InCAF PROCEEDING OF INTERNATIONAL CONFERENCE ON ACCOUNTING AND FINANCE

Volume 2, 2024, PP: 105-128

Optimizing sustainability reporting through business process automation and innovation: Insights from technology acceptance and diffusion theories

Syahril Ramadhan *, Arissetyanto Nugroho, Darmansyah
Universitas Pancasila, Jakarta
*Corresponding author: Syahril.Ramadhan@ppatk.go.id

Abstract

The study's key findings emphasize the pivotal role of perceived advantages and ease of use in shaping attitudes towards Business Process Automation (BPA) within sustainable development reporting. While a perceived relative advantage in BPA usage is linked to recognizing its utility, it doesn't necessarily extend to an ease-of-use perspective. The research underscores the importance of trialability, indicating that hands-on experience positively influences views on BPA's usefulness and ease of use. Interestingly, factors like compatibility with existing practices and complexity have limited impact on perceptions. The study also reveals that observability, including the visibility of benefits and social influence, might not be primary drivers for BPA adoption in sustainable development reporting. In conclusion, the research contributes valuable insights for strategically implementing BPA, integrating factors like trialability and perceived advantages, informed by the Innovation Diffusion Theory and the Technology Acceptance Model. This comprehensive framework aims to enhance data accuracy, efficiency, and decision-making processes, aligning with broader sustainability and environmental performance goals.

Keywords: BPA, Sustainable development reporting

INTRODUCTION

Sustainable reporting encounters challenges in adoption due to its complexity, resistance to change, data security concerns, limited resources, and the need for regulatory compliance. For instance, a company implementing a new sustainable reporting software might face resistance from employees accustomed to older systems, highlighting the importance of change management strategies. The incorporation of Business Process Automation (BPA) into reporting protocols presents a significant opportunity for organizations to amplify their operational efficiency and efficacy. The strategic infusion of automation technologies, including Robotic Process Automation (RPA) and Intelligent Process Automation (IPA), into Enterprise Resource Planning Systems (ERPSs) plays a pivotal role in enhancing the effectiveness of Sustainable Development Reporting (SAR), as emphasized by Dumitru *et al.* (2023). The importance of SAR has experienced a remarkable upsurge, serving as a fundamental framework for measuring, documenting, and revealing a company's performance across various aspects in public disclosures, as highlighted by Tiwari and Khan (2020). The growing demand for adherence to sustainability-related regulations within organizations has triggered a profound shift in the economic landscape, as discussed by Vărzaru (2022). Amidst this landscape, the concept of Industry 4.0 presents an opportunity to optimize corporate environmental practices by enhancing SAR tools, thus advancing sustainability and reporting practices, as outlined by Burritt and Christ (2016). As more companies transition to advanced ERPSs to align with reporting requirements and transparency expectations, early adopters are poised to achieve enhanced environmental outcomes, encompassing improved resource utilization, energy conservation, and a bolstered corporate reputation, as noted by Antony *et al.* (2023).

The convergence of robotics, artificial intelligence, and machine learning facilitates streamlined data collection across diverse domains, empowering manufacturing facilities to devise strategies that mitigate challenges such as resource depletion and energy restrictions, as discussed by Dumitru *et al.* (2023), Javaid

et al. (2022), Liao (2022), Shaikh *et al.* (2022), and Akkem *et al.* (2023). This collaborative synergy fosters operational efficiencies in data aggregation, enabling informed decision-making and targeted interventions to tackle sustainability issues. By employing a comprehensive and inductive approach to analyze leading enterprise resource planning systems (ERPSs) and automation platforms, the integration of data-driven automation, such as robotic and intelligent process automation solutions, within ERPSs can considerably enhance the quality of sustainability accounting and reporting Dumitru *et al.* (2023).

In Indonesia, the realm of sustainable development reporting encounters unique hurdles, even without a comprehensive regulatory framework in place. Nurzi *et al.* (2023) underscore that while a few Indonesian companies adhere to global sustainable development regulations, the proliferation of sustainability reports remains limited, especially in comparison to mandatory social responsibility reports. Particularly noteworthy is the diligent adherence of Indonesian financial institutions, evident through the creation of sustainable finance action plans and the submission of yearly sustainability reports to the financial regulator, as pointed out by Nurzi *et al.* (2023) and Setyowati (2023). However, the interpretation variability and inconsistency regarding the criteria for a 'green' project among financial institutions add complexities to the situation. Recognizing this, the Indonesian government has embarked on innovative strategies to channel private investments towards low-carbon development, supported by international organizations advocating for the mainstreaming of sustainable finance. Spearheaded by the Central Bank of Indonesia and the Financial Services Authority, this initiative underscores the commitment to nurturing sustainable finance, culminating in the formulation of a comprehensive roadmap. This roadmap encompasses diverse strategic initiatives aimed at augmenting the supply and demand for sustainable financial products, enhancing risk management policies to encompass environmental and social dimensions, and championing the broader sustainable finance agenda.

Against the backdrop of the financial sector, wherein the seamless integration of Business Process Automation holds paramount importance for the attainment of robust and sustainable development reporting, pivotal theoretical frameworks, namely the Technology Acceptance Model and the Innovation Diffusion Theory (IDT), emerge as founts of invaluable insights. The IDT posits that the attributes inherent to an innovation wield a substantial influence over the convictions harbored within organizations, consequently exerting a profound sway on the pivotal choice to either embrace or rebuff said innovation (Rogers, 1995). These attributes encompass a spectrum of elements encompassing relative advantage, compatibility, complexity, and trialability, all of which intricately mold the nuanced fabric of the decision-making process itself (Rogers, 1995). Noteworthy is the omission of observability, defined as the extent to which the benefits of an innovation are discernible by external parties, owing to the embryonic stage of blockchain's evolutionary journey (Rogers, 2003). Moreover, the propulsion of sustainability-driven innovations across sectors, healthcare being a salient example, finds a conducive avenue through the application of IDT's yardsticks, encompassing relative advantage, compatibility, complexity, trialability, and observability, thus ushering forth environmental sustainability as an enduring hallmark (Rogers, 2003).

In a broader context, the theory of innovation diffusion assumes a foundational role in comprehending the phases and cognitive underpinnings that underscore the assimilation of novel concepts, encapsulating products, services, or policies, all with the overarching objective of attaining sustainable development (Ezeh and Nkamnebe, 2018). The applicability of this theory traverses diverse domains and organizational landscapes, thereby accentuating its central significance in nurturing the embrace of innovative paradigms, thereby fuelling the crucible of sustainable expansion for organizations (Khan, 2022). Its currency and validity find extensive validation within the scholarly and research community, as evidenced by the broad acceptance it enjoys among scholars and researchers alike (Spencer *et al.*, 2011).

Within the domain of embracing innovative concepts, the Technology Acceptance Model (TAM) emerges as a commanding theoretical framework meticulously crafted to unravel the determinants that shape consciously intended behaviours (Bin, 2013; Sheppard *et al.*, 1988). With precision, TAM finds its application in prognosticating the inclinations of behavioural intent vis-à-vis the utilization of technology (Leung and Matanda, 2013). Central to the model's essence is the proposition that human conduct is innately governed by rationale, inherently tethered to the constraints imposed by the availability of

information (Tamjidyamcholo *et al.*, 2013). Nurtured by this fundamental premise, TAM unfurls as a comprehensive construct that finds relevance across a panoply of human activities (Guo and Feng, 2012; Haji Wahab, 2018). TAM, in its essence, serves as a beacon, illuminating the pathways to fathom the dynamics of persuasive communicative narratives and presaging behavioural outcomes predicated upon pre-existing dispositions and intentions (Haji Wahab, 2018).

While the Innovation Diffusion Theory and the Technology Acceptance Model have both undergone extensive research and demonstrated their effectiveness in various contexts, a discernible trend is gaining momentum—a trend that revolves around the amalgamation of these models to prognosticate usage intentions spanning diverse fields (Fu *et al.*, 2006). This strategic fusion harnesses the respective strengths of each model, thereby amplifying the explanatory prowess of investigations honed in on the realm of usage intent (Carter and Bélanger, 2005; Khalifa and Ning Shen, 2008; Tung *et al.*, 2008).

The existing research in the realm of sustainable reporting often lacks a comprehensive exploration of the integration between Innovation Diffusion Theory (IDT) and Technology Acceptance Model (TAM) in the context of overcoming these challenges. While individual studies have delved into aspects like user acceptance or regulatory compliance separately, there is a notable gap in the literature that systematically investigates how the principles of IDT, focusing on the adoption process, and TAM, emphasizing user attitudes and perceptions, can be synergistically employed to enhance sustainable reporting practices. An in-depth analysis of the interplay between these theories could provide valuable insights into developing tailored strategies that address the specific hurdles faced by organizations in adopting sustainable reporting technologies. This gap in research prevents a holistic understanding of the factors influencing the adoption of innovations like Business Process Automation, hindering organizations from implementing effective strategies for sustainable development reporting. Furthermore, while individual studies have explored the application of IDT or TAM in specific contexts, there is a lack of comprehensive research that synthesizes these theories, providing a unified framework applicable to various sectors and industries.

To bridge this research gap, it is imperative to develop a nuanced model that integrates IDT and TAM, acknowledging the complexity of technology adoption within the realm of sustainable reporting. Such a model should consider the unique attributes of sustainable innovations, including their compatibility with existing reporting practices, trialability, and relative advantage in enhancing environmental, social, and governance (ESG) performance.

LITERATUR REVIEW

TAM and DIT

Numerous research endeavours have underscored the pivotal role of integrating the Technology Acceptance Model (TAM) with complementary frameworks, particularly the Innovation Diffusion Theory (DIT), to achieve a more comprehensive comprehension of the intricate and rapid dynamics governing the adoption of information technology. While TAM has frequently been employed in prior studies to elucidate user acceptance of technologies, a lingering uncertainty persists regarding its ability to comprehensively address the multifaceted landscape of technology adoption. Consequently, several scholarly investigations have advocated for the amalgamation of TAM with DIT, as this collaborative approach augments explanatory potency and provides a more nuanced grasp of the swiftly evolving landscape of information technology adoption (Bill *et al.* (2003); Lee *et al.*, 2011; Legris *et al.*, 2003).

