Investigating Successful Government Digital Economic Framework Adoption in Indian Msmes: The Interplay of Perceived Organisational E-Readiness and Intention to Adopt

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Abstract:
The digital economy is growing in India. But at the same time, the digital shadow economy is also growing. Economists and intellectuals warn that the digital shadow economy threatens the global economy. If left unchecked, it could hinder a country's social and economic development. This study analysed factors enabling Indian micro, small, and medium enterprises (MSMEs) to adopt the Government of India's Digital Economic Framework (GDEF) to prevent the growth of the digital shadow economy (DSE). Data were collected through a structural questionnaire from 372 registered MSMEs. The results showed a significance with respect to the intention to adopt the GDEF and successful adoption. The study identifies that Indian MSME’s organizational readiness showed an indirect relationship with the successful adoption of the framework with mediating presence of intention to adopt the GDEF. The Indian MSMEs’ organizational critical factors, demonstrates that business resources, human resources, and top management commitment, had little impact on intention to adopt the GDEF. However, awareness, technological resource and firm’s governance plays a significant role on intention to adopt the GDEF. The study's result may benefit the policymakers, governments, international organizations and emerging economies in focusing on the strengthening or creating e-business enabling strategies and policies to safeguard their traditional economies against threats posed by the digital economy with the support by understanding the MSMEs intention to adopt and successful usage of government’s e-compliances.

Keywords: Digital shadow economy prevention, perceived organizational e-readiness, awareness, business resources, top management commitment, governance, intention to adopt, PLS-SEM, Indian MSMEs

Introduction
The widespread of the globalisation and the diffusion of internet has transformed the society (government, citizens, businesses and government agencies) from convention economy to digital economy, due to the
benefits it offers (UNCTAD, 2019; OECD, 2017). The digital economy exceeded $14.5 trillion in market size in 2021, with projections indicating it could reach $23 trillion by 2025 (Huawei, 2017; World Economic Forum, 2022) and in Indian context it is estimated to reach 1 trillion in market size by year 2025 (Ministry of Electronics and Information Technology, 2020).

India, in particular, has seen a significant reduction in cash circulation, down to approximately 10% of GDP in July 2023 and have spiked the use of digital payments (de Bragança, 2023). Viewing the pace of digital technology tools and services adoption by the Indian MSMEs for enhancing efficiency, effectiveness, communication, market presence, competitiveness, and reduction in firm’s burden in their business operations. the government in view to foster the Indian businesses have formulated several key technological digital tools and services like Digital Unified Payment Interface (UPI), Goods and services Tax (GST), online firm registration aka Udyog Aadhar Memorandum (UAM), Government Electronic Marketplace (GeM), Micro Units Development and Refinance Agency limited (MUDRA), Government training institutes for digital skill and training (Training Institute) in this study all the above mentioned six government’s technological digital tools and services will be collectively integrated and will be termed as Government Digital Economic Framework (GDEF). GDEF play a significant role in in harmonising, promoting investments, rationalising trade mechanism and innovation (Bhalla, Sharma and Kaur, 2023). However, globally, in context of businesses it has been observed, their reluctancy towards adopting government digital tools and services for the businesses fully, which intentionally and unintentionally has given rise to what is known as the digital shadow economy (Gaspareniene and Remeikiene, 2016; Cocoa and Nistor, 2023).

The digital shadow economy (DSE) characterized as illegal economic activities facilitated by technology (Yip et al., 2012), It has burgeoned, amounting to an estimated $40-55 billion in gross sales in India by 2022 (Mishra, 2017; Desai, 2015). A significant portion of this shadow economy is driven by non-compliant MSMEs operating on digital platforms, where over 2 million unlawful orders are placed daily (The Economic Times, 2018; Gupta, 2020). This unlawful production and provision of online products and services is characterized by owners concealing their actions to evade legal norms and taxation (Gasparniene et al., 2018).

To combat the digital shadow economy (DSE), scholars have highlighted the government intervention and implementation of e-government model or tools (Gaspareniene and Remeikiene, 2016; Cocoa and Nistor, 2023). Moreover, previous studies in leading journals have opined that GDEF has a significant impact on prevention of DSE determinants like reducing administrative burden costs, reducing tax evasion, and enabling citizens to act as whistle-blowers, e-Gov services can potentially lower the size of shadow activities (Ohrimenco et al., 2019). Furthermore, increasing the e-Gov index has been found to significantly reduce the size of the shadow economy determinants, with a greater impact observed in developed and higher income countries (Veiga and Rohman, 2017). Moreover, few studies concluded in context like tax evasion, cash payments, tax avoidance, corruption, bribery, money laundering (which are the determinants of digital shadow economy) government and its institutional borders to be high in vigilance and imposing substantial penalties to the offenders to create a fear in the minds of the stakeholders including the government agencies, bureaucrats, all types (micro, small, medium, domestic large scale and multinational firms) and forms (sole proprietor, partnership, joint hindu family, trusts and private enterprises) of businesses and consumers as to discourage them and establishing equal and fair opportunities to all in the ecosystem (Alam et al., 2023; Ali et al., 2021; Kalesnikaite et al., 2022).
The present study has been conducted in one of the world’s emerging economies – India which reformed much on digital infrastructure front aiming to create a transparent, competitive and productive business environment. To our knowledge limited studies have used six major recent e-government services and tools to measure the intention of the MSMEs (businesses) show the relationship of government digital economic framework (GDEF) compliance with dse specifically. Moreover, in the Information system technology adoption researches have extensively showcased firm’s internal competencies is influential for success/failure in previous E-government IS adoption in business world (Panda, Sahu & Gupta, 2019; Singh et al., 2018; George & Rajesh, 2020), the limited adoption of e-government services is attributed to factors such as the heterogeneity of users, lack of user-orientation, limited transformation of the firms, and the mismatch between expectations and supply (Veiga and Rohman, 2017). Researchers have called to investigate these factors and new crucial factors in order to facilitate the successful implementation of e-government services and prevent the emergence of a digital shadow economy. Moreover, in context of Indian MSMEs which specific critical factors are much relevant towards intention to adopt the GDEF which may lead towards digital shadow economy prevention (Bhalla et al., 2023). Thus, in this study the research aims to understand the factors behind Indian MSMEs intention to adopt the gdef for prevention of dse. The primary objective of the study is to investigate the following research questions: (1) Do firm’s organisational context factors influence the adoption of the Indian Government’s Digital Economic Framework? (2). Do firm’s organisational context as a whole influence the successful adoption (prevention of digital shadow economy) of the Indian Government’s Digital Economic Framework? (3) Do firm’s organisational critical factors influence the adoption of the Indian Government’s Digital Economic Framework? (4). Do intention to adopt mediates the relationship between the firm’s organisational context and prevention of Digital Shadow Economy participation i.e. Successful adoption?

