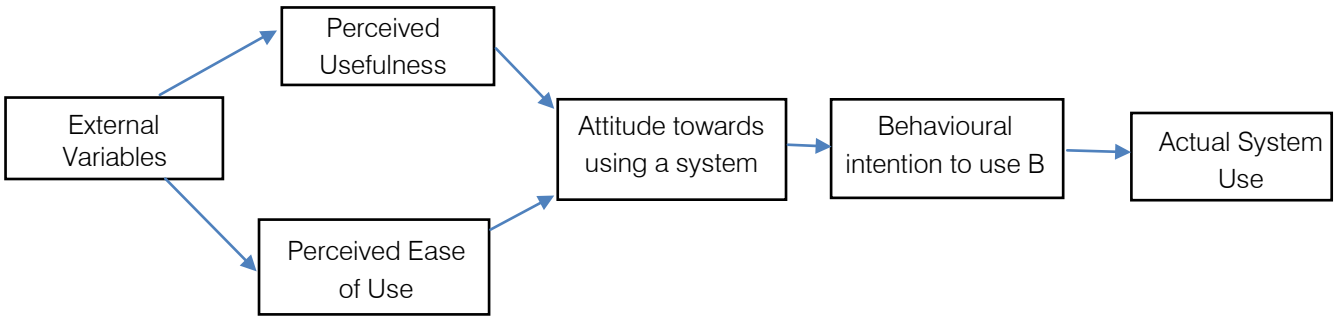

Figure 2: Advanced Graphic display of TAM by Davis 1989

TAM model has been used in many investigative research across the globe such as evaluation of e-learning systems acceptance by teachers by Shafeek 2011, study of online shopping behaviour by Zhou et al, acceptance of e-commerce with consideration of trust and perceived risk by Parlou 2003. Most research studies have shown reliable results in the various application of the model. As beautiful and widely accepted as TAM theory is, the weakness lie in the fact that social and organization factors were not accommodated in its construct. Perhaps these two factors have considerable impact in influencing innovation in technology and its adoption.

b) Theory of Reasoned Action, Theory of Planned Behaviour and Theory of Perceived Risk

Theory of Planned Behaviour is an extension of Theory of Reasoned Action while TRA stated the important role attitude takes in consumers intention to engage in some behaviours (Ajzen 1991), TPB extends the theory by adding perceived behavioural control (Taylor & Todd, 1995). This indicated existence of factors that can aid or hinder performance of a certain behaviour. Some behaviour of an individual performance depends on personal intention which is affected by attitudes and subjective norms (Sanayei & Bahmani, 2012). Conclusively Ajzen and Fishbein 1977, affirmed that an individual with strong believe in positive outcomes will exhibit positive attitude about the behaviour, while negative attitude will be shown when individual expects negative consequences such as loss in perceived risk. Perceived risk is uncertainty that might lead to loss in future. Theory of perceived risk was initially proposed by Bauer in 1960 to describe consumer behaviour considering perceived risk in subject term. Over the years, more studies from Cox (1964, 1967), Rich (1964), Cunnigham (1967), Amdt (1968) and Schiffman 1972, Lutz and Reilly (1973) among others have elaborated the concept of perceived risk. It was commonly seen as factor that has adverse effect on perceived intention by consumers. In accordance with Ryu (2018) claim, perceived risk is splitted into four classes which affect Fintech adoption behaviour.

1. Financial Risk
2. Security Risk
3. Operational Risk
4. Legal Risk

The proposed research questionnaire can bedrafted based on these four classes of the perceived risk.

