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RESEARCH ARTICLE

The utilisation of mobile payment systems among construction workers in India, with a focus on the influence of customer convenience

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ABSTRACT

The paper studies the adoption and diffusion of mobile payments among construction workers in India, which constitute 12.4 % of the workforce. This research paper investigates the effects of the post-corona epidemic on the adoption of mobile payment systems among Indian construction workers using the Unified Theory of Acceptance and Use of Technology (UTAUT). A questionnaire was filled out by 405 construction workers in India. The data was analysed using structural equation modelling. The results show that performance expectancy, effort expectancy, facilitating conditions, and social influence significantly influence the construction workers' behavioural intention (BI). The mode of payment/customer convenience moderates between facilitating conditions and behavioural intention. The adoption of mobile payments among construction workers is investigated, as well as the moderating effects of payment mode on response efficacy and behavioural intention. In the literature, scarce research has been available on the adoption of mobile payments by construction workers.

Keywords: Construction workers, UTAUT, mobile payment, behavioural intention, moderator, actual use

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1. Introduction

Mobile payment systems have had a profound impact on the lives of underprivileged segments of society by addressing the challenges posed by traditional banking systems. These systems have been increasingly adopted by these economically disadvantaged groups, as well as by educated populations worldwide. Synergies are available with mobile payments making them very simple to use for people, as it adopts user-friendly technology. A "mobile payment" is a type of payment made via a smartphone. Instead of using cash, cheques, debit/credit cards, or other payment methods, consumers can accept payments or make payments using their mobile phones to purchase products and services. From 2018 to 2023, the number of mobile proximity payment users globally is expected to increase. In 2019, there were 0.95 billion mobile proximity payment users globally, with the number expected to rise to 1 billion by 2020. By 2027, the global mobile payment market is expected to reach USD 8.94 trillion, with a CAGR of 29.0% over the forecast period.

A mobile user can use m-payments to send money or pay for goods and services by using a variety of technologies, such as an SMS, a near-field communication device, a Java application against GPRS, a WAP service against IVR, or various mobile communication technologies, like the unified payments interface (UPI) used in India. The transaction happens within a matter of seconds. You are alerted to the transfer right away by both the customer's bank and the m-payment businesses. The utility of the technology is that customer can pay or receive money from any bank in the country.

The availability of smart phones and high speed data have increased demand for m-payment globally. The emergence of e-commerce and digital technology is driving the expansion of mobile payments. The 'Z' generation is so ingrained in digital technology that it appears that left hands do their work for them. Due to its integration with artificial intelligence technology, which enables merchants and companies to follow client preferences, m-payments acceptance has also surged among businesses. This in turn aids in creating marketing campains that correctly reflect consumer aspirations.

Covid-19 has also fueled the habit and usage of m-payments around the world. According to the Reserve Bank of India's index, which gauges utilization of transactions (online), digitally made payments nationwide saw a rise, measuring 13.24% in the year in March 2023. In Mar 2023, the RBI's (RBI-DPI) was at 395.57, scaled up from 349.30 in March 2022 as compared to 377.46 in September 2022. Due to local governments' social isolation policies enforced on the populace, the epidemic has altered consumer behavior. As most of the population were working form home due to pandemic, m-payments has become a prefered mode of money transfer in addition to credit card, net banking etc. Even the WHO has advised the public to use contactless payments due to the pandemic. Globally the adoption of m-payments is risen steadily. It is evident from figures observed in the post-pandemic survey that there are still some concerns regarding the usage of m-payments technology, which, up to a certain extent, nullified post-pandemic. Issues concerning security, trust, cash, etc., were raised initially, but the growth of m-payments significantly surged anyway. In India, banks, NBFCs, and technology firms offer m-payments services. Multiple companies, including Google (Google, Phonepay, Paytm, Amazon Pay, etc.), offer UPI-based payment services. Users can connect their bank accounts to their phone numbers using payment apps facilitated by the UPI, a standard supported by the banking sector. Customers who want to use this service must register with the

companies that offer the payment transfer service and most importantly it is a free service for consumer.

The apex organization in charge of the implementation of mobile payments in India is called the Mobile Payment Forum of India (MPFI). India has been the fastest-growing mobile payments market in the world. India's transition to cashless transactions intensified after COVID-19. After 2018, non-card mobile payments increased by 163 percent to $286 billion. In terms of value, customers used credit cards to make 5.1 trillion POS transactions and 8.1 trillion e-commerce purchases in 2022. Consumer apps from Google and Walmart's PhonePe have tightened their hold on UPI payments, while Paytm, which is funded by Alibaba, has made further strides in building out a system akin to a bank. The adoption of m-payments among lower middle income group has been steadily rising but relatively on the lower side due to number of reasons. M-payments are influenced by a number of factors, including income level, financial inclusion, and awareness of m-payments. Construction workers consitute 12.4% of the workforce in India. There are an estimated 54 million constructions workers in India. However, there are little detailed statistics on construction workers available at the national, regional, or international levels. Construction workers include workers, either in individuals or in groups, who have been mainly searched for work on a temporary or seasonal basis in urban areas of other Indian states or geography in real estate sector. Rural workers are mainly employed in temporary, unqualified jobs, characterised by low wages, insecurity of the job and economic vulnerability which are peculiar features of informal working environments. Such rural construction workers are employed through National Rural Employment Guarantee Scheme. Above workmen are socially and politically vulnerable, while providing 7 % of India's GDP. Basic details concerning their employment and living arrangements, as well as their recruitment process, are typically unknown. Research on the adoption of mobile phones among these construction workers is significant from the financial inclusion aspect. But adoption of m-payments and its impact post corona pandemic is still not studied amongst this class of workers. So there is a need to understand the challenges experienced by this strata while adopting this payment technology. Also, it is crucial to examine the acceptance and spread of m-payments among lower income group individuals like construction workers, farmers, and workers in the unorganized sector. The following research questions were developed for the study:

Whether the construction workers in India have adopted a mobile payment system?