Literature review

(A) Nexus between Government Digital Economic Framework and prevention of Digital Shadow Economy

The institutional environment's role in addressing the shadow economy has been widely studied. Institutional theory suggests that organisations' strategic decisions are influenced by their social context. This includes social norms, practises, and expectations, which shape corporate behaviour (Meyer and Rowan, 1977; North, 1990; Peng, 2003). This perspective highlights the influence of conformity on digital technology adoption. Regulations, customs, and cultural differences limit the use of digital technologies by digitised businesses (Swoboda and Sinning, 2022).

Institutional theory helps digital companies deal with regulations and use their unique advantages to overcome challenges in weak institutional environments. (Cumming et al., 2023) The institutional environment has a big impact on regulatory functions and economic growth (Golovko et al., 2018; Plotnikov et al., 2019). Regulations can impact the shadow economy and the overall stability of an economy. Resource availability and use laws also play a role in an economy's maturity and stability. Schneider's (2000) research shows that Ukraine and Russia saw an increase in the shadow economy's share of GDP, while Poland and Romania saw a decrease. This suggests that the size of the shadow economy is influenced by reforms and the institutional environment.

Studies explore how e-government can reduce the shadow economy. According to Arendsen et al. (2014), centralised government websites, portals, and online forms hindered effective administrative procedures. Rohman and Veiga (2017) showed that e-government reduces the shadow economy in low- and middle-
income countries. Martins et al. (2018) and Yamen et al. (2023) propose that digital governance tools are effective against corruption. Research on the adoption of e-government digital frameworks to prevent digital shadow economy issues is limited. Limited research has been conducted on the influence of e-government services on citizen engagement in shadow economy activities and its factors (Plotnikov et al., 2019; Golovko et al., 2018). There is a lack of research on how businesses use digital economy products to combat the shadow economy. More economic research is needed in this area.

(B). Intention to adopt the Government Digital Framework on the prevention of Digital Shadow Economy i.e., Successful adoption of the framework

This paper explores the connection between the digital shadow economy and e-government services, using insights from scholarly sources. E-government initiatives can impact the shadow economy by cutting costs, preventing tax evasion, and encouraging whistleblowing (Veiga et al., 2017; Rohman and Veiga, 2017). E-government has a greater impact in developed and wealthier countries, highlighting the importance of strong infrastructure for reaping its benefits (Coca and Nistor, 2022). E-government has the potential to address challenges related to institutions, regulations, compliance costs, and administrative complexities in the shadow economy (Goel and Sauernois, 2016). It also affects MSMEs, affecting their resources and formalisation processes (Okunogbe and Pouliquen, 2018). E-government promotes fair tax payments, with corporations prone to tax evasion paying more and smaller enterprises evading less (Nimer, Uyar, Kuzey, and Schneider, 2022).


A study by Arendsen et al. (2014) measures how government programmes and e-government frameworks help decrease administrative burden for Dutch firms. Their study shows that centralising government websites and implementing online forms, e-procurement, e-tax filings, and e-databases with legal and administrative standards improve administrative efficiency. Organisational variables are important for understanding service utilisation.

E-government adoption reduces informal economic activity, with long-term consequences (Plotnikov et al., 2019). The panel Granger test confirms bidirectional causality between the shadow economy and e-government, showing the intricate relationship between them.

E-government services can greatly impact the shadow economy by reducing tax evasion, corruption, and administrative challenges. This relationship has implications for both developed and developing nations. Ongoing research is crucial for evaluating the effectiveness of government digital frameworks in addressing the digital shadow economy and promoting economic growth (Prakash and Gunian, 2020). Considering critical success factors for firms adopting e-government initiatives is crucial for successful adoption in emerging economies (Thamjaroenporn and Achalakul, 2020). Hence, the hypothesis:

**H1: There is a significant relationship between intend to adopt GDEF and successful adoption**

(C) Organisational Construct on the successful adoption of the framework

Alatas et al. (2009) and Taghavi (2005) discuss the research focus on how an organization's internal environment affects corruption levels within a nation. Strong organisational culture aligning personal...
objectives with organisational demands can deter corruption, according to these studies. Kingston (2008) suggests changing workplace culture to decrease the Digital Shadow Economy (DSE) and associated indicators like bribery, which can contribute to corruption.

Community efforts to discourage bribery can help reduce corruption, despite potential moral objections from organisations (Onishchyk, 2022). To prevent the digital shadow economy, key factors include improving tax morale, creating a business-friendly environment, ensuring justice, promoting corporate governance, and recognising the importance of the concept. According to Seleim and Bontis (2009), multinational corporations (MNCs) and reputable organisations with better internal environments are less likely to operate in the shadow economy. They recommend evaluating cultural differences and ensuring top management's commitment to anticorruption efforts. Understanding domestic firms is important for investigation because they lack political capital and face constraints due to their foreignness (Krstić and Radulović, 2015).

Corporate regulations and norms can limit a company's involvement in the shadow economy, whether it's a domestic or multinational company (Zahedi et al., 2009; Sehhat, Kenari, and Mijani, 2012). Internal business variables, such as tax knowledge, ethics, and perception, have a significant impact on preventing DSE-related tax evasion (Goerke, 2021; Abdixhiku et al., 2017; Bame-Aldred et al., 2013; Tarmidi et al., 2020).

Organisational features, such as employee enthusiasm, ethical culture, awareness, education, and top management enforcement, can deter tax evasion. Limited research has focused on organisational constructs that inhibit the digital shadow economy.

Gaspareniene, Remeikiene, and Navickas studied the digital shadow economy and its effects on tax avoidance, evasion, and corruption from consumers' perspectives. There is limited research on organisational constructs in digital shadow economy avoidance. Poor IT infrastructure and policy non-compliance in developing and emerging nations contribute to the expected rise of the digital shadow economy (Remeikiene et al., 2018). MSMEs are believed to contribute to the shadow economy because of their sector, size, accessibility, limited investment in digital technology, weak organisational governance, and commitment.

Chinese non-financial organisations' participation in shadow banking has been associated with higher levels of risk-taking in firms that have limited resources and weak corporate governance (Rozanova, 2019). Organisations must understand their internal resources and their relationship with the digital shadow economy to effectively manage and mitigate risk.