The Innovation Diffusion Theory (DIT) is a robust social and psychological framework that aids in forecasting individuals' decisions to adopt novel innovations, discerning adoption patterns, and comprehending their underlying structures (Rogers, 1995; Rogers and Shoemaker, 1983). The integration of the Technology Acceptance Model and DIT empowers researchers and practitioners to attain heightened explanatory prowess and deeper insights into the determinants shaping the acceptance and dissemination of emerging technologies, encompassing facets such as Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) (Min *et al.*, 2019). While TAM chiefly delves into individual attitudes and perceptions toward technology, encompassing factors like usefulness and ease of use, DIT adopts a more encompassing perspective by considering the social and organizational dynamics that influence the adoption and proliferation of innovations.

The Technology Acceptance Model (TAM) is a vital framework for understanding information technology acceptance (Davis, 1989). TAM acknowledges the roles of PEOU and Perceived Usefulness (PU) in shaping user attitudes and adoption. Integrating Data-Driven Business Process Automation into digitization and sustainability contexts is driven by the expectation that the process will be transparent and easily comprehensible. While TAM has been extensively used, its limitations in reflecting the complexities of consumer adoption have led researchers (e.g., Kim, 2016; Lee *et al.*, 2011; Morosan and DeFranco, 2014; Yang, 2005) to augment TAM with additional factors for enhanced explanatory power.

Through this synergistic fusion of both models, a more comprehensive grasp of the intricate interplay among individuals, organizations, and technologies can be achieved, thereby paving the way for more efficacious strategies for successful technology implementation and integration. This amalgamation of TAM and DIT holds substantial promise across diverse domains, including the realm of sustainable development reporting in the financial sector, where the embrace of innovative solutions such as Business Process Automation assumes a pivotal role in realizing sustainability objectives.

Relative Advantage

Relative Advantage (RA) plays a critical role in the adoption of innovative solutions like Business Process Automation, as it assesses how superior the innovation is perceived compared to existing methods or processes. Previous studies have emphasized the significance of considering Relative Advantage, particularly in the context of adopting sustainable innovations in hospital settings (Khan *et al.,* 2022). A key factor that influences the intention to adopt blockchain technology is the perception that both the focal firm and its key supply network partners will gain a relative advantage from its implementation, rather than just one party receiving exclusive benefits (Hartley *et al.,* 2022). Similarly, the adoption of 3D Printing Technology is more likely when organizations perceive a greater Relative Advantage associated with its utilization (Marak *et al.,* 2019).

This relative advantage has been identified as a significant factor that impacts the adoption and attitudes towards using innovations, such as the Islamic Credit Card (Jamshidi and Kazemi, 2020) and the Uber mobile application (Min *et al.,* 2019). Moreover, relative advantage aids in innovation adoption, benefiting individuals and businesses alike. Employees with a proactive mindset tend to be more effective in developing strategies, especially when adopting innovations to improve work practices (Bongers *et al.,* 2022). Sustainable innovation adoption involves implementing new technologies in alternative ways to promote sustainability within the business sector and contribute to environmental preservation (Cillo *et al.,* 2019). Organizations embracing sustainable practices strive to achieve both efficiency and environmental protection.

Recognizing the importance of relative advantage, industries seek to improve their products and services by capitalizing on this factor (Junnonyang, 2021). In fact, the concept of relative advantage holds paramount importance in the enhancement of business practices and the attainment of sustainability objectives (Hu and Yin, 2021). Sustainable development is a key aspect of business growth, with many companies relying on relative advantages to gain a competitive edge in the market (Bianchi, 2019). The adoption of new technologies empowers businesses to enhance productivity, provided they have competent employees who can effectively embrace and implement innovations (Kuruppuge, 2018).

This study examines the impact of Data-driven Business Process Automation on employee satisfaction, retention, productivity, and the company's overall value and market advantage. The research aims to comprehend how the adoption of this automation technology can enhance organizational productivity and effectiveness. Furthermore, the investigation delves into the perceived ease of adopting Data-driven Business Process Automation within the context of digitization and sustainability, evaluating its relative advantages to derive the PU and PEOU components, forming the basis for the hypotheses (H): H1: RA is positively related to PU, and H2: RA is positively related to PEOU.

Compatibility

Compatibility, an inherent capability, enables individuals to adeptly adapt and perform tasks across various circumstances (Danity *et al.*, 2000). This attribute supports seamless integration of innovative practices in the work environment, aligning skills with transformative processes to enhance innovation

adoption and yield benefits (Ziaee *et al.*, 2019). It fosters an organizational culture that promotes innovative ideas, improving work outcomes (Ziaee *et al.*, 2019). For employees, compatibility strategically addresses resistance to innovative changes by aligning practices with current competencies, facilitating smoother transitions (Jerg-Bretzke *et al.*, 2020), especially effective in proficient workforces, where compatibility lays the foundation for sustainable innovation (Skaˇckauskien and Vestert, 2021).

Compatibility empowers individuals with flexible skills, facilitating effective task execution (Danity *et al.*, 2000). It fosters innovation adoption and positive outcomes (Ziaee *et al.*, 2019), particularly overcoming resistance to novel ideas within organizations (Jerg-Bretzke *et al.*, 2020). A competent workforce is pivotal for achieving sustainable innovation goals (Skaˇckauskien and Vestert, 2021). The integration of innovations relies on employee competence and their willingness to embrace novel approaches (Giedraiti and Stašys, 2019).

Compatibility aligns innovations with values and needs of potential adopters (Rogers, 2003), in sectors like CAATT adoption, aligning innovative technologies with existing infrastructure and values (Morteza et al., 2011; Rogers, 2003). This study assesses the compatibility of Data-Driven Business Process Automation within digitalization and sustainability, aligning with operational requirements. Evaluating perceived advantages and simplicity related to integrating Data-Driven Business Process Automation leads to hypotheses: Compatibility positively relates to PU (H3) and PEOU (H4).

Complexity

Perceiving the intricacies of an innovation encompasses its level of difficulty in understanding and usage (Rogers, 1995; Rogers, 2003). The success of integrating a new technological system heavily depends on its perceived execution challenges (Rogers, 2003), including adapting established processes for novel technologies, highlighting the importance of user-friendly innovations for successful adoption (Kandil *et al.*, 2018). Complexity's role in innovation adoption is emphasized by numerous studies (Harindrnath *et al.*, 2008; Kandil *et al.*, 2018), presenting a challenge for decision-makers (Asiaei and Rahim, 2019). Previous research consistently demonstrates an inverse correlation between complexity and new technology adoption (Alshamaila *et al.*, 2013; Gangwar, 2018; Tan *et al.*, 2009).

In this study, the complexity construct from DIT and PEOU construct from TAM share conceptual similarities, though with differing directions (Moore and Benbasat, 1991). Complexity captures innovation characteristics, while PEOU assesses beliefs (PU and PEOU) when adopting new technology. Complexity is examined as a functional aspect of the Uber app, an independent variable, while PEOU gauges users' perceptions of using the app. Lee *et al.*, (2011) established discriminant validity between these constructs, confirming their distinction. Bill *et al.* (2003) found complexity significantly negatively impacted PU for software developers adopting methodologies, and Hasan (2007) confirmed complexity's significant direct effects on both PU and PEOU. Thus, we propose hypotheses: H5: Complexity is negatively related to PU. H6: Complexity is negatively related to PEOU.

Trialability

Trialability holds significant importance in motivating and shaping perceptions regarding the adoption of innovations, such as Data-driven Business Process Automation in the context of digitization and sustainability. As defined by Rogers (2003), trialability involves testing innovations before formal implementation (Jilani *et al.*, 2022). Organizations offering trialability tend to make informed decisions based on initial product trials, contributing to effective growth and aligning with innovativeness (Tchetchik, 2020). Proof-of-concept trials, as outlined by Rosenberg (1982), allow organizations to evaluate new technologies like blockchain, identifying essential changes needed for innovation benefits (Gartner, 2020). Consultants play a pivotal role in these trials, offering specialized knowledge and facilitating fast, cost-effective assessments (Hald and Kinra, 2019; van Hoek, 2019).

Rogers (2003) describes trialability as experimenting with an innovation on a limited basis. Flight *et al.* (2011) extend this to customers trying or experimenting with innovations on a small scale. Carayannis and Turner (2006) emphasize trialability as the degree of testing a product or innovation on a trial basis. Lin and Chen (2012) suggest that experiencing an innovation before full adoption reduces fears and uncertainties, increasing adoption likelihood.

Prior research supports the link between trialability and intention to use (Anuar *et al.*, 2012; Corrigan, 2012), as well as attitude toward use (Chen *et al.*, 2009), consistent with Agarwal and Prasad's (1997) proposition. Organizations prefer experimenting before full commitment to understand capabilities and benefits (Agarwal and Prasad 1998; Rogers 2003; Al-Jabri and Sohail, 2012). Empirical studies confirm trialability's positive association with adoption rates (Jung *et al.*, 2011; Teo *et al.*, 1995). Hence, hypotheses: H7: Trialability is positively related to PU, and H8: Trialability is positively related to PEOU.

Observability

Observability, as defined by Rogers (2003), refers to how evident the outcomes of an innovation are to others within a social framework. Its impact on self-presentation concerns in prosocial behaviours has been highlighted in previous research (Wu *et al.*, 2017). Linked closely to the visibility of successful practices, observability emphasizes the importance of showcasing positive results (Lin and Chen, 2012). When individuals witness successful application of an innovative solution and are motivated to advocate for it due to its visible benefits, it leads to behavioural intention. Lichtenstein and Williamson (2006) further note that observability signifies how much a service's effective use can be witnessed.

Observability also influences the adoption of innovations. Higher perceived observability leads to greater inclination for individuals and organizations to adopt an innovation (Lin and Chen, 2012). Others' visible benefits from the innovation, especially business partners, foster enthusiasm among management and individuals to embrace it. Yusof's study (1999) on Islamic banking adoption highlights that sharing experiences and feedback among potential users significantly shapes their attitude toward adopting such services. Empirical studies confirm the positive relationship between observability and adoption (Al-Jabri and Sohail, 2012; Teo *et al.*, 1995).

Observability's positive impact extends to perceptions of an innovation's utility and user-friendliness. Lee *et al.*, (2011) propose that employees' easy observation of a system positively affects perceived usefulness (PU) and perceived ease of use (PEOU), aligning with the notion that visible benefits encourage innovation adoption. Park and Chen (2007) support this by showing observability's positive impact on user attitudes. An example in the Uber mobile app, offering visible features like arrival times and costs, illustrates how observability enhances adoption. These attributes are expected to positively influence users' perceptions of utility and ease of use Lee *et al.*, (2011). Thus, hypotheses: H9: Observability positively relates to PU, and H10: Observability positively relates to PEOU.