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Table 1: Typical questionnaire based on integration of TRA, TPB and Theory of perceived risk

PERCEIVED RISK (PR)
1. Financial losses are likely to occur when I am using Fintech services
2. I am worried about my personal financial information when using Fintech services
3. someone might easily have access to my financial information when I am set up on Fintech platform
4. fintech companies are often far away to resolve issue on time in case of potential financial losses
5. there is a legal uncertainty for Fintech users as it is not easy to sue Fintech companies

c) Unified Theory of Acceptance and Use of Technology

UTAUT was founded by Venkatesh and others in 2003 based on eight other theories to investigate the effect of many factors on individual intention and acceptance of new technology. The theories combined to form UTAUT are

1. Theory of Reasoned Action (TRA) by Fishbein & Ajzen 1975
2. Technology Acceptance Model (TAM) by Davis 1989
3. Motivational Model (MM) by Davis et al 1992
4. Theory of Planned Behaviour (TPB) by Ajzen 1991
5. Model of Personal Computer Utilization (MPCU) by Thompson et al 1991
6. The Social Cognitive Theory (SCT) by Bandural 1986
7. Innovation Diffusion Theory (IDT) by Rogers 1995
8. Combined TAM and TPB Model by Taylor and Todd, 1995

The unified model has four constructs to visualize user acceptance and behaviour of usage of new technology:

1. Performance Expectancy – User expect better performance for using the new technology. This is analogous to perceived Usefulness in TAM theory.
2. Effort Expectancy- easiness in using the new technology. Perceived ease of use. According to Venkatesh et al, 2003, this is situation when user believes that the new technology will be easy to operate and use. No doubt, effort expectancy is positively associated with performance expectancy. Thus, overall system will improve if it is easy to use (Davis 1989)
3. Social Factors – factors from immediate environment (friends, colleagues, family) affecting the user's behaviour
4. Facility Conditions: When users belief in existence of robust tools and infrastructure supporting the new technology.

Aside the constructs, UTAUT has four key moderating variables which display interaction among themselves at various stages of the constructs. They are Age, Gender, Education and Voluntariness of use. They moderate the effect of independent variables on dependent variables in the study of technology adoption.

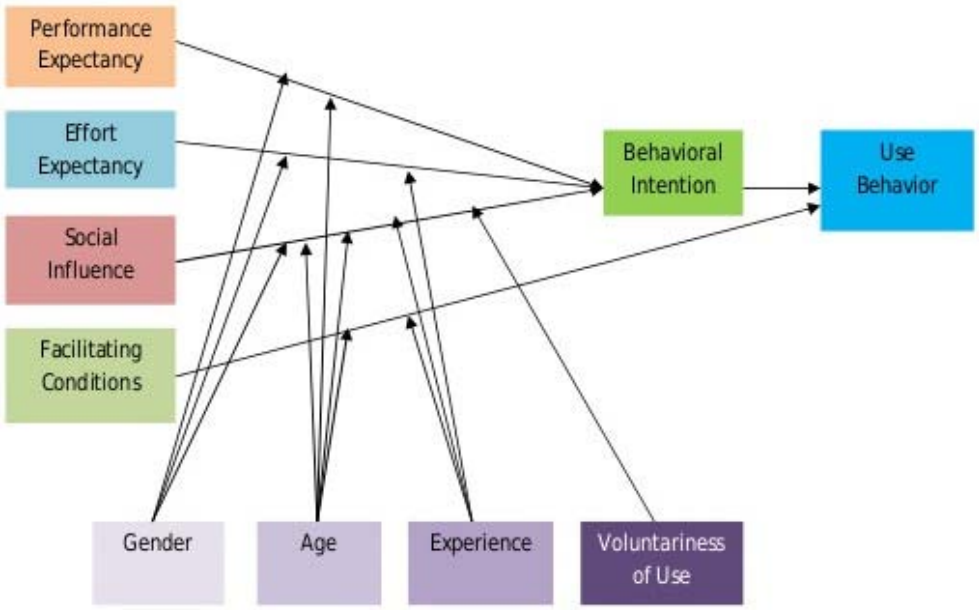

Figure 3: Graphical description of UTAUT Model

The research questions and objectives are tied to four constructs in UTAUT model to measure Fintech adoption.

