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Adoption of digital financial transactions: A review of literature and future research agenda

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ABSTRACT

This review synthesizes the prior literature on digital financial transactions (DFTs), identifies the factors that influence the adoption of DFTs, and sheds light on the research gaps in this area. This review focuses on the empirical studies published from 2009 to 2020. We identify fifteen factors that motivate the adoption of DFTs as well as five inhibitors to adoption. The literature lists perceived usefulness, perceived ease of use, compatibility, trust, security, effort expectancy, performance expectancy, and facilitating conditions as the most significant factors affecting the adoption of DFTs. In the study, cost of use, perceived danger, complexity, unwillingness to change, and privacy concerns are identified as major challenges to DFT adoption. Additionally, the paper outlines various research gaps in this field of research, particularly from the standpoint of methodology. The present work has significance for policymakers and managers in formulating policies and strategies to encourage the adoption of DFTs. As per the results, a research agenda for the future has been established.

1. Introduction

The finance industry has been among the frontrunners in embracing and utilizing the internet and mobile technology in consumer markets, and consequently, its service delivery has changed at a rate unprecedented in its history (Alkhowaiter, 2020). Drawing on Information and Communication Technologies (ICTs), financial institutions have also extended a plethora of innovative services to customers, with digital payment solutions at the top of the list. Digital financial transactions (DFTs) have been defined variously in previous literature, but the basic concept is that any payment[1] or financial transactions in which a digital or electronic device is used to initiate, activate, and confirm the transaction can be referred to as DFTs. DFTs comprise all kinds of financial transactions made using digital or electronic mediums, such as online payment, mobile wallets, cryptocurrency, and electronic payment (Agarwal and Zhang, 2020; Alkhowaiter, 2020; Choo, 2013; Patil et al., 2017; See-To et al., 2014; Singh, 2009). DFTs are an essential component of the banking and finance industry, yet there are certain underlying challenges to DFT adoption. Firstly, financial transactions have always been most vulnerable to the disruption brought on by new technology (He et al., 2020). Consequently, understanding how users respond to shifting demand and technology is becoming critical for new digital businesses seeking to emerge as well as for existing institutions (Kizildag et al., 2020; Liébana-Cabanillas et al., 2021; J. Liu et al., 2020; T. Liu et al., 2020; Petralia et al., 2019). Another challenge is the gradual adoption of DFTs at the individual level. Customers prefer cash and physical access to numerous transactions, which they perceive are lacking in digital modes of payment. The usage of DFTs is unexpectedly low in several emerging markets, including India, Malaysia, China, etc. (Aziz and Naima, 2021; Owusu et al., 2021; N. Singh et al., 2020; S. Singh et al., 2020). Many remote rural towns and small businesses that operate in developed and developing economies are lagging in the digital race (Philip and Williams, 2019; Sharma et al., 2020; Wargo et al., 2021). The problem is more concerning in low-income countries where many individuals are still unbanked and financially excluded (Aziz and Naima, 2021). Moreover, low DFTs adoption also exists among older adults (Choudrie et al., 2020; Panhwer et al., 2020). The unexpected low diffusion of DFTs necessitates further investigation into the underlying causes of adoption behaviour (Demir et al., 2020; McLean et al., 2020; Talwar et al., 2020).

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[1] Note: The authors have used the term DFTs to describe various cashless transactions performed digitally or electronically. As per the past literature, the term "payment" represents both cash and non-cash financial transactions. But, in a strict sense, "payment" refers to only non-financial transactions (Singh, 2009). For this reason, the term "digital financial transactions" was chosen.

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From what has been gleaned from previous research, it is evident that the adoption of DFTs must be increased. A review of recent literature and the determinants identified by past researchers could aid in the designing of a better model to increase the DFTs adoption. Although, DFTs have been extensively studied for more than three decades, there is still a lack of comprehensive review literature (Alkhowaiter, 2020; Choo, 2013; Hanafizadeh et al., 2014b; Karsen et al., 2019; Milian et al., 2019; Shailza and Sarkar, 2019; Suryono et al., 2020; Tam and Oliveira, 2017; Taylor, 2016; Utami et al., 2021). The available literatures on systematic review are somewhat scattered; for example, some studies are restricted to certain geographical boundaries (Alkhowaiter, 2020), while some are limited to specific modes of DFTs (Dahlberg et al., 2008; Deichmann et al., 2016; Hanafizadeh et al., 2014b; Shaikh and Karjaluoto, 2015; Slade et al., 2013; Souiden et al., 2021; Taylor, 2016), and specific factors (Karsen et al., 2019; Pal et al., 2019; Tam and Oliveira, 2017). Furthermore, over the past decade, numerous advances, including digital currency, blockchain technology, crowdfunding, virtual banking, social media banking, etc., have developed a substantial body of knowledge (J. Liu et al., 2020; T. Liu et al., 2020), necessitating an in-depth understanding of the subject area to prepare academics for a constantly changing and innovative DFT environment. As the"...*novelty of digital payment or electronic payment is only a technical aspect*" (Vlasov, 2017, p. 217), understanding and creating a framework under which digital financial services will be embraced by consumers and society at large remains a high-priority research issue. Therefore, the present study provides a systematic review of DFTs research published from 2009 to 2020, followed by important adoption factors to address and reconcile the existing knowledge gaps in light of the rising interest in the domain.

Previous studies on literature review state that a well-crafted review article not only offers readers a state-of-the-art understanding of the research topic but also helps in finding the research gaps and future research avenues (Paul et al., 2021; Paul and Criado, 2020). We identify the gaps that help future researchers. Thus, the gaps identified in the study will serve as a foundation for future research and suggest new research directions. One of the unique contributions of the study lies in the fact that the selected time period, i.e., 2009 to 2020, synthesizes the recent studies. Authors have followed a structured method of literature review (Paul and Criado, 2020) through the presentation of the theories used, context, constructs, and methods in the form of tables and figures. It reveals how past literature has evolved, theories utilized, most researched topics in the domain, and methodologies employed in past literatures. The factors have been identified manually by reviewing the literature, while the future research agenda has been drawn up using the TCM approach (Paul et al., 2017; Paul and Criado, 2020; Paul and Rosado-Serrano, 2019; Rosado-Serrano et al., 2018). The given avenues for future research provide a deeper understanding of what needs to be done by discovering untapped theories, constructs, and potentially novel methods. The authors believe that such a review could inspire more research into understanding consumer preference and choice. Given the conflicting theoretical arguments and empirical data, the authors do not

