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SPECIAL FOCUS PAPER

Determinants of Mobile Payment Adoption by Businesses: An Empirical Study Using the Perceived E-Readiness Model (PERM)

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ABSTRACT

The digital transformation of financial ecosystems has accelerated in recent years, with mobile payment systems emerging as a cornerstone of modern commerce. While much of the existing research has emphasized consumer adoption of mobile payments, the determinants that drive businesses to adopt and integrate these systems remain comparatively underexplored. Businesses, as critical stakeholders in the payment ecosystem, not only influence consumer usage but also shape the broader trajectory of financial inclusion and digital economy growth. Against this backdrop, this study applies the perceived e-readiness model (PERM) to investigate the factors influencing business adoption of mobile payment solutions. The model emphasizes organizational readiness for the adoption of mobile payments and studies both internal and external readiness factors that impact the adoption of mobile payment technology. The internal readiness is accessed by perceived organizational e-readiness (POER) constructs like awareness, human resource, business resource etc., and the external readiness is accessed by the readiness of the Government, market forces, and the readiness of the competitors. The study was conducted on 144 businesses spanning multiple sectors. The data was collected through a survey using a questionnaire on a Likert scale. The data was analysed by employing partial least squares structural equation modelling. The findings reveal that awareness, human resources, and strategic alignment are the most critical enablers of mobile payment adoption among businesses. While external ecosystem factors (government, market forces, and support industries) matter, the readiness and commitment of the businesses themselves through informed leadership, skilled employees, and strategic planning play the dominant role. The study contributes to both theory and practice by extending the application of PERM to the context of digital financial services and offering actionable recommendations for policymakers, technology service providers, and business managers.

KEYWORDS

mobile payment, perceived e-readiness model (PERM), PLS-SEM

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1 INTRODUCTION

Readiness with respect to the rapidly changing technology in the current business environment is the key driving force for the sustainability and growth of organizations. The payment industry is the one, that is a pioneer in innovation and technology adoption. From barter system to digital currency, payment system have innovated multi-levels and evolved manifolds. It is evident from the past scenarios that only those businesses survived the era of technology advancements who accepted the technology and integrated the same in their businesses. Mobile payments are such an innovation in the financial technology field that lead to the payment industry to the new heights. Mobile payment adoption by businesses brought operational efficiency and improved the service delivery to the consumers.

According to Rogers [1], the adoption of innovation is a continuous process that begins with the need to bring the new body of knowledge into the existing system. The innovation passes through the various communication channels till its adoption or rejection at the end user.

Information technology has been continuously innovating since its inception [2] and has also gone through the various stages of the innovation process, starting from early adopters to laggards who still have not adopted the system. Similarly, mobile payment or e-commerce technology is the advancement of the information technology field which, as per many researchers, is continuously going through the process of diffusion of innovation. Technology innovation moved from computer-based systems to mobile networks, which store, process, and communicate information simultaneously, and it is utilized in various fields, including mobile payment systems. Before the diffusion of technology at the micro level, it is crucial to understand the readiness level of all the stakeholders (consumers, businesses, regulators and technology service providers and innovators).

In previous studies, mobile payment adoption is accessed in many aspects, like the technology aspect TAM [3], behavioural factors like attitude, perceived trust, behavioural intention etc., and innovation attributes [1].

The current study examines the readiness of businesses for adoption of mobile payments. It is important to assess the external environment readiness, which supports the businesses to adopt and integrate technology into their products and services, while any organization's internal response to new technology is equally important.

The current study aims to identify the key determinants of mobile payment adoption by understanding its' organizational (internal) and environmental (external) readiness factors. This study adopted the constructs of readiness from the perceived e-readiness model (PERM).

2 LITERATURE REVIEW

The review of existing studies on mobile payment adoption is categorized into two sections: the first section revises the theories and models on technology readiness and e-readiness in general and then e-readiness at the firm level and the next section carefully reviews empirical research conducted on mobile payment adoption by businesses.