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Table 2: Typicalresearch questionnaire using UTAUT constructs

PERFORMANCE EXPECTANCY (PE)
1. Using Fintech products can make banking and transaction activities convenient
2. I can make use of Fintech services without any restriction based on time and location
EFFORT EXPECTANCY (EE)
1. It is easier to initiate and conclude transactions using Fintech services
2. it is easier to personally set up Fintech platform and learn its usage without the use of manual
SOCIAL INFLUENCE (SI)
1. I will make use of Fintech services if my friends and relatives are using it
2. I will make use of Fintech services if my colleagues/business partners/clients/suppliers are using Fintech services
FACILITY CONDITIONS (FC)
1. The availability of basic facility to support Fintech services make it easy to access Fintech services
2. The availability of basic facility to support Fintech services make it easy to initiate and conclude transactions using Fintech services
3. The readily available of basis facility to set up Fintech Services influences the adoption of Fintech for various transactions

UTAUT has been condemned by few researchers in their works such as Bagozzi Richard 2007 and Li Jerry 2020 due to many variables embedded in UTAUT be default and make outputs ambiguous. Perhaps UTAUT has been successfully utilized by many technology adoption investigation studies across the world such as study of perceptions of some individuals in Northern Finland toward mobile services by Koivumaki et al 2007, study of factors contributing to mobile learning adoption among museum staffs in England by Welch et al 2020 and Social Media adoption by selected non-profit organization in United States by Curtis et al 2020. Also, the core UTAUT model was extended and well utilized in some studies like influence of online social support on network information technology usage by Lin and Anol 2008, Model of acceptance with peer support (MAPS) Sykes et al 2009 and study of gender differences in mobile internet acceptance by Wang and Wang 2010. Thus, with UTAUT and other theories (TRA, TAM, IDT) we will be able to investigate empirically why some users are ready and willing to adopt new technology in their financial transaction while others are skeptical.

Few Existing research on Fintech services adoption.

The following are few notable research works on Fintech adoption in chronological order.

Table 3: Existing researches on Fintech Adoption

S/n	Research Title	Author (s)	Year
1.	Factors influencing the adoption of Internet Banking	S. Naimi Baraghani	2008
2.	Applying Theory of Perceived Risk and Technology Acceptance Model in the online shopping channel	Huang Jing-Wen and Yong-Hui Li	2009
3.	Extending the Unified Theory of Acceptance and Use of Technology	V Venkatesh, J. Thong, Xin Xu	2012
4.	Understanding Benefit and Risk Framework of Fintech Adoption: Comparison of Early Adopters and Late Adopters	Hyun-Sun Ryu	2018
5.	An adoption of Fintech Services in Malaysia	Tun-Pin Chong Keng-Soon William Choo Yen-Sun Yip Pui-Yee Chan Hong-Leong Julian The Shwu-Shing Ng	2019

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6.	Adoption Intention of Fintech Services for Bank Users: An empirical examination with an extended technology acceptance model	Hu Z. D	2019
7.	Factors Influencing attitudes and intention to adopt financial technology services among the end-users in Lagos State, Nigeria	Yusuf Opeyemi Akinwale & Adam Konto Kyari	2020
8.	Perceived Risk Factors affect intention to use Fintech	Ooi Chee Keony	2020
9.	Fintech Revolution, Perceived Risks and Fintech Adoption: Evidence from Financial Industry of Pakistan	Asima Saleem	2021
10.	Evaluating Drivers of Fintech Adoption in the Netherlands	Rasheedul Hassan Muhammad Ashfaq Lingli Shao	2021