More research is needed to understand the digital shadow economy in India and how it interacts with organisational factors. Thus, it is hypothesised that:

\[ H2: \text{There is a significant relationship between the Perceived Organisational E-Readiness and successful adoption of the framework} \]

**D) Organisational construct on the intention to adopt the framework.**

Over the past two decades, extensive research has focused on the adoption of Government Digital Economy Frameworks (GDEF) and e-government working effects in both developed and developing countries in various dimensions of this phenomenon, including the roles of citizens, intermediaries, public sector entities, institutions, and enterprises.

E-government service adoption in SMEs is influenced by a range of factors, including individuals, businesses, technology, and available resources such as technological capabilities and financial resources
(Riyadh, Alfaiza, and Sultan, 2019). Additionally, organizational factors such as resources, culture, awareness, training, connectivity, and management support have been associated with the adoption of e-government services in developing countries (Al-Shehry, 2008; Alameem, 2007; Alqahtani, 2016). Studies have emphasized that organizational readiness, encompassing factors like human capital resources, legal frameworks, knowledge, and ICT infrastructure, significantly impacts e-government adoption, particularly in Eastern and Central Europe (Ziemba, Papaj, and Zelazny, 2013). Moreover, leadership, organizational learning, and IT resources have been identified as influential factors in e-government framework adoption (Medaglia, Rukanova, and Tan, 2022).

However, it's crucial to recognize that contextual factors play a substantial role in e-government adoption. Factors that drive adoption may vary by government size and location (Ziemba et al., 2016). Political, social, and ICT infrastructure elements, as well as leadership and development, are country-specific, necessitating tailored strategies for each context (Alghamdi, 2017).

In conclusion, this body of research on GDEF and e-government adoption highlights the significance of organizational resources and underscores the influence of contextual factors in shaping digital transformation effectively, as it is important to understand the significance of Indian MSMEs internal context with GDEF for better understanding and implementing the strategies to delimit the DSE. Thus, we hypothesise:

**H3: There is a significant relationship between the Perceived Organisational E-Readiness and intention to adopt the framework.**

Research underscores the critical role of internal organizational awareness in technology adoption, particularly in e-government services (Limayem et al., 2007). Understanding various aspects of information management is essential for effective support, including operational behavior and security. Multiple studies suggest that awareness drives e-government adoption (Parent et al., 2005; Murru, 2003; El Rassi, 2019).

However, in mobile government (m-government) services, awareness's impact on adoption may be limited, with factors like comparative advantage, usability, compatibility, and government support taking precedence (Mandari and Chong, 2018; Thamjaroenporn and Achalakul, 2020).

In the broader context of digital transformation, standardization in infrastructure, culture, data management, and governance is crucial for government-wide success (Medaglia, Rukanova, and Tan, 2022). This framework aims to create a secure environment for big data analytics and digital innovations (Ramachandran, Chelliah, and Soundarabai, 2021), while the support for circular economy transition in digital government remains underexplored (Rokhim, Mayasari, and Wulandari, 2021).

In microservices design for cloud-based e-government services, flexibility and security improvements are possible. In online platform adoption for people entrepreneurship credit, factors like perceived usefulness, simplicity, subjective norm, availability, trust, and pricing significantly influence adoption, with awareness and acceptability playing a lesser role (Sidek, 2015). Further research is needed to understand how awareness influences the adoption of the Government Digital Economy Framework (GDEF) among Indian MSME owners or managers. Thus, we hypothesise:

**Hypothesis 3 (i): There is a significant relationship between the awareness and intention to adopt the framework.**

The adoption of digital tools and frameworks in business and government is influenced by various factors and resources, as supported by several studies. In the context of the digital economy, intangible assets and "firm competencies" are considered valuable business resources for adopting digital tools (Molla and
Infrastructure plays a significant role in shaping the adoption of government digital frameworks in India (Tewari and Sharma, 2011). Corporate resource structures impact the adoption of e-commerce and e-government, with factors like open communication, risk appetite, corporate culture, stakeholder interactions, and digitalization planning playing crucial roles. Funding for future digital innovations is also essential (various sources).

The cost of technology adoption, including installation and maintenance expenses, affects a corporation's willingness to adopt digital payment systems (Sidek, 2015). In Poland, e-government adoption is influenced by corporate culture, expenditures, team orientation, company size, and change management (Ziemba, Papaj, and Zelazny, 2013).

The alignment of business and IT teams is emphasized in e-Government projects to ensure effective resource utilization (Thamjaroenporn and Achalakul, 2020; Atieh and Farzali, 2012). Factors like senior management commitment, governance, IT competence, external pressures, and management opposition affect corporate capacities (various sources).

Additionally, business owners and managers are advised to benchmark technology features, benefits, functionalities, tasks, and costs before implementing digital economy tools (Boar, Bogan, English, 1994). The size, age, and readiness of a company also impact e-Government adoption (Liang et al., 2017).

In India, the role of digital government in a circular economy transition is underexplored but holds potential for sustainability and resource efficiency (Medaglia, Rukanova, and Tan, 2022). A unified digital government framework can enhance government service access (Rao, 2013).

Ultimately, the adoption of government digital frameworks should consider the resources and objectives of Indian Micro, Small, and Medium Enterprises (MSMEs) and their potential impact on Government Digital Economy Framework (GDEF) adoption (various sources). Thus, it is hypothesised:

**Hypothesis 3 (ii):** There is a significant relationship between the business resource and intention to adopt the framework.

The adoption of digital economy tools, such as e-commerce and e-government portals, hinges on several critical technological factors. These factors include the availability of ICT infrastructure, ICT standards, technological compatibility, privacy, security, and the presence of flexible IT tools and technical support teams (Molla & Licker, 2005; Sidek, 2015; Alghamdi & Beloff, 2016; Ziemba, Papaj, & Zelazny, 2013; Alqahtani, 2016; Jasimuddin, Mishra, & Saif Almuarqab, 2017). Poor national ICT infrastructure can hinder e-government adoption, as it limits digital technology utilization (Glyptis et al., 2020; Kachwamba & Hussein, 2009). System complexity and incompatibility caused by weak IT foundations can also impede information sharing (Henningsson & Van Veenstra, 2010). Additionally, factors like a reliable internet connection and IT technical support are crucial for the success of digital economy instruments (Zakaria, Janom, & Yaakub, 2010).