2.1 Theories on technology readiness

Technology readiness is defined as "*people's propensity to embrace and use new technologies for accomplishing goals in home life and at work*" by Parasuraman [4]. Similar to the diffusion of innovation, understanding readiness of businesses and consumers to adopt the new technology has become important. This study reviews the past research on e-readiness, which is closely associated with mobile payment technology. The various studies on e-readiness will give the framework for understanding the readiness of the mobile payment technology globally and locally.

The penetration of information and communications technology (ICT) at the global level leads to the advancements in the various businesses and society by creating the whole infrastructure of a digitally ready society [5]. The phenomenon of e-readiness is introduced at the end of the 20th century. There are several studies to assess e-readiness at the country level as well as the industry level. The United Nations Conference On Trade And Development (UNCTAD) [6] provides the assessment of e-commerce ecosystems in the developing countries where it accesses the seven constituents of digital transformation, namely "e-commerce assessment, ICT infrastructure, payment solutions, logistics and facilitation for trade, legal and regulatory framework, and access to finance and skill development." The assessment of e-readiness is conducted at various levels by several organizations to understand the difference between the status of e-readiness among developed countries and developing economies [7].

Several organizations developed various assessment measures to quantify the e-readiness of countries. Most of the assessment indicators are derived from the first-hand studies conducted at the consumer level, firm level, or country level. These studies include surveys, case studies, interviews and direct observation through assessing the digital infrastructure and business environment [8]. Few studies have also been based on the other dimensions of assessment of e-readiness like the digital divide among developed countries and developing nations and the gender gaps in e-readiness [9] and attitudinal and behavioural aspects.

Mutula and Brakel [10] proposed integrated e-readiness assessment tool by compiling the assessments of various organizations like CID, Harvard University, EIU and IBM Corporations, UNDP, UNCTD and McConnell International. As the technology advances, the readiness is also measured as per the new technology; for example, the latest report on e-readiness was published by PWC [11], which is a comparative assessment of the readiness of 27 countries with respect to electric vehicles. This report mentions the factors the impact the usage and purchase of electric vehicles in different countries.

Several empirical studies were conducted on the country e-readiness [12]–[14]. Bui [12] used secondary data from various countries and identified 8 factors and their 52 surrogate measures to quantify and develop algorithms that can calculate the e readiness of countries. These factors are knowledgeable citizens, macro economy, industry competitiveness, willingness to invest in ICT infrastructure, digital infrastructure and access to a skilled workforce. A study is conducted on the e-readiness of developing countries, and it emphasizes the need for legal, technological, financial, and social infrastructure required for a digitally empowered society [15].

The empirical examination of determinants of e-business across 26 developed countries is conducted [16] by using secondary and cross-sectional databases to document the continuous existence of the digital divide and e-readiness. The study reveals that only ICT advancement does not define countries' readiness, but

human capital and other physical infrastructure also play a vital role in enabling e-businesses. There should be a link to be established among businesses and government institutions to overcome the challenges related to e-readiness.

2.2 E-readiness at the firm level

The traditional e-readiness assessment measures were access-oriented, like access to ICT facilities and availability and affordability of digital infrastructure at the macro level. At the firm level there is a shift in the focus from technology to the users [8], [15]. The businesses are the users of the technology, and it is important to assess the readiness of firms, their internal and external environmental readiness to adopt technology. The firm-level readiness assessment studies are done in various studies and, e-readiness focus shifted from the macro level to the micro-level. The micro level e-readiness begins with the research in developed countries like the United States, Australia, a few countries in Europe and Asian countries [17]. Most of the studies are conducted in the field of e-commerce and digital finance.

The penetration of ICT in developing nations brought the interest of researchers in micro-level assessment of the readiness of businesses in the developing countries like India, Uganda, China, Spain, etc. [10], [18], [19], [20], [21], [22], [23], [24]. A few organizations also moved their focus from accessing country e-readiness of specific business-like SMEs and banking and finance [25]. The major indicators of firm-level readiness, which are assessed in the previous studies, are businesses' willingness to adopt the new technology, the TOE framework, human capital readiness and external environment like competitors and government [23].

