MODELS OF TECHNOLOGY ADOPTION AND GROWTH OF FINTECH IN INDIA: A REVIEW

Arnab K Ganguly[1], Prof. Purna Prasad Arcot[2]

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Abstract

This paper provides an overview of Fintech in India, starting with an overview of the current state of Fintech in the country, the range of Fintech companies operating in India, the level of investment in different sectors, and the growth patterns observed. This work draws on prior academic work and public data to examine theoretical constructs for technology adoption and their relevance to the Fintech domain in developing countries, with a particular emphasis on India. This paper identifies potential gaps in the literature for future research; the work ultimately contributes to the understanding of the state of Fintech in India and provides insights for future research in the field.

Keywords: Fintech, Payments, Lending, Investment Management, TAM, UTAUT, DOI

[1]School of Management, CMR University, 5 Bhuvanagiri, OMBR Layout, Bengaluru, Karnataka 560043,
[2]BE (ECE),MBA (Finance & Sys), MPhil (Business Administration), PhD(UK), Director for School of Management, CMR University, 5 Bhuvanagiri, OMBR Layout, Bengaluru, Karnataka 560043,

Email: [1]arnabkumar.ganguly@cmr.edu.in, [2]purnaprasad.a@cmr.edu.in

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1. Introduction

Fintech, or financial technology, uses technology to improve financial services such as payments, personal investments, online lending, and digital currencies. Gomber and other researchers (Gomber et al., 2017) define Fintech as, **"Fintech is a new financial industry that applies technology to improve financial activities."**

Fintech companies have increased competition in the financial services industry, leading traditional institutions to adopt and invest in Fintech solutions. Unlike traditional institutions, Fintech companies use technology to create new business propositions and target new market segments that were previously not economically viable. Fintech companies can either disintermediate or partner with incumbent banks and financial institutions, depending on the market landscape. As a result, Fintech has become an important focus area for stakeholders in India's financial services industry, including traditional banks, Non-Banking Financial Companies (NBFCs), payment banks, investors, payment service providers, broking and wealth management companies, insurance providers, and pureplay Fintech players. Regulators are sometimes playing catch up as the market landscape evolves rapidly.

2. Purpose and Methodology

This paper aims to explore the Indian Fintech industry and its drivers from the perspective of individual users. It utilises theoretical frameworks for technology adoption and applies them to the current scenario. Recent research articles, book chapters, and papers published preferably after 2015 are examined to determine the drivers and antecedents for user acceptance of Fintech in India.

Evolution of Fintech

Fintech, or financial technology, has been around since the 1990s when online banking first emerged, allowing customers to access their bank accounts and make transactions online. This was just the beginning of an IT-enabled transformation in the financial industry, as described by Venkatraman's five levels of IT-enabled transformation (Venkatraman, 1994), two of which were evolutionary and three of which were revolutionary. This is shown in Fig. 1 below.

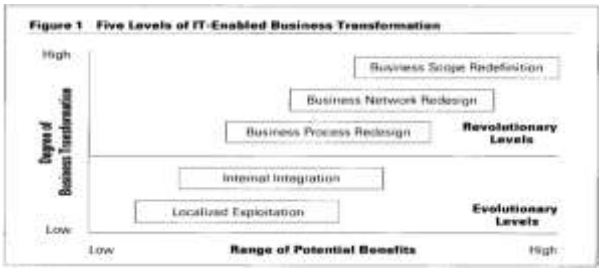


Figure 1: Levels of IT-Enabled Transformation

In the early 2000s, online banking evolved into mobile banking, increasing the convenience and accessibility of financial services. While mobile banking had already become popular in developed countries like the USA, it took longer to catch on in India, where the mobile revolution only began in 1995.

The 2010s saw an explosion of new Fintech companies, particularly in online lending, digital currencies, and robo-advisory services. In India, the growth of Fintech was enabled by multiple digital initiatives that were implemented over time. A chronology for growth of Fintech in India is shown in Fig. 2.

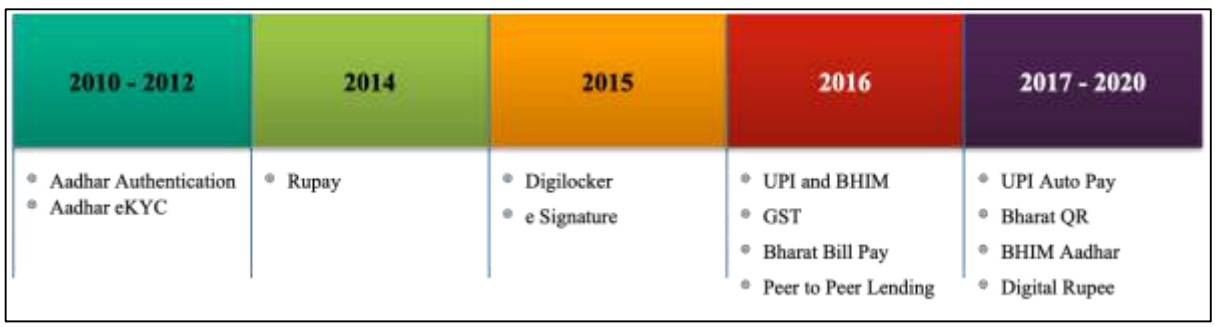


Figure 2: Chronology of Digital Initiatives in India (BCG & PhonePe, 2021)

As shown above, the advent of Fintech in India can be traced back to around 2015-2016, when a number of initiatives were put into place.