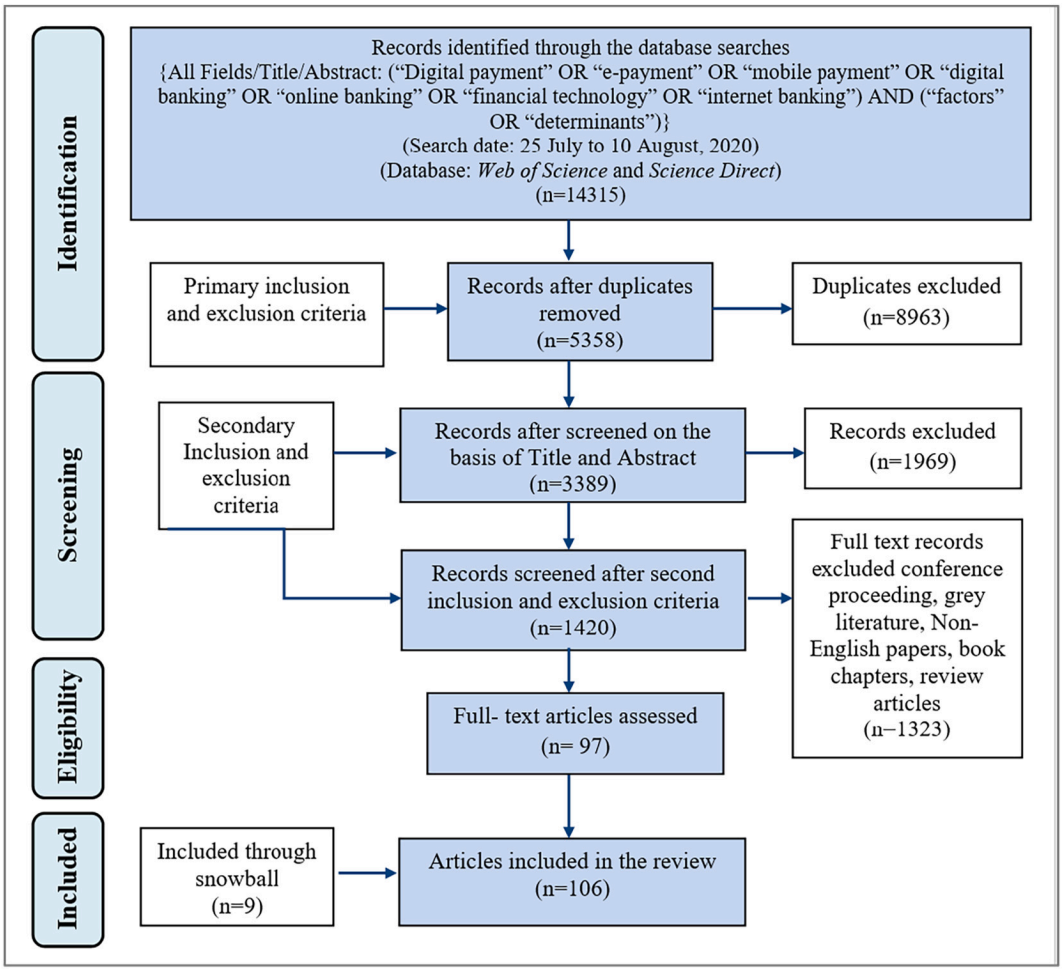


Fig. 1. PRISMA model.
Source: Compiled by authors.
Note: Since the search date was limited to a certain date range, studies published after that date may have been missed.

offer formal hypotheses. However, the authors do answer the following research questions (RQ):

RQ-1: How much research has been done related to the adoption of DFTs?
RQ-2: What are the antecedents that influence the adoption of DFTs?
RQ-3: How has the past literature evolved?
RQ-4: What theories have been used by researchers in past studies?
RQ-5: What is the future scope of research in the concerned field?

The study is organized as follows: Section 2 discusses the literature search and review approach used by the authors along with its findings; Section 3 consists of the discussion and implications; and finally, Section 4 contains the future research agenda of the study.

2. Literature search approach

Research into DFTs has significantly expanded; considering it as a homogeneous area of study is no longer possible. The study incorporates research that explains the challenges, users' perceptions, and the factors influencing the intention to adopt DFTs.

2.1. Review method

To analyze the most recent literature on DFTs, the authors have performed a systematic review of the literature. A systematic literature review (SLR) is regarded as the most informative and scientific type compared to other existing review methods (Paul et al., 2021). SLR tries to answer a research question, usually about the status quo of a field of research (Kraus et al., 2020). Another crucial feature of SRL is that it answers questions that can be misleading when a single study is taken in isolation (Petticrew and Roberts, 2008).

2.2. Review process and database search

The paper focuses solely on empirical studies, conducted between 2009 and 2020, that attempted to determine the reasons for the adoption of digital financial payments. The motivation for the emphasis on the recent literature is to capture the emerging horizons in the research domain. The introduction of digital currencies, e-governance, increased numbers of mobile holders, and improved technological infrastructure have all influenced the digital environment to a large extent. For this reason, digital financial services have caught the researchers' interest during this period. Focusing on recent research will provide an overview of current research findings and document the most up-to-date knowledge and findings in the area. The use of an online database ensures the highest standards and transparency and means the search can be applied globally (Podsakoff et al., 2005). Therefore, literature was drawn from two world-leading electronic databases, 'Web of Science' and 'Science Direct', to ensure the inclusion of high-quality studies in the concerned areas (Bramer et al., 2017). An article's potential value could be reflected by the quality of the journal in which it is published (Kuskova et al., 2011), and thus, emphasis was also given to the articles published in reputed journals to ensure the inclusion of valuable articles. The inclusion of articles from Google Scholar has been debated in some studies on the premise that it shows too many non-academic sources (Haddaway et al., 2015).

Table 1
The ten most cited studies.

Authors	Total citations	Citation per year
Lee (2009)	1712	142.67
Hargittai (2010)	1579	143.55
Zhou et al. (2010)	1195	108.64
Schierz et al. (2010)	1075	97,73
Kim et al. (2010a, 2010b)	1046	95.09
Martins et al. (2014)	894	127.71
Yu (2012)	765	85
Gu et al. (2009)	757	63.08
Zhou (2013)	579	72.38
Al-Jabri and Sohail (2012)	556	61.78

Source: Based on Google Scholar as on 8 August 2020.



Fig. 2. Geographical location of the reviewed studies.
Source: Compiled by authors.

The systematic review process was carried out using the 'Preferred Reporting Items for Systematic Reviews and Meta-Analyses' (PRISMA) guidelines (Moher et al., 2009), which comprised the use of keywords to search for relevant works in the database. The keywords were decided after a thorough study of past review articles (Canabal and White, 2008; Kahiya, 2018; Kraus et al., 2020; Liñán and Fayolle, 2015; Paul et al., 2017; Paul and Criado, 2020; Paul and Rosado-Serrano, 2019; Rosado-Serrano et al., 2018; Schiavi et al., 2020). The database was searched between July 25 and August 5, 2020. The complete exclusion and inclusion process provided the 106 most relevant articles for study. The flow chart for the review of the literature followed for the PRISMA model is given in Fig. 1. Within-study and between-study literature analysis has been used in the present study. In the within-study analysis, the full content of the articles has been analyzed and in the between-study analysis, a comparison of two or more studies has been done. This revealed similarities and differences between the studies.

The study has reviewed the literature using the structure-based review method. In the structured method, authors provide insightful information about the methods, theories, and constructs in the form of figures and tables (Paul and Criado, 2020). In the next sections, the authors have presented the most cited past studies, geographical location of the published studies, antecedents of adoption of DFTs, and profiles of the past studies.

2.3. Most cited studies

Based on the citation analysis, authors have determined the top 10 most influential studies. As per the past literatures (Cai, 2018; Dahlberg et al., 2015; Kahiya, 2018; Milian et al., 2019; Paul et al., 2017), the citation analysis not only indicate which articles are the most popular, but also the articles that have made the greatest contribution to their respective fields. The ranking given in Table 1 is based on the total number of citation counts. The average citation score was calculated by dividing the total citation counts with the number of years since the study was published (excluding the year of publication). The review process showed that Hargittai (2009), Lee (2009), and Schierz et al. (2010) are the top three studies with citations of more than 1100. The authors believe these studies could serve as a foundation for future research.

Table 2
Motivators of DFTs adoption.