Key technological factors influencing e-government adoption success include high company computerization, ICT infrastructure availability, accessibility, and the absence of ICT standards. Adequate technical skills, ICT knowledge, and a strong willingness of companies to use digital economy tools also play a role (Molla & Licker, 2005). Indian enterprises benefit from effective organizational resources, allowing them to utilize digital economy technology (Singh, 2016). The adoption of e-government technology is influenced by perceived utility, trust in government technology, and top management commitment (Jermsittiparsert, 2021; Lu, 2013). Technology resources, including information technology foundation, network-based tool familiarity, computerization level, and technology availability and
accessibility, are crucial for India's government digital framework adoption (Raman & Aashish, 2023). Thus, it is hypothesised:

*Hypothesis 3 (iii): There is a significant relationship between the technology resource and intention to adopt the framework.*

Human resource refers to the availability and presence of workers with technical information technology (IT) knowledge, relevant knowledge to use and adopt digital tools in business operations, and skills related to digital economy tools and solutions (Molla and Licker, 2005). The literature lists human resource constructs that promote e-government. In their study on the determinants of e-government maturity in transition countries in Central and Eastern Europe, Ifinedo and Singh (2011) found that employees' knowledge, abilities, and education level influence whether an organisation adopts e-government services. Kappelman et al. (2006) identified awareness, education, communication, ICT skills, and marketing skills as important human resource constructs. Enterprise human resource organisations can hinder e-government service adoption, their findings show that an industry's HR design can hamper e-government adoption. Human resources like open companies (Powell and Dent-Micallef, 1997). Research also shows that "education/IT knowledge," "training," and "experience with the adoption of IT" are the main human resource structures that enable or hinder e-government service adoption. To determine the intention to adopt e-government services in the Indian market, it is crucial to examine whether Indian MSMEs' human resources (skills, technical know-how, education level, knowledge, and experience in ICT use) influence GDEF adoption. Therefore, it is hypothesised:

*Hypothesis 3 (iv): There is a significant relationship between the human resource and intention to adopt the framework.*

Governance, Willcocks and Griffiths (1997), Hartman, Sifnos, and Kador (2000), and Molla and Licker (2005) investigate tactical, strategic, and operational models used by developing countries to govern corporate operations, activities, and digital tool and application adoption. Governance affects electronic payment deployment (Sidek, 2015; Ndou, 2004). Numerous research and guidelines show that firms must follow IT governance to achieve electronic sustainability and business goals. Many firms aspire to go digital, thus they need good IT governance and e-policy (Al-Zoubi et al., 2010).

Gengatharen and Standing (2005) found that "governance" affected e-government adoption in a government-sponsored regional e-marketplace for SMEs. Good governance encouraged connection building, corporate systems thinking, vendor development, and digital technology utilisation, according to their research. Governance indicates organisational efficiency and transformation (Ashaye and Irani, 2019). Karlinger (2014), Bruque and Moyano (2007), and Eilat and Zinnes (2000) found that governance improves company operations and promotes creative technology and solutions. The literature on a firm's governance and its intention to adopt the government's digital framework in India is unclear and scarce (Akhtar and Riaz, 2019). Despite the noble intentions driving corporate governance changes, India needs a holistic solution adapted to its issues (Tewari and Sharma, 2011). Thus, corporate governance must be addressed to successfully implement the Indian government's digital architecture. A few respected journal studies have found that governance has no impact on e-government (Plotnikov et al., 2019). Thus, it is vital to examine whether Indian MSMEs' corporate governance affects GDEF adoption. Thus, we hypothesise:

*Hypothesis 3 (v): There is a significant relationship between the governance and intention to adopt the framework.*
Top management commitment is the level of organisational commitment and support given by top management, notably the CEO, to the adoption or use of instruments used in the digital economy (such as e-government and e-commerce). Al-Zoubi and Eam (2011); Molla and Licker (2005); Mujahed, Ahmed, and Samikon (2021). According to Ziemba, Papaj, and Zelazny (2013), top management's excellent leadership makes implementing e-government in businesses simple.

In a reputable journal, Gill-Garcia and Flores-Ziga (2020) discovered that senior management support is essential for the adoption of e-government. Top management support is essential for responsible and sustainable transformation in a company's internal and external settings, claim Lin et al. (2020). Saif-Ur-Rehman (2016) asserts that "the adoption of new technologies requires a change in employees' work attitudes, in-depth knowledge of new and existing digital technologies, performance, and skills". Such barriers are eliminated by management commitment. By offering training and revising job responsibilities for employees, management engagement helps eliminate uncertainty and resistance to using new systems. Some highlighted the dedication of top management to "education and training" (Vousinas, 2017; Bruque and Moyano, 2007). To spread knowledge, educate managers on the benefits and drawbacks of adopting or implementing institutional frameworks (such as e-regulatory frameworks or e-government services), and boost a business' efficiency, productivity, and income, internal workshops, awareness campaigns, and seminars can be held (e.g., Williams and Schneider, 2016; Sung, Awasthi, and Lee, 2017). In the context of government digital framework adoption in India, the level of commitment of top management and leadership plays a significant role, as Top managers need knowledge and commitment for adoption and continued success of technology usage (Mackness, 2014). However, the specific relationship between top management commitment and the intention to adopt the government digital framework in India is not directly addressed in the studies. Therefore, in order to determine the goal of the Indian MSME owner or manager, it is necessary to assess whether top management commitment influences the adoption of GDEF. Hence the hypothesis:

Hypothesis 3 (vi): There is a significant relationship between the top management commitment and intention to adopt the framework.

(E) Successful Adoption and Indian MSMEs organisational e-readiness is mediated by the intention to adopt the GDEF.

Studies have found connections between organisational resources, e-government service acceptability, and DSE prevention. Only a few research have looked at the predicted associations. Researchers like Plotnikov et al. (2019) and Jameel, Asif, and Hussain (2019) discovered that awareness and the relationship between the underground economy and institutional environment are mediated by the e-regulatory framework. Organisational characteristics are a significant driver of whether e-government prevents the causes of the digital shadow economy, according to a 2016 study by Veiga et al. on how digital government apps could minimise administrative burden (one of the driving factors of SE/DSE). Atkinson (2003) and Khairo Al-Da'abseh et al. (2018) contend that a firm's internal factors make up the entirety of its management system; as a result, adoption of e-government services mediates a favourable impact on illegal behaviour. Alomari (2020), using the same compliance unit as a mediator, looked into the connection between money laundering and e-government services. After the measurement model has been validated, the employed model has experience and displays a good fit. The results show, however, that the suggested model does not achieve any verifiable improvement in fit over the "partially mediated model." However, according to their data, compliance units and money laundering, a major factor in the underground economy, are
positively correlated with e-government apps. As a result, the compliance unit reduces e-government and money laundering. Similar to this, the firm's top management's dedication and perseverance assisted Ghana's MSMEs in their fight against corruption (Khalid, 2020).