The emergence of blockchain technology and its application in the financial industry is beginning to have an impact on Fintech. Large players already exist internationally, mainly dealing with cryptocurrency exchanges or experimenting with new services related to staking of cryptocurrencies. Recent developments in Fintech include decentralized finance (DeFi) and digital assets such as Non-Fungible Tokens (NFTs), which are gaining in popularity and may change the way the banking industry traditionally operates.

According to a recent comprehensive survey of Fintech literature by Sangwan and other researchers (Sangwan et al., 2020), Fintech can be divided into three themes: the financial industry, innovation/technology, and law/regulation. These researchers note that the impact of Fintech can be best understood from the viewpoints of consumers, market players, and regulators. However, according to them, Fintech is still in its nascent stage.

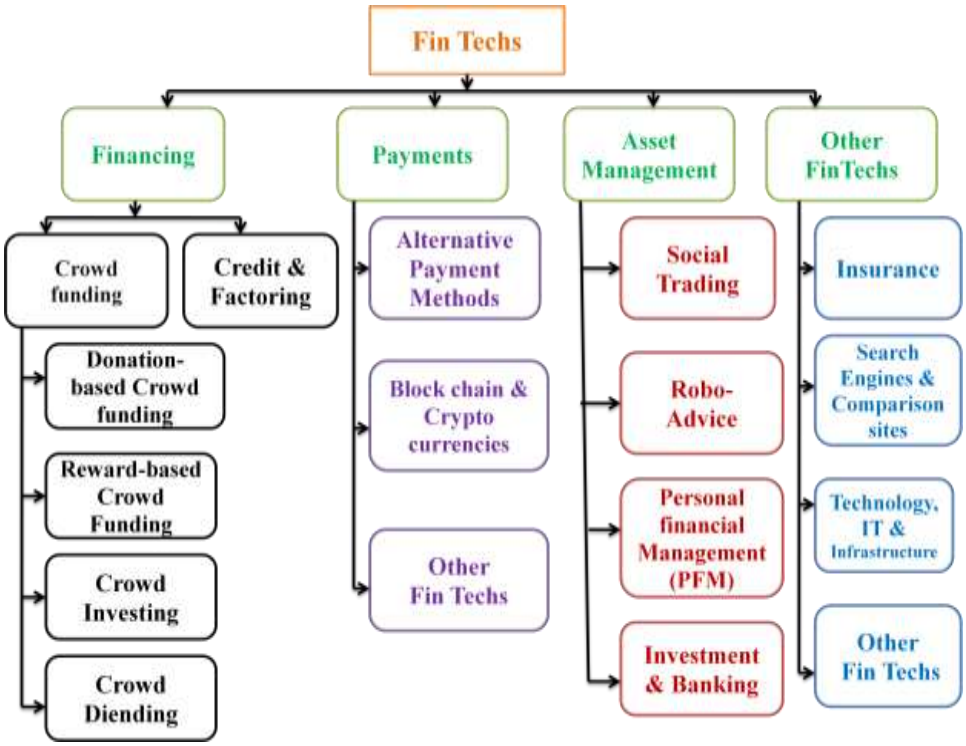
Overall, Fintech has come a long way since the 1990s with the development of online banking and has now become a major disruptor in the financial industry, with new innovations constantly emerging. While Fintech is still in its early stages, it has already had a significant impact on the way financial services are delivered and consumed.

Breadth of Services in India

Rajpal and Manglani (Rajpal & Manglani, 2022) carry out a survey of Fintech services in India and find that the Fintech market exhibits high adoption for services like Payments, Digital Lending, WealthTech, Insurance and Neo Baking. Among these the most rapidly growing market is payments though the other sectors are not far behind in terms of rate of growth and potential business. The following illustration typifies the extent of Fintech in India

Figure 3: Services provided by Fintech companies in India (Source: Segments and Elements of Fintech Source:

(Dorfleitner et al., 2017)



Each of these services is at varying levels of development and an understanding of the level of development can be had from the two exhibits below showing the relative position of India in comparison with other large economies and the sector specific funding and investment in India for each of the foregoing service areas. Evidently, within India, payments, lending and neo-banking are the biggest sectors for investment funding, with insuretech catching up fast.

Figure 4: Progression of Fintech 2020

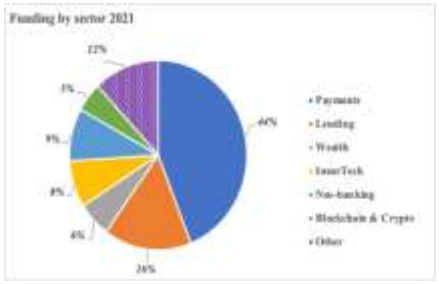


Figure 5: Funding proportion of service areas 2021

Source: (E&Y Fintech India, 2022)

In his master's thesis of the Indian Fintech industry, Pradeep Sharma (Sharma, 2019) mentions that business payments, wallets and consumer payments are most developed categories in terms of the number of companies and capital raised. SME lending appears to hold a lot of promise for the future, as do insurance tech and P2P lending.

Payments The Reserve Bank of India (RBI) in its vision document for payments (RBI, 2022) mentions **E-Payments for Everyone, Everywhere, Everytime** (4 Es) - this lays down a 6 point aim for payments in its vison for 2025 - Provide every user with Safe, Secure, Fast, Convenient, Accessible, and Affordable e-payment options.