If yes, how is the diffusion of mobile payments?

What is the impact of consumer convenience/mode of payment on behavioural intention of construction workers?

This research paper investigates construction workers' adoption of m-payments in India. It also examines the impact of various factors on behavioural intention towards m-payments. In addition, the research also looks at the moderating impact of consumer convienience/mode of payment on response efficacy and behavioural intention. The research paper is organised in the following manner: Introduction, Review of literature, Research Methodology, Data Analysis, Results and Discussion, Managerial implications, and Conclusion.

2. Review of Literature

The review of the literature examines the literature on consumer convenience, m-payments globally, construction workers in India and throughout the world, behavioural models, and technological adoption.

2.1 Literature on Technology Adoption

Due to its significance in the human development index, technology adoption has been a subject of much investigation worldwide. Technology has been shown to boost human productivity and efficiency. Additionally, it facilitates consumer comfort, ease of work, and financial inclusion. To examine this phenomenon, a number of technology adoption and dissemination models have been propounded by researchers. The most innovative model of innovation adoption and diffusion among customers is the Innovation Diffusion Theory.[1] The relevant rate is higher in nations that only recently accepted modes of mobile telecommunications, which suggests a trend of convergence in levels of dispersal. The rate of diffusion increases when the number of companies increases. The size of the

fixed telephone network and the length of the waiting list both affect how quickly information spreads. The "epidemic" diffusion model, the one who adheres 'S' function in the dispersal of new technology, is used in this research work[2]. With this model, new technologies, products, services, and ideologies can be studied[3]. The sequential next important model is Technology Adoption Model (TAM). Davis (1986) theoretically put forward computer technology use behaviour through development of TAM. The notion of reasoned action, a well-known theory in the field of social psychology, served as the basis for this model. (TRA; Fishbein and Ajzen, 1975), the same enumerates the behaviour of a person by its intentions. Individual attitudes toward behaviour as well as social norms, or the perception that other people / groups approve of or disapprove of behaviour, influence this intention. Numerous researchers had used TAM in their work. For instance, Hampshire looked into the confidence, risk, and utility of mobile payments among British consumers using TAM and sequential mixed techniques[4]. Consumers in the UK are very concerned about the risk and reliability of mobile payments. Perceived trust reduces perceived risks and has a favorable impact on perceived utility, whereas perceived risk has a negative impact on perceived utility.[5] Additionally, perceived utility has a favorable and considerable influence on British consumers' attitudes, which may result in adoption [6]. Bailey has incorporated in the basic TAM mobile payment adoption (particularly tap & go kind payment) issues, new technology anxiety, and mobile payment privacy concerns in the USA[7]. The self-efficacy of mobile payments has a big impact on how easy they are to use and how often people use them. This in turn influences how mobile payments are perceived, which in turn affects mobile payments. Data protection also pertains to a person's mindset and intent when using mobile payments. Anxieties about new technology affect ease of use but not perceived utility. [8]. Lewis studied the barriers to mobile banking services. The expected outcome of this study is to evaluate a model that, from a methodological viewpoint, is better able to forecast consumers' intentions to use mobile banking by building on the technological acceptance model and innovation diffusion theory. The data were analysed by modelling structural equations. The survey's findings demonstrated the significance of m-banking services as indications of compatibility, perceived utility, and risk. Along with being highly direct, compatibility established a crucial precedent for perceived utility, perceived comfort, and credibility. Credibility and confidence are essential for lowering the risk of m-banking in general. [9]. Luarn and Lin investigated the human behavioral intention of utilizing mobile banking by using the extended technology acceptance model (TAM), which included one trust-based component and two resource-based constructs. The intention to use mobile banking has been positively influenced by perceived self-efficacy, financial costs, credibility, ease of use, and usefulness, according to 180 samples that were collected and observed in Taiwan. [10].

The UTAUT model created by Venkatesh is yet another crucial framework for technology adoption. Eight pioneer models used in earlier studies to explain the behavior of information systems were evaluated and combined to develop the theory. (theory of the reasoned action, TAM, motivational model, planned behaviour theory, a common theory of planned behavior/acceptation of technology models, personal computer model, social cognitive theory, and diffusion of innovation. UTAUT subsequently validated around 50% of the actual use of a longitudinal study as well as 70% of the variance in the behavioral intent to use (BI) by Venkatesh et al. (2003). The following five elements are direct predictors of behavioral intention and use behavior in the UTAUT model: performance expectancy, defined as "the extent to which a individual believes that using the system will assist him or her in achieving gains in job performance," effort expectancy, which is "the degree of ease associated with the use of the system", social influence, which is "the degree to which an individual perceives that important others believe he or she should use the new system", According to facilitating conditions, it is "the extent to which a individual believes that an institutional and technological framework is in place to support the use of the system.", and (5) behavioural intention, which is "the individual's subjective probability that he or she will perform in the relevant behavior". The four variables in the UTAUT model—sex, age, expertise, and voluntary use—are also influenced by moderators. This model has been extensively utilized to investigate how technology is adopted. For example, Teo researched the impacts of comfort and speed in mobile payments. He investigated how

the unified theory of acceptance and use of technology (UTAUT) is impacted by m-paid transaction convenience (CPC) and transaction perceived speed (PTS). So findings indicate that the BI only significantly affects the facilitating conditions (FC) and effort expectancy (EE). Particularly, it was determined that the positive relationship between PTC and EE and its anticipated performance was significant (PE). Additionally, PTS backed up the beneficial BI-EE associative relationship [11]. Sobti conducted study on the causes and consequences of Indian users' intention and acceptance of mobile payment services including m-wallets and m-banking. Key findings show the beneficial and significant effects of behavioral intent, demonetization, and favorable conditions on the uptake of mobile payment systems in India. A better disclosure for describing the factors that precede behavioral intention was advocated by extended UTAUT model. In addition to UTAUT history, the perceived costs and risks as a background to behavioral intents also had extra explanatory strength. Three models employ age as the moderating variable, which means that younger users prioritize mobile payment services' user-friendly interface and are more impacted by their social circles and societies in deciding whether or not to use them. [12].