Many existing researches on Fintech such as those listed above have shed light on various aspects of user's intention to adopt Fintech services. Empirical investigations have been used to justify the common theories starting from TRA, TPB, TAM, Diffusion theory, motivational model, Model of Personal Computer Utilization (MPCU), Social Cognitive Theory (SCT) and UTAUT. Some of these works have been outside Nigeria to show Fintech adoption. Baraghani in 2009 investigated adoption of of internet banking within the context of Iran using extended TAM model with TPB. The main constructs in the research are Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Trust and Intention to Use. Just like Baraghani's work, Yong-Hui et al integrated Theory of Perceived Risk (TPR) with TAM to study online shopping behaviour among 637 respondents in 2009. While TAM constructs such as PEOU and PU show positive influence on adoption, the TPR showed negative influence on PU and intention of respondent to shop through online channel. The research was performed in Taiwan. Similarly, Asima 2021 study on Fintech adoption in Pakistan was done using TPR and TAM. Hyun-Sun Ryu 2018 framework on Fintech adoption deviated from TAM and concentrated on benefit-risk of financial users to model adoption in Korea. The constructs on perceived benefits are monetary value, convenience and seamless transaction. These are PEOU and PU in another form.in actual fact, TAM constructs have captured PU (value-monetary/non-monetary) and PEOU (convenience/seamless transaction) in different forms in many existing researches in Fintech adoption. UTAUT progressed from TAM with additional constructs such as Social Influence and Facility Conditions aside Effort expectancy (PEOU) and Performance expectancy (PU). These additional constructs are very important to show impact of other people on financial users and contribution of supporting facility on user's readiness to adopt Fintech services. For example, the work on adoption of Fintech services in Malaysia carried out by Tun-Pin Chong and others in 2019 did utilized UTAUT but was silent on the construct of facility condition. They introduced other constructs-Security which capture risk and Perceived Enjoyment.

III. Methodology (Research Design)

Research philosophy deals with ultimate beliefs guiding and supporting activities in an investigative study. There are various classes of philosophies in research area; the choice of what to be used depends on what the study is all about. As claimed by Sauders et 2007, research philosophy is the first stage to be handled in any research process which is focusing on creation of knowledge and entire nature of the knowledge. It is pertinent to select appropriate research philosophy in order to get every other stages right. The four main philosophies in shallow context are

1. Pragmatism
2. Positivism
3. Realism
4. Interpretivism

The most suitable philosophy for the proposed research on Fintech adoption is Interpretivim. Aside being commonly used in research philosophy in complex business studies, it is utilized to interpret potential financial user's intentions, perceptions and their actions with respect to Fintech services. As confirmed by Remneyi, 1998, interpretivism is seen as means of monitoring reality behinds selected situation. Most researches in Fintech adoption intend to study adoption pattern without any generalization of the outcomes.

a) Sampling

i. *Sample Size*

There are various ways of determining sample size as justified in past researches. Some are calculative while others follow rule of thumb. The first approach to our sample size as sample to variable ratio. Hair et al, stated the preserved ratio to be 15. Since our