To this end RBI and the Government of India have created the necessary backdrop through rules and legislation that will encourage the growth of Fintech companies in this sector.

Parts of the so called 'India Stack', which comprises of many initiatives for the development

of Fintech in the country is driving a robust growth rate of 23.06% CAGR in the volume of digital payments, from USD 16.4 trillion in 2021 to an estimated USD 106.2 trillion in 2030. Some of the core components driving this are shown in Table 1.

UPI UNIFIED PAYMENTS INTERFACE	Feature: Unified Payments Interface (UPI) is a system that powers multiple bank accounts into a single mobile application (of any participating bank), merging several banking features, seamless fund routing & merchant payments into one hood. Facts: 382 Banks live in December 2022 Payments through Virtual Payment Address (VPA) Enabling P2P, B2B, and P2M transactions
AePS AADHAAR ENABLED PAYMENT SYSTEM	Objective: To empower a bank customer to use Aadhaar as his/her identity to access his/ her respective Aadhaar enabled bank account and perform basic banking transactions like cash deposit, cash withdrawal, Intrabank or interbank fund transfer, balance enquiry and obtain a mini statement through a Business Correspondent. Facts: 138 live entities as of December 2022 Enabling transactions at POS and micro-ATM using Aadhaar More than 371.9 million approved transactions with more than 30 million eKYC

Table 1: Parts of India stack promoting digitalization of payments Source: National Payments Corporation of India https://www.npci.org.in

The " India Stack" is supported by many other contributing initiatives such as eKYC, Bharat Bill Pay, NACH (National Automated Clearing House); NFS (National Financial Switch) and so on that are contributing to the digitalization of payments. This has led to the establishment of multiple players within payments, a few of the better-established players in the payments sector are depicted in Figure 6; some players like PayTM, PhonePe, GooglePay have almost become household names, with almost everyone accepting payments through these at least in the large cities of the country.

Payments				
Digital Wallets	paytm	MobiKwik	PhonePe	
Payment Gateways	CCAvenue	instamojo	PayU	Razorpay
Point of Sale (POS)	Pine Labs	mswipe	ezetap	paytm

International Remittances	MoneyGram	Revolut	WISE	Fable
API/ Software Providers	Razorpay	PayMonk Digital Today, Better Tomorrow	BillDesk	RBP FINVIS RURAL BANKING PROGRAMME

Figure 6: Range of services within payments sector in India

Lending

Digital lending has attracted more than USD 9 billion in investments over the last 5 years. This sector is expected to increase from USD 38 billion in 2021 to USD 515 billion by 2030, clocking a CAGR of nearly 33% in the current decade. This is largely backed by product and business model innovations (E&Y FINTECH India, n.d.).

The observed growth is due to Fintech companies like Paytm, Capital Float, and LendingKart developing online platforms for providing small business loans and personal loans. A few noteworthy players are:

- KredX, Hummingbird, Hylobiz and Vayana network which are in the area of automated tracking of invoices and cash-flow management to help create the infrastructure for lending.
- Vayana network, Lending Ka□t and Early Salary providing tech-based tools for strong ML-capable risk analytics, facilitating the lending process.
- Fintech companies like Zest, Lazypay, Ola, Fai□cent, Moneytap, Lendbox, Rupifi, postpe and Razorpay providing short term credit available relatively easily and quickly compared with traditional borrowing.
- Xiaomi and Ola preparing the groundwork for introducing technological tools and programs viz Mi Lending and Ola Pragati for digital lending.
- Marcus and C2FO providing corporate customers risk-free solutions for management of working capital loans.
- Big established banks like ICICI, HDFC Bank and Bank of Baroda entering the field for facilitating MSME loans.
- Global giants Visa and Mastercard are readying their Buy Now Pay Later (BNPL) platforms, which promises to shake up landscape of digital lending.

Neo-banking

Neo-banking is viewed as being part of the Asset Management sector. Neo-banks, unlike the traditional banking giants, usually are based on mobile centric technology with fast, responsive user interfaces that are easy to use for consumers.

Although a digital banking licence is not yet available in India, this sub-sector is showing great promise at present with the funding level going up by 5x in the period 2021-20122 alone, from USD 134 million to around USD 675 million. The size of neo-banking is poised to hit the USD 215 billion mark by 2030, up from around USD 40 billion in 2021, representing a CAGR of nearly 21%. There are currently many regulatory hurdles, though it is to be expected that the RBI, in keeping with its vision, will facilitate this sub sector and a digital banking licence will be a feasibility in the not-too-distant future.

Ernst and Young (EY) keep a regular tab on Fintech across the world and in their opinion the move toward neo banks is already in place in Asia in 2022. (E&Y FINTECH India, n.d.)

Literature Review A literature review is carried out in a systematic manner with an examination of theoretical constructs underlying adoption of technology followed by a review of literature in the context of Fintech adoption and its underlying antecedents, first at a global level and finally in India.

Theoretical Constructs

Technology forms a key part of Fintech and, in order to understand the adoption of Fintech, it becomes imperative to investigate the way in which technological innovations get adopted. There are many theories dealing with the adoption and spread of Technology and a look into the principal ones is carried out.