Mobile payment has been widely used during the pandemic in China to avoid direct as well as indirect proximity in transactions, retain social segregation, and support stable social economies because of its convenience, dependability, and contact-free features. During the pandemic, Zhao looked at the technological and psychological influences on user m-payment intents for the COVID-19 epidemic. The empirical results demonstrate that users' views of technology and intellect jointly influence their intention to accept the M-payment.[13] It significantly affects the benefits expected by social effect and confidence given the epidemic situation. In the beginning, this study combined MAT and UTAUT to provide a theoretical framework for analysing user intents.[14]

Venkatesh further developed on this UTAUT model and came up with UTAUT 2 model. There are three additional structures are part of UTAUT2: habit, value for money, and hedonic incentives. To investigate how these factors affect behavioural intentions and technology use, the individual differences such as name, age, sex, and experience are used. The variance explained by behavioral intention increased significantly (from 40% to 52%) and technology utilization increased significantly (from 40% to 74%) in UTAUT2, according to the results. This model gained wide acceptance for adopting of technology studies. [15]. For example, NFC-MPs, which are still quite new in the US, work with mobile devices that have NFC proximity technology (such as the Apple iPhone 6), and they differ dramatically from traditional mobile online payments.[16] To develop a complete model, this study examined the Unified Theory of Acceptance and Use of Technology (UTAAUT2) that describes the purpose of NFC-MP in the hospitality industry using information from a sample of 794 hotel guests chosen at random from the US population. The highest predictor of intentions was the anticipation of performance, while hedonic reward, habit, and social impact all had just minor effects. [17]. Authors developed and tested a model concept which, combining modified UTAUT2 with CBE, combines consumers' intentions to use contactless payments in a developed country with a modified Unified Acceptance Theory and Technology Use model. In Finland, a contactless payment service provider helped the authors reach 22,000 customers, and 165 of those responses were useful. The collected data was analysed applying structural equation modelling. According to the study, the UTAUT2 and CBE models jointly account for almost 70% of the usage variance. Forecasters, habits, and overall consumers' satisfaction are strongest when compared to usage intentions. The model also supports the strong relationship between usage and purpose. [18]. However, m-payment services are cost-free in India as compared to other money transfer options. Also, incentives and habit can be covered in effort expectancy and behavioural intention. Figure 1 displays the research model.

2.2 Literature on m-payments adoption

The establishment of Paypal in 1998 served as the primary impetus for m-payments. This technology allowed 95 million people to make transactions using their mobile phones in 2001, bringing mobile commerce to $2.4 billion. This sparked the creation of mobile payment services like Apple Pay, Samsung Pay, and others around 2014. Since that time, numerous research studies on the use of m-payments have been undertaken. and their effects globally. For example, Kshetri (2012) studied

mobile payments in emerging markets. The authors found mobile payments as a tool of socio-economic development in emerging markets in emerging nations. Mobile phone penetration is influencing the growth of m-payments in emerging economies [19]. Yeh researched all the factors that influence the use of mobile payments. In comparison to the global adoption of mobile technology, he discovered that m-payment adoption is lower. He observed that factors impacting the adoption of mobile payments include public policy, switching costs, brand equity, and service quality. [20]. The effect of affective elements on perceived risk as well as usefulness of m-payments was examined by Liu et al. The paper integrates and influences the model of the consumer response system. The findings show that users' intention to accept is somewhat correlated with perceived risk, usefulness, and positive emotion. Positive emotion significantly influences perceived risk as well as perceived utility in a positive way. Furthermore, perceived utility greatly reduces users' risk perceptions. Multigroup analyses demonstrate that at the introduction stage of the market, instead of market expansion, predicted acceptance is significantly influenced by both positive and negative feelings, including pleasure and perceived threat. Instead, the impact of positive utility on acceptance intention is substantially stronger at a stage of market development than it is at the introduction [21]. Francisco studied mobile payment adoption in Spain. Using structural equation modeling, the study examined the adoption of the Apple Pay mobile payment system and its precursors. The adoption process was more influenced by perceived value than by perceptions of utility and risk. [22].

Zhao investigated the attitudes and experiences of U.S. adults toward mobile payments and discovered that those who use cards are less inclined to use near-field communication systems than those who just use cash only payment system. In terms of the intention behind NFC mobile payments, previous experiences with mobile non-NFC payments have been very positive. These convictions included the increase in consumer confidence and the utility in mobile NFC payments. Additionally, it was found that confidence between non-NFC mobile payment experiences and NFC mobile payment intention served as a mediator. [23]. Denis evaluated 40 of the highly cited papers from 1999 to 2015 as part of an assessment of the literature to determine the trends in research on mobile payments. As a new form of payment in the twenty-first century, businesses are increasingly embracing mobile payments (m-payments). M-payments, the new payment channel, have increased the amount of literature on this subject in recent years. In order to identify important subjects of research and methodologies investigated, this paper summarizes the findings of a literature review. To identify these trends, the authors looked at the 20 publications that have received the most citations since 1999 and the 20 articles that have been published most recently on m-pays as of August 2014. [24].