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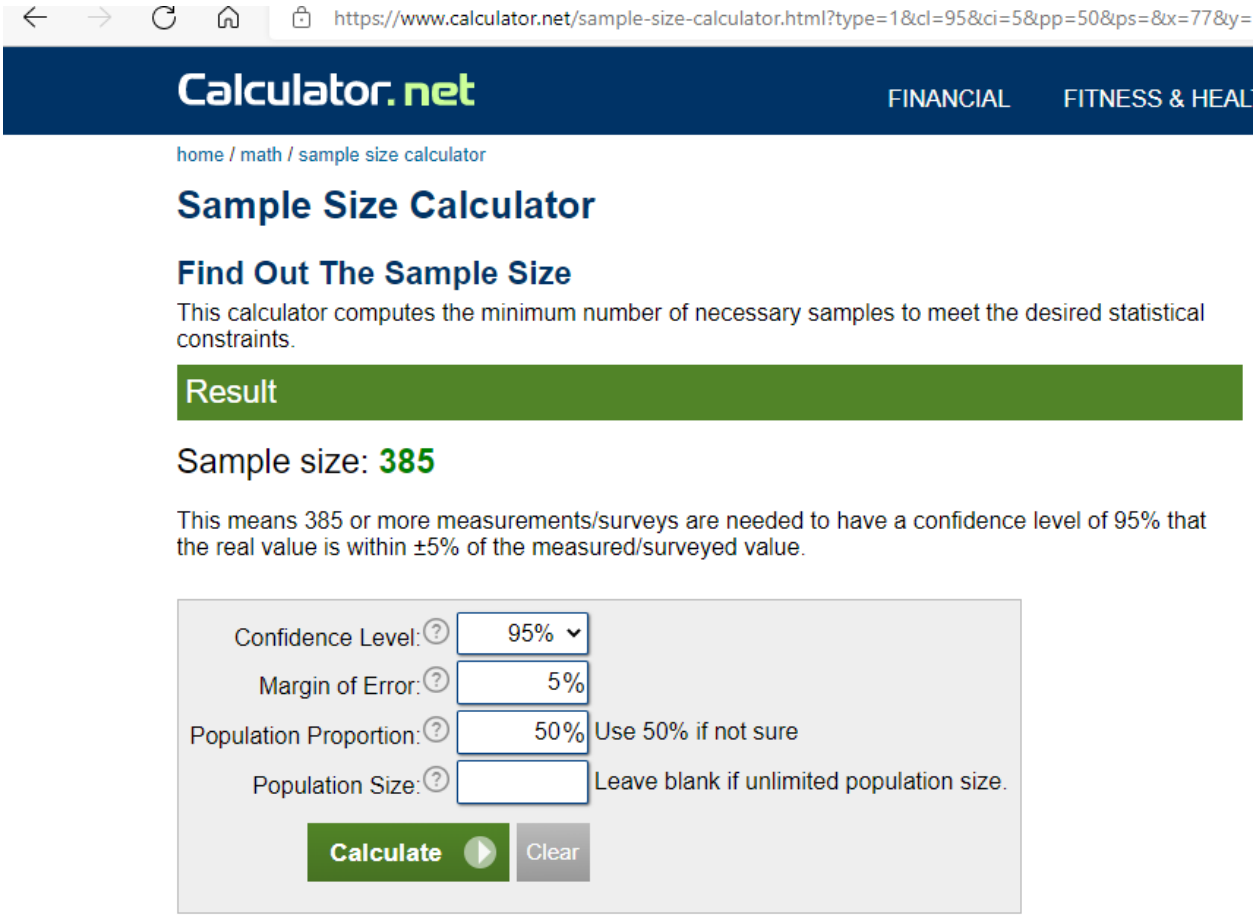
independent variables in six then our sample size can be range between 90 and 120. Another advantage of sample to variable ratio is that the research is interpretative in nature and generalization of final outcome is not necessary. Calculator.net launched in 2015 is commonly used sample size calculator just like Raosoft Sample size calculator and KMT (Krejie & Morgan, 1970). Many researchers like Amzat et al 2017, Cruz et al 2014 and Fernades et al 2014 testified to ease of use and its satisfactory outcomes. Making use of calculator.net with the applicable parameters is shown below. With this, the number of respondents for the research work will produce confidence level of 95%. Fintech adoption study is quantitative and Structural Equation Model is often used in treating the linkages among the constructs and the dependent variable, thus sample size below 200 will not be suitable (Kline 2005 and Kline 2016).



b) Methods of Data Collection

For proper conduct of fintech adoption research study, empirical data will be collected using questionnaire survey approach. Questionnaire survey is very suitable for acquiring data in Information Science as related by Chen Lin, 2019. Bryman, 2013, a questionnaire survey will allow us collect large amount of data needed for this investigation in order to appropriately mask behaviours of fintech users. Questionnaire can be easily processed statistically and result analyzed with much convenience. The research will make use of convenient sampling technique to carry out the survey. Convenient sampling is efficient, simple to use and implement as questionnaire will only be shared among users that are conveniently available for the study. Convenience sampling is regularly used in the field of social science due to its proximity, accessibility, willingness and quick response (Jager et al, 2017).