The Theory of Reasoned Action or TRA in short, proposed by Fishbein in 1967 and later extended by Fishbein and Ajzek in 1975 (Fishbein, 2008), proposes that the intention to perform a given behaviour can be viewed as a function of two basic factors: A person's attitude toward performing the behaviour and/or the person's subjective norm concerning his or her performance of the behaviour. Attitude is taken to be one's overall positive or negative feeling about personally performing the behaviour. The second factor is subjective norm, defined as "a person's perception that most people who are important to him think he should or should not perform the behaviour in question"

This assumes that human beings are rational creatures and the theory has been criticized for

oversimplifying a complex area. The Theory of Planned Behaviour or TPB by Ajzen (Ajzen, 1991) extends the initial work in the TRA in 1987. The TPB postulates three conceptually independent determinants of intention.

- The first is the attitude toward the behaviour in question and refers to the degree to which a person has a favourable or unfavourable evaluation or appraisal of the behaviour.
- The second is a social factor termed as 'subjective norm'; it refers to the perceived social pressure to perform or not to perform the behaviour.
- The third antecedent of intention is the degree of perceived behavioural control which refers to the perceived ease or difficulty of performing the behaviour and it is assumed to reflect past experience as well as anticipated difficulties in implementation.

As a general rule, the more favourable the attitude and subjective norm with respect to a given behaviour along with a greater level of perceived behavioural control, the stronger should be an individual's intention to perform the behaviour under consideration. The relative importance of attitude, subjective norm, and perceived behavioural control in the prediction of intention is expected to vary across behaviours and situations. This can be illustrated as in Fig. 7 below.

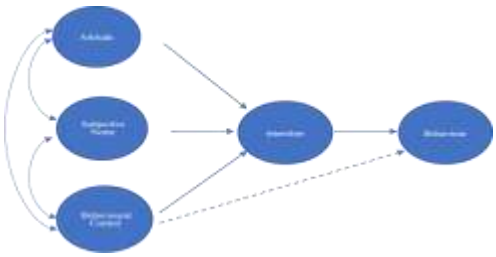


Figure 7: Constructs in the Theory of Reasoned Behaviour

Technology Acceptance Model - TAM (Davis, 1989) is the culmination of efforts in the direction of understanding this domain since the mid 1960s. The TAM is a simple model, which has proved its effectiveness over time. This essentially models the adoption of Technology on two underlying factors - Perceived Usefulness and Perceived Ease of Use of a technology. According to TAM, users' intention to use a technology depends on these two interacting factors, this can be modelled by Fig. 8.

Figure 8: Schematic of Technology Acceptance Model (TAM)

TAM has been extended by Venkatesh and Davis (Venkatesh & Davis, 2000), the extended model, called TAM 2, encompasses factors such as Social influence - subjective norm, voluntariness and image - and Cognitive instrumental process - job relevance, result demonstrability as well as perceived use of use.

Hartwick and Barki (Hartwick & Barki, 1994) find that subjective norm has significant effect on intention in mandatory settings but not in voluntary settings. Moore and Benbasat (Gary C. Moore; Izak Benbasat, 2001) define image as "the degree to which use of an innovation is perceived to enhance one's status in one's social system." According to TAM 2 subjective norm will positively influence image because, if important members in a social group believe that a person should perform a behaviour - for example use a Fintech application - then performing that action will tend to elevate that person's standing in the social group concerned.

Proponents of TAM 2 show that subjective norm, voluntariness and image have different effects that depend on experience of the users as well as the time elapsed since implementation. A schematic of TAM 2 is laid out in Fig. 9 below.