Cao examined the process for establishing trust when switching from an online payment system to a mobile payment system. They adopted the trust theory and proposed that payment (online) trust (i.e. trust in source) as well as relationship factors for source targets, namely the similarity, impact mobile payment trust (i.e. trust in target). User satisfaction and the persistence of mobile payment intentions are both impacted by the resulting trust.[5] The results demonstrate that, through satisfaction, the transfer of trust has a positive impact on the intention to make a mobile payment. Satisfaction has a considerable impact on sustainability. Additionally, trust and perceived similarity between online and mobile payments, as well as perceived entity, can favourably influence mobile payment trust. [25].

The authors identify payment culture and safeguards as important factors that influence perceived security (PS) as well as trust. The objective of said paper is to scrutinise how users' attitudes toward using mobile payments are influenced by PS and confidence, as well as the reasons for the divergent development of mobile payments in China & USA. Concerned findings show that security has a significant positive impact on OS and trust and that this impact is not outweighed by payment culture (as measured by mobile payment coverage (CMPC) and uncertainty avoidance (UA), security measures (as measured by security technology protection (STP), security rules and policies (SRP), and security responsibility commitment), or security measures themselves. There are no notable differences in confidence between the USA & China with regard to security measures or the impacts

of PS and PS, but CMPC and PS have a considerably lesser impact on trust in USA compared to China. [26].

Liu performed a meta-analysis to analyse these findings. The primary study's practical implications are that, while consumer habits are hard to alter, they can be adjusted to take into account these crucial aspects by careful design and awareness training. Consideration and incorporation of crucial elements like perceived utility, perceived risk, social influence, confidence, and perceived ease of use into mobile payment products and marketing campaigns are necessary to encourage consumer mobile payments, particularly in Western nations like the USA. [27].

Yang investigated and quantified how varied levels of insecurities lead to various perceived risk dimensions that impede the acceptability of m-payments. An unsecured risk value framework has been put forward based on the theories of perceived risk, perspective, and value. Despite the fact that perceived performance risk, perceived financial risk, and perceived data privacy risk are shown to have a significant negative impact on perceived value and intent to accept, perceived information asymmetry, perceived technological uncertainty, perceived regulatory uncertainty, and perceived service intangibility are perceived as the main determinants of the perceived risk. [28].

The research on internal construction workers usage of technology is significantly scarce. James, for instance, discovered a number of factors that affect the adoption of online banking by Chinese workers. BoP consumers from China have relocated from rural areas to emerging metropolitan areas to work in Shanghai. According to the findings of a logit regression analysis, Chinese workers who possess greater levels of economic, biological, and social resources are more likely to use online banking services. [29]. In a developing country environment, Hussian observed the utilisation of mobile payments amongst the Bottom of the Pyramid (BoP) market. The findings demonstrate that the BoP segments' behaviour has a considerable impact on expectations for performance (PE), effort (EE), facilitating conditions (FC), habit, and society (BI).[30] It has been demonstrated that habits, SI, compatibility with lifestyles, and PE are more likely to be intentions. Again, the impact of EE and FC on m-paid BI are relatively curtailed. Whereas Hedonic motivation (HM) and pricing value (PV), on the other hand, are the two insignificant predictors of m-payment uptake. [31].

In order to understand the adoption and purpose of mobile payment applications, a modified technology readiness index (TRI) with an enlarged expectation confirmation model in the context of IT (E-ECM-IT) (apps) has been created and tested by Humbani. For the validation of the proposed model, the proposed model's factor structure for the measuring items, and to test the proposed model and validate the hypotheses applying structural equation modelling, a confirmatory factor analysis was conducted. It was found that the total model described 81% of adoption changes and 78.5% of continued use of mobile payment services. Drivers performed better than inhibitors because they were the best predictor of ongoing intentions. [32].

Due to the simplicity, dependability, and contact-free character of mobile payments (M-Payment), the direct and indirect interaction contacts in transactions have been greatly reduced during the COVID-19 pandemic in China. This has made it possible to preserve social distance and has helped the social economy to stabilize. In order to enhance technology acceptance in the context of emergencies, the goal of this article is to comprehensively examine the technical and psychological variables influencing consumers' intentions to accept M-payment. The empirical results demonstrate that users' perception of technology and intellect jointly influence their intention to accept the M-payment in the COVID-19 pandemic.[33] MAT and UTAUT were first combined in this study to create a theoretical framework for analyzing user intentions[14].

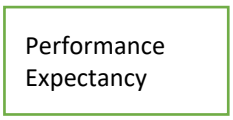
Using data from three continents and global patterns, Holm assessed the development, potential, and constraints of mobile payments. (Europe, Asia, and North America). Four case studies from the UK, Germany, China, and the USA were analysed in connection to various methods of payment, with a focus on mobile payments for goods and services. Between the two major regional actors in Europe and the two leading global players, a thorough examination contrasts their similarities and differences (the United States and China) [34].