Factors	Definition	Citation	Citation count
Perceived usefulness (PU)	The degree to which a person believes that using a particular technology would enhance his or her job performance.	(Alalwan et al., 2016; Alcántara-Pilar et al., 2018; Ben Mansour, 2016; Chauhan et al., 2019; Chawla and Joshi, 2019; Chen and Liu, 2013; Foroughi et al., 2019; Giménez and Tamajón, 2019; Gu et al., 2009; Gupta et al., 2020; Hartono et al., 2014; Hu et al., 2019; Kim et al., 2010a; Koenig-Lewis et al., 2015; Koksal, 2016; K.C. Lee et al., 2011; Lee, 2009; Lestari, 2019; Liébana-Cabanillas et al., 2018; Liébana-Cabanillas et al., 2014b; Liébana-Cabanillas et al., 2013; Marakarkandy et al., 2017; McLean et al., 2020; Ogbanufe and Kim, 2018; Patel and Patel, 2018; Qu et al., 2018; Schierz et al., 2010; Shaw, 2014; S. Singh et al., 2020; Sinha and Mukherjee, 2016; Siyal et al., 2019a; Talwar et al., 2020; Tarhini et al., 2014; Q. Yang et al., 2015; Yang et al., 2012; Zhu and Chang, 2014)	35
Perceived ease of use (PEOU)	The degree to which a person believes that using a particular system would be free of effort.	(Alalwan et al., 2016; Ben Mansour, 2016; Boateng et al., 2016; Chauhan et al., 2019; Chen and Liu, 2013; Giménez and Tamajón, 2019; Gu et al., 2009; Hartono et al., 2014; Hu et al., 2019; Johnson et al., 2018; Kim et al., 2010a; Koenig-Lewis et al., 2015; Koksal, 2016; K.-W. Lee et al., 2011; Liébana-Cabanillas et al., 2018; Liébana-Cabanillas et al., 2014b; Liébana-Cabanillas et al., 2013; Marakarkandy et al., 2017; McLean et al., 2020; Patel and Patel, 2018; Qu et al., 2018; Runnemark et al., 2015; Shaw, 2014; Singh and Sinha, 2020; Sinha and Mukherjee, 2016; Siyal et al., 2019b; Tarhini et al., 2014; Teoh et al., 2013; Q. Yang et al., 2015; Zhou, 2011b)	30
Compatibility (C)	Compatibility refers to the situation in which customers perceive a product or service as relevant to their actions, ways of thinking and their lifestyle.	(Al-Jabri and Sohail, 2012; Chawla and Joshi, 2019; Jung et al., 2020; Koksal, 2016; Oliveira et al., 2016; Schierz et al., 2010; Tarhini et al., 2014; Q. Yang et al., 2015; Yang et al., 2012).	9
Trust (T)	T is a readiness to be in vulnerability based on the favorable expectations about the future behaviour of another party.	(Alalwan et al., 2018; Barkhordari et al., 2017; Ben Mansour, 2016; Boateng et al., 2016; Chawla and Joshi, 2019; Chu et al., 2012; Gao and Waechter, 2017; Goczek and Witkowski, 2016; Gu et al., 2009; Hanafizadeh et al., 2014a; Hong, 2015; Hu et al., 2019; Jung et al., 2020; Jünger and Mietzner, 2020; Kim et al., 2010b; Koksal, 2016; Ladhari and Leclerc, 2013; Lee and Kim, 2020; Liébana-Cabanillas et al., 2013; Marakarkandy et al., 2017; Merhi et al., 2019; Ogbanufe and Kim, 2018; Qasim and Abu-Shanab, 2016; Sampaio et al., 2017; Shankar et al., 2020; Shankar and Jebarajakirthy, 2019; Sharma et al., 2017; Shaw, 2014; Sinha and Mukherjee, 2016; Slade et al., 2015; Talwar et al., 2020; Tarhini et al., 2014; Teo et al., 2015b; Teoh et al., 2013; Verkijika, 2018; Y. Yang et al., 2015; Yoon and Occeña, 2015; Yuan et al., 2019; Zhou, 2011b)	39
Security (S)	Perceive security refers to the extent to which one believes that the web is secure to transmit sensitive and confidential information.	(Chawla and Joshi, 2019; Ghosh Roy and Upadhyay, 2017; Gikandi and Bloor, 2010; Hartono et al., 2014; Liébana-Cabanillas et al., 2018; Merhi et al., 2019; Ogbanufe and Kim, 2018; Patel and Patel, 2018; Schierz et al., 2010; Shankar and Jebarajakirthy, 2019; Teoh et al., 2013; Zhou, 2011a)	12
Effort expectancy (EE)	The degree of ease associated with the use of the system.	(Alalwan et al., 2018, 2017; Baptista and Oliveira, 2015; Boateng et al., 2016; Chaouali et al., 2016; Jung et al., 2020; Lai et al., 2012; Martins et al., 2014; Merhi et al., 2019; Patil et al., 2020; Qasim and Abu-Shanab, 2016; Rahi et al., 2019a, 2019b; Sharma et al., 2020; Teo et al., 2015b; Verkijika, 2018; Zhou et al., 2010)	17
Performance expectancy (PE)	The possibility of the product malfunctioning and not performing as it was designed and advertised and therefore failing to deliver the desired benefits.	(Alalwan et al., 2018, 2017; Baptista and Oliveira, 2015; Chaouali et al., 2016; Jung et al., 2020; Martins et al., 2014; Merhi et al., 2019; Oliveira et al., 2016; Patil et al., 2020; Qasim and Abu-Shanab, 2016; Rahi et al., 2019b, 2019a; Sharma et al., 2020; Teo et al., 2015b; Verkijika, 2018; Yu, 2012; Zhou et al., 2010)	17
Facilitating condition (FC)	The degree to which an individual believes that use of the system is being supported by the organizational and technical infrastructure.	(Alalwan et al., 2018, 2017; Baptista and Oliveira, 2015; Chawla and Joshi, 2019; Giménez and Tamajón, 2019; Patil et al., 2020; Rahi et al., 2019a, 2019b; Sharma et al., 2020; Teo et al., 2015b; Verkijika, 2018; Yu, 2012; Zhou et al., 2010)	13
Hedonic motivation (HM)	HM often conceptualized as 'perceived enjoyment'. It is a perception that the given technology is entertaining.	(Alalwan et al., 2018, 2017; Baptista and Oliveira, 2015; Koenig-Lewis et al., 2015; McLean et al., 2020; Merhi et al., 2019; Venkatesh et al., 2012; Verkijika, 2018)	8
Perceived service (PS)	PS is a broad term and includes different types of services provided to the users such as information quality, system quality, user interface, website design, website social features, reliability, credibility, and image.	(Boateng et al., 2016; Gupta et al., 2020; Hu et al., 2019; Jahanmir and Cavadas, 2018; Koksal, 2016; Kuisma et al., 2007; Ladhari and Leclerc, 2013; Laukkanen, 2007; Lee and Kim, 2020; Natarajan et al., 2017; Rahi et al., 2019a, 2019b; Shankar and Jebarajakirthy, 2019; Sharma et al., 2018; Shaw, 2014; Tarhini et al., 2014; Yu, 2012; Yu and Fang, 2009)	19
Self-efficacy (SE)	SE represents a person's understanding and beliefs in his or her skills and capability to perform a task given. An individual with high DFTs self-efficacy is expected to have higher intention to continue using DFTs.	(Anouze and Alamro, 2019; Foroughi et al., 2019; Giménez and Tamajón, 2019; Gupta and Arora, 2017; Koksal, 2016; Lestari, 2019; Marakarkandy et al., 2017; Teoh et al., 2013; Yu, 2012)	9
Relative advantage (RA)	The degree to which an individual perceives an innovation to be better than the precursor to that innovation.	(Al-Jabri and Sohail, 2012; Carbó-Valverde and Liñares-Zegarra, 2011; Gupta and Arora, 2017; Johnson et al., 2018; Runnemark et al., 2015; Q. Yang et al., 2015; Yang et al., 2012; Zhang and Mao, 2020)	8

(*continued on next page*)

Table 2 (*continued*)

Factors	Definition	Citation	Citation count
Trialability (T)	The extent to which service providers allow users to try the innovation and make them comfortable to use it and aids the adoption of the innovation.	(Al-Jabri and Sohail, 2012; Johnson et al., 2018; Koksal, 2016).	3
Social influence (SI)	The degree to which people base their opinion based on surrounding people.	(Bapna and Umyarov, 2015; Baptista and Oliveira, 2015; Carlson et al., 2015; Faroughian et al., 2012; Jahanmir and Cavadas, 2018; Jung et al., 2020; Koenig-Lewis et al., 2015; Larsson and Viitaoja, 2017; Liébana-Cabanillas et al., 2014b; Martins et al., 2014; Patel and Patel, 2018; Patil et al., 2020; Qasim and Abu-Shanab, 2016; Rahi et al., 2019b, 2019a; Safeena et al., 2014; Sampaio et al., 2017; Sharma et al., 2020; N. Singh et al., 2020; Verkijika, 2018; Yu et al., 2017; Zhu and Chang, 2014)	12
Awareness (A)	It is a broad term and reflected by the knowledge, financial literacy, skills and observability of an individual towards DFTs.	(Al-Jabri and Sohail, 2012; Al-Somali et al., 2009; Anouze and Alamro, 2019; Goczek and Witkowski, 2016; Hargittai, 2009; Jung et al., 2020; Jünger and Mietzner, 2020; Koenig-Lewis et al., 2015; Riquelme and Rios, 2010; Yusuf Dauda and Lee, 2015)	10

Source: Compiled by authors.