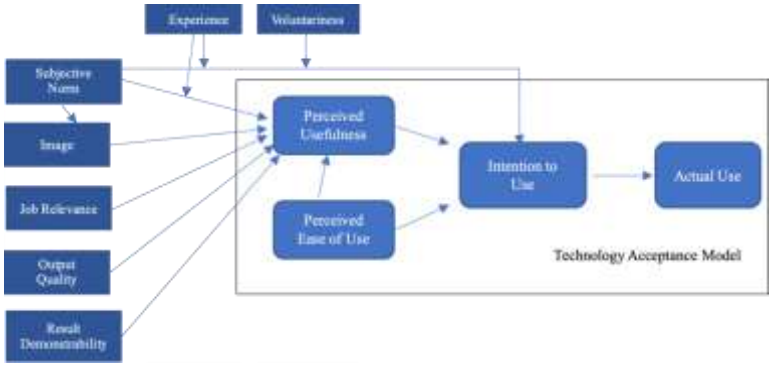
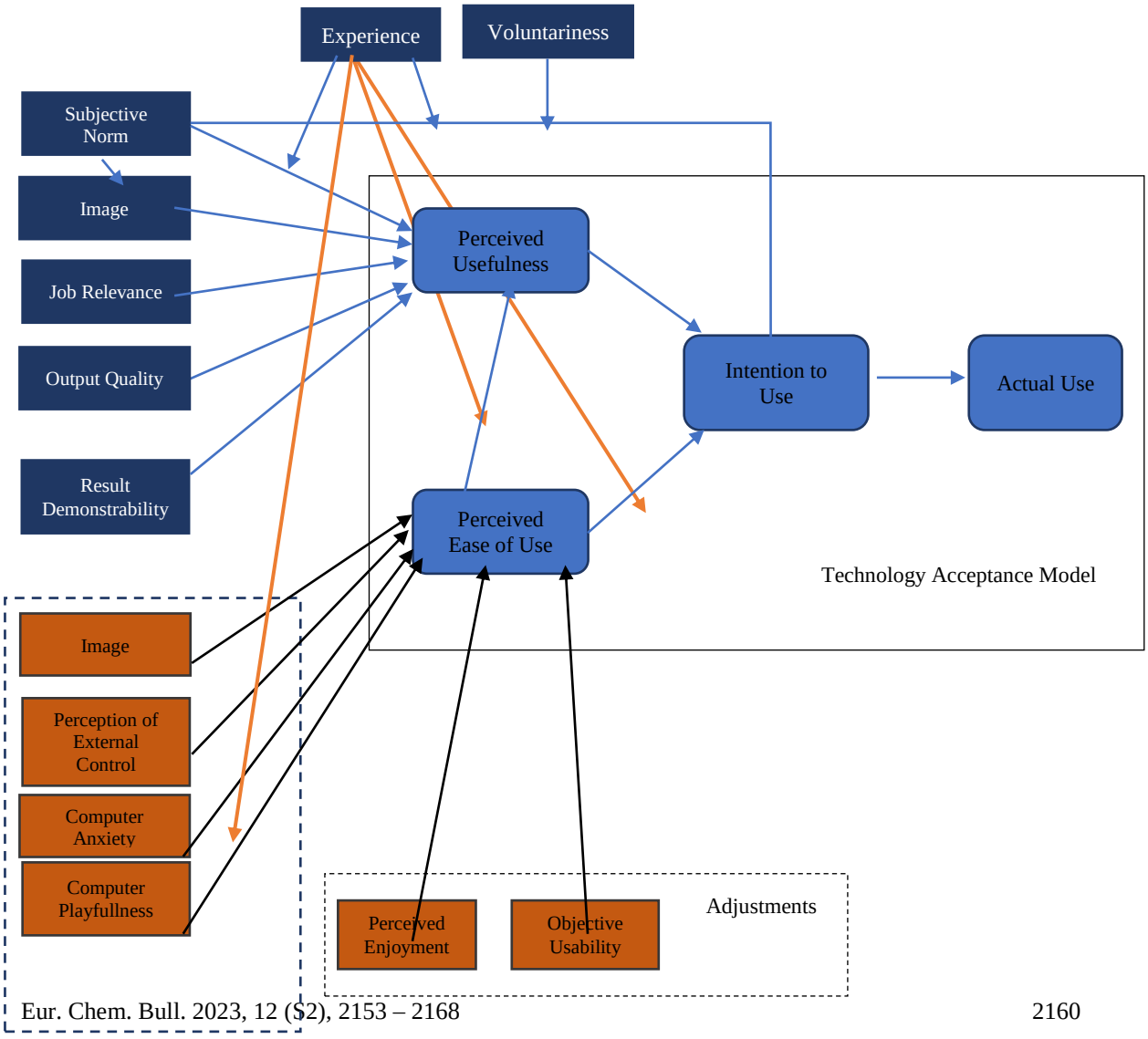


Figure 9: TAM 2 as proposed by Venkatesh, Davis, Barki et al.

A further extension of the TAM 2 is made by Venkatesh and Bala (Venkatesh & Bala, 2008) to include factors that influence perceived ease of use and usefulness (Venkatesh, 2000). This is done to improve practical application of theory (Venkatesh & Davis, 1996). The extended theory, called TAM 3, can be schematically viewed as in the following Fig. 10. The proponents of TAM 3, include the factors influencing perceived ease of use and also suggest new relationships between experience and (1) perceived ease of use and perceived usefulness (2) computer anxiety and perceived ease of use; and (3) perceived ease of use and intention to use. The need for this extension is clearly to help adoption of technology and associated innovations in an organizational setting as organisational interventions can be devised for practically driving adoption of new IT applications.



Anchors

Figure 10: Factors affecting perceived ease of use and interactions in TAM 3

Rogers (E. M. Rogers, 1995) writing with respect to guidelines from his theory of Diffusion of Innovation (DOI) mentions that primarily 5 attributes of an innovation, shown in Fig. 11 majorly affect the rate of adoption. It should be noted that there are direct parallels between some factors in TAM 2 and the DOI.

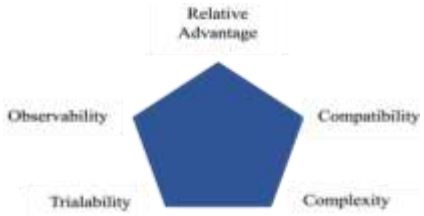


Figure 11: Attributes affecting the rate of Technology adoption, Source Rogers

- Relative advantage - the advantage of using the innovation over existing alternatives.
- Compatibility referring to the degree to which an innovation is perceived by an individual user to be similar to previous beliefs and experience.
- Complexity - the degree to which a new idea is perceived to be difficult to understand.
- Trialability or the degree to which an innovation can be divided for experimental use by an individual.
- Observability - referring to the degree to which a new idea can easily be observed by others.

Rogers (E. Rogers, 2003), writing again on DOI, posits that five main elements influence the spread of an innovation.

- The innovation itself.
- Adopters.
- Communication channels.
- Time and
- A social system.

Rogers separates adopters into different categories, noting that adoption is heavily dependent on social capital. Adopters are characterised by the curves shown in Figure 12. The tipping point is thought to be somewhere at the boundary between the early adopters and the early majority.