2.3 Perceived E-readiness model

Molla and Licker [18] did the empirical investigation of the most prominent factors that impact the e-commerce readiness of an organization in developing countries. The authors define e-readiness as "an organization's assessment of the e-commerce, managerial, organizational, and external situations in making decisions about adopting e-commerce." The study was based on the 150 businesses from South Africa. The PERM Model given by Molla and Licker is widely used in the research related to e-commerce readiness of businesses in other developing countries by many researchers [26], [27], [28], [29], [30], [31], [32]. To make the PERM model more parsimonious, e-readiness is defined by two constructs: organization e-readiness that is perceived organizational e-readiness (POER) and e-readiness of the external environment that is PEER. There are three major attributes of perceived organizational e-readiness:

1. The organization's perception towards innovation and its possible benefits and challenges.
2. The abidance of managers towards the new innovation.
3. Other key organization components like its infrastructure, business resources and processes.

The PEER attributes are measured by assessing the organization's external environment factors, which directly or indirectly affect the business. Both the external and internal attributes of POER and PEER together are empirically tested to predict the e-commerce adoption of businesses in developing countries. Figure 1 represents the model of e-readiness by Molla and Licker [18].

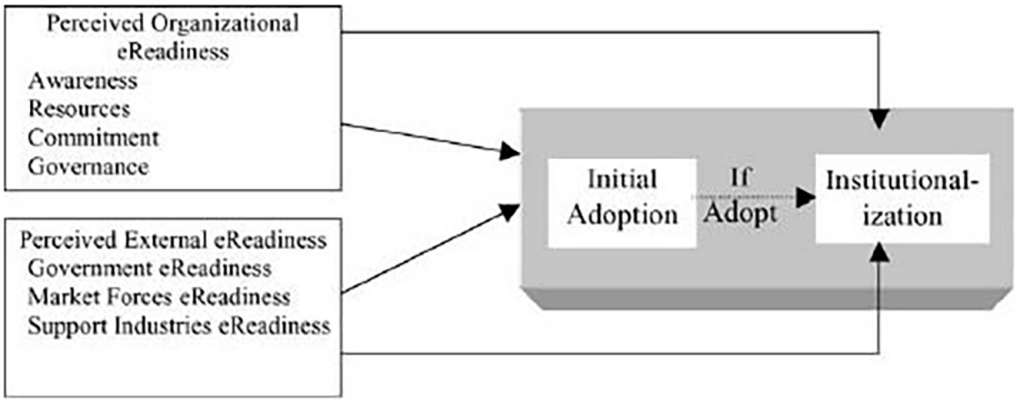

Fig. 1. The PERM constructs (Molla and Licker [18])

Though the e-readiness framework [18] was developed to empirically test the adoption of e-commerce by consumers in developing countries, being a part of technology, the model was used to study businesses with respect to diffusion of technology innovation and adoption.

2.4 Past studies on technology adoption by businesses

Most of the studies related to technology adoption are conducted on SMEs, as these industries are at the forefront of digital transformation and adoption of technology [33]. The integration of digital technology brings operational excellence, customer satisfaction, and competitive advantage and fosters innovation [34]. The technology organization and environment (TOE) [23] framework was used to analyse SMEs' readiness in using mobile payment application. This research on small and medium-scale businesses in Indonesia revealed that a higher level of perceived pressure from the competitors and support from the technology service providers demonstrate a higher level of adoption of technology among the organizations.

A similar study was conducted on 322 small business owners and managers to establish the interrelationship between organizational, individual, and environmental factors to understand the diffusion of innovation in small retail stores [35]. The variables included are product group, knowledge of technology, attitude, demographic characteristics of decision-maker, switching cost, environmental hostility and market uncertainties. Another study proposed the "Small Business Technology Acceptance Model (SBTAM)." This model suggests that the most direct approach to increase acceptance is to communicate the benefits of technology through demonstration and personal selling efforts [36].