Table 3
Inhibitors to DFTs adoption.

Factors	Definition	Citation	Citation count
Cost of use (CU)	Cost could be monetary as well as non-monetary. The monetary cost involves the transaction fees and internet charges while the non-monetary cost involves time and effort taken for documentation, registration, or learning and use the innovation.	(Alalwan et al., 2018, 2017; Anouze and Alamro, 2019; Baptista and Oliveira, 2015; Billon et al., 2009; Gikandi and Bloor, 2010; Gupta and Arora, 2017; Jünger and Mietzner, 2020; Kim et al., 2019; Koksal, 2016; Merhi et al., 2019; Tarhini et al., 2014; Valverde et al., 2016; Verkijika, 2018; Yang et al., 2012; Yu, 2012; Zhou, 2011b)	17
Perceived risk (PR)	Perceived risk is a broad term that includes different types of risks such as financial risk, performance risk, and psychological risk, social risk and privacy risk affecting the adoption of DFTs.	(Al-Jabri and Sohail, 2012; Alalwan et al., 2018, 2016; Alcántara-Pilar et al., 2018; Hong, 2015; Johnson et al., 2018; Jung et al., 2020; Khedmatgozar and Shahnazi, 2018; Koenig-Lewis et al., 2015; K.-W. Lee et al., 2011; Lee, 2009; Lestari, 2019; Liébana-Cabanillas et al., 2014b; Marakarkandy et al., 2017; Martins et al., 2014; Ryu, 2018; Sharma et al., 2020; N. Singh et al., 2020; Sinha and Mukherjee, 2016; Siyal et al., 2019a; Tarhini et al., 2014; Verkijika, 2018; Q. Yang et al., 2015; Yang et al., 2012; Y. Yang et al., 2015; Zhu and Chang, 2014)	26
Complexity	A psychological perception in the mind of users that use of given product is very difficult and often results in anxiety towards the DFTs.	(Anckar and Walden, 2003; Au and Kauffman, 2008; Gikandi and Bloor, 2010; Liu et al., 2015; Sinha and Mukherjee, 2016; Slade et al., 2015)	5
Resistance to change (RC)	Habit of using traditional and long-established ways of making payments and resisting the acceptance of novel or latent technologies.	(Agarwal et al., 2009; Siyal et al., 2019a)	2
Privacy concerns (PC)	Fear of losing important personal information and the fear of information being shared without the owner's knowledge and permission.	(de Kerviler et al., 2016; Kim et al., 2019; Merhi et al., 2019; Q. Yang et al., 2015)	4

Source: Compiled by authors.

2.4. Geographical location of the past studies

The analysis of the geographical location of the studies showed India, China, and South Korea to be the most surveyed countries (n = 31). Furthermore, taking into account the frequency, the authors found that the most of studies have been conducted in Asian countries. The probable reason behind the finding could be the recent drive towards the adoption of digital payment in these countries. A close observation of Fig. 2 exhibits that the European Union was the second most surveyed geographical region (n = 15) after Asia.

2.5. Antecedents of DFT adoptions

The study investigated the numerous factors that affect intention to adopt DFTs. The identified factors either encourage or discourage users from adopting DFTs. This section presents all the identified factors in two categorized forms; motivators and inhibitors.

2.5.1. Motivators of DFTs

Table 2 shows the factors identified as having a positive influence on the intention to adopt DFTs.

2.5.2. Inhibitors to DFTs

The factors identified as having a detrimental effect on the intention to adopt DFTs are given in Table 3.

2.6. Profile of the studies

2.6.1. Theories and models

Out of 106 studies, 95 are based on some distinct theory or an extension of those theories. The theories and models utilized in the reviewed studies are given in Fig. 3. The 'Technology Acceptance Model' (TAM), introduced by Fred Davis in 1989, has provided a very important base for analyzing the acceptance of DFTs. TAM and TAM2 have been successfully used by most of the studies. 'Unified Technology of Acceptance and Use of Technology' (UTAUT) was found to be the second most utilized theory in the studies. Out of all reviewed articles, some studies (Billon et al., 2009; Brandtzæg et al., 2011; Demir et al., 2020;

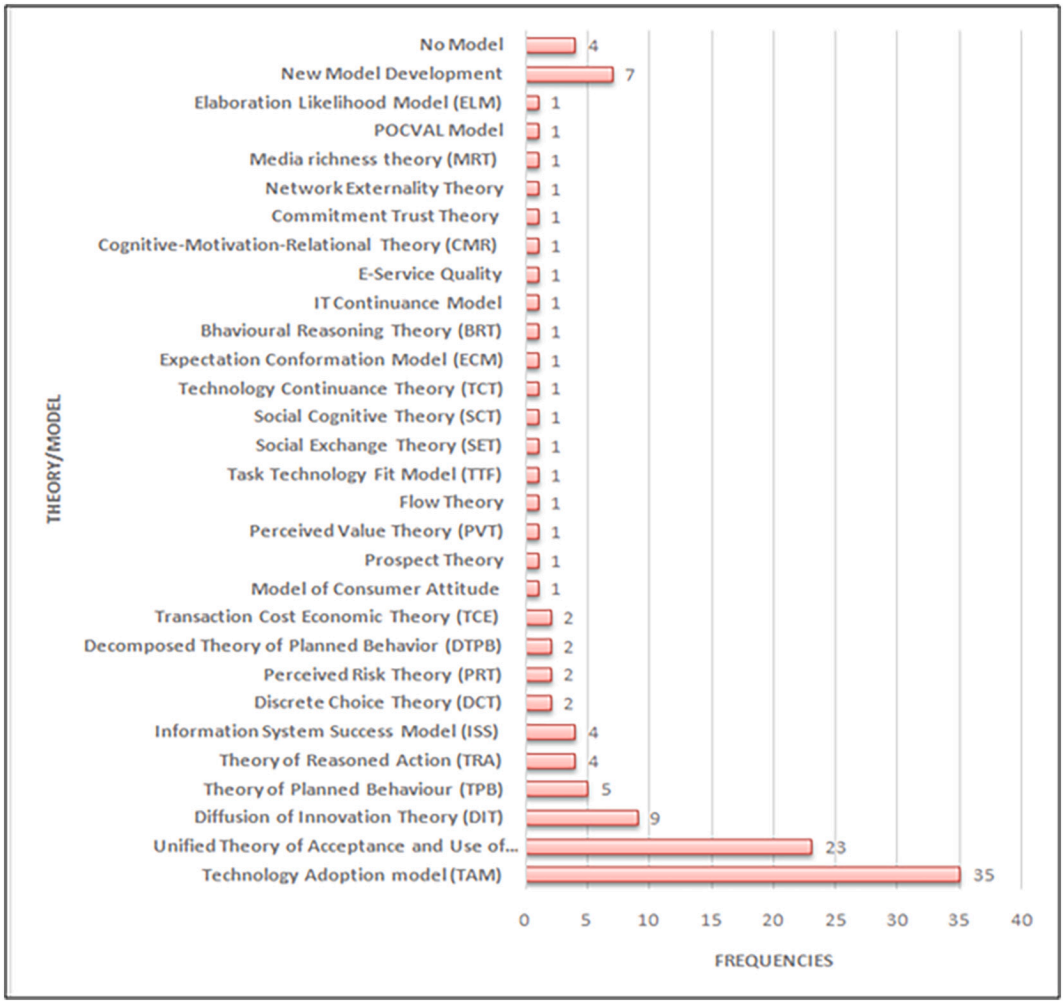


Fig. 3. Theory/model used in past studies.
Source: Compiled by authors.