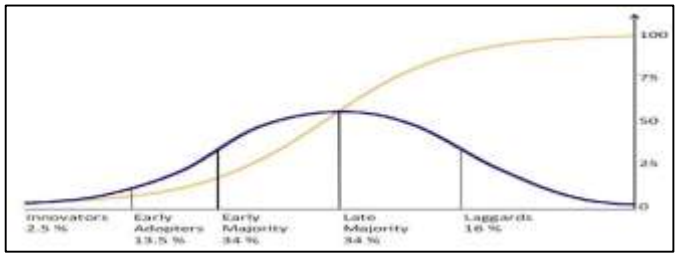


Figure 12: Adoption timeline for different adopters, Source Brisco et al, 2011

Greg Orr (E. Rogers, 2003) reviews Rogers' theory and points out that the mechanism for diffusion of an innovation involves a sequence that users undergo; he notes that DOI theory oversimplifies the adoption process and overlooks the social and political factors that can hinder or facilitate diffusion. Additionally, Orr suggests that the theory assumes a unrealistic linear and homogeneous diffusion process. Despite these limitations, Orr concludes that the DOI theory remains a valuable framework for understanding the adoption of innovations.

Moore and McKenna in their book named, "Crossing the Chasm" (G. A. Moore & McKenna, 1999) provide an adaptation of Rogers' Diffusion theory. They argue that there is a chasm between the early adopters of the product and the early majority. This theory can be considered an improvement over Rogers.

Other approaches like Unified Theory of Acceptance and Use of Technology (UTAUT) have tried to integrate concepts from TAM 2 as well as DOI. The proponents of UTAUT (Venkatesh et al., 2003) posit that adoption can be better explained using a mix of factors from the aforementioned theories. Specifically 4 constructs, elaborated in Table 2 are seen to directly affect user intention for using an innovation.

No.	Construct	Definition
1	Performance expectancy	Defined as the degree to which an individual believes that using the system will help him or her to attain gains in job. This is similar to perceived usefulness in TAM and relative advantage in DOI.
2	Effort expectancy	Defined as the degree of ease associated with use of the system. This is analogous to perceived ease of use in TAM ease of use in DOI.
3	Social influence	Can be thought as the degree to which an individual perceives that important others believe he or she should use the new system. This is similar to subjective norm in TAM 2 or to image in DOI. The researchers in question also find that social influence works at its best in mandatory settings which is similar to Hartwick and Barki's (Hartwick & Barki, 1994) findings related to TAM 2.
4	Facilitating conditions	The degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system. This definition is akin to compatibility within DOI.

Table 1: Principal Constructs in the Unified Theory of Acceptance and Use of Technology (UTAUT) UTAUT has been extended and has been named "The Unified Theory of Acceptance and Use of Technology 2" or UTAUT 2; this adds three additional factors to the original four:

1. Hedonic Motivation: The degree to which an individual derives pleasure or enjoyment from using technology.
2. Price Value: The degree to which an individual believes that the benefits of using technology outweigh its cost.
3. Habit: The degree to which an individual is accustomed to using technology as part of their daily routine.

UTAUT 2 also accounts for the effects of cultural differences and technological advancements on technology acceptance and use. Results in comparative studies between UTAUT and UTAUT 2 show that the extensions introduced in UTAUT 2 lead to a significant improvement in the explained variance of behavioural intention and actual use of technological innovations.

Adoption of Fintech and associated technological developments

Moore and Benbasat (G. C. Moore & Benbasat, 1996) empirically test the theory related to adoption of technology and are able to show that though the user's own attitude and the expectations of others influence the degree to which an user uses a technological innovation based on Information Technology, the most significant perceptions that had an effect on degree of use were ease of use, relative advantage and compatibility. Chuang and others (Chuang et al., 2016) study the adoption of Fintech using a TAM perspective. The authors list 4 conclusions related to trust, perceived usefulness and perceived ease of use:

1. The degree of positive and negative evaluation of customers in using a Fintech Service is the most important factor affecting actual usage of that Fintech Service.
2. Customers will have a high level of trust if the transactional system is seen as safe and secure and if the desired results are achieved.
3. Positive attitude towards use will be enhanced if customers are able to conveniently and quickly perform transactions without restrictions of time and location.
4. Customer attitude towards usage of a given Fintech application will be reinforced positively if they can quickly download the application and use it with minimum difficulties.

Haqqi and Suzianti (Haqqi & Suzianti, 2020) present a study in Indonesia of risk benefit analyses carried out by users when deciding to adopt a specific application for payments or peer to peer lending. The authors show through data analysis that an increase in trust and convenience have a direct positive influence on the intention to adopt Fintech. Thus, according to the authors, risk reduction forms a very important driving force for increasing adoption.

Kim and others (Kim et al., 2015) studying factors leading to acceptance of payment type Fintech services in Korea note that the most critical factors in acceptance of such services are usefulness and ease of use, supporting TAM and similar models. Furthermore, it implies that a quick user onboarding process and a convenient and easy to

use User Interface (UI) providing for a convenient User Experience (UX) may be the most significant factors in acceptance of payment-type Fintech services.