In contrast to understanding individual-level acceptance, Yu and Tao [37] examined TAM (technology acceptance model) constructs to study business-level technology acceptance and chose electronic marketplaces. This study revealed that perceived usefulness, perceived ease of use, business characteristics of the firm and subjective norms are indicators of technology adoption at the decision stage. While perceived usefulness and subjective norms influence the continued use of technology post-adoption.

The study conducted for the businesses in Southern California [38] argues that information technology adoption can be utilized as the strategy to increase the profitability of the firm. A qualitative study was conducted through semi-structured interviews and methodological triangulation achieved through the analysis of reports

and business plans of the companies. It has been observed that the companies that adopted ICT were profitable in the third year of their business. The survey [39], in collaboration with the National Bureau of Economic Research, was conducted on a large sample of U.S. firms for the diffusion of advanced technologies like artificial intelligence (AI), cloud computing, robotics, and the digitization of business information. It has been observed from the survey that adoption of the advanced technologies was seldom and generally inclined towards older and established firms, while digitization was widespread among most of the firms; cloud computing was employed by fewer businesses. The SMEs significantly lag behind large organizations in digitization. The main determinants for digital transformations of SMEs are knowledge, technology readiness, value chain, and internal competencies, which act as drivers of digital transformation [40]. Another study on Blockchain Technology (BCT) reveals that understanding of blockchain technology and its user-centric implementation have a positive impact on intention to adopt the BCT for risk management [41].

Another study was conducted [42] to identify antecedents and inhibitors of adoption of digital technology in SMEs in developing countries, bringing the conceptual framework by integrating the TOE framework and Diffusion of Innovations (DOI) theory. This study empirically identified complexity and perceived cost as potential barriers to adopting the ICT in SME sector. While relative advantage, competitive pressure, and government support are enablers for ICT adoption in SMEs in Bangladesh.

The survey study on 2200 micro and small businesses in Indonesia [43] to determine barriers to adoption of digital innovation reveals the importance of mobile phone and internet penetration in driving small-scale enterprises to increase the productivity and efficiency of the firms. It was observed that younger firms with access to the Internet have a higher probability of digital technology adoption as compared to older and traditional businesses. As per this study, the major barrier of digital technology adoption was digital literacy and habit. A similar study was conducted to understand the challenges of state-of-art technology adoption by SMEs in developing and emerging markets. The state-of-art technology in the study is meant by the new emerging technological innovations like artificial intelligence, cloud computing, IOT, etc. [44]. The study of the relation between the firm's strategic renewal process and digital penetration identifies that there is a positive correlation between the adoption of digital technology and when it is a part of businesses' strategy [45].

It is evident from the review of past studies that most of the research on technology adoption is carried out on small and medium enterprises and in developing and emerging economies. This implies that challenges of adoption of technology are mostly in the developing economies because of slow penetration, infrastructural constraints, traditional ways of doing business and strategic implementation. With the rapid advancement and globalization, the penetration of technology in developing nations has increased at a fast pace over the past two decades, leading to the diffusion of advanced technologies and their adoption among the majority of businesses. Very few studies considered the factors of external and internal readiness to assess the adoption of mobile payment adoption.

3 PROPOSED A MODEL TO ASSESS THE E-READINESS OF THE BUSINESSES

This study aims to examine the factors influencing the businesses' mobile payment adoption by employing the PERM model. The determinants of the mobile

payment adoption are based on the perceived e-readiness model [18] for retail businesses. The model is widely used in recent studies to understand the e-readiness phenomenon for the businesses [46]. The proposed model of the study is presented in Figure 2.