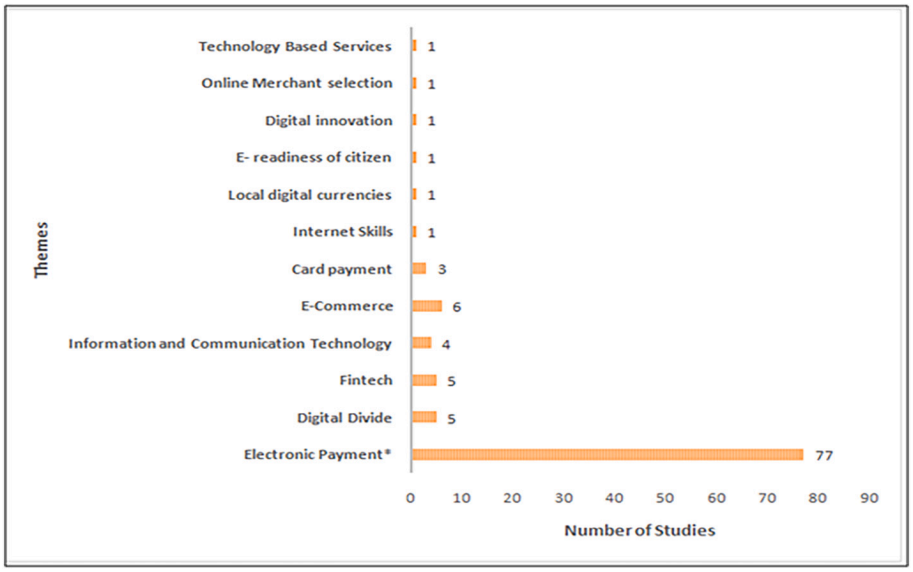


Fig. 4. Themes of the previous literature.
Source: Compiled by authors.
*Electronic payment includes all different kinds of payment terminologies used in past studies such as mobile banking, mobile payment, mobile wallet, internet banking, e-banking, online payment, web-based payment, digital banking.

Table 4
Data analysis tools and technique used.

Method	Citation
Correlation	(Baptista and Oliveira, 2015; Billon et al., 2009; Hanafizadeh et al., 2014a; Hargittai, 2010; Hong, 2015; Larsson and Viitaoja, 2017; Marakarkandy et al., 2017; Schierz et al., 2010; Vicente and López, 2011)
Confirmatory factor analysis	(Alalwan et al., 2017, 2018; Anouze and Alamro, 2019; Barkhordari et al., 2017; Ben Mansour, 2016; Boateng et al., 2016; Chaouali et al., 2016; Gu et al., 2009; Hanafizadeh et al., 2014a; Hartono et al., 2014; Hong, 2015; Johnson et al., 2018; Khedmatgozar and Shahnazi, 2018; Kim et al., 2010b; Koenig-Lewis et al., 2015; Liébana-Cabanillas et al., 2018; Liébana-Cabanillas et al., 2014a, 2014b, 2014c; Liébana-Cabanillas et al., 2013; Marakarkandy et al., 2017; McLean et al., 2020; Patel and Patel, 2018; Qasim and Abu-Shanab, 2016; Qu et al., 2018; Rahi et al., 2019a; Rahi et al., 2019b; Ryu, 2018; Sampaio et al., 2017; See-To et al., 2014; Shankar et al., 2020; Shankar and Jebarajakirthy, 2019; Siyal et al., 2019b; Tarhini et al., 2014; Q. Yang et al., 2015; Y. Yang et al., 2015; Yang et al., 2012; Yuan et al., 2019; Zhou, 2011b, 2013; Zhou et al., 2010; Zhu and Chang, 2014)
Exploratory factor analysis	(Barkhordari et al., 2017; Chen and Liu, 2013; Hartono et al., 2014; Al-Jabri and Sohail, 2012; Kim et al., 2010b; K.-W. Lee et al., 2011; K.C. Lee et al., 2011; Liébana-Cabanillas et al., 2013; Qu et al., 2018; Safeena et al., 2014; Vicente and López, 2011; Q. Yang et al., 2015; Y. Yang et al., 2015; Yoon and Occeña, 2015)
Regression	(Al-Jabri and Sohail, 2012; Lee and Kim, 2020; K.-W. Lee et al., 2011; K.C. Lee et al., 2011; Lee, 2009; Runnemark et al., 2015; Safeena et al., 2014; Teoh et al., 2013)
Multiple regression	(Anouze and Alamro, 2019; Hargittai, 2009; Jung et al., 2020; K.-W. Lee et al., 2011; K.C. Lee et al., 2011; Qasim and Abu-Shanab, 2016; Sinha and Mukherjee, 2016; Teoh et al., 2013; Tsetsi and Rains, 2017)
Logistic regression	(Bapna and Umyarov, 2015; Koksal, 2016; Srinuan et al., 2012)
Logit regression	(Carbó-Valverde and Liñares-Zegarra, 2011; Jünger and Mietzner, 2020; Kim et al., 2019)
OLS regression	(Hargittai, 2010; Schierz et al., 2010)
Squared multiple regression	(Yang et al., 2012)
Binomial logit model	(Srinuan et al., 2012)
Polynomial regression	(Teo et al., 2015a)
Binary logistic regression	(Jahanmir and Cavadas, 2018)
Linear regression	(Grover and Kar, 2020)
Partial least square method	(Baptista and Oliveira, 2015; Carlson et al., 2015; Chaouali et al., 2016; Chu et al., 2012; Faroughian et al., 2012; Foroughi et al., 2019; Gao and Waechter, 2017; Gupta and Arora, 2017; Johnson et al., 2018; Khedmatgozar and Shahnazi, 2018; Martins et al., 2014; Oliveira et al., 2016; Ryu, 2018; Shaw, 2014; Teo et al., 2015b; Yang et al., 2012; Q. Yang et al., 2015; Y. Yang et al., 2015; Yoon and Occeña, 2015; Yu, 2012; Yu et al., 2017; Yuan et al., 2019; Zhou, 2011a; Zhou et al., 2010; Zhu and Chang, 2014)
K mean cluster analysis	(Brandtzæg et al., 2011)
Harman's single factor test	(Ogbanufe and Kim, 2018; Yoon and Occeña, 2015)
Content analysis	(Grover and Kar, 2020)
Structural equation modeling	(Alalwan et al., 2016, 2017, 2018; Alcántara-Pilar et al., 2018; Anouze and Alamro, 2019; Barkhordari et al., 2017; Ben Mansour, 2016; Boateng et al., 2016; Carlson et al., 2015; Chaouali et al., 2016; Chauhan et al., 2019; Chawla and Joshi, 2019; Chu et al., 2012; Gao and Waechter, 2017; Giménez and Tamajón, 2019; Gu et al., 2009; Gupta et al., 2020; Gupta and Arora, 2017; Hanafizadeh et al., 2014a; Hartono et al., 2014; Hong, 2015; Hu et al., 2019; Khedmatgozar and Shahnazi, 2018; Kim et al., 2010a; Kim et al., 2010b; Koenig-Lewis et al., 2015; Lee, 2009; Lestari, 2019; Liébana-Cabanillas et al., 2014a, 2014b, 2014c, 2018; Liébana-Cabanillas et al., 2013; Martins et al., 2014; McLean et al., 2020; Merhi et al., 2019; Oliveira et al., 2016; Patel and Patel, 2018; Patil et al., 2020; Qu et al., 2018; Ryu, 2018; Sampaio et al., 2017; Schierz et al., 2010; See-To et al., 2014; Shankar et al., 2020; Shankar and Jebarajakirthy, 2019; Sharma et al., 2020; N. Singh et al., 2020; S. Singh et al., 2020; Siyal et al., 2019b; Talwar et al., 2020; Tarhini et al., 2014; Teo et al., 2015a; Verkijika, 2018; Q. Yang et al., 2015; Y. Yang et al., 2015; Yang et al., 2012; Yu et al., 2017; Yuan et al., 2019; Zhang and Mao, 2020; Zhou, 2011a, 2013; Zhou et al., 2010)
ISM-MICMAC	(Sharma et al., 2018)
Micro and macrodata analysis of large sample	(Goczek and Witkowski, 2016)
t-Test	(Malaquias et al., 2018; Ogbanufe and Kim, 2018)

Source: Compiled by authors.