Perceived Ease Of Use

In this study, Perceived Ease of Use (PEOU) is defined as users' belief in the minimal effort required to engage with a specific system, encompassing cognitive and physical aspects (Davis, 1989). This interpretation implies that users perceive the technology as user-friendly and uncomplicated. The strong connection between PEOU and adoption intention has been extensively demonstrated in prior research. Yoon (2016) emphasizes PEOU's significant impact on perceived usefulness of Mobile Library Applications (MLA). Similarly, Sheikhshoaei and Oloumi (2011) underline the positive influence of PEOU on intention to use mobile library services.

Kim (2016) introduced subjective norm and perceived credibility to assess their impact on hotel tablet app adoption. Morosan and DeFranco (2014) highlighted subjective norm and PEOU's role in club members' adoption of mobile devices within club environments. PEOU in the TAM framework is the perception of system use as straightforward (Van der Heijden, 2003), influencing attitudes and adoption intentions (Kim, 2016; Wang *et al.*, 2012). Prior research reinforces the positive impact of PEOU on adoption intention (Chin and Todd, 1995), signifying users' perception of minimal difficulty in using a system. This aspect is pivotal in shaping attitudes and intentions toward embracing new technological solutions. Thus, hypotheses: H11: PEOU positively relates to Data-Driven Business Process Automation within the context of digitization and sustainability.

Perceived Usefulness

The concept of Perceived Usefulness (PU), reflecting an individual's belief that using a specific system will enhance job performance, stands as a pivotal construct (Davis, 1989). Also referred to as performance expectancy, PU is commonly investigated to assess product usability, a determinant of user satisfaction, and a crucial factor in studies related to the intention to continue using a technology (for example, Kim and Nam, 2019; Singh, 2020). Drawing from this body of research, satisfaction with a gamified m-learning application relies on its ability to streamline academic tasks while leveraging the advantages of mobility. Furthermore, the influential role of perceived usefulness as a strong precursor to intention, highlighted by Premkumar and Bhattacherjee (2008), underscores its paramount importance within the framework of the Technology Acceptance Model.

The unwavering belief is that integrating Data-Driven Business Process Automation into the context of digitization and sustainability will inherently enhance efficiency. The notion of perceived usability revolves around the extent to which a product can be effectively utilized by specific users to achieve predefined objectives with efficiency, while ensuring satisfaction within a particular application context (Davis, 1989). This perspective also extends to perceived usability, encompassing factors such as quality, value, and usability disconfirmation, collectively contributing to user satisfaction and subsequently influencing the inclination to sustain the usage of a product or service (Davis, 1989). This viewpoint gains further support through the extension of the Expectation-Confirmation Theory, which is substantiated by empirical evidence.

The intricate connection between Perceived Usefulness (PU) and the intention to adopt Data-Driven Business Process Automation within the digitalization and sustainability framework holds paramount significance. PU encapsulates an individual's perception of the tangible benefits a technology can offer (Venkatesh *et al.*, 2011). Often defined as the extent to which users believe that a digital system will enhance their performance (Davis, 1989), PU embodies a subjective estimation of the likelihood that the technology will improve their overall effectiveness. This relationship assumes particular prominence in educational contexts like e-learning, where learners continuously assess their learning experiences, intrinsically tied to perceived learning outcomes, which in turn shape the extent to which learning objectives are achieved. The consistent validation of the substantial relationship between perceived usefulness and adoption in previous technology acceptance studies underscores the pivotal role that this construct plays in shaping user behaviour and nurturing sustained usage. Therefore, the following hypotheses are proposed: H12: PU is positively related to Data-Driven Business Process Automation within the context of digitization and sustainability.

RESEARCH METHODS

Construct Measurement

In this study, the methodology involved the development of a survey instrument aimed at assessing various dimensions related to Data-Driven Business Process Automation (DDBPA) within the context of digitization and sustainability. A comprehensive literature review was conducted to identify relevant constructs and measurement items. The research incorporated a total of eight variables, namely advantage, compatibility, complexity, trialability, observability, Perceived Ease of Use (PEOU), Perceived Usefulness (PU), and the intention to adopt DDBPA.

To construct the survey instrument, a total of 15 questions were adapted from existing scales and modified to align with the specific context of DDBPA. These questions were designed to capture insights into the mentioned variables, as well as factors such as attitude and future usage intention towards DDBPA. Of particular note, the dimensions of relative advantage, compatibility, complexity, trialability, and observability were measured using sets of two items each, carefully selected from previous research studies.

For instance, the two items measuring relative advantages were adapted from Khan *et al.* (2022), while the compatibility dimension was assessed using two items borrowed from the works of Jamshidi and Kazemi (2019), Khan *et al.* (2022), and Min (2019). Complexity was addressed with two items derived

from Al-Okaily (2022), while trialability was evaluated through two items adapted from Khan *et al.* (2022). Similarly, observability was gauged using two items drawn from Jamshidi and Kazemi (2019).

Perceived Usefulness (PU) was evaluated using a set of two items, three of which were adapted from the study by Manis and Choi (2018). Meanwhile, Perceived Ease of Use (PEOU) was assessed using two items each adapted from Inan *et al.* (2023) and Manis and Choi (2018). Additionally, items from Al-Okaily (2022), Inan *et al.* (2023), and Manis and Choi (2018) were selected to measure the intention to adopt DDBPA within the context of digitization and sustainability.

The survey instrument utilized a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), to capture respondents' perceptions and attitudes towards the various dimensions of DDBPA. The instrument's detailed structure and content can be found in the Appendix section of this study, providing transparency and replicability in the assessment process.

Data collection

Sampling and data collection procedures were central to the research methodology employed in this study. The survey, a crucial aspect of gathering empirical insights, was conducted through an electronic medium, optimizing efficiency and reach. The target population consisted of 104 commercial banks, encompassing a diverse range of financial institutions. The survey instrument, which encapsulated various dimensions related to Data-Driven Business Process Automation (DDBPA) within the context of financial integration, was distributed during the implementation of a financial integration rating survey by the Indonesian financial intelligence unit, PPATK, in July 2022.

The survey was administered to all 104 commercial banks, ensuring comprehensive coverage of the population. This approach aimed to capture a holistic perspective on the adoption and perceptions of DDBPA across the banking sector. The data collection process witnessed a commendable response rate, with each of the 104 questionnaires being diligently filled out by the participating banks. The diligent efforts of these banks culminated in the collection of all the completed questionnaires, which were then received and recorded on August 4, 2023.

The meticulous execution of the data collection process underscores the study's commitment to rigor and reliability. By obtaining responses from all 104 surveyed banks, the research endeavours to provide a comprehensive understanding of the subject matter. The dataset garnered from this extensive survey forms the foundation for subsequent analyses and insights, empowering the study to draw meaningful conclusions and contribute to the existing body of knowledge in the realm of DDBPA and its implications within the financial sector.

Result

The study employed Partial Least Squares Path Modelling (PLS-PM) to assess the hypotheses within the proposed model. PLS-PM was chosen as the most suitable analytical approach due to the main focus being on understanding predictive relationships among the constructs, rather than confirming or testing theoretical frameworks (Chin and Newsted, 1999; Sarstedt *et al.*, 2014). Consequently, this research utilized PLS-SEM with the utilization of Smart PLS (Ringle *et al.*, 2005) to achieve the research objective. The outcome of the SmartPLS Analysis is presented in Figure I, while the descriptive analysis is depicted in Figure II.

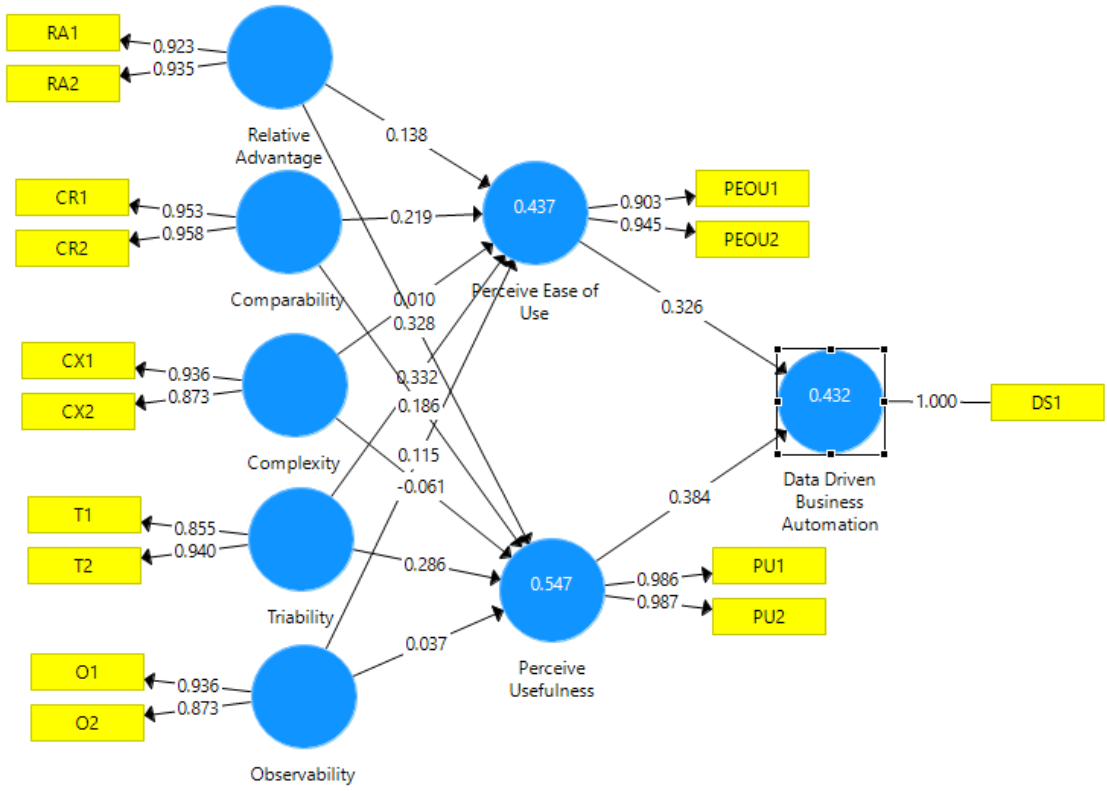

Figure 1. Result of SmartPLS Analysis

	No.	Missing	Mean	Median	Min	Max	Standard Devia...	Excess Kurtosis
RA1	1	0	4.212	4.000	3.000	5.000	0.615	-0.510
RA2	2	0	4.317	4.000	3.000	5.000	0.559	-0.620
CR1	3	0	4.135	4.000	3.000	5.000	0.573	-0.062
CR2	4	0	4.212	4.000	3.000	5.000	0.549	-0.153
CX1	5	0	2.365	2.000	1.000	5.000	0.889	0.492
CX2	6	0	2.663	2.000	1.000	5.000	0.987	-0.594
T1	7	0	4.202	4.000	2.000	5.000	0.578	1.240
T2	8	0	4.192	4.000	3.000	5.000	0.556	-0.114
O1	9	0	3.538	4.000	1.000	5.000	0.950	-0.538
O2	10	0	3.356	4.000	1.000	5.000	1.037	-0.803
PEOU1	11	0	3.779	4.000	2.000	5.000	0.784	-0.195
PEOU2	12	0	4.000	4.000	3.000	5.000	0.635	-0.490
PU1	13	0	4.183	4.000	3.000	5.000	0.584	-0.272
PU2	14	0	4.221	4.000	3.000	5.000	0.604	-0.467
DS1	15	0	4.000	4.000	2.000	5.000	0.665	-0.097