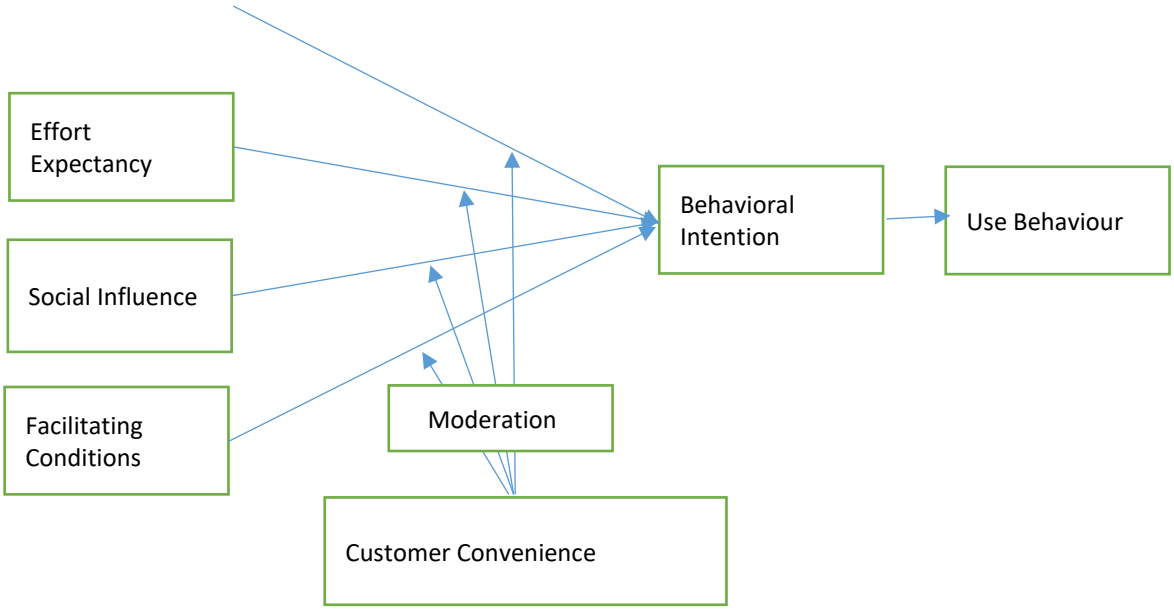
Consumers learn new habits and improvise. For instance, if customers are unable to visit the store, the store goes home. New regulations and procedures will probably change how people shop and make purchases of goods and services, even as they revert to their old behaviours. New habits will also be brought about by developments in technology, changes in demographics, and creative methods that consumers have learnt to deal with the flurry of work, recreation, and training limits. [35].
In various sectors the UTAUT was used. For instance, Juna examined elements influencing the early use of advanced ADAS (ADAS) systems by focusing on driver comfort and safety. Through the use of structural equation modelling to analyse the study model, they have determined the parameters impacting the early adoption of ADAS. Conversely, effort expectations, performance expectations, and hedonic motivation are only a few of the unique success factors. [36].

2.3 Literature on Consumer Convenience

One of the primary motivations behind people purchase any goods on the market was convenience. Access, decision-making, transactional, benefit, and post-benefit dimensions are all included in the concept of convenience of service, which is defined as the time and effort spent by a customer in relation to purchasing or utilizing the service.
By decreasing or eliminating the barriers to engaging in an activity, convenience is provided. These obstacles include the cost of retail literature. When a consumer enters a retail store, they must deal with dual basic costs: time as well as efforts. So, the features that minimize the work and time required for shop patronage can be used to describe shop convenience.
The building of service comfort is multi-dimensional. In the retail sector, service convenience primarily relates to pace and comfort related to shopping. Yale have investigated six convenience classes such as time, use, accessibility, portability, adequacy, handling and avoiding discomfort. The five comfort parameters Brown (1990) created are time, place, acquisition, use, and ease of execution. The similarities between the first four dimensions and the four utilities identified by the theory of economic use were also emphasized. Reimers developed an alternative shop convenience definition empirically. The attributes of convenience stores were discovered through household mail-out surveys. The alternate definition is supported by evidence, which demonstrates that 25 of the trial attributes in a department store serve as a convenience attribute. The three most frequently used store operations features were parking, vehicle access, and payment methods.

Figure 1: Conceptual model for the study





Hypothesis

Hypothesis were developed for three constructs of UTAUT model Based on the above literature, following hypothesis have been formulated:

1) Performance expectancy results in behavioural intention of the construction workers towards mobile payments
2) Effort expectancy results in behavioural intention of the construction workers towards mobile payments.
3) Social influence results in behavioural intention of the construction workers towards mobile payments.
4) Facilitating conditions results in behavioural intention of the construction workers towards mobile payments.
5) Behavioural intention results in actual use behaviour of the construction workers towards mobile payments.
6) Mode of payment moderates the relationship a. performance expectancy, b. effort expectancy, c. social influence and d. facilitating condition and construction worker's behavioural intention to use mobile payment.

3. Materials and Methods

Different research designs and methodologies have been adopted in the literature studying technology adoption and health behaviour. Prominent methodologies adopted are exploratory, descriptive, experimental, etc. Our study is empirical in nature and the research design is descriptive in nature. The data was collected from construction workers in Pune city of India. Pune is a major industrial and automobile centre in the western region of India, with a population of over 8 million. Construction workers from many states come to Pune for livelihood. Convenience sampling was used for data collection. The sample size of the study is 405. A questionnaire was prepared in the local language (Hindi) by the researchers and filled out through Google Forms. The cross-sectional data was collected in the month of April 2024. The construction workers are mostly employed as workers on construction site in Pune city of India. In India, the 1979 Act said that a building worker is someone who is hired by or through a licensed contractor in one state to work for a business in another state. The Act is now part of the Occupational Safety, Health, and Working Conditions (OSH) Code 2020. Construction workers now include all workers whose family income is less than Rs 18,000 per month and who go to another state to work for someone else or for themselves.

4. Data analysis

The data was collected from 405 respondents from different sites of real estate construction worker. The demographic profile of the construction workers is as follows. Maximum respondents (61%) are in the age group of 31-40 followed by respondents in the age group of 21-30 (31%). All the respondents are males as female were not eager to give responses. Maximum respondents (76%) have not completed their education beyond 10^{th} standard. Maximum (83%) of the respondents were married. Out of 405 respondents 296 respondents used mobile payment usually and 109 respondents used mobile payment occasionally, they usually preferred to use cash payments. Mode of payment has taken as a moderator in this study.