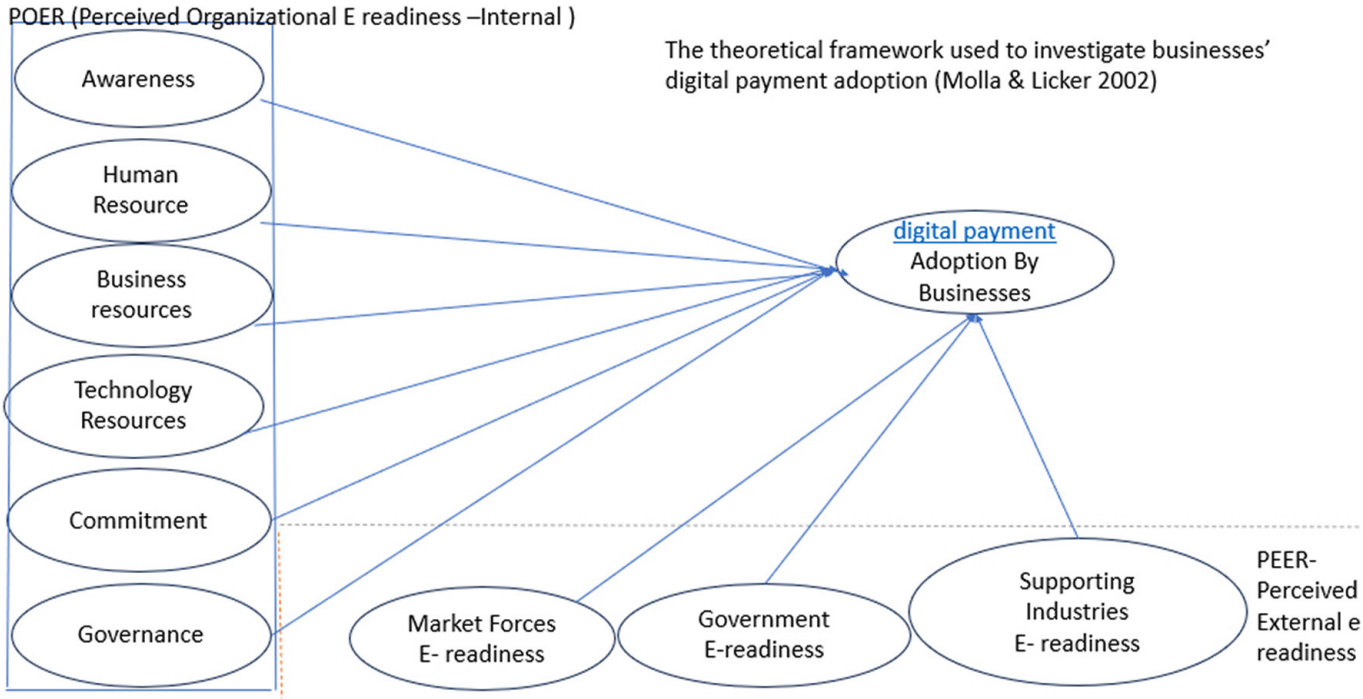

Fig. 2. Conceptual framework of the study

Source: Constructed by authors.

The proposed model assesses awareness, human resource, business resource, technology resource commitment, and governance as POER and market forces e-readiness, government e-readiness and supporting industry e-readiness as perceived external e-readiness variables of mobile payment adoption by businesses.

4 MATERIALS AND METHODS

This study critically examines the factors of mobile payment adoption among various retail businesses in India. The survey was conducted on retail businesses located in various cities of India. 144 usable responses from the survey are obtained which are used as a sample for the current study. The required sample size of the study is estimated based on various previous survey-based studies with respect to technology adoption. The sample size is also confirmed by employing a "priori statistical power analysis" to estimate the sample size using G*Power software. The effect size for the sample size determination is taken as 0.35 [47], with an alpha of 0.05 and power of 0.95. The projected sample size with the above values was 80 from G*Power 3.1 software.

This study employed the convenience sampling method for the data collection. The information is collected by distributing the hard copy of the questionnaires. The data collected through a closed-ended questionnaires and responses recorded on the 5-point Likert scale. The questions of the study are adopted from existing

research on technology readiness, and the analysis included descriptive statistics, exploratory factor analysis (EFA), confirmatory assessments (validity and reliability) and structural equation modelling (SEM) for the variables.