Figure 2. Descriptive analysis

Test of the outer model

The outer model, integral to assessing the validity and reliability of measurement scales, underwent a comprehensive evaluation to establish sound psychometric properties. Validation processes were established through both convergent and discriminant validity assessments, drawing on established methods (Hulland, 1999). The results of the final outer model indicate that all the 15 remaining indicators had loadings exceeding the satisfactory level of >0.7 (Figure III) providing evidence for convergent validity (Gerbing and Anderson, 1988). In addition, Average Variance Extracted (AVE), were assessed to ascertain convergent validity. Similarly, the assessment of AVE values exhibited scores well above the

0.50 minimum threshold (Figure IV), signifying that on average, the constructs explained more than half of their respective indicator's variance (Ali *et al.*, 2018; Fornell and Larcker, 1981; Hair *et al.*, 2011).

	Comparability	Complexity	Data Driven Busines...	Observability	Perceive Ease of Use	Perceive Usefulness	Relative Advantage	Triability
CR2	0.958							
CR1	0.953							
CX1		0.936						
CX2		0.873						
DS1			1.000					
O1				0.936				
O2				0.873				
PEOU1					0.903			
PEOU2					0.945			
PU1						0.986		
PU2						0.987		
RA1							0.923	
RA2							0.935	
T1								0.855
T2								0.940

Figure 3. Measurement model

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Comparability	0.905	0.907	0.955	0.913
Complexity	0.784	0.843	0.900	0.819
Data Driven Business Automation	1.000	1.000	1.000	1.000
Observability	0.784	0.842	0.900	0.819
Perceive Ease of Use	0.833	0.878	0.922	0.855
Perceive Usefulness	0.973	0.974	0.987	0.974
Relative Advantage	0.842	0.846	0.927	0.863
Triability	0.771	0.868	0.893	0.807

Figure 4. Construct validity and realibility

The assessment of discriminant validity was meticulously conducted through the PLS Algorithm, using The Fornell-Larcker method (Figure V). The analysis Fornell-Larcker criterion demonstrated that the square roots of AVE values for each variable were consistently higher than their respective correlations with other latent variables, reaffirming the measures' discriminant validity (Hair *et al.*, 2011; Henseler *et al.*, 2009).

	Comparability	Complexity	Data Driven Bu...	Observability	Perceive Ease ...	Perceive Usefu...	Relative Advan...	Triabilit
Comparability	0.956							
Complexity	-0.269	0.905						
Data Driven Bu...	0.446	-0.100	1.000					
Observability	0.290	0.064	0.394	0.905				
Perceive Ease o...	0.573	-0.128	0.600	0.345	0.925			
Perceive Useful...	0.654	-0.235	0.616	0.283	0.712	0.987		
Relative Advan...	0.777	-0.243	0.481	0.252	0.535	0.670	0.929	
Triability	0.652	-0.162	0.504	0.395	0.601	0.631	0.606	0.89

Figure 5. Fornell-larcker criterion (discriminant validity)

The reliability of the scales was examined through average variance extracted (AVE), composite reliability (CR), and Cronbach's Alpha (Chin, 1998; Fornell and Larcker, 1981; Hair *et al.*, 2016). The results (Figure III) showed that for all the measured constructs, all AVEs were greater than 0.5, and the estimates of CR and Cronbach's Alpha were greater than 0.7 (Fornell and Larcker, 1981), thus indicating reliability.

Test of the inner model

Following the validation of the outer model, the subsequent stage of the analysis involved evaluating the significance of the inner path structural model. This phase aimed to illuminate the connections between the latent constructs under investigation (Hair *et al.*, 2014). Building on the established reliability and validity, the assessment criteria for PLS-SEM outcomes encompassed path coefficient significance, R^2 values, effect sizes (f^2), and predictive relevance (Q^2) (Hair *et al.*, 2014).

	Original Sample (O)	Sample Mean (M)	Standard Deviation ...	T Statistics ...	P Values
Comparability -> Perceive Ease of Use	0.219	0.256	0.194	1.126	0.261
Comparability -> Perceive Usefulness	0.186	0.204	0.144	1.292	0.197
Complexity -> Perceive Ease of Use	0.010	0.016	0.074	0.140	0.888
Complexity -> Perceive Usefulness	-0.061	-0.060	0.060	1.018	0.309
Observability -> Perceive Ease of Use	0.115	0.114	0.096	1.192	0.234
Observability -> Perceive Usefulness	0.037	0.037	0.073	0.507	0.612
Perceive Ease of Use -> Data Driven Business Automation	0.326	0.332	0.125	2.613	0.009
Perceive Usefulness -> Data Driven Business Automation	0.384	0.377	0.103	3.743	0.000
Relative Advantage -> Perceive Ease of Use	0.138	0.104	0.158	0.874	0.383
Relative Advantage -> Perceive Usefulness	0.328	0.315	0.120	2.724	0.007
Triability -> Perceive Ease of Use	0.332	0.326	0.109	3.037	0.003
Triability -> Perceive Usefulness	0.286	0.281	0.104	2.742	0.006

Figure 6. Hypothesis testing outcomes

The study's results unveiled complex interconnections among various variables, as demonstrated in Figure VI. 4. The envisioned model underwent estimation through bootstrapping using 5,000 subsamples, and only 5 hypotheses received support. Specifically, Trialability displayed a favourable impact on both Perceived Usefulness (PU) (β (Original sample/path coefficient) = .332, p (p value/significant) < 0.003) and Perceived Ease of Use (PEOU) (β = .286, p < 0.006). Additionally, Relative advantage had a constructive impact on PU but not on PEOU, with β = .328, p < 0.007. Both PU and PEOU were both significantly related to attitude, with β = .384, p < 0.000, and β = .326, p < 0.009, respectively. Therefore, only Hypotheses 1,7,8, 11 and 12 is supported.

	R Square	R Square Adjusted
Data Driven Bu...	0.432	0.421
Perceive Ease o...	0.437	0.408
Perceive Useful...	0.547	0.524

Figure 7. R^2 value

	Comparability	Complexity	Data Driven Bu...	Observability	Perceive Ease ...	Perceive Usefu...	Relative Advan...	Triability
Comparability					0.029	0.026		
Complexity					0.000	0.007		
Data Driven Bu...								
Observability					0.019	0.002		
Perceive Ease o...			0.092					
Perceive Useful...			0.128					
Relative Advan...					0.013	0.090		
Triability					0.099	0.091		

Figure 8. f^2 value

Since the goal of PLS-PM is to predict key target constructs, it is important to assess the structural model by evaluating the coefficient of determination (R^2 value) (Hair *et al.*, 2016). After evaluation of R2 values, effect size (f^2) of different exogenous constructs on endogenous latent variable is examined. As illustrated in Figure VII the R^2 values for all endogenous variables surpassed the .26 values suggested by Cohen

(1988), indicating reliable predictive power of the model. However, effect sizes (f^2) as indicated on Figure VIII indicated that exogenous constructs like complexity and observability had small effect sizes on PU and PEOU and relative advantage small effect sizes on PEOU. These findings indicated that these constructs had a significant but small influence on the intention to adopt Data-driven Business Process Automation in the context of digitization and sustainability. However, exogenous constructs have large influence on the intention to adopt Data-driven Business Process Automation.

	SSO	SSE	Q^2 (=1-SSE/SSO)
Comparability	208.000	208.000	
Complexity	208.000	208.000	
Data Driven Business Automation	104.000	61.247	0.411
Observability	208.000	208.000	
Perceive Ease of Use	208.000	142.914	0.313
Perceive Usefulness	208.000	103.544	0.502
Relative Advantage	208.000	208.000	
Triability	208.000	208.000	

Figure 9. Q2 value

To further assess the predictive validity of the model, the blindfolding procedure was employed to generate cross-validated redundancy measure Q2 (Stone-Geisser test) (Hair *et al.*, 2014). The assessment of predictive relevance employed blindfolding, yielding Q2 values for PEOU (0.313), PU (0.502), and the intention to adopt Data-driven Business Process Automation (0.411) that were all above zero, affirming the model's predictive relevance (Figure IX). The results demonstrated that all Q2 values were significantly above zero, reinforcing the predictive ability of the hypothesized theoretical model and providing strong evidence in favour of its predictive validity.

CONCLUSION

The key findings and implications revolve around the perceived advantages and ease of use of Business Process Automation (BPA) within the context of sustainable development reporting. Specifically, the study suggests that when individuals perceive a relative advantage in using BPA, they are more likely to view it as useful for their tasks. However, this perceived relative advantage does not necessarily translate into a perception of ease of use for BPA.

In addition, the study emphasizes the importance of trialability in fostering positive perceptions of BPA. The ability for individuals to experiment with BPA before full adoption positively influences their perceptions of its usefulness and ease of use. This highlights the significance of hands-on experience in shaping perceptions of innovative technologies like BPA.

Furthermore, the research indicates that the compatibility of BPA with existing practices and its complexity do not significantly influence perceptions of its usefulness or ease of use in the context of sustainable development reporting. This suggests that these factors might have a limited impact on individuals' decision-making regarding BPA adoption.