The intention to adopt and the organizational readiness of Indian MSMEs mediate the prevention of the digital shadow economy. The adoption of technologies such as blockchain (Salim et al., 2022), e-commerce (Kosasi et al., 2019), marketing technology (Riswandi and Permadi, 2022), and e-wallets (Iranmanesh et al., 2023) can contribute to preventing the digital shadow economy. Factors such as technology readiness, organizational readiness, corporate governance, firm’s resources, and top management commitment influence the intention to adopt these technologies (Apriani and Wuryandari, 2022). The success of adoption also depends on factors like perceived cost, firm’s characteristics and experiences, perceived ease of use, perceived risk, and awareness. Therefore, by focusing on improving organizational readiness, addressing technological gaps, and considering the factors influencing adoption intention, Indian MSMEs can effectively prevent the digital shadow economy. Thus, it is hypothesized that:

Hypothesis 4: Intention to adopt mediates the relationship between organizational E-Readiness and the prevention of the digital shadow economy (Successful adoption).

(F) Interplay of Institutional and information systems theory towards intention of organisational constructs to adopt and prevent digital shadow economy.

Institutional theory and information system theory can help assess a firm's internal ability to adopt the framework and prevent digital shadow economy. Institutional theory argues that regulatory pressure can boost or hinder information system adoption (Krell, Matook, and Rohde, 2009). Organisational culture and knowledge transfer affect IS success, according to information system theory (Magala, 2000). These theories help organisations analyse framework adoption and digital shadow economy prevention.

The interaction between institutional theory and information systems theory can help in better understanding why organisations choose to adopt or prevent the digital shadow economy. Institutional theories offer valuable insights into how internal organisational capability impacts strategic responses to the pressure for institutional conformity (Krell, Matook, and Rohde, 2009). These theories can provide insight into the adoption and assimilation of information systems (IS) security management (Kent et al., 2022). Alternatively, the theory of information systems can provide insight into the various factors that impact the acceptance and utilisation of information systems by employees within an organisation (Magala, 2000). The study intends to investigate the impact of institutional influences and organisational change on the adoption of information systems (IS) and the prevention of the digital shadow economy by integrating these two theories. As the adoption of an interdisciplinary approach can offer a comprehensive understanding of the intricate social phenomena associated with IS adoption and the prevention of illegal digital activities. The researcher has developed the conceptual framework in figure 1 for the investigation of relationships of exogenous variables with the mediator and with the endogenous variable.
RESEARCH METHODOLOGY

This study explores factors that encourage the adoption of the Indian Government's Digital Economic Framework (GDEF) and discourage participation in the Digital Shadow Economy (DSE) using a positivist approach. Hypothesis testing is used in positivist research to determine truth and make predictions (Greener, 2008). This study used scientific methods, including surveys, facts, and attributes, with a positive research approach.

Data survey on the perspectives and preparedness of Indian MSME owners for adopting the Indian Government's Digital Economic Framework were collected. The MSME Data Bank Portal and District Industries Centre of Gautam Buddha Nagar, UP, shared a list of Indian MSMEs. UP was chosen for its significant number of MSMEs, which are representative of the Indian MSME population. Gautam Buddha Nagar was chosen for two specific reasons. Despite its status as a prominent intellectual district in India, it has not received much academic attention. It updated the records for MSME. The population under study is 14,066. The 1970 algorithm by Krejcile and Morgan estimated 372 sample sizes for a study with a 95% confidence level. The questionnaire was sent to 1082 respondents via electronic and physical means. To ensure fairness and equal representation, the study employed probability random sampling, selecting every 13th respondent. The study's response rate of 34.38% is relatively high.

The study examined MSME owner-managers in Gautam Buddha Nagar across multiple industries, such as auto components, beauty and cosmetics, consumer durables and electronics, construction, e-commerce, education and training, FMCG, gems and jewellery, garments, apparels, textiles, leather and accessories, home décor, hospitality and tourism, industrial equipment, real estate, and retail. We survey CEOs, owners, managing directors, partners, directors, and general managers of micro, small, and medium-sized firms. The digital shadow economy includes prominent industries and businesses (Putnins and Sauka, 2015; Remeikiene, Gaspareniene, and Schneider, 2018).
The study's survey consists of 43 questions divided into four parts, as shown in figure 2. Demographic data is collected at the beginning. The 10 questions cover industry type, business sector, operation size, establishment years, annual turnover, job title, years with company, years in current position, GST number (online or offline), and registration method (online or offline). These criteria described the demographics of respondents regarding their use of e-government services and DSE. The demographics of enterprises (Micro, Small, and Medium-scale) greatly affect their use of e-government services for DSE participation. The second section covers the organisational environment. This section assesses Indian MSME owners-managers readiness in terms of GDEF. The study analysed various factors such as the firm's internal environment (including human, business, and technical resources), innovation, awareness, governance, and top management commitment. Section two's instruments are based on relevant innovation, e-readiness, technology adoption, and research. Three industry professionals and two academics conducted pretesting on authorised surveys. Explanatory factor analysis ensures reliability of constructs.

The third part of the survey will ask about the target audience's behaviour and intentions regarding the use of GDEF services and its elements.

The final research phase examined the framework's effectiveness in combating the digital shadow economy. GDEF elements were used for identification purposes.

The second, third, and fourth survey sections used a 5-point Likert scale from 'strongly disagree' (1) to 'strongly agree' (5). Previous research has shown that all scale items in this area are highly reliable and valid.