Before testing the proposed set of hypothesis, we followed the two steps procedure suggested by Andersons and Gerbing's (1988). First, we have done measurement model testing through confirmatory factor analysis (CFA) technique to confirm the psychometric properties of the constructs. Several fit indices were considered such as normed chi square (CMIN/DF); Standardized Root Mean Square Residual (SRMR), root mean square error of approximation (RMSEA); goodness of fit index (GFI); adjusted goodness of fit index (AGFI); comparative fit index (CFI); normed fit index (NFI); Probability of close fit (Pclose); Tucker Lewis index (TLI) (Byrne, 2010).

Confirmatory factor analysis was conducted by using AMOS 26 software with all the six constructs namely, Performance Expectancy (PE) Effort Expectancy (EE), Social Influence (SI), Facilitating Condition (FC) Behavioral Intention (BI) and User Behavior (UB). Results of the model fit indices: CMIN/df = 1.358, RMR = 0.017, SRMR= 0.036, RMSEA = 0.030, CFI = 0.982, TLI = 0.978, GFI = 0.945,AGFI= 0.927 were within the threshold values as recommended by (Bentler, 1990; Hu & Bentler, 1999; Hair et al., 2010; Kim & Sundar, 2014). The results of fit indices are reported in Table 1.

Table-1 Model Fit indices

	CMIN/df	**SRMR**	**RMSEA**	**CFI**	**TLI**	**GFI**	**AGFI**
Cut-off value	≥3.000	<0.08	≤.06	≥0.90	≥0.90	≥0.90	≥0.80
Actual value	1.358	0.036	0.030	0.982	0.978	0.945	0.927

Source: Authors' own calculations

Second, we assessed the convergent validity and reliability of scale. The standardized factor loading (Table 2) reported that all the loading representing the respective constructs were greater than threshold value 0.50 (Hair et. al., 2010). Besides this as reported in table 3, all the composite reliability and Cronbach α estimates reported more than 0.7 and the AVE (Average Variance explained) values of each construct were above 0.50 meeting the recommended values suggested by Fornell Larcker (1981) and Hair et.al . (2010). Also, to examine the discriminant validity, a comparison of intercorrelation values and square roots of AVE was conducted (Fornell and Lacker (1981)) for latent construct. As shown in Table 3 the squared root of AVE values was greater than their counterpart pertaining to intercorrelation values. Hence its confirming the discriminant validity.

Table 2: Factor Loading

Constructs			**Estimate**
EE3	<---	EE	0.849
EE4	<---	EE	0.849
EE2	<---	EE	0.79
EE1	<---	EE	0.719
BI4	<---	BI	0.784
BI3	<---	BI	0.767
BI2	<---	BI	0.734

BI1	<---	BI	0.641
SI1	<---	SI	0.758
SI3	<---	SI	0.718
SI2	<---	SI	0.73
FC1	<---	FC	0.769
FC3	<---	FC	0.663
FC2	<---	FC	0.711
PE3	<---	PE	0.739
PE4	<---	PE	0.729
PE2	<---	PE	0.678
PE1	<---	PE	0.648
UB2	<---	UB	0.657
UB3	<---	UB	0.699
UB1	<---	UB	0.778

Source: Authors' own calculations

Table 3 Construct Validity and Reliability

	α	CR	AVE	EE	BI	SI	FC	PE	UB
EE	0.878	0.879	0.646	**0.804**					
BI	0.82	0.823	0.538	0.519***	**0.734**				
SI	0.779	0.78	0.541	0.479***	0.444***	**0.736**			
FC	0.755	0.758	0.512	0.507***	0.585***	0.442***	**0.716**		
PE	0.788	0.791	0.513	0.191**	0.409***	0.226***	0.393***	**0.717**	
UB	0.753	0.755	0.509	0.581***	0.703***	0.464***	0.641***	0.436***	**0.713**

** $p < 0.010$; *** $p < 0.001$ Source: Authors' own calculations

The common method bias (CMB) test was conducted using Harman's single factor Method. The study involved the use of Harman's single-factor test utilizing exploratory factor analysis (EFA) on six constructs together with their corresponding unremoved items. The absence of any emergent factor and the recording of 29.738% variation for the first factor indicate that there is no reason to be concerned about the common method bias (CMB) in the current study data. The figure falls under the prescribed threshold of 50 percent, as proposed by Podsakoff et al. (2003).