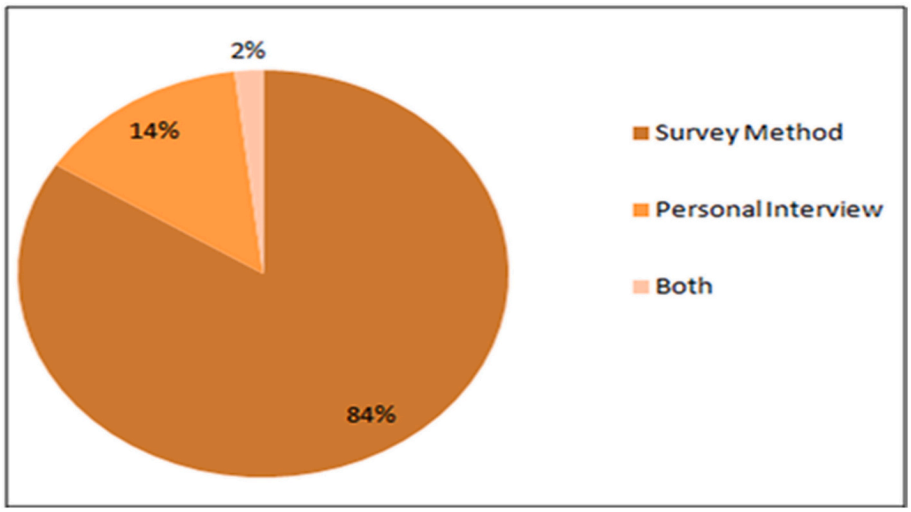


Fig. 5. Data collection method.
Source: Compiled by authors.

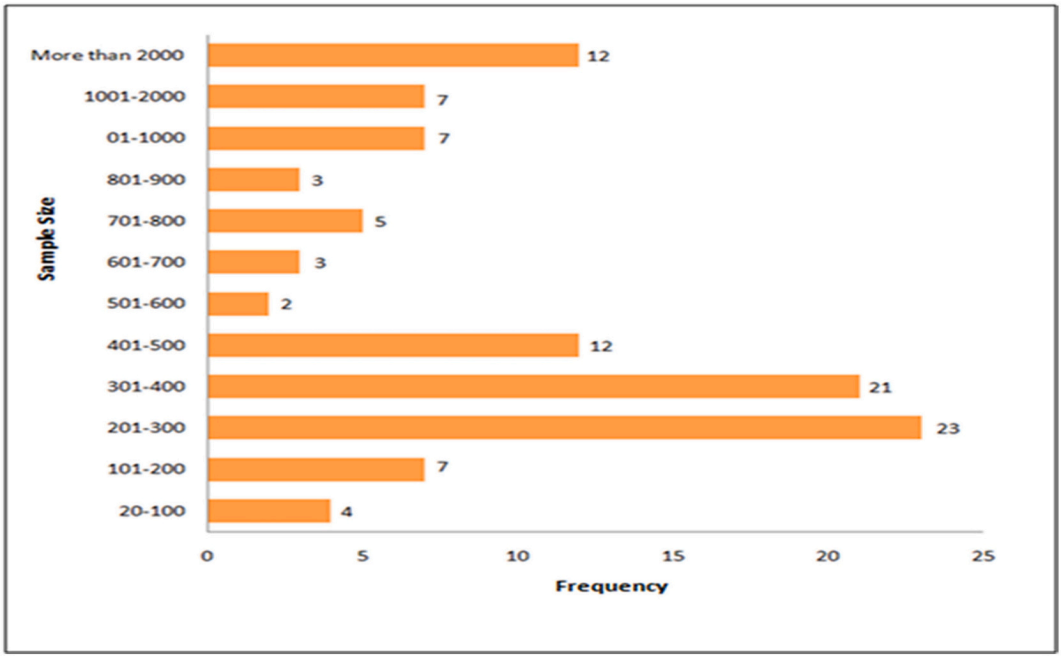


Fig. 6. Sample size chosen in the past research.
Source: Compiled by authors.

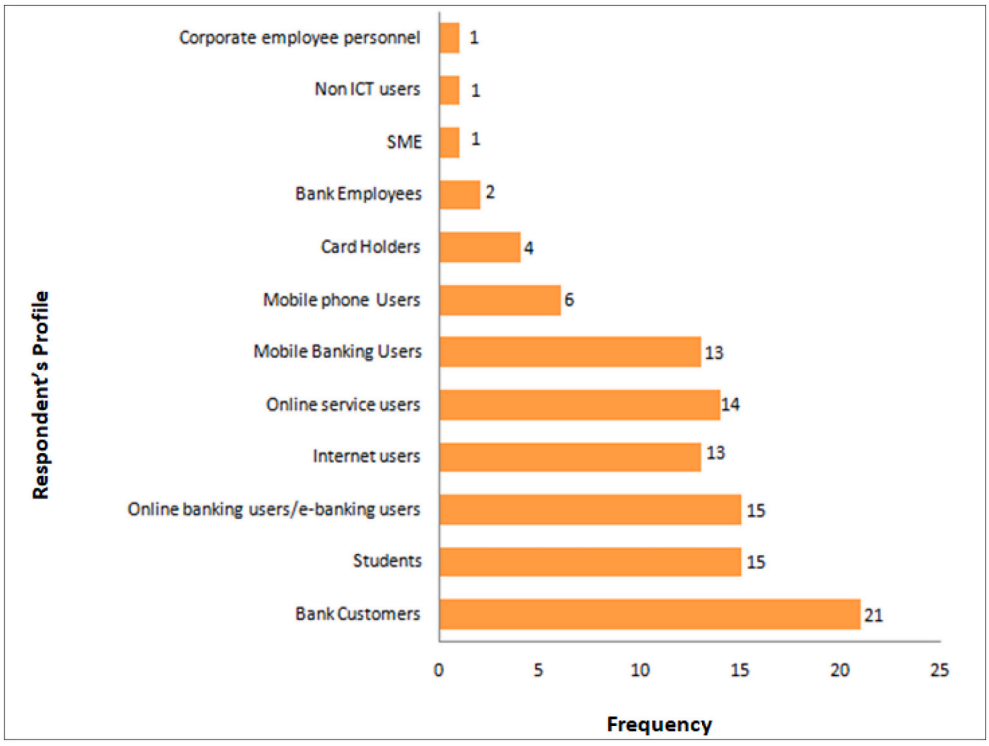


Fig. 7. Profile of respondents.
Source: Compiled by authors.

Faroughian et al., 2012; Gikandi and Bloor, 2010; Grover and Kar, 2020; Kim et al., 2010a, 2010b; Lestari, 2019; Vicente and López, 2011; Yu et al., 2017; Zhou, 2011a, 2011b) are either not based on any model or developed a new model.

2.6.2. *Themes of the reviewed studies*

Fig. 4 displays the themes and context of identified literature. The table also shows that most of the research has been done on E-payment, while digital innovation, e-readiness, local digital currencies, and technology-based services are some less explored areas in the concerned field.

2.6.3. Methodology overview

2.6.3.1. Statistical data analysis tools and technique. Table 4 presents the statistical tools and techniques used in the reviewed studies. The authors observed that regression and SEM have been adopted in most of the studies. It is worthwhile to note that PLS-SEM is experiencing a widespread application as the maximum number of studies has applied this method in 2019 and 2020.