5 RESULTS AND DISCUSSION

5.1 Descriptive analysis

The firms represented a diverse set of sectors, with retailers and distributors forming the largest group (37.5%), followed by financial services (14.6%) and information services (10.4%). The majority of the respondents are in leadership positions like directors and founders. Majority (80.6%) of firms were old firms (>15 years), while 19.4% were young firms (≤15 years). The profile of the business firms is summarized in Table 1.

Table 1. Firm profile (N = 144)

Variable	Category	Percent (%)
Business Sector	Retailers & Distributors	37.5
	Financial Services	14.6
	Information Services	10.4
	Manufacturing	9.7
	Transportation	6.9
	Services/Real Estate/Utilities/Agriculture & Mining	20.9
Employees	<10	26.4
	10–49	16.7
	50–250	36.1
	>250	20.8
Yearly Turnover	< ₹2 Cr	18.8
	₹2–9 Cr	22.9
	₹10–50 Cr	27.1
	> ₹50 Cr	31.3
Respondent Role	Director	18.8
	Founder	15.3
	General Manager	16.0
	Manager	17.4
	CEO/MD	6.3
	Other	26.4
Firm Age	>15 years (Old)	80.6
	≤15 years (Young)	19.4

Source: Compiled by authors.

The exploratory factor analysis is performed to assess the dimensions of the measurement scale using principal component analysis. The sample adequacy was established by the KMO measure (0.658) Bartlett's Test of Sphericity ($\chi^2 = 4376.0$, $p < 0.001$) and confirming data suitability for factor analysis. Using Principal Component Analysis (PCA) with Varimax rotation, 10 components were extracted, explaining ~80% of the variance. Constructs included: Awareness (A), Human Resources (HR), Business Resources (BR), Technological Resources (TR), Governance (G), Business Strategy (BS), Market Forces Readiness (MFR), Support Industry Readiness (SIR), Government Readiness (GR), and Mobile Payment Adoption by Businesses (DPAB).

Factor loadings across items exceeded 0.7, confirming convergent validity. Cronbach's Alpha values ranged from 0.906 to 0.950, all exceeding the 0.7 benchmark, and Composite Reliability (CR) values were consistently above 0.9, indicating strong reliability. Average Variance Extracted (AVE) values exceeded 0.5, establishing convergent validity. Discriminant validity was confirmed using both HTMT ratios (below 0.85) and the Fornell–Larcker criterion (see Figure 3).

5.2 Structural model assessment

The proposed model was assessed by partial least square structural modelling techniques through Smart PLS software. The path analysis of the hypothesized relationships is given in Table 2. As shown in the model, awareness is the strongest predictor of mobile payment adoption followed by human resource and business resource. Among external factors, it is evident that there is significant impact of government, market forces and support industries on adoption of mobile payment by businesses.

Table 2. Path coefficients and significance

Path	β	Sample Mean	Std.dev	T	P Values
A –> DPAB	0.721	0.713	0.050	14.383	0.000
BR –> DPAB	0.288	0.283	0.032	9.056	0.000
BS –> DPAB	0.306	0.297	0.035	8.760	0.000
G –> DPAB	0.189	0.158	0.045	4.199	0.000
GR –> DPAB	0.136	0.122	0.028	4.871	0.000
HR –> DPAB	0.344	0.340	0.039	8.754	0.000
MFR –> DPAB	0.102	0.084	0.028	3.626	0.000
SIR –> DPAB	0.083	0.085	0.033	2.537	0.011
TR –> DPAB	0.187	0.165	0.031	5.968	0.000

Source: Analysed by authors.

The model strength was examined by measuring R^2 value (0.664), which shows sufficient explanatory power of the model [47]. The SRMR (Standardized Root Mean Square) value falls below 0.088, which is 0.066, which explains good model fit [48], and the NFI (Normed Fit Index) value also explains acceptable model adequacy. Table 3 represents the model fit summary of the proposed model. The structural model and path coefficients are shown in Figure 3.