4.1 Hypothesis testing

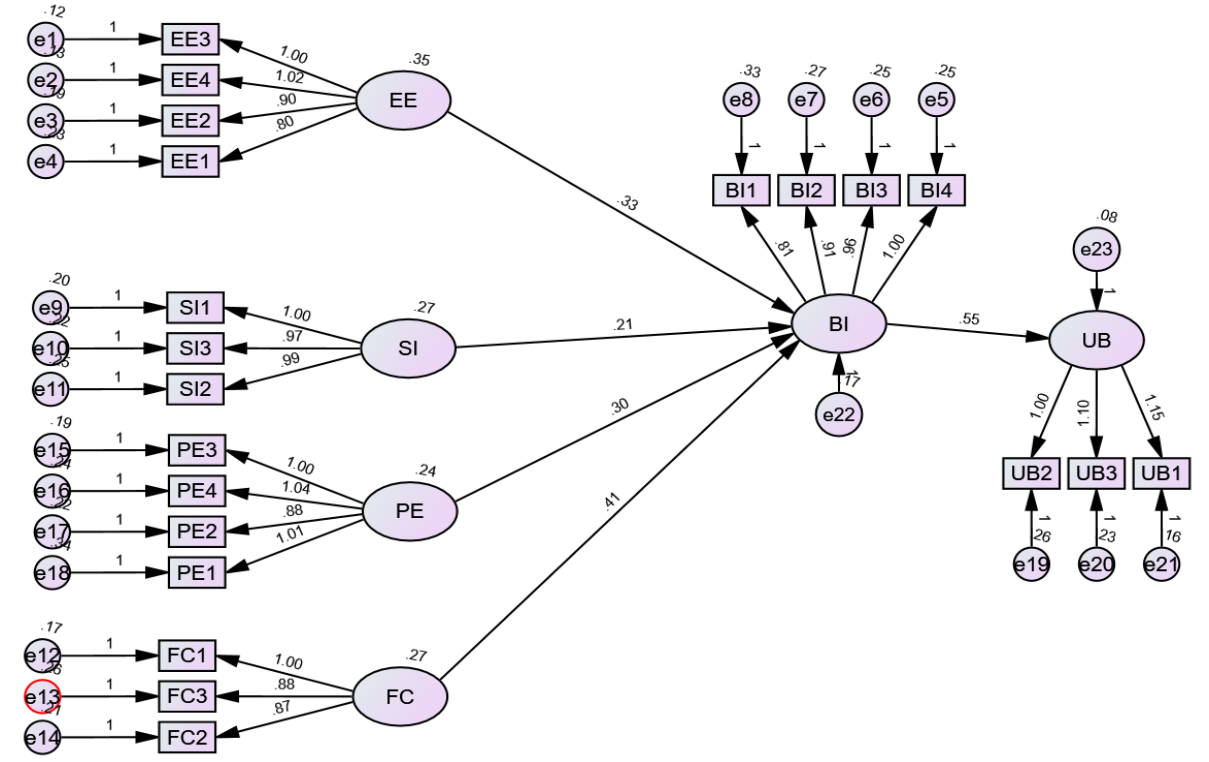


Figure 2: Structural Model
(Source: SPPS Software)

Table 4: Hypothesis Testing

			Estimate (β)	S.E.	C.R. (t)	P	Results
BI	<---	EE	0.329	0.049	6.746	***	Supported
BI	<---	SI	0.207	0.057	3.627	***	Supported
BI	<---	PE	0.299	0.061	4.883	***	Supported
BI	<---	FC	0.406	0.063	6.413	***	Supported
UB	<---	BI	0.555	0.063	8.82	***	Supported

Note: *** p < 0.001. Source: Authors' own calculations

4.2 Structural Model

Figure 2 and Table 4 reports the results of structural model. The results of the study demonstrated significant positive relationship with construction worker's behavioural intention to use mobile payment, Effort expectancy (β = 0.329 t = 6.746, p <0.001), Social Influence (β = 0.207, t = 3.2627p <0.01), Performance expectancy (β = 0.299 t = 4.883, p <0.01), Facilitating condition (β = 0.406 t = 6.413, p <0.001). Behavioural intention (β = 0.555 t =8.22, p <0.001) had significant relation with use behaviour of construction worker. Result shows that Effort expectancy and facilitating conditions were the most contributing factors to use mobile payments among the construction workers. These results support H1, H2, H3, H4 and H5.

4.3 Moderator role of mode of payment:

To examine the moderator effect of mode of payment in the model, a multigroup analysis was used to compare the mode of payment cash versus mobile payment. used. used. To examine the invariance of the model parameters across the two payments groups, nested comparisons of constrained models were performed. The results of model comparisons by chi-square differences reported in Table 5. A comparison between Models1 and 2 shows insignificant chi-square difference (*P*= 0.146), supporting the invariance of these parameters across cash and mobile payment. Subsequently, Model 3, in which

all structural weights were constrained, was compared with Model 2. The addition of constraints on structural paths lead to a significant chi-square difference (p= 0.001), suggesting that at least one of the structural weights varies across mode of payments. These results support H6 (a, b, c and d).

Table 5. Invariance tests

Model	χ2	df	CFI	RMSEA	△χ2 (△df)	P
Model 1 Unconstrained	549.346	368	0.911	0.035		
Model 2 Measurement weights	570.074	383	0.908	0.035	20.728 (15)	0.146
Model 3 Structural weights	603.536	388	0.901	0.037	54.190 (20)	***

Note: *** p < 0.001. Source: Authors' own calculations

As shown in Table 6, mode of payment was found to have a significant moderation effect on the relationship between Performance expectancy (PE) and behavioural intention (BI). The effect on both mobile payment and cash payment method were significant; through the effect mobile payment (β = 0.219, t= 2.616, *P*= 0.009) was much stronger than cash payment (β = 0.614, t= 2.36 *P*= 0.018). Mode of payment had a positive and significant moderation effect between Effort expectancy (EE) and behavioural intention (BI) to use. However, the effect was only significant and much stronger for mobile payment (β = 0.503, t= 5.296 *P*= 0.000). but not for cash (β = 0.045, t= 0.381, P= 0.703). By contrast, the moderation effect on social influence (SI) and behavioural intention (BI) was not significant effect for mobile payment method (β = 0.044, t=0.524, *P*= 0.6), but it is significant in cash payment (β = 0.647, t=2.519, *P*= 0.012). However, Mode of payment was found to have a significant moderation effect on the relationship between facilitating condition (FC) and behavioural intention (BI) for mobile payments (β = 0.361, t= 2.467, *P*= 0.014) but not for cash (β = 0.171, t=1.255, *P*= 0.209).