Ryu carries out a study of the factors leading to acceptance of Fintech in Korea (Ryu, 2017). The author finds that perceived benefit/ usefulness has a much higher impact on usage of Fintech compared to the negative effect on usage that perceived risk provides. The author also finds that convenience is the leading reason that determines perceived benefit. Legal risk is the most dominant on the risk front, followed by security, operational and financial risk. Additionally, unclear regulations impede the growth of Fintech as organizations become unsure about compliance in that domain of business. Urus and other researchers (Tajul Urus et al., 2022) study the factors leading to adoption of Fintech among well educated, fresh graduates aged between 18 and 22 in Malaysia. Their findings based on a modified UTAUT suggest that only 2 factors drive generation Z consumers:

- Cultural factor of individualism.
- Performance expectancy.

Mirza Alam (Alam, 2014) carries out a study on factors promoting the adoption of Mobile Banking in Bangladesh using a slightly modified version of the UTAUT and his findings can be summarized as in the table below:

Factor (decreasing order of strength)	Criterion	Effect
Social Influence	Intention	Significant
Effort Expectancy	Intention	Significant
Performance Expectancy	Intention	Significant
Perceived Financial Cost	Intention	Significant
Perceived Credibility	Intention	Insignificant
Behavioural Intention	Behaviour	Significant
Facilitating Conditions	Behaviour	Insignificant
Perceived Self-efficacy	Behaviour	Insignificant

Table 2: Factors affecting Intention to use or actual usage of Fintech Source: Alam, 2014

Lema (Lema, 2017) carries out a TAM based study on the factors leading to adoption of mobile financial services in Tanzania and findings suggest that for the poor, unbanked population there, only three factors are significant:

- Social influence has the maximum significance, in order to drive up adoption it makes sense in such markets to create social awareness so that the pressure to use increases.
- Perceived usefulness is the next highest in significance suggesting that users value functional products that will them fulfil their transactional needs.
- Perceived cost has a negative impact on adoption showing that users are likely to be cost sensitive and will prioritize affordable services.

Factors affecting Fintech in Indian context Vijai (Vijai, 2019) discusses the opportunities and challenges for Fintech companies in India. The paper highlights the growth potential of Fintech in India due to the large population and the government's push towards a digital economy. The author notes that cybersecurity risks are a significant challenge for Fintech companies in India and building robust security measures, the lack of an appropriate regulatory framework, along with the difficulty in obtaining funding are significant inhibitors.

Krishna Priya and Anusha (Krishna Priya & Anusha, 2019) writing on Fintech issues and challenges in India highlight the growth of Fintech in India and the challenges it faces. The paper highlights Fintech's potential in India while identifying regulatory challenges, cybersecurity risks, financial inclusion, and technological limitations as some of the significant challenges that Fintech companies face in India.

Qambar Abidi (Abidi, 2021), in a note detailing the state of the Fintech industry in India, states that the significant growth potential of Fintech in India due to the country's large population, rapidly expanding digital infrastructure, and supportive government policies can help bring more people into the formal financial sector. The author notes that Fintech can help bridge the gap between the underbanked populations in India and the formal financial sector. This note also discusses the challenges faced by Fintech companies in India, including regulatory challenges, cybersecurity risks, and difficulties in accessing funding.

Singh and other researchers (S. Singh et al., 2021a) working on a study of antecedents for adoption of Fintech in India point out that acceptance of Fintech with users is not as per expectations and this can be due to various factors such as lack of trust or responsiveness in available Fintech services. They show that usefulness and ease of use have direct effect on intention to use. Trust and responsiveness have indirect effect on intention to

use and are mediated by usefulness and ease of use. Manish and Sergeeva (Manish & G, 2022), in a recent article on the Indian Fintech scenario, delve into the areas shaping the Fintech landscape in the country. The authors point out that future developments will primarily depend on the following five focus areas being pursued:

1. Customer Experience (CX) not merely a product - CX has to be built into all innovation and partnerships.
2. Continuous innovation will be needed even to maintain a competitive market position.
3. Swift collaboration with API providers, open-source stacks and the like will be needed within policy and regulatory guidelines.
4. Speed to market will be essential and this will be difficult to achieve given the highly regulated nature of financial services.
5. An eye on regulatory and government initiatives will remain essential as has been the experience with the governments drive on UPI.

Singh and Sharma (A. K. Singh & Sharma, 2022) have carried out a recent study on the effect of COVID-19 on adoption of Fintech. Their findings support the postulates of TAM and the authors state, "subjective norms, perceived ease of use and perceived usefulness have statistically significant impacts on Fintech payment services during the COVID-19 pandemic."

Singh and other researchers (S. Singh et al., 2021b) undertake in-depth interviews with Fintech experts and a large number of users. They find that though ease of use positively influences the use of Fintech services, social influence has a negative impact. Behaviour intention and usefulness have no significant impact on use; this is in contradiction to the findings of many other researchers and does not support TAM. The authors also add that security and responsiveness affect the usage but are mediated through ease of use. Raman and Aashish (Raman & Aashish, 2021) carry out research into the antecedents of intention to continue using mobile payments. They find that service quality, attitude, effort expectancy and perceived risk are direct influences on the intention to continue using mobile payments while perceived trust, convenience and social value have no influence on users' intention to continue using mobile payments systems. Allil and Khan (Allil & Khan, 2016) carried out a study on the factors affecting acceptance of Fintech for individual users and find that there is a direct positive relationship between Attitude toward Fintech, Subjective Norm of individuals. Perceived Utility, Compatibility, Personal Innovativeness and the Intent to Use these services.