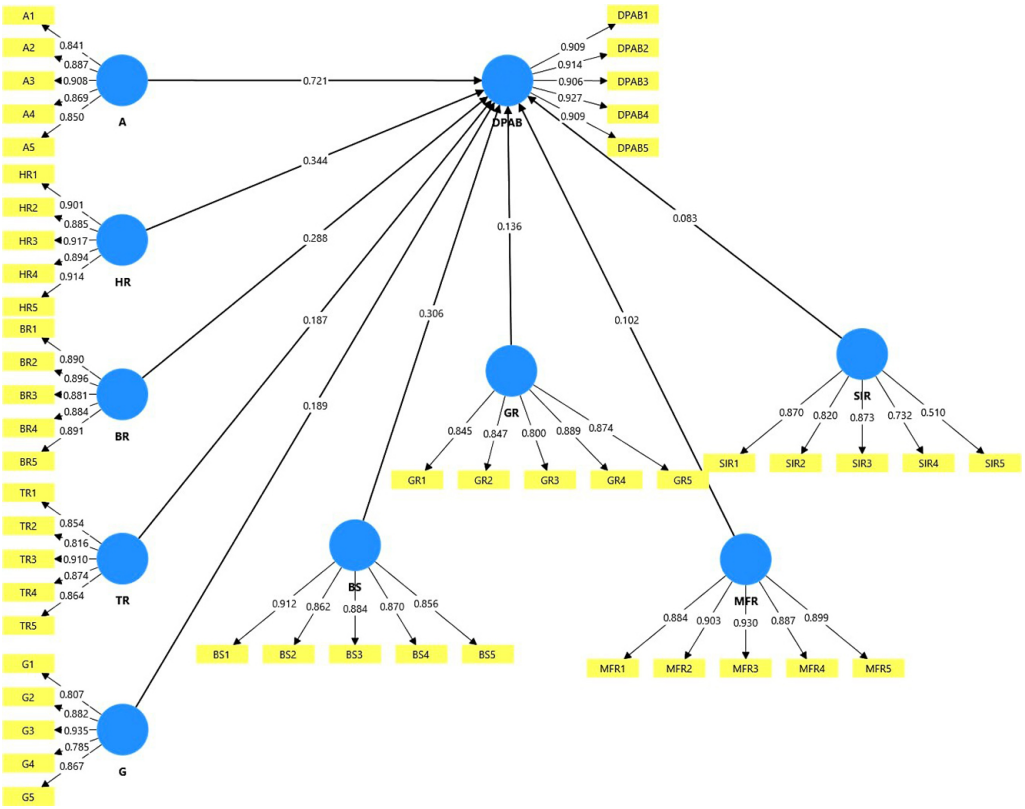

Fig. 3. Developed structural model for businesses

Source: Made by authors.

Table 3. Coefficient of determination (R^2) and model fit summary

Indicator	Value	Benchmark	Interpretation
R^2 (DPAB)	0.664	≥0.26	Substantial explanatory power
Q^2 predict (DPAB)	0.649	>0	Predictive relevance established
SRMR	0.066	<0.08	Good model fit
NFI	0.690	0.60–0.90	Acceptable model adequacy

Source: Analysed by authors.

6 CONCLUSION AND FUTURE IMPLICATIONS

The current study reveals that mobile payment adoption by businesses is significantly determined by their internal as well as external readiness factors. From the study it was concluded that among internal awareness is the strong determinant of adoption intention. While people of the firm (HR) and the availability of technology infrastructure and business resources (availability of funds for implementation) are key factors in the successful adoption of digital payment. External determinants like government support, the mobile e-commerce revolution, and supporting industries like technology service providers also play a vital role in mobile payment adoption by firms. Going forward, it is also imperative to explore sustainability aspects related to mobile technologies. Given the benefits of AI integration to sustainability, it is also imperative to see how incorporating sustainability aspects can impact users' readiness and adoption intentions of mobile payments.

This study is limited to determining readiness factors that impact retail businesses in general, but in future, the research can be continued by examining the impact of characteristics of businesses on the mobile payment adoption. Further, the proposed model can be empirically examined for the mobile payment adoption in a specific industry or consumer segment.

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