The study also explores the concept of observability, indicating that the visibility of benefits from BPA use and observing others using it may not strongly influence individuals' perceptions of its usefulness or ease of use. This finding suggests that social influence and observable benefits might not be primary drivers of BPA adoption in the context of sustainable development reporting.

Overall, this study contributes valuable insights into the integration of BPA in sustainable development reporting practices. By considering factors such as trialability, perceived advantages, and ease of use, organizations can strategically implement BPA to enhance data accuracy, efficiency, and decision-making processes. This integrated approach, informed by the Innovation Diffusion Theory

(IDT) and the Technology Acceptance Model (TAM), offers a comprehensive framework for promoting the effective adoption of BPA within the realm of sustainable development reporting, ultimately contributing to the broader goals of sustainability and environmental performance.

Theoretical implication

The research investigating the integration of Business Process Automation (BPA) in sustainable development reporting yields significant theoretical implications that underscore the multifaceted nature of technology adoption within the context of sustainability. By leveraging the amalgamation of the Innovation Diffusion Theory (IDT) and the Technology Acceptance Model (TAM), the study enhances our theoretical understanding of how organizations navigate the complexities of adopting BPA for sustainable development practices.

The integration of IDT and TAM provides a comprehensive lens through which to analyse the adoption of BPA, extending beyond conventional technology adoption models to encompass the specific challenges and dynamics of sustainability reporting. This unique theoretical framework allows for a nuanced exploration of factors influencing the adoption of BPA within the realm of sustainable development, illuminating the interplay between perceived characteristics of the technology and individual attitudes towards its adoption.

The study's findings reveal the pivotal role of trialability in driving the successful integration of BPA for sustainable development reporting. The theoretical implications drawn from the research highlight trialability as a crucial mechanism that bridges the intention-action gap by enabling organizations to experiment, assess outcomes, and refine their approaches. This aligns with the broader implications of trialability observed in other contexts, where it empowers users and organizations to navigate uncertainty and complexity inherent in adopting novel technologies.

Furthermore, the integration of BPA in sustainable development reporting presents a unique challenge of aligning technological advancement with environmentally responsible practices. The theoretical implications extend to how trialability can be harnessed as a strategic tool to mitigate perceived risks and uncertainties associated with the integration of advanced technologies in sustainability initiatives. This aligns with findings from other research areas, where trialability interacts with factors such as perceived risk and satisfaction to shape adoption outcomes (Essel, (2022); Pobee, (2022)).

Trialability, when interacting with factors such as perceived risk and satisfaction, shapes technology adoption outcomes in a nuanced manner. Perceived risk, representing individuals' concerns about negative consequences associated with adopting a new technology, is often prominent in complex contexts like Business Process Automation (BPA) for sustainability initiatives. In such cases, trialability offers a practical solution by allowing individuals and organizations to experiment with the technology before committing fully. This interaction between trialability and perceived risk is transformative – trialability offers a controlled environment for users to experience the technology's benefits and drawbacks firsthand, leading to risk mitigation and increased confidence in adoption decisions.

Concurrently, user satisfaction with a technology significantly influences adoption choices. When trialability is introduced into the equation, it provides a mechanism for users to engage directly with the technology's functionalities. This hands-on experience enables them to assess its performance, fit, and alignment with their needs. Positive trial experiences foster higher satisfaction levels as users witness tangible benefits during the trial period. This positive correlation between trialability, trial experience, and satisfaction strengthens the case for technology adoption. Users who experience successful trials are more likely to envision the technology's potential to improve their processes and outcomes, leading to greater satisfaction and, subsequently, higher adoption intentions.

The interplay between trialability, perceived risk, and satisfaction is reciprocal and synergistic. As users engage in trials, they actively confront and address perceived risks, leveraging the opportunity to validate the technology's benefits. This hands-on experience leads to enhanced satisfaction, as users witness the technology's impact on their specific context. Simultaneously, increased satisfaction lowers perceived risk, contributing to a cycle of positive reinforcement. This cycle effectively navigates the decision-making process, as users move from initial trial stages to higher confidence and readiness for adoption.

Practical implications

Organizations seeking to enhance their sustainable development reporting processes can strategically leverage the concept of trialability to maximize the benefits of integrating automation technologies like RPA, IPA, and ERPSs. The positive relationship between Relative Advantage (RA) and Perceived Usefulness (PU) emphasizes the potential advantages of these technologies in improving data accuracy, efficiency, and decision-making, aligning with the principles of sustainable development reporting. By highlighting these advantages, organizations can foster greater acceptance among stakeholders, emphasizing how the adoption of automation technologies can contribute to their sustainability goals.

Addressing the Perceived Ease of Use (PEOU) of automation technologies is pivotal in sustainable development reporting. When implementing RPA and IPA solutions, organizations should prioritize user-friendly interfaces and intuitive processes. This ensures that users have a positive experience with the technologies, leading to improved Perceived Usefulness and driving adoption for sustainable development reporting tasks. The positive relationship between PU and PEOU, and their connection to Data-Driven Business Process Automation, further underscores the significance of automation in enhancing the quality and insights of sustainable development reports. Automation not only facilitates real-time data generation but also empowers organizations to make informed decisions and promptly respond to sustainability challenges.

Strategic implementation of Business Process Automation in the context of sustainable development reporting aligns these technologies with the organization's overarching sustainability goals. This integration ensures the creation of comprehensive and accurate sustainability reports, effectively showcasing an organization's progress and commitment to sustainable practices. Incorporating Enterprise Resource Planning Systems as central platforms further streamlines the integration process, contributing to the effectiveness of sustainable development reporting practices.

The benefits identified from the integration of AI and ML technologies reinforce the importance of trialability in driving acceptance and adoption. By adapting these technologies, organizations can extract deeper insights, forecast trends, and proactively address sustainability challenges. The adaptability of AI and machine learning aligns well with the concept of Relative Advantage, emphasizing that the adoption of these technologies can bring tangible benefits to both sustainable development reporting and broader organizational operations.

The connection between trialability and the integration of automation technologies in sustainable development reporting underscores the importance of strategic adoption. By emphasizing Relative Advantage, user-friendliness, and their positive impact on Perceived Usefulness and Perceived Ease of Use, organizations can effectively drive the adoption of RPA, IPA, ERPSs, AI, and ML technologies. These technologies collectively contribute to enhanced data analysis, decision-making, and the overall effectiveness of sustainable development reporting efforts, thereby promoting a more sustainable future.

Also, to fully realize the potential benefits outlined in the research findings, companies must also consider several additional factors. User training and support play a pivotal role in ensuring the successful adoption of automation technologies like RPA, IPA, and ERPSs. Providing comprehensive training programs and ongoing support empowers users to navigate these systems effectively, enhancing their perceived ease of use and overall acceptance. Customizability is another crucial aspect, allowing organizations to tailor automation solutions to their specific sustainable development reporting needs. The ability to customize the technology to match existing workflows and reporting requirements contributes to a seamless integration process and positively influences perceived usefulness.

Usability testing stands as an essential step in the adoption journey, involving real users to assess the user-friendliness of automation interfaces and processes. Insights gained from usability testing inform refinements that directly impact the perceived ease of use, ensuring that the technologies align with user expectations. Pilot project success is another critical consideration. Conducting pilot projects enables organizations to validate the technologies' efficacy in a controlled environment before full-scale implementation. Demonstrating successful pilot projects not only instills confidence in the technology but also garners support from key stakeholders.

Time-limited trials can act as effective strategies to encourage trialability and adoption. By offering users the opportunity to experience the benefits of automation within a limited timeframe, companies can demonstrate the technologies' value, influencing positive perceptions and adoption decisions. Additionally, involving end-users throughout the planning, design, and implementation phases enhances user engagement and ownership. Engaged users are more likely to champion the technology's adoption and contribute to its effective use.

The role of regulators in fostering the integration of automation technologies in sustainable development reporting is crucial. Regulatory sandboxes provide a controlled environment where organizations can test and experiment with new technologies, including RPA, IPA, and ERPSs, without facing the full burden of regulatory constraints. These sandboxes facilitate trialability by allowing companies to assess the technologies' viability and benefits within a supportive framework. Knowledge sharing platforms established by regulators can disseminate best practices, success stories, and lessons learned from pilot programs. This sharing of insights encourages cross-industry collaboration and accelerates the adoption curve.

To further accelerate adoption, regulators can facilitate pilot programs that encourage organizations to develop proof of concept (PoC) projects using new technologies. These PoC projects demonstrate the potential benefits of automation technologies and build confidence for broader trials and implementation. This support from regulatory bodies helps alleviate concerns related to potential risks and uncertainties. Outdated regulations can indeed hinder trialability and innovation by imposing unnecessary barriers. Regulators can play a proactive role by modernizing regulations to align with the evolving technological landscape, thereby enabling organizations to explore automation opportunities.

Moreover, regulatory encouragement for organizations to participate in time-limited trials can promote a culture of experimentation and innovation. By actively endorsing the use of automation technologies in sustainable development reporting, regulators signal their commitment to advancing environmental, social, and governance initiatives. This, in turn, encourages organizations to embark on technology-driven transformation journeys, leveraging the potential benefits for both sustainability goals and business operations.

Limitations and future research

This study, while offering valuable insights, is not without its limitations, which provide avenues for future research to enhance the breadth and depth of understanding. It's essential to begin by recognizing the potential constraint of limited contextual understanding that is intrinsic to the research's specific focus, which, in this instance, centers around the banking industry. The examination of Business Process Automation (BPA) and its integration into sustainable development reporting is situated within the context of the banking sector. However, this industry-specific lens could potentially constrain the generalizability of the findings to broader domains.

To move beyond these limitations and foster a more robust theoretical foundation, there is a notable opportunity for further exploration in diverse industries, cultures, and organizational settings. While the banking industry served as a pertinent context for the current study, it represents just one facet of the vast landscape of business sectors. Inclusion of industries ranging from manufacturing to healthcare, technology, and beyond, can provide a richer understanding of how the integrated framework manifests and influences technology adoption dynamics in distinct ways.

Cultural variation represents a critical factor that may wield significant influence over the effectiveness of the integrated theoretical framework, especially given that this research is conducted within the context of Indonesia. As cultures possess distinct attitudes, beliefs, and social norms that shape individuals' perceptions and behaviors, it is evident that the findings of this study might be influenced by the specific cultural context in which it was conducted. However, the application of the integrated framework's insights should not be confined solely to the Indonesian context; rather, its broader implications warrant exploration in diverse cultural landscapes.