Table 6: Comparison of structural relationship across mode of payment

			Mobile Payment			Cash		
			β	t	P value	β	t	P value
BI	<---	EE	0.503	5.296	***	0.045	0.381	0.703
BI	<---	SI	0.044	0.524	0.6	0.647	2.519	0.012
BI	<---	PE	0.219	2.616	0.009	0.614	2.36	0.018
BI	<---	FC	0.361	2.467	0.014	0.171	1.255	0.209

Note: *** p < 0.001. Source: Authors' own calculations

5. Results and Discussion

The main aim of this study was to investigate adoption of mobile payments among construction workers. The research studied the effect of social influence, effort expectancy, facilitating conditions on behavioural intentions towards mobile payments. The study is first of its kind as no study has been done to understand the adoption of mobile payments and that to for construction workers, who are one of the vulnerable organs of a society in India. Effort expectancy emerged as a significant factor to influence behavioural intention towards mobile payments in India, which is also found in previous research that have considered effort expectancy as an important driver of adoption of technology. Social influence turned to be an influencer of technology adoption in our study, but literature shows mixed results. It identified social influence as a noteworthy determinant of behavioural intention. However, contrasting findings indicate that social influence does not exert any influence on

behavioral intention. The potential cause for this phenomenon could be attributed to a lower level of education among the individuals surveyed in India. Facilitating conditions also have an important influence on adoption of mobile payments. Due to excellent mobile penetration in India and government of India schemes like Jan Dhan yojana, which helps construction workers to open new bank accounts easily has given fillip to the creation of facilitating conditions.
The motivation for individuals' desire to embrace contactless payments as a means can be traced to their perceived need for a technology that offers convenience. The analysis of research data and the testing of hypotheses demonstrate that factors such as effort expectancy, social influence, facilitating settings, exert a positive influence on individuals' intention to use contactless payment services. Nevertheless, it appears that social influence exerts a substantial impact on individuals' inclination to embrace contactless payment systems. The moderating variable, mode of payment is affecting the facilitating conditions of construction workers, as he is afraid of losing money, if he insists for m-payments. This has far reaching implications for the adoption of m-payments.[37] Because for a construction worker, income is more than anything else. His priority is always money as he has to feed his family.

6. Discussion

The use of mobile payment technologies among construction workers in India is a rather relevant and interesting topic of study, especially in the wake of the COVID-19 pandemic. It was already noted that the COVID-19 pandemic has contributed to the growth of digitalisation across industries, including construction. The focus of this paper is to discuss the Indian construction workers who form a large 12% of the total workforce. In doing so, this paper targets the 4% of the workforce, thus filling a research gap since empirical studies on the uptake of MPAs among the population are scarce. This research uses the Unified Theory of Acceptance and Use of Technology (UTAUT), a theory that has been widely known to capture most of the contextual factors of technology acceptance.[38] With performance expectancy, effort expectancy, facilitating condition and social influence as the main factors to determine BI, it ensures that construction workers comprehensive understanding of the factors affecting them. These variables are especially so given that the mobile payment system is considered to exist within a certain range of technological comfort and infrastructure support.

This result that performance expectancy has a significant effect on BI conforms with earlier literature on the technology adoption.[37] construction users are also in a position to embrace the mobile payment systems as other users do so if they are efficient, reliable and can supplement their financial transactions. This becomes even more relevant in a world that is trying to ‘return to normalcy’ after the COVID-19 pandemic and where contactless transactions have as much to do with the ease of use as much as they do with safety. Two of these antecedents are particularly interested for the present analysis: perceived behavioral control and effort expectancy. Since most of the constructions workers might have a low level of exposure to the use to digital technologies, the ease of use of the mobile payment systems becomes a key consideration. The following are also essential: The facilitating condition is the availability of the smartphone, internet connection, and technical support. The discovery that these conditions impact BI so greatly shows that in order to adopt mobile payments, there is need to make sure infrastructure is readily deployed to this effect. In India, where the users’ web access and smartphone adoption rate are still ascending, the chances for the mobile payments’ popularity among construction workers are high supposing that the facilitating conditions are given.

7. Conclusion

Extensive research has been conducted on the mobile payment systems among urban migrated worker class in India but no such study has been conducted on construction workers which is also an important segment of population. The research supports and proves the efficiency of the tool, considering the factors that influence the behavioural intention concerning the use of innovations, regulated by the UTAUT. The study shows that the proposed model of factors that determine the use

of mobile payments has an important factor called performance expectancy, which is defined as the extent to which one believes that using mobile payments will improve the financial transaction. Another dimension, which is effort expectancy, and which look at the level of difficulty of using these systems plays an equally crucial role, alongside the fact, that construction workers are not homogeneous in terms of their technological literacy. The study also demonstrates that the enabling factors were available and this include the availability of smartphones and enhance internet connection is crucial aspect of enabling environment to support the Mobile payments. Finally, the role of encouragement from peers and the community goes hand in hand with the social influence as a factor that propels the adoption of technology within this population group. A methodological innovation of the present study is the assessment of customer convenience as the moderator between facilitating conditions and behavioural intention. This points to the fact that there is need to have better and efficient methods of payment so as to encourage more people to use them. In conclusion, this study offers useful implications for the policy makers, developers and the stakeholders who wish to strengthen the digital financial inclusion for construction workers in India, with focussing on the infrastructure, usability and Social Norms.

8. Limitations and future scope for research

The paper has its own limitations. Getting responses based on behavioural intentions was difficult because construction workers work more than 12 hours a day. Because of these problems, data were gathered both online and offline (if possible), and the criteria for forced adoption were considered by matching them with the amount of time people have spent using contactless payment methods. There are some problems with the study that will need to be fixed in future research. The study used UTAUT to find out how people act when they use contactless payment. Other theories can be used to study the phenomena. It could also be judged by how people feel about it. The economic impact of cashless payment services can also be looked at in the future. Another problem is the small sample size; results might be better with a bigger sample size. Studies can be done in different parts of the world. The current study model could be looked at in different fields, such as banking, healthcare, and hospitality sectors.

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Conflict of interest

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