### Table 1: Adopted and adapted survey instrument for the study

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<td><strong>Section 1</strong></td>
<td><strong>Common Variable</strong> (Demographics)</td>
<td>Type of industry: Business sector; Size of business operation; Years since establishment of a firm; Yearly turnover of the firm; Job title; Years of services with the company; Years of services on the current position: GST number obtained (online/offline); Registration done via online/offline</td>
<td>10</td>
<td>Liang, Qi, Wei and Chen (2017); Lev-On and Steinfeld (2015); Sidek (2015); Putnins and Sauka (2015)</td>
</tr>
<tr>
<td><strong>Section 2</strong></td>
<td><strong>Critical Success Factors (Independent Variable)</strong></td>
<td>Awareness: aware of technology innovation and its benefits; awareness and knowledge of technological adoption tool; perceived benefits, opportunities, risks and threats; awareness; understanding of external forces; understanding of technological adoption's suitability and applicability</td>
<td>Awareness- 5</td>
<td>Sidek (2015); Molla and Licker (2005)</td>
</tr>
<tr>
<td></td>
<td>Business resource- capabilities and competencies to adopt technology adoption (good infrastructure support for adopting technology systems; utilise facilitating resources in daily operations; financial resources to adopt technology systems; reviewing business resource to ensure suitability and to facilitate relevant technology adoption)</td>
<td>Business Resource- 4</td>
<td>Shao, Luo and Liao (2015); Sidek (2015)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Human resource- education and training (consulting experts and workshops); employee attitude towards innovation; training on intend to adopt systems; satisfaction and willingness to adopt new technology facilities</td>
<td>Human Resource- 5</td>
<td>Shao, Luo and Liao (2015); Sidek (2015)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Technology resource- compatibility; complexity; relative advantage and cost which facilitates the adoption of technological systems</td>
<td>Technology resource- 7</td>
<td>Shao, Luo and Liao (2015); Kurnia and Johnston (2000)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Governance- clearly defined roles, responsibilities and accountability; clear analysis of impact after adoption; readiness for change: defined set of rules and regulations and integration in firm's policies to influence technological adoption</td>
<td>Governance-4</td>
<td>Sidek (2015)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Top management commitment executive support; willing to bear the risk; commitment to adopt technological systems</td>
<td>Top management commitment-3</td>
<td>Shao, Luo and Liao (2015); Wijethilake et al. (2018)</td>
<td></td>
</tr>
</tbody>
</table>
As few of the questions were modified as per the research objectives, Exploratory factor analysis deemed necessary as the modifications loses the internal reliability of the component measuring the construct (Hair et al., 1998). Therefore, EFA is tested employing IBM SPSS version 26 and later it is also used for descriptive analysis. To assess the measurement model and structural model with mediation effect, Smart PLS was employed.

DATA ANALYSIS and RESULTS
Exploratory Factor Analysis (EFA) determined the dimensional structure of the successful adoption (digital shadow economy prevention) instrument specifically for the research purpose. IBM SPSS 26 performed EFA with principal component analysis and varimax rotation (table 1). Minimum factor loading was.50 (Leech et al., 2005). The scale's commonality—variance in each dimension—was also examined to ensure adequate explanation. All similarities exceeded.50. Overall correlation matrix significance was determined by Bartlett's test of sphericity. X2 (n=372) = 3193.988 (p<0.001), indicating factor analysis. All similarities exceeded Bartlett's sphericity test's.500 limits, indicating good significance. In addition, factor analysis was used to analyse the Kaiser-Meyer-Olkin MSA based on the study's sample. High statistic values (0.5–1) suit factor analysis. A number below 0.5 shows factor analysis is improper. EFA needs more data. This study's KMO MSA was 0.699, suggesting factor analysis. Ideal MSA values for factor analysis are above 0.600. The varimax rotation for EFA research yielded eleven scale factors that described 76.581% of the data variation, indicating that the EFA's eight-factor loadings fit this research's theoretical proposition and had significant correlations. Showing the instrument is suitable for this research.

The study had no missing online or offline survey data. Thus, no mean substitution or replacement occurred. Turkey (1977)'s boxplot method was utilised to identify outliers. Few conditional and collective outliers were found in the study, but no extreme outliers. Osborne and Overbay (2004) encourage researchers to evaluate whether the responding data contains groundbreaking knowledge that may or may not pertain to the research project but has global worth. This study kept outliers since PLS-SEM can produce meaningful results with them (Ringle et al., 2012; Hair et al., 2011).

Its mean, median, and standard deviation are good. Skewness and kurtosis were examined using IBM SPSS 2t descriptive statistics. SEM allows skewness between -3 and +3 and kurtosis between -10 and +10 (Hair et al., 2006). The study's data set is normally distributed since it falls within projected values.

Manufacturing companies in garment, apparel, textiles, leather, accessories, beauty & cosmetics, industrial equipment, and home décor participated most in the survey. Services were dominated by e-commerce, education and training, hospitality, and tourism. Most of the micro-scale enterprises have been operating for over 9 years in their respective industries and made 50 lacs every year. The majority of respondents...
were Indian micro-business owners with over 15 years of experience. Most firms register offline, however 197 out of 372 receive their GSTIN online. 257 pay their GST offline. The reliability test for Gautam Buddha Nagar-based MSMEs found that few indicators of the chosen organisation and environment constructs towards GDEF adoption, leading to successful adoption, had factor loadings above the threshold value of 0.6 (Hair et al., 2017) as shown in Figure 3. PLS path modelling examines the square root of AVE and cross-loading using discriminant validity. Table 2 shows that each construct's square root of AVE was bigger than its highest correlation with the other constructs.


![Figure 2: Measurement model of Lower Order Constructs evaluation after treatment](image)
Measurement model assessment validates the higher-order construct. Each construct was tested for reliability and convergence. As Sarstedt et al. (2019) advised, the Higher Order Constructs' (HOCs) discriminant validity was assessed using the Lower Order Constructs' latent scores. HOCs (POER) results showed reliability and validity. Summarising the results, the reliability and convergent validity for all other constructs are >.60 and >.50, respectively. In addition to reliability and validity, discriminant validity of the POER with the LOCs (awareness, human resource, technology resource, business resource, top-management commitment, governance, government support, ancillary industry support, and market support) is assessed. Fornell and Larcker's (1981) criterion shows that the construct's square root of AVE is higher than its correlation with all other constructs, and HTMT is lower than .95 as indicated by Franke and Sarstedt (2019); Gold, Malhotra and Segars (2011).

### Table 3: High-Order Construct Reliability and Convergent Validity

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Cronbach’s Alpha</th>
<th>Composite Reliability</th>
<th>Average Extracted (AVE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>POER</td>
<td>.698</td>
<td>0.701</td>
<td>.537</td>
</tr>
</tbody>
</table>

### Table 4: Fornell and Larcker (1981) Criterion- Higher- Order Discriminant Validity

<table>
<thead>
<tr>
<th>Constructs</th>
<th>DSEP</th>
<th>GDEF</th>
<th>POER</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSEP</td>
<td>.845</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GDEF</td>
<td>.279</td>
<td>.885</td>
<td></td>
</tr>
<tr>
<td>POER</td>
<td>.650</td>
<td>.666</td>
<td>.597</td>
</tr>
</tbody>
</table>

### Table 5: HTMT- Higher- Order Discriminant Validity

According to Tables 3, 4, and 5, the Higher Order Constructs (HOCs) are also above the threshold values, indicating strong reliability and validity. Since the HOC's convergent and discriminant validity meet threshold values, it can be stated that the finding results were reliable and valid for higher-order constructs as well alike lower-order constructs.

A 5,000-sample re-sample bootstrapping approach is used to assess the structural model's collinearity, R-square ($R^2$), effect magnitude ($f^2$), predictive significance ($Q^2$), model fit, and path coefficient ($\beta$). Hair et al. (2017) advised validating multicollinearity for each set of predictors before analysing the structural model.