Most fintech adoption research is to analyze important factors which impact adoption of Fintech services. The investigation to analyze behavioural intentions of users will be achieved empirically by collecting data through survey method. Specifically, survey method is chosen, being a quantitative data collection technique used to collect data that are close-ended in nature from selected respondents. Many research studies in Fintech adoption subject area used quantitative research methodology as claimed by Noofa et al, 2020 and thus, most researches align with that stand. The survey questionnaire will be prepared by the researchers and administer to financial users on the field. The questions will be interval-based (Likert Scale).

The key segment of the questionnaire will be drafted to investigate the factors influencing the user adoption of Fintech services based on model selected (TAM, UTAUT, TRA, TPB and TPR). Each item bundled

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under the factor questions is delivered in Likert format. Most study use 7-point Likert scale. This will improve reliability to optimum level (Joshi et al, 2015).

c) Sampling Method

The sampling method to be used commonly used in Fintech adoption research is convenience sampling. The investigator (s) prioritized selection of the respondents based on users that are much willing and ready to complete the questionnaire. It is a non-probability method used by researchers to make sample from people that are in a close proximity (Etikan et al, 2016). Also, large sample size is needed to form research deduction based on convenience sampling.

d) Sample Research Hypothesis

Research hypothesis are formulated from the constructs of the selected model. Sample below is shown below

Table 4: Typical research hypothesis

Hypothesis Number	Hypothesis	Linking Models to Research Questions
H1	Performance Expectancy will have significant influence on use intention of Fintech services among financial users.	*Performance Expectancy as mentioned in UTAUT which is analogous Perceived Usefulness in TAM model*
H2	Effort expectancy will have significant influence on use intention of Fintech services among financial users	*Effort Expectancy as mentioned in UTAUT which is analogous Perceived Ease of Use in TAM model*
H3	Social influence will have significant influence on use intention of Fintech services among users	*As stated in UTAUT model to measure influence from family, friend and colleague*
H4	Facility conditions will have significant influence on effort expectancy of Fintech services among users	*As stated in UTAUT model to measure robustness of the new technology in when compared to its ease of use.*
H5	Facility conditions will have significant influence on use intention of Fintech services among users	*As stated in UTAUT model to measure robustness of the new technology in when compared to its usefulness*
H6	Perceived risk will have a significant influence on use intention among financial users	*Based on TPR model*
H7	Education level plays the moderating role in research model concerning users' intention to use financial services	*Based on Diffusion model*
H8	Financial risk is positively associated with its perceived risk among users	*Based on TPR model*
H9	Security risk is positively associated with its perceived risk among users	*Based on TPR model*
H10	Operational risk is positively associated with its perceived risk among users	*Based on TPR model*
H11	Legal risk is positively associated with its perceived risk among users	*Based on TPR model*

e) Validity and Reliability

In order to make sure content validity and survey questions are relevant and suitable, pilot test is carried out. This will be reviewed by expert against targeted measures. Also, all proposed constructs is tested using Cronbach alpha coefficient for acceptability.

Cronbach Coefficient	Internal Consistency
0.9 and above	Excellent
0.8 – 0.9	Good
0.7 – 0.8	Acceptable
0.6 – 0.7	Questionable
0.5 – 0.6	Poor

In many research work, confirmatory factor analysis is used to test model. Also, convergent validity and discriminant validity is carried out. Convergent validity will show correlation extent of multiple indicators for a specific variable. This is done by measuring average variance extracted (AVE). AVE measures of the sample should be greater than 0.5 to indicate convergency in applicable constructs. Discriminant validity indicates no linkage between each variable (measures of each variable can be distinguish from one another). It is tested by evaluating that AVE is greater than the squared interscale correlation for all constructs.

Similarly, composite reliability (CR) and Cronbach's alpha is used to test internal consistency of the data collected. For the proposed model to show good internal consistency CR should be greater than 0.7 and Cronbach's alpha should be greater than 0.8 (Fornell & Larcker, 1981).

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