2.6.3.2. Data collection technique and sample size. Figs. 5 and 6 present the data collection method and sample size used in the past studies, respectively. The authors observed that 18 studies have used secondary data for research. Ten studies were found to have conducted research using a sample from more than one country (Bapna and Umyarov, 2015; Billon et al., 2009; Brandtzæg et al., 2011; Demir et al., 2020; Jahanmir and Cavadas, 2018; Sampaio et al., 2017; Scott et al., 2017; See-To et al., 2014; Takieddine and Sun, 2015; Vicente and López, 2011). Limited studies (n = 2) have used mixed methods for data collection. Most of the studies have used convenience sampling. 84 % of empirical studies preferred the survey method for data collection. The review depicted that the online method of data collection is gaining popularity.

2.6.3.3. Profile of respondents. Fig. 7 shows the characteristics of the respondent from whom data has been collected in literature. Most of the researchers have collected responses from bank customers (n = 21). The review revealed that most recent researchers have collected data from young e-banking users and students whereas the quantum of data collected from corporate employees, non-ICT users, and small and medium scale enterprises (SME) is the lowest.

3. Findings and discussion

The objective of the study was to identify the factors affecting the intention to adopt DFTs and the recent trend of research in this area. The study delivered two key insights. First, it identified the factors through a systematic literature review and classified them into two categories: motivators, and inhibitors, to provide an understanding of the inherent nature of each of the factors. The second insight is the analysis of the methodology used in the empirical research. RQ-1 has been addressed through analysis of the geographical location of the published articles. The study found that most of the research contributions were from emerging countries such as India, China, South Korea, and Taiwan. Emerging economies have witnessed enormous growth in internet users in recent years. The governments in these countries have also recently taken many initiatives to encourage citizens to adopt digital transactions. This may be one of many possible reasons that this area has attracted a great deal of interest from researchers. It is important to note here that South Korea, Norway, the USA, and all the European countries are the most digitally developed countries while India, China, Malaysia, Brazil, Turkey, and Chile are regarded as the least digitally developed countries (Cruz-Jesus et al., 2018). The review revealed that most of the recent studies have been conducted in India, the United States, Jordon, and some other Asian countries. Of late, people are showing increased willingness to adopt digital mode of payment; however, most of the past studies reported that consumers' favorable attitude does not translate into actual use, with the majority of consumers hesitant to use DFTs. Thus, probable explanations for the observed inconsistency towards DFTs could be given by addressing RQ-2. Among the identified factors that influence the adoption of DFTs positively, Trust, PU, PEOU, EE, PE, and PS were found to be the most cited factors while PR, and CU were the most cited factors among the inhibitors to adoption. In most of the previous studies (e.g., Anouze and Alamro, 2019; Cudjoe et al., 2015; Goyal et al., 2013; Patel and Patel, 2018; Sinha and Mukherjee, 2016) PU and PEOU were regarded as significant factors in adopting new technology. The influence of factors such as RC, PC, complexity, SE, RA, and T has received less attention. Factors such as C, S, FC, and HM were reported to be significant constructs in many studies.

RQ-3, RQ-4, and RQ-5 have been answered by providing insight into the methodologies of the published research work. All the selected research is related to 12 different contexts of DFTs. Apart from E-payment, being the most voguish area of research, fintech, m-commerce, digital currencies, and digital innovations are the most recent areas of research that are gaining popularity. Theories and models provide a very important base for analyzing the acceptance of a solution. In the present study, the authors have found some less explored theories and also given due emphasis to the newly developed models. Although TAM and UTAUT have been recognized as the most relevant theories of technology adoption, models such as ELM, IT continuance, network externality theory, and E-SQ are found to be highly relevant models applied in most recent research work.

3.1. Managerial implications

The findings of the present study offer important implications for banking institutions, financial institutions, telecom companies, and online retailers that are currently providing or planning to provide digital payment services. Usefulness has always been an important determinant of attitude and also mediates the influence of easiness on attitude (Anouze and Alamro, 2019; Lee, 2009). Hence, the first implication is that digital payment solutions must be presented as a product that is user- friendly and easy to use. Trust in offline or physical banks helps users to trust online banking, which consequently creates an intention to adopt DFTs. Johnson et al. (2018) posited that the more secure the people believe a digital payment service to be, the more likely they will adopt it. Offline banking is still perceived as safer than online banking as it allows for personal interactions, and gives a sense of security (K.-W. Lee et al., 2011; K.C. Lee et al., 2011). Institutions need not only work on security but also must communicate these features to the customers. Customers view third-party certification favorably for rating the security level (Gao and Waechter, 2017).

Also, it was found that customers give significant importance to the service component; therefore, improving services could result in an increased customer base. Banks can use social media platforms to spread requisite awareness by sharing videos and app-related information. Companies offering digital payment facilities should organize memorable events, strange occurrences, and street graphics to influence the technology adoption decision of customers. Ghazali et al. (2018) suggested that companies can also use customer feedback to identify customers' needs. The services can be improved by analyzing online reviews of e-payments apps. Authors encourage companies to identify important customer needs through segmentation. This will help in understanding the preference of households, educated professionals, workers, and entrepreneurs.

3.2. Policy implications

For the policy implications, factors such as awareness, social influence, facilitating conditions, and resistance to change need more emphasis. Governments should invest a significant amount of funds in creating digital financial awareness (Rastogi and E., 2018). They should also try to establish an ecosystem to increase internet access and promote awareness regarding the use of digital payment. Additionally, a strategic policy that includes people with disabilities is required. A replicated policy could include the addition of headphone jacks to ATMs, clear and readable display of ATM screen, sound features in a digital wallet, spoken input, and voice recognition. Adequate funding is required to encourage fin-tech freelancers to become smart

entrepreneurs and this will lead to the entry of new entrepreneurs providing digital payment services (Damian and Manea, 2019). Regulatory and general market conditions are more critical determinants of the diffusion of digital financial services (Lashitew et al., 2019). Therefore, governments in the emerging economies should work on improving the DFT infrastructure. The penalties and fines charged to those undertaking fraudulent activities are unknown to the users. Such information should be provided by governments whenever any fraudulent transactions take place, to build the confidence of citizens.

3.3. Academic contributions

This study contributes to the literature, as it presents what is presently known and what is not regarding the relationship between various factors and the adoption of DFTs. The most important contribution of the study is the analysis of the recent trend of research relating to adoption of DFTs. It is evident from the study that there has not been any specific research on DFTs that has explored factors and information outlined in the recently published articles yet. These findings can assist researchers in identifying the journal that has published most of the research articles, the authors with the highest publications, the most commonly surveyed countries, and the most important themes of the published research work. The factors have been identified based on the outcome of numerous studies conducted in various contexts and the suitability of these should be examined empirically in future research. Moreover, more empirical research needs to be done in rural areas, as well as in developing and frontier economies.

4. Future research agenda

In light of the growing interest in the field of DFTs, the study suggests additional avenues for future research, which constitute opportunities for future investigations. As such, RQ-5 is answered in this section. Following the approach indicated by prior research (Paul et al., 2017; Paul and Singh, 2017), this study provides future research directions using a TCM approach, where T represents theory, C represents context, and M represents methods. Scholars perceive theories as points of view to investigate, whereas the premise of the investigation is covered by the context and the methods that bring to light the empirical evidence that can be used to extend the analysis.

4.1. Future research agenda-theory

There are some less explored but useful theories (for instance, the pull-push-mooring model) for identifying the intention to switch that should be utilized in future research. Additionally, previous literatures have extended the theories with new factors, yet there is the opportunity for theory development (Sharma et al., 2020). As the digital transition takes place, the user's perception is also evolving. To account for users' more complex perceptions, modern models must be more all-encompassing. When it comes to understanding adoption, the more general theories and models are no longer as useful as the innovation-specific models that are likely to develop as a result of subsequent research efforts (Mullan et al., 2017). The extension of theory is a small step on the path of DFTs adoption. To build a model that is both more comprehensive and applicable, which will allow for a greater rate of adoption, it will be necessary for future research to integrate at least two or more different theories (Gao and Waechter, 2017; Humbani and Wiese, 2019; Lee, 2009; Liébana-Cabanillas et al., 2014a, 2014b, 2014c; Oliveira et al., 2016; Rahi et al., 2019a, 2019b; N. Singh et al., 2020; S. Singh et al., 2020; Sinha and Mukherjee, 2016; Zhou et al., 2010). There is a dearth of grounded techniques that are supported by quantitative validation. In the theoretically-grounded model, the potential inclusion of a moderation and mediation effect of the factors presents additional prospects for future research (Boateng et al., 2016; Hong, 2015; Runnemark et al., 2015). Therefore, the authors encourage junior researchers to develop models incorporating moderation and mediation effects. The development of such model will not only help the adoption but will also give insight into complicated DFTs adoption behaviour to various stakeholders.