Recognizing the potential implications of cultural variation, there emerges a compelling need for cross-cultural studies that transcend national boundaries. Such studies are essential to illuminate the interplay between cultural factors and technology adoption behaviors, providing a comprehensive understanding of how the integrated theoretical framework holds relevance across different cultural contexts.

Cultural factors wield a significant impact on technology adoption dynamics. Attitudes toward innovation, beliefs about the role of technology, and societal norms surrounding change all contribute to the intricate tapestry of technology adoption behaviors. Engaging in cross-cultural studies can offer profound insights into how these cultural factors interact with the integrated framework's components—such as relative advantage, compatibility, and observability—across various cultural settings.

These cross-cultural studies can adopt a comparative approach, assessing the applicability and effectiveness of the integrated framework across diverse cultures. By investigating the extent to which the framework aligns with adoption patterns, these studies can uncover cultural nuances that either amplify or modify the framework's influence on technology adoption. Through these investigations, researchers can pinpoint specific cultural elements that interact with each framework component, shaping its impact on individuals' perceptions and adoption decisions.

Furthermore, organizational contexts vary significantly in terms of size, structure, and operational dynamics. By extending the exploration beyond a specific industry, researchers can assess how the integrated framework operates in organizations with different organizational cultures, hierarchies, and operational requirements. This extension can illuminate how factors such as leadership styles and change management strategies interact with the integrated framework to influence the adoption outcomes.

Another notable limitation that deserves attention in this study concerns the temporal dynamics captured within the research framework. The study's focus on technology adoption may have provided a snapshot of perceptions and attitudes within a specific timeframe. However, technology adoption is a dynamic process influenced by a multitude of factors that evolve over time. To gain a more comprehensive understanding of the intricate nuances of Business Process Automation (BPA) adoption dynamics, it becomes apparent that a more extended temporal perspective is required.

Addressing this limitation necessitates the implementation of longitudinal studies, which involve tracking the adoption and diffusion of BPA over an extended period. By observing the evolution of adoption patterns, researchers can gain insights into how perceptions, attitudes, and even behaviors shift as organizations accumulate experience and familiarity with the technology. These longitudinal insights can shed light on the trajectory of adoption, allowing researchers to identify critical junctures where shifts in perceptions or challenges arise.

In the context of sustainable development reporting, this longitudinal approach offers a vantage point to examine the long-term impacts of BPA adoption on reporting practices. As organizations integrate BPA into their reporting processes, researchers can investigate how the technology's utilization affects data accuracy, reporting efficiency, and overall environmental performance over time. This extended observation can provide valuable insights into the sustained benefits of BPA integration as well as any potential challenges that emerge after the initial adoption phase.

Furthermore, the temporal perspective offered by longitudinal studies is particularly pertinent in the realm of technological innovation. As BPA evolves and becomes more established, its benefits and drawbacks might become more evident. This extended observation can uncover how perceptions of BPA's relative advantage, compatibility, and other factors may shift in response to the changing landscape of technology and its applications.

Our findings also have great potential to further enrich the understanding of technology adoption within the context of Business Process Automation (BPA). Expanding the scope of investigation to incorporate variables such as leadership, change management strategies, and infrastructure readiness can offer valuable insights into the intricacies of BPA implementation success. These variables can serve as moderating factors that shape how BPA adoption unfolds within organizations. Moreover, in order to enhance the depth of understanding and solidify the applicability of the integrated Innovation Diffusion Theory (IDT) and Technology Acceptance Model (TAM) framework, a rigorous comparative evaluation is strongly warranted. Beyond the scope of this study, a comparative assessment of the integrated framework against other established models employed in explaining technology adoption can provide

valuable insights into the strengths and limitations of each model. This approach could aims to elucidate which theoretical framework presents the most comprehensive and accurate insights within distinct contextual domains.

REFERENCES

Agarwal, R. and Prasad, J. (1997), "The role of innovation characteristics and perceived voluntariness in the acceptance of information technologies", *Decision Sciences*, Vol. 28 No. 3, pp. 557-582.

Agarwal, R. and Prasad, J. (1998), "A conceptual and operational definition of personal innovativeness in the domain of information technology", *Information Systems Research*, Vol. 9 No. 2, pp. 204-215.

Akkem, Y., Biswas, S.K., and Varanasi, A. (2023), "Smart farming using artificial intelligence: A review. Engineering Applications of Artificial Intelligence", Vol. 120, p. 105899.

Ali, F., Rasoolimanesh, S. M., Sarstedt, M., Ringle, C. M., and Ryu, K. (2018), "An assessment of the use of partial least squares structural equation modelling (PLS-SEM) in hospitality research", *International Journal of Contemporary Hospitality Management*, Vol. 30 No. 1, pp. 514-538.

Al-Jabri, I. and Sohail, M. S. (2012), "Mobile banking adoption: Application of diffusion of innovation theory".

Al-Okaily, M. (2021), "Assessing the effectiveness of accounting information systems in the era of COVID-19 pandemic", *VINE Journal of Information and Knowledge Management Systems*, Vol. 10.

Alshamaila, Y., Papagiannidis, S., and Li, F. (2013), "Cloud computing adoption by SMEs in the northeast of England: a multi-perspective framework", *Journal of Enterprise Information Management*, Vol. 26 No. 3, pp. 250-275.

Antony, J., Sony, M., McDermott, O., Furterer, S., and Pepper, M. (2023), "How does performance vary between early and late adopters of Industry 4.0? A qualitative viewpoint", *International Journal of Quality and Reliability Management*, Vol. 40, pp. 1–24.

Anuar, M.M., Adam, F., and Mohamad, Z. (2012), "Muslim consumers' perception on internet banking services", *International Journal of Business and Social Science*, Vol. 3 No. 5, pp. 63-71.

Asiaei, A. and Rahim, N.Z. (2019), "A multifaceted framework for adoption of cloud computing in Malaysian SMEs", *Journal of Science and Technology Policy Management*, Vol. 10 No. 3, pp. 708-750.

Bianchi, C., de Gennaro, G., Romano, M., Battini, L., Aragona, M., Corfini, M., Del Prato, S., and Bertolotto, A. (2019), "Early vs. standard screening and treatment of gestational diabetes in high-risk women—An attempt to determine relative advantages and disadvantages", *Nutrition, Metabolism, and Cardiovascular Diseases*, Vol. 29, pp. 598–603.

Bin, G. (2013), "A reasoned action perspective of user innovation: model and empirical test", *Industrial Marketing Management*, Vol. 42 No. 4, pp. 608-619.

Bongers, I., Stikkelbroek, Y., and Bachrach, N. (2022), "Alarming Situation Amongst Mental Health Care Employees; Mental Health Issues with Possible Resignation as a Consequence", *TSG, Available online*: https://europepmc.org/article/med/35789616

Burritt, R. and Christ, K. (2016), "Industry 4.0 and environmental accounting: A new revolution? Asian Journal of Sustainability and Social Responsibility", Vol. 1, pp. 23–38.

Carayannis, E.G. and Turner, E. (2006), "Innovation diffusion and technology acceptance: the case of PKI technology", *Technovation,* Vol. 26 No. 7, pp. 847-855.

Carter, L. and Bélanger, F. (2005), "The utilization of e-government services: Citizen trust, innovation and acceptance factors", *Information Systems Journal*, Vol. 15 No. 1, pp. 5-25.

Chen, J.V., Yen, D.C., and Chen, K. (2009), "The acceptance and diffusion of the innovative smart phone

use: a case study of a delivery service company in logistics", *Information and Management*, Vol. 46 No. 4, pp. 241-248.

Chin, W. W. (1998), "The partial least squares approach to structural equation modelling", *Modern Methods for Business Research*, Vol. 295 No. 2, pp. 295–336.

Chin, W. W. and Newsted, P. R. (1999), "Structural equation modeling analysis with small samples using partial least squares, statistical strategies for small sample research". *Thousand Oaks, CA: Sage Public*.

Chin, W. W. and Todd, P. A. (1995), "On the use, usefulness, and ease of use of structural equation modeling in MIS research: A note of caution", *MIS Quarterly*, Vol. 19 No. 2, pp. 237–246.

Cillo, V., Messeni Petruzzelli, A., Ardito, L., and Del Giudice, M. (2019), "Understanding sustainable innovation: A systematic literature review", *Corporate Social Responsibility and Environmental Management*, Vol. 26 No. 5, pp. 1012-1025. John Wiley & Sons Ltd.

Cohen, J. (1988), "Statistical power analysis for the behavioral sciences". *Hillsdale, NJ: Lawrence Erlbaum Associates*.

Corrigan, J.A. (2012), "The implementation of e-tutoring in secondary schools: a diffusion study", *Computers and Education*.

Dainty, A. R. J., Bagilhole, B. M., and Neale, R. H. (2000), "The compatibility of construction companies' human resource development policies with employee career expectations", *Engineering Construction and Architectural Management*, Vol. 7 No. 2, pp. 169-178. John Wiley & Sons Ltd.

Davis, F. D. (1989), "Perceived usefulness, perceived ease of use, and user acceptance of information technology", *MIS Quarterly*, Vol. 13 No. 3, pp. 319–340.

Dumitru, V.F., Ionescu, B.S., Rîndasu, S.M., Barna, L.E.L., and Crîjman, A.M. (2023), "Implications for Sustainability Accounting and Reporting in the Context of the Automation-Driven Evolution of ERP Systems", *Electronics*, Vol. 12, p. 1819. doi: https://doi.org/10.3390/electronics12081819

Essel, R. E. (2022), "Assessing the Moderating Role of Trialability and Perceived Risk of E-Banking Adoption in an Emerging Economy", *Vision* (New Delhi, India).

Ezeh, P.C. and Nkamnebe, A.D. (2018), "A conceptual framework for the adoption of Islamic banking in a pluralistic-secular nation: Nigerian perspective", *Journal of Islamic Marketing*, Vol. 9 No. 4, pp. 951-964.

Flight, R.L., D'Souza, G., and Allaway, A.W. (2011), "Characteristics-based innovation adoption: scale and model validation", *Journal of Product and Brand Management*, Vol. 20 No. 5, pp. 343-355.

Fornell, C., and Larcker, D. F. (1981), "Evaluating structural equation models with unobservable variables and measurement error", *Journal of Marketing Research*, Vol. 18 No. 1, pp. 39-50.