Gupta and Dhingra (Gupta & Dhingra, 2022) investigate factors that are responsible for a large section of users to resist the use of Fintech in India and their conclusions indicate that facilitating conditions play the most dominant role in influencing adoption of mobile financial services; this therefore demands special attention for better implementation of Fintech.

Kedar Bhide in his short work on growth of digital payments in India (Bhide, 2019) mentions that regulatory initiatives of the Government and the Reserve Bank of India, viz. the Indian Stack comprising the trinity called 'JAM' (Jan Dhan, Aadhaar & Mobile) and digital signage locker, has helped Fintech companies. Many associated developments such as Aadhaar Enabled Payment Stack (AEPS), Unified Payment Interface (UPI), India Quick Response code (QR code), Immediate Payment Service (IMPS), National Automated Clearing House (NACH), Bharat Bill Pay Service (BBPS) together create one of the largest interoperable payment systems in the world.

Bhide considers the penetration of the Internet as a very important driver in India. A table indicating adoption is reproduced in Table 3 from his cited work.

Year	No. of Internet users in India (in Million)	Percent Growth Rate
2018 (actual)	483.0	-
2019 (actual)	525.3	8.8%
2020 (projected)	564.5	7.5%
2021 (projected)	601.0	6.5%
2022 (projected)	634.9	5.6%
2023 (projected)	666.4	5.0%

Table 3: Growth of Internet Users in India (Source: www.statista.com)

The author also considers increasing use of smartphones as an important driver for Fintech. The growth observed is shown in Figure 13.

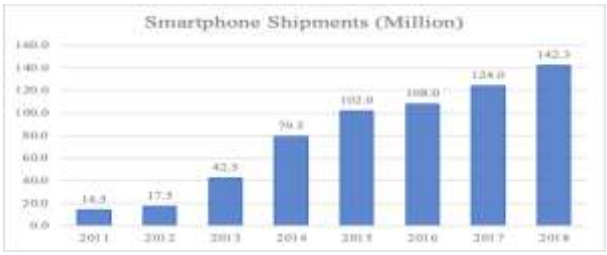


Figure 13: Smartphone shipments in (From: Bhide, opus citato)

Sivathanu, studies the use of digital payments during the COVID pandemic in India (Sivathanu, 2019) The results broadly support the UTAUT showing that both the reach and penetration of the digital payment systems increased during this period. There was an increase in the average time spent and in the frequency of use of digital payments by consumers. However, significant barriers to adoption were observed, such as low internet access, low digital literacy rate among consumers and lack of regular electricity supply. Moreover, consumers were concerned about the trail of information left behind by digital payments disclosing to service providers many details about transactions. This issue of privacy and confidentiality was a source of concern for users and can act as a long-term hindrance to adoption.

Vajid and Farroqi (Dr. Abdul Vajid & Dr. Abdul Wahid Farooqi, 2022) refer to the challenges and issues for Fintech adoption in India. According to them Emotional attachment to cash, unclear and costly to comply banking regulations, problems with access to the internet, cybersecurity and financial inclusion of the underbanked population are core issues which need to be overcome for the country to be a long term digital superpower.

Value This review provides a panorama of the recent scenario in the Indian Fintech industry in the backdrop of theoretical constructs underlying adoption of technology enabled services and the application of these constructs to the observed adoption in India. This work should provide future researchers a starting point for further work in this interesting area.

Practical Implications and Limitations

This review covers the domain of Fintech from a causative and a drivers of growth perspective, especially among end users of these services. The review indicates that there exist under explored areas such as insuretech and the sub-domains of P2P and SME lending within the Fintech industry, which have very good future growth prospects in India and would benefit from further study by academia, practitioners and regulators.

This literature review is conducted entirely on the internet, without any recourse to funding for being able to access paid routes providing direct industry data. Availability of such resources would have allowed inclusion of more recent data, which is not yet available in the public domain.

Conclusion and the Path Ahead

Fintech has been growing rapidly in recent years, driven by a combination of factors including a large and young population, a growing middle class, and increasing access to the internet and more mobile devices. The Indian government has also been supportive of the Fintech industry, and has implemented several initiatives to promote digital financial inclusion, such as the Jan Dhan Yojana, launch of Unified Payment Interface (UPI) and Aadhar Enabled Payment System (AEPS). The unexpected demonetization of 2016 has also accelerated the growth of the mobile payment ecosystem in India. Future endeavours by the Government are likely to include working on creating a conducive regulatory environment for Fintech companies in India, including more transparent regulations, creation of guidelines for digital lending, and the introduction of the data protection bill which has been long pending with the lawmakers.

Carlin and other researchers studying the adoption of Fintech across generations (Carlin et al., 2017) note that Fintech has not benefitted everyone in the same way, the tech savvy Gen Z is the most benefitted, while the older Baby Boomers are the least. Chuen and Teo writing with respect to the industry in China (Chuen & Teo, 2015) mention that Fintech is still in its early stages, it will likely define and shape the future of financial services. Other supporters like Gomber and others (Gomber et al., 2017) conclude, in their in-depth study, that development of Fintech will require collaboration as well as competition between traditional financial service providers and new age Fintech companies.

In summary, while concluding, it can be said that Fintech has the potential to make financial services more accessible, efficient, and secure for individuals and businesses in general and especially in an underserved country like India. Fintech is expected to continue to play an important role in the financial services industry in India in the future, adding significantly to the country's economy while promoting innovation and financial inclusion.

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