Latent collinearity is tested using Variance Inflation Factor (VIF) to ensure no variable collinearity. Diamantopoulos and Sigouw (2006) said VIF must be less than 3.3 to demonstrate no collinearity. Hair et al. (2017) also suggested a VIF value below 5.0. Based on the VIF value acceptance literature. The result showed HOCs and LOCs Inner VIF values < 3.3, indicating no collinearity between latent variables in the reflective model. The $R^2$ as shown in table 6 denotes POER explains 47% variance in intention to adopt the Government Digital Economic Framework and 35% variance in Digital Shadow Economy Prevention.
(Hair et al., 2017). The model predicted GDEF and DSEP of 0.366, for $Q^2$ values (table 7). Since $Q^2$ values were above zero, the model was predictive (Hair et al., 2017). The effect size $f^2$ illustrated in table 8 shows the strength of the relationship of POER (exogenous) on GDEF and DSEP (endogenous). The $f^2$ result suggests that the effect size values have either a very small, small and medium effect size which is responsive to the hypothesis of the study (Hair et al., 2017). Lastly, table 9 showed that the value of SRMR was 0.108, and that of RMS_theta was 0.022. Both the values were within the threshold level. The value of NFI was 0.58 that was reasonably close to 0.90. Therefore, the model was considered fit for further analysis.

**Table 6: $R^2$ of the model**

<table>
<thead>
<tr>
<th>Endogenous LV</th>
<th>R Square</th>
<th>R Square Adjusted</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSEP</td>
<td>.641</td>
<td>.648</td>
<td>Substantial</td>
</tr>
<tr>
<td>GDEF</td>
<td>.590</td>
<td>.590</td>
<td>Substantial</td>
</tr>
</tbody>
</table>

**Table 7: $Q^2$ (Predictive Relevance) of the model**

<table>
<thead>
<tr>
<th>Endogenous LV</th>
<th>SSO</th>
<th>SSE</th>
<th>$Q^2$ (1-SSE/SS0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSEP</td>
<td>1116.00</td>
<td>837.306</td>
<td>.250</td>
</tr>
<tr>
<td>GDEF</td>
<td>744.000</td>
<td>471.329</td>
<td>.366</td>
</tr>
</tbody>
</table>

**Table 8: Effect size ($f^2$)**

<table>
<thead>
<tr>
<th></th>
<th>DSEP</th>
<th>GDEF</th>
<th>POER</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSEP</td>
<td>.020</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GDEF</td>
<td></td>
<td>.012</td>
<td>.205</td>
</tr>
<tr>
<td>POER</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 9: Model Fit Summary**

<table>
<thead>
<tr>
<th></th>
<th>Saturated Model</th>
<th>Estimated Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>SRMR</td>
<td>0.108</td>
<td>0.108</td>
</tr>
<tr>
<td>$d_{ULS}$</td>
<td>1.227</td>
<td>1.227</td>
</tr>
<tr>
<td>$d_G$</td>
<td>0.402</td>
<td>0.402</td>
</tr>
<tr>
<td>Chi-Square</td>
<td>849.909</td>
<td>849.909</td>
</tr>
<tr>
<td>NFI</td>
<td>0.578</td>
<td>0.578</td>
</tr>
<tr>
<td>RMS Theta</td>
<td>0.022</td>
<td>0.022</td>
</tr>
</tbody>
</table>

According to Hair et al. (2011), two-tailed test crucial t-values are 1.65, 1.96, and 2.58. Table 10 showed the standardised route coefficient and hypothesis test. Few organisational environment subconstructs were favourably significant to the intention to adopt the framework like Technological Resource (TR) ($\beta = 0.052$, $T$ value = 7.040, $p < 0.001$), Governance (G) ($\beta = 0.049$, $T$ value = 3.648, $p < 0.001$). Moreover, Indian MSMEs organisational environment was insignificant with successful adoption of the framework ($\beta = 0.106$, $T$ value = 1.443, $p < 0.149$ but had a significant relationship with intention to adopt the GDEF ($\beta = 0.051$, $T$ value = 7.882, $p < 0.001$). Furthermore, there is a strong relationship of intention to adopt the GDEF with the successful adoption i.e., digital shadow economy prevention $\beta = 0.165$, $T$ value = 2.664, $p < 0.008$. 
The relationships indicate that Indian MSMEs organisational environment have willingness to adopt the GDEF but do not have much awareness, sound technical knowhow, top management commitment to successfully adopt and use it for long term. The findings for organisational environment showcased similar relationships in previous research as well.

Table 10: Hypothesis testing results

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Relationship</th>
<th>Std. Beta</th>
<th>Std. Error</th>
<th>t-value</th>
<th>p-value</th>
<th>( \eta^2 )</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>GDEF → DSEP</td>
<td>.165</td>
<td>.062</td>
<td>2.664</td>
<td>.008</td>
<td>.020</td>
<td>Supported</td>
</tr>
<tr>
<td>H2</td>
<td>POER → DSEP</td>
<td>.106</td>
<td>.067</td>
<td>1.443</td>
<td>.149</td>
<td>.012</td>
<td>Not Supported</td>
</tr>
<tr>
<td>H3</td>
<td>POER → GDEF</td>
<td>.413</td>
<td>.053</td>
<td>7.822</td>
<td>.000</td>
<td>.205</td>
<td>Supported</td>
</tr>
<tr>
<td>H3 (i)</td>
<td>A → GDEF</td>
<td></td>
<td></td>
<td>1.337</td>
<td>.182</td>
<td>.012</td>
<td>Not Supported</td>
</tr>
<tr>
<td>H3 (ii)</td>
<td>BR → GDEF</td>
<td></td>
<td></td>
<td>1.883</td>
<td>.011</td>
<td></td>
<td>Supported</td>
</tr>
<tr>
<td>H3 (iii)</td>
<td>TR → GDEF</td>
<td></td>
<td></td>
<td>7.040</td>
<td>.000</td>
<td>.188</td>
<td>Supported</td>
</tr>
<tr>
<td>H3 (iv)</td>
<td>HR → GDEF</td>
<td></td>
<td></td>
<td>1.557</td>
<td>.120</td>
<td>.017</td>
<td>Not Supported</td>
</tr>
<tr>
<td>H3 (v)</td>
<td>G → GDEF</td>
<td></td>
<td></td>
<td>3.648</td>
<td>.000</td>
<td>.049</td>
<td>Supported</td>
</tr>
<tr>
<td>H3 (vi)</td>
<td>TMC → GDEF</td>
<td></td>
<td></td>
<td>.674</td>
<td>.500</td>
<td>.012</td>
<td>Not Supported</td>
</tr>
<tr>
<td>H4</td>
<td>POER → GDEF → DSEP</td>
<td>.068</td>
<td>.025</td>
<td>2.372</td>
<td>.018</td>
<td>Supported</td>
<td></td>
</tr>
</tbody>
</table>