Fu, J.R., Farn, C.K., and Chao, W.P. (2006), "Acceptance of electronic tax filing: A study of taxpayer intentions", *Information and Management*, Vol. 43 No. 1, pp. 109-126.

Gangwar, H. (2018), "Understanding the determinants of big data adoption in India: an analysis of the manufacturing and services sectors", *Information Resources Management Journal*, Vol. 31 No. 4, pp. 1-22.

Gartner (2020), "Gartner says 80% of supply chain blockchain initiatives will remain at the pilot stage through 2022", Available at: https://www.gartner.com/en/newsroom/press-releases/2020-01-23-gartner-says-80–of-supply-chain-blockchain-initiative

Gerbing, D. W. and Anderson, J. C. (1988), "An updated paradigm for scale development incorporating unidimensionality and its assessment", *Journal of Marketing Research*, Vol. 25 No. 2, pp. 186–192.

Giedraiti, A. and Stašys, R. (2019), "Improvement of teamwork compatibility: The example of an

industrial enterprise", *Forum Sci. Oeconomia*, Vol. 7, pp. 53–66.

Guo, S. and Feng, G. (2012), "Understanding support for internet censorship in China: An elaboration of the theory of reasoned action", *Journal of Chinese Political Science*, Vol. 17 No. 1, pp. 33-52.

Hair, H.G.M., Ringle, C.M., and Sarstedt, M. (2014), "A Primer on Partial Least Squares Structural Equations Modelling (PLS-SEM)", *SAGE Publications*.

Hair, J. F., Hult, G. T. M., Ringle, C., and Sarstedt, M. (2016), "A primer on partial least squares structural equation modelling (PLS-SEM)", *Thousand Oaks, CA: Sage*.

Hair, J. F., Ringle, C. M., and Sarstedt, M. (2011), "PLS-SEM: Indeed a silver bullet", *Journal of Marketing Theory and Practice*, Vol. 19 No. 2, pp. 139-151.

Haji Wahab, M.Z. (2018), "Perception of the Takaful operators' performance towards customers' intention in using medical Takaful card among public sector", *Journal of Islamic Marketing*, Vol. 9 No. 3.

Hald, K.S. and Kinra, A. (2019), "How the blockchain enables and constrains supply chain performance", *International Journal of Physical Distribution and Logistics Management*, Vol. 49 No. 4, pp. 376-397.

Hardgrave, Bill C., Davis, Fred D., and Riemenschneider, Cynthia K. (2003), "Investigating Determinants of Software Developers' Intentions to Follow Methodologies", *Journal of Management Information Systems*, Vol. 20 No. 1, pp. 123-151, DOI: 10.1080/07421222.2003.11045751.

Harindranath, G., Dyerson, R., and Barnes, D. (2008). "ICT adoption and use in UK SMEs: a failure of initiatives?", *Electronic Journal of Information Systems Evaluation*, 11(2), 91-96.

Hartley, J. L., Saway, W., and Dobrzykowski, D. (2022), "Exploring blockchain adoption intentions in the supply chain: perspectives from innovation diffusion and institutional theory", *International Journal of Physical Distribution and Logistics Management*, Vol. 52 No. 2, pp. 190-211.

Hasan, B. (2007), "Examining the effects of computer self-efficacy and system complexity on technology acceptance", *Information Resources Management Journal*, Vol. 20 No. 3, pp. 76–88.

Henseler, J., Ringle, C. M., and Sarstedt, M. (2015), "A new criterion for assessing discriminant validity in variance-based structural equation modelling", *Journal of the Academy of Marketing Science*, Vol. 43 No. 1, pp. 115-135.

Hu, A. and Yin, C. (2021), "The Distinction between the Absolute and Relative Advantages of Cultural Capital: Different Conceptualizations", *Different Consequences. Sociology*, Vol. 55, pp. 803–822.

Hulland, J. (1999), "Use of partial least squares (PLS) in strategic management research: A review of four recent studies", *Strategic Management Journal*, Vol. 20 No. 2, pp. 195–204.

Inan, D. I., Hidayanto, A. N., Juita, R., Lesmono, D. R., Honggo, F., Melissa, M., and Melianti, S. D. (2023), "What Motivates Students to Continue Using Online Collaborative Tools: Post-Acceptance of Information System Approach", *International Journal of Emerging Technologies in Learning (iJET)*, Vol. 18 No. 09, doi: https://doi.org/10.3991/ijet.v18i09.36177

Jamshidi, D. and Kazemi, F. (2020), "Innovation diffusion theory and customers' behavioral intention for Islamic credit card: Implications for awareness and satisfaction", *Journal of Islamic Marketing*, Vol. 11 No. 6, pp. 1245-1275.

Javaid, M., Haleem, A., Singh, R.P., Suman, R., and Gonzalez, E.S. (2022), "Understanding the adoption of Industry 4.0 technologies in improving environmental sustainability", *Sustainable Operations and Computers*, Vol. 3, pp. 203–217.

Jerg-Bretzke, L., Limbrecht-Ecklundt, K., Walter, S., Spohrs, J., and Beschoner, P. (2020), "Correlations of the "work–family conflict" with occupational stress—A cross-sectional study among university employees", *Front. Psychiatry*, Vol. 11, p. 134.

Jilani, M.M.A.K., Moniruzzaman, Dey, M., Alam, E., and Uddin, A. (2022), "Strengthening the Trialability for the Intention to Use of mHealth Apps Amidst Pandemic: A Cross-Sectional Study", *International Journal of Environmental Research and Public Health*, Vol. 19, p. 2752.

Jung, J., Chan-Olmsted, S., Park, B., and Kim, Y. (2011), "Factors affecting e-book reader awareness, interest, and intention to use", *New Media & Society*, Vol. 14 No. 2, pp. 204-224, doi: https://doi.org/10.1177/1461444811410407.

Junnonyang, E. (2021), "Integrating TAM, perceived risk, trust, relative advantage, government support, social influence and user satisfaction as predictors of mobile government adoption behavior in Thailand", *International Journal of E-Business and E-Government Studies*, Vol. 13, pp. 159–178.

Kandil, A.M.N.A., Ragheb, M.A., Ragab, A.A., and Farouk, M. (2018), "Examining the effect of TOE model on cloud computing adoption in Egypt", *The Business and Management Review*, Vol. 9, pp. 113-123.

Khalifa, M. and Ning Shen, K. (2008), "Explaining the adoption of transactional B2C mobile commerce", *Journal of Enterprise Information Management*, Vol. 21 No. 2, pp. 110-124.

Khan, A.J., Ul Hameed, W., Iqbal, J., Shah, A.A., Tariq, M.A.U.R., and Ahmed, S. (2022), "Adoption of Sustainability Innovations and Environmental Opinion Leadership: A Way to Foster Environmental Sustainability through Diffusion of Innovation Theory", *Sustainability*, Vol. 14, p. 14547.

Kim, J. (2016), "An extended technology acceptance model in behavioral intention toward hotel tablet apps with moderating effects of gender and age", *International Journal of Contemporary Hospitality Management*, Vol. 28 No. 8, pp. 1535–1553.

Kim, J. and Nam, C. (2019), "Analyzing continuance intention of recommendation algorithms", *Proceedings of the 30th European Conference of the International Telecommunications Society, Helsinki, Finland*, Available at: https://www.econstor.eu/bitstream/10419/205190/1/Kim-Nam.pdf

Kuruppuge, R. H. and Gregar, A. (2018), "Employees' organizational preferences: A study on family businesses", *Economic and Sociology*, Vol. 11, pp. 255–266.

Lee, Y. H., Hsieh, Y. C., and Hsu, C. N. (2011), "Adding innovation diffusion theory to the technology acceptance model: Supporting employees' intentions to use e-learning systems", *Journal of Educational Technology and Society*, Vol. 14 No. 4, pp. 124–137.

Legris, P., Ingham, J., and Collerette, P. (2003), "Why do people use information technology? A critical review of the technology acceptance model", *Information and Management*, Vol. 40 No. 3, pp. 191–204.

Leung, L.S.K. and Matanda, M.J. (2013), "The impact of basic human needs on the use of retailing self-service technologies: A study of self-determination theory", *Journal of Retailing and Consumer Services*, Vol. 20 No. 6, pp. 549-559.

Liao, P. (2022), "Research on Environmental Accounting Information Disclosure in the Era of Artificial Intelligence", *In Proceedings of the 2022 6th International Seminar on Education, Management and Social Sciences, Chongqing, China*.

Lichtenstein, S. and Williamson, K. (2006), "Understanding consumer adoption of internet banking: An interpretive study in the Australian banking context", *Journal of Electronic Commerce Research*, Vol. 7 No. 2, pp. 50-66.

Lin, A. and Chen, N.C. (2012), "Cloud computing as an innovation: perception, attitude, and adoption", *International Journal of Information Management*, Vol. 32 No. 6.

Manis, K. T. and Choi, D. (2018), "The virtual reality hardware acceptance model (VR-HAM): Extending and individuating the technology acceptance model (TAM) for virtual reality hardware", *Journal of Business Research*, Vol. 100, pp. 503–513.

Marak, Z., Tiwari, A., and Tiwari, S. (2019), "Adoption of 3D printing technology: an Innovation Diffusion Theory perspective", *International Journal of Innovation*, Vol. 7 No. 1, pp. 87-103.

Min, S., So, K. K. F., and Jeong, M. (2019), "Consumer adoption of the Uber mobile application: Insights from diffusion of innovation theory and technology acceptance model", *Journal of Travel and Tourism Marketing*, Vol. 36 No. 7, pp. 770-783.

Moore, G. C. and Benbasat, I. (1991), "Development of an instrument to measure the perceptions of adopting an information technology innovation", *Information Systems Research*, Vol. 2 No. 3, pp. 192-222.

Morosan, C. and DeFranco, A. (2014), "When tradition meets the new technology: An examination of the antecedents of attitudes and intentions to use mobile devices in private clubs", *International Journal of Hospitality Management*, Vol. 42, pp. 126–136.

Morteza, G., Daniel, A. A., and Jose, B. A. (2011), "Adoption of e-commerce applications in SMEs", *Industrial Management Data Systems*, Vol. 111 No. 8, pp. 1238-1269.

Park, Y. and Chen, J. V. (2007), "Embracing and Implementing the Novel Application of Smartphone Technology", *Industrial Management & Data Systems*, Vol. 107 No. 9, pp. 1349–1365.