4.2. Future research agenda-context

Adoption behaviour across samples with varying characteristics was identified as a key area where more research is needed. Young adults and older people have different preferences (Srinuan et al., 2012). The authors strongly recommend that more research be conducted on the challenges and difficulties the visually impaired and adults over the age of 50 (Kim et al., 2019) experience while using DFTs. The study suggests that beyond specific attributes of DFTs (the ease of use, relative advantages, compatibility, trialability, and usefulness of information systems), future research should consider its enabling environment variables (Mullan et al., 2017) and the customer-service provider relationship built up in the offline environment, which has the potential to influence usage intention (Chiou and Shen, 2012). From the environmental point of view, it was found that using DFTs leads to the reduction of carbon emissions (Mardaani et al., 2019). Extensive research is needed to figure out how users' perception of sustainable and green finance influences their willingness to adopt DFTs. Moderating role of some factors such as specific internet devices (Boateng et al., 2016), location (restaurant, rural-urban area, office, etc.) and day (holidays or working days) where the payment is carried out (Runnemark et al., 2015), culture (Takieddine and Sun, 2015) must be investigated in future research.

Service providers have recently started adding more robust security features like facial recognition, fingerprint lock, voice recognition systems, etc., and these changes are opening new dimensions for research. The study recommends the development of in-depth empirical research about the use of different approaches applied to increase the security and privacy of DFTs. Digital payment platform has become one of the most searched examples of the digital ecosystem, however, the availability of digital payment service is not limited to the banking or telecommunications industries alone rather applicable to insurance, investment, healthcare, real estate, FMCG, etc. also. Thus, more research needs to be done on emerging payment technologies and their potential applications in different industries. While many apps have added digital shopping, travel, and online hotel bookings to their portfolios, social networking apps like WhatsApp, Facebook, and Snapchat have recently started their payment platforms. Future research might investigate website banking, prepaid payment instruments, micro cards, biometric payment, and facial recognition-based payment. It is crucial to note here that limited studies have considered the trends and needs of rural populations. The findings revealed that villagers are still far away from adopting DFTs; therefore, the authors recommend conducting more studies specifically targeted at rural areas.

4.3. Future research agenda-methods

Most of the literature was found to be based on primary data. Non-acceptability and the lack of usability of the results for a wide geographical area are some of the limitations of using primary data. Therefore, the study suggests that future researchers should conduct more studies using secondary data. A focus group study could be adopted to address these problems. Focus group studies are useful for qualitative research as they involve gathering a rich understanding of participants' experiences and beliefs. Nvivo, MAXQDA, and Netnography research tools can be used in future research for this purpose. For researchers aspiring to do a literature review of the empirical published research, the authors recommend methods such as Meta-analysis, thematic analysis, hybrid review, or bibliometric analysis. Notably, most of the quantitative studies identified by this study utilized cross-sectional research. This research could be further benefitted by longitudinal

research to offer more insight into the effectiveness, as well as the performance, of digital payment modes.

As indicated throughout the study, user perceptions and preferences are evolving in parallel with the digital ecosystem's transformations. As a consequence, an understanding of their perception is crucial for the development of an effective adoption model. There are limited models available to quantify the level of social engagement that exists between individuals. One such approach that spares researchers from complex modeling and provides an understanding of unique and complicated social interactions is the "social network analysis" (SNA) approach. The authors recommend that researchers use an SNA to find out the extent to which social factors affect adoption decisions. This approach can also be used to measure the strength of the impact of all the identified factors. In order to measure the more emerging payment innovation technique, machine learning approaches can be used (Lestari, 2019). The major contribution of the machine learning approach is that it can be utilized on primary as well as secondary data.

5. Conclusion

DFTs have become an essential element of society in the 21st century. It has brought about a revolution in the banking and finance service industry as a whole. Despite this evolution, research based on DFTs adoption yielded contradictory results. It was found that customers prefer cash and physical access to numerous transactions, which they perceive are lacking in digital modes of payment. The unexpected low diffusion of DFTs necessitates further investigation into the underlying causes of adoption behaviour. Thus, low adoption of DFTs and limited availability of review literature on DFT adoption has encouraged the authors to review the pertinent literatures related to factors affecting the decision to adopt DFTs. The present study provides a systematic review of research published from 2009 to 2020, followed by important adoption factors and recent trend of research. The contribution of the study lies in the fact that authors have not just identified the factors reported in the past studies but also shed light on the research gaps in this area. To identify the relevant studies, the 'Preferred Reporting Items for Systematic Reviews and Meta-Analyses' (PRISMA) model was used, resulting in 106 empirical articles. The authors have followed a structured method of literature review through the presentation of theories, context, constructs, and methods. The authors offer probable explanations for the observed inconsistency towards DFTs. Additionally, the factors that have received the most attention in the literature and those that have largely been overlooked are identified. As per the findings, trust, perceived usefulness, perceived ease of use, effort expectancy, performance expectancy, and perceived security were found to be the most cited factors. The cost of use, perceived danger, complexity, unwillingness to change, and privacy concerns are identified as major challenges to DFT adoption.

The analysis found that most of the empirical studies have been conducted in developing countries such as India, China, South Korea, Taiwan etc. Most empirical articles on the adoption of DFTs found were based on various e-payment services. TAM theoretical framework is still the most adopted framework in recent empirical studies while, models such as ELM, IT continuance, network externality theory and E-SQ are found to be highly relevant models. Most of the studies have collected data from bank customers, students and online banking users. Statistical tools and techniques analysis indicated that SEM was one of the highest adopted analysis techniques. Finally, the study provided managerial, policy, and theoretical implications. The implications provided can help in speeding the process of digital adoption. The future research agenda provided in the study will be useful for the researchers working in this area. The implication of the study presumes a strong presence and broad coverage of basic and digital infrastructure. The authors are of the view that companies offering digital financial products should not view their offering just as a unique product that presents a new business line, and overprice the product with extra charges. Banks can use social media platforms to spread requisite awareness by sharing app-related information. Companies offering digital payment facilities should organize memorable events, strange occurrences, and street graphics to influence customers' decision. Suggested that companies can also use customer feedback to identify customers' needs. The present study also provides a research guide for aspiring scholars willing to work in this area. There are some less explored but useful theories for identifying the intention to switch that should be utilized in future research. The authors recommend that more research be conducted on the challenges and difficulties the visually impaired and adults over the age of 50 experience while using DFTs. Extensive research is needed to figure out how users' perception of sustainable and green finance influences their willingness to adopt DFTs. Future research might investigate website banking, prepaid payment instruments, micro cards, biometric payment, and facial recognition-based payment. There is a strong necessity for a balance between 'research-based practices' and 'practice-based research'.

CRediT authorship contribution statement

K. Kajol: Conceptualization; Data curation; Formal analysis; Investigation; Methodology; Visualization; Writing - Original draft preparation. **Prof. Ranjit Singh:** Conceptualization; Supervision; Methodology; Validation; Writing - review & editing. **Prof. Justin Paul:** Supervision; Methodology; Validation; Visualization; Writing - review & editing.

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Author statement

We have no conflict of interest. Our manuscript is neither submitted to another journal nor published in another journal.

Data availability

The present study is a review article, therefore, data was extracted by authors from digital literature databases. All the data have already been shared by the authors in the manuscript.

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