**DISCUSSION**

The examination of the factors contributing to the inconsistent outcomes of POER The causes of POER subconstruct inconsistencies in India have been studied. Similar to AlAwadhi and Morris (2009), the research found a lack of awareness about framework adoption. There may be additional reasons Indian MSMEs are unaware of GDEF's potential and benefits. They may be adopting GDEF due to competition from rivals. Recent research shows that Indian MSMEs lack business resources, particularly infrastructure support. These companies also struggle to maintain regular monitoring practices, which are essential for GDEF process optimisation and efficacy. Human resources did not affect GDEF implementation. The GDEF platform's lack of significance may be due to employees' low digital literacy and essential abilities. Even if their company has deployed GDEF services like Government e-Marketplace (GeM), Goods and Services Tax (GST), electronic-way bill (e-way bill), Udyog Aadhar Memorandum, or Skill India Programme, MSMEs are unlikely to use them.

The research found a high association between technology resources and GDEF adoption, contrary to past studies in reputable journals on emerging or developing economies. Results show that Indian micro, small, and medium firms (MSMEs) want to adopt the GDEF system to improve operational efficiency, cut expenses, improve tax filing accuracy, and increase market acceptance. Top management commitment and GDEF implementation in poor nations have yielded mixed results, according to Gill-Garcia and Flores-Ziga (2020). Corporate management may not promote GDEF system adoption in corporate operations, limiting TMC's importance in the study. Lack of support may be due to financial pressure, adoption risk, opposition to change, or severe monitoring or third-party audits interfering with informal activity difficulties. These factors may slow corporate procedures, lowering revenue and profit.
Governance and technology help organisations change and perform better, according to Ashaye and Irani (2019). This study found a strong correlation between firm governance and MSMEs' GDEF implementation objectives. GDEF initiatives have well-defined roles, duties, and accountability systems, explaining the correlation. Informing employees on the potential effects of GDEF services and establishing suitable ICT rules and organisational policies help facilitate and shape their adoption. However, Indian Micro, Small, and Medium Enterprises (MSMEs) are inefficient due to top management neglect, poor monitoring, and a reluctance to dedicate resources to GDEF system creation and improvement.

The research showed that Indian Micro, Small, and Medium Enterprises (MSMEs)' intention to adopt the GDEF and subsequent successful adoption can help government agencies like the National Small Industries Corporation (NSIC), Skill India training centres, and policymakers develop and implement policies to address MSMEs' challenges. This technique helps firms of any size shift from partial or complete informality to formalisation, benefiting them. Informal markets do not contribute to GDP. Vaidya and Hyde (2011) say the diffusion of innovation theory is essential for Indian GDEF and e-government adoption.

Business owner-managers' views on GDEF adoption in the Digital Shadow Economy are untapped in information systems technology adoption study. The use of Smart National Identity Cards (SNIC) (Hassan et al., 2014), E-Government Information Systems in the Board of Intermediate and Secondary Education (BISE) (Shafique et al., 2017), the Digital Government whistle-blower initiative in Ethiopia (Walle, 2020), and cloud computing in e-government have all been studied. There is little research on DSE GDEF adoption perceptions. These studies reveal public sector technology uptake. They do not particularly study Digital Shadow Economy perspectives of GDEF deployment.

Limitations exist because further research is needed to fully understand business owner-managers framework adoption. The study began with Gautam Buddha district MSMEs. Culture, politics, society, infrastructure, income, regulation, and the environment affect distinct locations. GDEF adoption intention also affected Perceived Organisational E-Readiness. The notion of parsimony required one mediator. Several business maturity constructs can be used to analyse new GDEF adoption intention and success results. Data was also collected using self-reported surveys. One of the best COVID-19 databases. This method generated a lot of data, but responders' accuracy depended on recollection, mood, and viewpoint. Given the probable unacceptability of such reactions, future researchers should use mixed approaches, a blend of qualitative and quantitative methods. In conclusion, this research subject is uncharted, thus future researchers may use various methods to find new views. Neupane et al. (2014) note that e-government services have transformed the government's working process more than policymakers'.

**CONCLUSION**

The study found that few organisational preparation elements affected GDEF adoption intention. That internal preparedness elements showcases that Indian MSMEs' basic competencies are unstable and need strengthening. Indian companies eliminate digital shadow economy by using GDEF. GDEF's full mediation ties with POER and DSEP provided new insights into Indian Digital Shadow Economy Prevention.

Indian MSME awareness, human resources, and top management commitment were unimportant with GDEF adoption. Without GDEF and DSEP, Indian MSMEs' organisational readiness was low, suggesting
that the digital shadow economy and its determinants will develop. In India, GDEF services and technologies can reduce DSE and related factors.

The study improved knowledge and practise. First, the subject of this research study is not well explored globally, therefore the study findings are original and invite academics and researchers in this field to study the digital shadow economy and its drivers, which threatens the national economy. Secondly, business DSE literature is limited (Veiga, Janowski, and Barbosa, 2016; Andreev et al., 2018; Farzanegan, Hassan, and Badreldin, 2019 Research on e-regulatory compliance and DSE prevention is scarce (Abiola, 2013; Gasparénienè et al., 2016). So, this study filled the void.

Third, research uses PERM. It examined developing-world enterprises' adoption constructs (Molla and Licker, 2005; Sidek, 2015). In undeveloped countries like India, enterprise architecture to embrace e-government services (preventing DSE) has not been explored using this approach. It also crossed theoretical boundaries.

Fourth, Indian company adoption of e-government services is rarely quantified (Kumar, Sachan and Mukherjee, 2018; Alyralat et al., 2023) for digital shadow economy avoidance by looking at GDEF adoption intention. Previous research suggests studying the firm's impact on the country's shadowiness (Remeikiene and Gasparénienè, 2016). Schneider and Buehn (2017) urged more shadow economy development and minimization study. This work advanced knowledge and literature.

Finally, studying success variables reduced e-regulatory adoption failure and perhaps MSMEs DSE. The study also fills a literature gap by identifying Indian MSMEs' key success factors (CSFs) for GDEF implementation to avert DSE. To prevent players from exploiting loopholes and enhance business ecosystem openness and legality, authorities and policymakers may need to improve rules and regulations.

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