Pobee, F. (2022), "Non-Probabilistic Approach to e-Banking Adoption: The Moderating Impact of Trialability", *Management and Labour Studies*, Vol. 47 No. 2.

Premkumar, G. and Bhattacherjee, A. (2008), "Explaining information technology usage: A test of competing models", *Omega*, Vol. 36 No. 1, pp. 64–75.

Ringle, C., Wende, S., and Will, A. (2005), "SmartPLS 2.0 v 3 (beta)", Hamburg, Available at: www.smartpls.de

Rogers, E. M. (1995), "Diffusion of innovations", *New York, NY: Free Press.*

Rogers, E. M. (2003), "Diffusion of Innovations", *New York, NY: Free Press.*

Rogers, E. M. and Shoemaker, F. (1983), "Diffusion of innovation: A cross-cultural approach", *New York, NY: Free Press.*

Rosenberg, N. (1982), "Inside the black box: Technology and economics", *Cambridge: Cambridge University Press.*

Sarstedt, M., Ringle, C. M., and Hair, J. F. (2014), "PLS-SEM: Looking back and moving forward", *Long Range Planning*, Vol. 47 No. 3, pp. 132–137.

Sebrina, Nurzi., Taqwa, Salma., Afriyenti, Mayar., and Septiari, Dovi., (2023), "Analysis of sustainability reporting quality and corporate social responsibility on companies listed on the Indonesia stock exchange", *Cogent Business and Management*, Vol. 10 No. 1, p. 2157975.

Setyowati, A. B. (2023), "Governing sustainable finance: insights from Indonesia", *Climate Policy*, Vol. 23 No. 1, pp.108-121.

Shaikh, T.A., Rasool, T., and Lone, F.R. (2022), "Towards leveraging the role of machine learning and artificial intelligence in precision agriculture and smart farming", *Computers and Electronics in Agriculture*, Vol. 198, p. 107119.

Sheikhshoaei, F. and Oloumi, T. (2011), "Utilizing the Technology Acceptance Model for Iranian Engineering Faculty Libraries", *The Electronic Library*, Vol. 29 No. 3, pp. 367–378. doi: 10.1108/02640471111141106

Sheppard, B.H., Hartwick, J., and Warshaw, P.R. (1988), "The theory of reasoned action: A Meta-analysis of past research with recommendations for modifications and future research", *Journal of Consumer Research*, Vol. 15 No. 3, pp. 325-343.

Singh, S. (2020), "An integrated model combining ECM and UTAUT to explain users' post-adoption

behaviour towards mobile payment systems", *Australasian Journal of Information Systems*, Vol. 24, pp. 1–27. Available at: https://journal.acs.org.au/index.php/ajis/article/view/2695

Ska˘ckauskien˙e, I. and Vestert ˙e, J. (2021), "Service modularisation compatibility to organisational objectives", *In Proceedings of the International Scientific Conference Contemporary Issues in Business, Management and Economics Engineering, Vilnius, Lithuania*, 13–14 May.

Spencer, A.J., Buhalis, D., and Moital, M. (2011), "A hierarchical model of technology adoption for small owner-managed travel firms: an organizational decision-making and leadership perspective", *Tourism Management*.

Tamjidyamcholo, A., Bin Baba, M.S., Tamjid, H., and Gholipour, R. (2013), "Information security–professional perceptions of knowledge-sharing intention under self-efficacy, trust, reciprocity, and shared-language", *Computers and Education*.

Tan, K. S., Chong, S. C., Lin, B., and Eze, U. C. (2009), "Internet-based ICT adoption: evidence from Malaysian SMEs", *Industrial Management and Data Systems*, Vol. 109 No. 2, pp. 224-244.

Tchetchik, A., Zvi, L. I., Kaplan, S., and Blass, V. (2020), "The joint effects of driving hedonism and trialability on the choice between internal combustion engine, hybrid, and electric vehicles", *Technological Forecasting and Social Change*, Vol. 151, p. 119815.

Teo, H. H., Tan, B., and Wei, K. K. (1995), "Innovation diffusion theory as a predictor of adoption intention for financial EDI", *ICIS 1995 Proceedings*, Vol. 14.

Tiwari, K., Khan, M.S. (2020), "Sustainability accounting and reporting in the industry 4.0. Journal of Clean Production", Vol. 258, p. 120783.

Tung, F.C., Chang, S.C., and Chou, C.M. (2008), "An extension of trust and TAM model with IDT in the adoption of the electronic logistics information system in HIS in the medical industry", *International Journal of Medical Informatics*, Vol. 77 No. 5, p. 324.

Van der Heijden, H. (2003), "Factors influencing the usage of websites: The case of a generic portal in the Netherlands", *Information and Management*, Vol. 40 No. 6, pp. 541–549.

Van Hoek, R. (2019), "Exploring blockchain implementation in the supply chain: learning from pioneers and RFID research", *International Journal of Operations and Production Management*, Vol. 36 No. 6,7,8, pp. 829-859.

Vanek, M. J. (2019), "Diffusion of innovations theory and work as a social determinant of health", *AEDI Working Paper Series*, Vol. 2019 No. 01.

Vărzaru, A.A. (Year), "An Empirical Framework for Assessment of the Effects of Digital Technologies on Sustainability Accounting and Reporting in the European Union".

Venkatesh, V., Thong, J.Y., Chan, F.K., Hu, P.J.H., and Brown, S.A. (2011), "Extending the two-stage information systems continuance model: incorporating UTAUT predictors and the role of context", *Information Systems Journal*, Vol. 21 No. 6, pp. 527-555.

Wang, Y. S., Wu, S. C., Lin, H. H., Wang, Y. M., and He, T. R. (2012), "Determinants of user adoption of web "Automatic Teller Machines": An integrated model of 'Transaction Cost Theory' and 'Innovation Diffusion Theory'", *The Service Industries Journal*, Vol. 32 No. 9, pp. 1505–1525.

Wu, L., Gao, Y., and Mattila, A. S. (2017), "The impact of fellow consumers' presence, appeal type, and action observability on consumers' donation behaviors", *Cornell Hospitality Quarterly*, Vol. 58 No. 2, pp. 203-213.

Yang, K. C. C. (2005), "Exploring factors affecting the adoption of mobile commerce in Singapore", *Telematics and Informatics*, Vol. 22 No. 3, pp. 257–277.

Yoon, H. (2016), "User acceptance of mobile library applications in academic libraries: An application of the technology acceptance model", *The Journal of Academic Librarianship*, Vol. 42 No. 6, pp. 687–

693.

Zeng, H. J., Xu, X., Li, Y., and Duan, W. (2018), "Influence of moderating factors on technology acceptance model: Cloud computing services in universities", *Computers in Human Behavior*, Vol. 87, pp. 134–142.

Ziaee Mashhadi, A. H., Emadzadeh, A., & Hosseini, M. (2019), "Assessing the compatibility of the Radiology Technology Curriculum with Professional Requirements: Viewpoints of Radiology Technology Employee in Mashhad University of Medical Sciences", *Future Med. Educ. J.*, Vol. 9, pp. 44–50.

Abeng, M. O. (2016). Analysis of the effect of oil price shock on industry stock return in Nigeria. EcoMod 2016.

Adaramola, A. O. (2012). Oil price shocks and stock market behaviour: The Nigerian experience. *Journal of Economics*, *3*(1), 19–24.

Ajala, K., Sakanko, M. A., & Adeniji, S. O. (2021). The asymmetric effect of oil price on the exchange rate and stock price in Nigeria. *International Journal of Energy Economics and Policy*, *11*(4), 202–208. https://doi.org/10.32479/ijeep.10977

Akaike, H. (1998). A new look at the statistical model identification. In E. Parzen, K. Tanabe, & G. Kitagawa (Eds.), *Selected Papers of Hirotugu Akaike* (Springer S, pp. 215–222). New York,: Springer.

Bastianin, A., Conti, F., & Manera, M. (2016). The impacts of oil price shocks on stock market volatility: Evidence from the G7 countries. *Energy Policy*, *98*, 160–169. https://doi.org/10.1016/j.enpol.2016.08.020

Caporale, G. M., Menla Ali, F., & Spagnolo, N. (2015). Oil price uncertainty and sectoral stock returns in China: A time-varying approach. *China Economic Review*, *34*, 311–321. https://doi.org/10.1016/j.chieco.2014.09.008

Degiannakis, S., Filis, G., & Kizys, R. (2014). The effects of oil price shocks on stock market volatility: Evidence from European data. *The Energy Journal*, *35*(1), 35–56.

Ebechidi, S., & Nduka, E. K. (2017). Modeling the impact of oil price shocks on energy sector stock returns: Evidence from Nigeria. *Economics Bulletin*, *37*(4), 2574–2584.

Hamilton, J. D. (2009). Understanding crude oil prices. *The Energy Journal*, *30*(2), 179–206.

Kang, W., Ratti, R. A., & Yoon, K. H. (2015). The impact of oil price shocks on the stock market return and volatility relationship. *Journal of International Financial Markets, Institutions and Money*, *34*, 41–54. https://doi.org/10.1016/j.intfin.2014.11.002

Obi, B., Oluseyi, A. S., & Evans, O. (2018). Impact of oil price shocks on stock market prices volatility in Nigeria: New evidence from a non-linear ARDL cointegration. *Journal of Global Economy*, *14*(3), 173–190.

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, *16*(3), 289–326. https://doi.org/10.1002/jae.616

Pho, K. H., Ly, S., Ly, S., & Lukusa, T. M. (2019). Comparison among Akaike information criterion, Bayesian information criterion and Vuong's test in model selection: A case study of violated speed regulation in Taiwan. *Journal of Advanced Engineering and Computation*, *3*(1), 293–303. https://doi.org/10.25073/jaec.201931.220

Ross, S. A., Friend, I., & Bicksler, J. L. (1977). *Risk and return in finance*. Cambridge, MA.: Ballinger Publishers.

Salisu, A. A., Raheem, I. D., & Ndako, U. B. (2017). *A sectoral analysis of asymmetric nexus between oil and stock* (Working Papers No. 033). https://doi.org/10.13140/RG.2.2.26744.96008

Uzo-Peters, A., Laniran, T., & Adenikinju, A. (2018). Brent prices and oil stock behaviors: Evidence from Nigerian listed oil stocks. *Financial Innovation*, *4*(1), 8. https://doi.org/10.1186/s40854-018-0092-2