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Impact of Organisational Factors on the Circular Economy Practices and Sustainable Performance of Small and Medium-sized Enterprises in Vietnam

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ABSTRACT

Internal organisational factors have been identified as barriers to adopt circular economy (CE) practices in prior research. However, empirical evidence is limited to support this claim. Additionally, their impact on sustainable business performance, especially for the emerging economies and within the small and medium sized enterprises (SMEs) have not been studied adequately. This research bridges these knowledge gaps drawing on from CE, human resource management, innovation and sustainability literature to develop and validate a theoretical model that examines the relationships between organisational factors (leadership, innovation, culture, and skills) and their impact on adopting CE practices to enhance sustainable performance of SMEs. A survey was conducted among 205 SMEs' employees in Vietnam, and responses were analysed using employing Structural Equation Modelling. Our findings reveal that organisational leadership will facilitate developing the culture and innovation capability to adopt CE practices through a 'hub and spoke' strategy for enhancing sustainable performance among the SMEs in Vietnam. In this vein, we recommend creating knowledge sharing strategies, collaborative and cooperative CE working groups within and between SMEs, and information systems capabilities to build sustainable business organisations.

1. Introduction

The Circular economy (CE) concept is restorative and regenerative through advocating reduce-reuse-recycle of materials, compared to the traditional linear 'take, make, dispose' model, which uses vast quantities of non-renewable resources (Dey et al., 2022; García-Quevedo, Jové-Llopis, & Martínez-Ros, 2020; Mangla et al., 2018; Saha, Dey, & Papagiannaki, 2020; Schroeder, Anggraeni, & Weber, 2019). The existing business and management literature has discussed CE practices as a combination of lean practices (which emphasises on achieving resource efficiency through responsible consumption of materials and waste reduction), and sustainable oriented innovation (focuses on optimising business processes to achieve economic benefits) and sustainable practices (reduce, reuse and recycle philosophy to increase environmental performance by reducing greenhouse gas emissions and social performance through the creation of new jobs) (Dey et al., 2019b; 2020). According to World Economic Forum PACE report, CE adoption will lead to GDP growth by 0.8–7%, adding 0.2–3% more jobs and reduce carbon emissions by 8–70%, therefore, resulting into economic growth and business productivity in the developing economy [SDG8] (WEF, 2017).

Many large organisations have launched sustainability and low-carbon initiatives. However these are still uncommon in SMEs plagued by resource and financial constraints (Dey et al., 2019a, 2019b; 2020). In the last few years, academic literature has turned its focus towards understanding the drivers and barriers for adopting CE in the SMEs, because these organisations make up around 90% of the world

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businesses, employing 50–60% of the world population, and significantly contributing up to 70% of global pollution collectively (Bonner, 2019). CE adoption is being increasingly studied in the operations management literature to help reduce GHG emissions resulting from business processes and practices, and advocate green operational strategies (Bhatia, Jakhar, Mangla, & Gangwani, 2020). Although, the adoption and implementation of CE has been widely studied in developed economies such as UK (Dey at al., 2019b; Dey at al., 2020), USA (Lonca, Lesage, Majeau-Bettez, Bernard, & Margni, 2020; Vunnava & Singh, 2021), Australia (Payne, Nay, & Maguire, 2021; Halog, Balanay, Anieke, & Yu, 2021), European countries (Leipold, Weldner, & Hohl, 2021; Mazur-Wierzbicka, 2021; Dey et al., 2022), China (Pesce et al., 2020; Kuo & Chang, 2021), and few developing economies such as Mexico (Rodríguez-Espíndola et al., 2022), and India (De, Chowdhury, Dey, & Ghosh, 2020), empirical research for factors impacting CE adoption in emerging (low and middle-income) economies (Tura et al., 2019) are still scant.

With an annual GDP growth rate of 7% in recent years, Vietnam is among the world's fastest growing middle-income developing economies (Hai et al., 2020). According to the Vietnamese General Statistics Office, SMEs represented more than 97% of the total enterprises in 2020, creating livelihood for 60% of the Vietnamese workforce in sectors such as trading, repair of motor vehicles and household goods, manufacturing (especially food and beverage sector), and construction (Nguyen et al., 2020; Dinh & Nguyen, 2018). However, sustainable growth within these enterprises in Vietnam is curtailed by environmental degradation, plastic waste, depletion of natural resources and high carbon emissions (VN, 2020). In that context, a shift to CE has been acknowledged by both Vietnamese stakeholders and governmental policy makers as a way to overcome the limitations of the traditional linear economic model (CEV, 2018). Different initiatives and reforms (e.g., introducing carbon pricing tools to reduce greenhouse gas emissions, carbon tax for businesses and economic incentives for low carbon businesses) have thus been made by the Vietnamese government to minimize the resource utilization and emissions (VNT, 2019). Irrespective of the government initiatives, carbon emissions are growing faster in Vietnam compared to any other country in the region (South East Asia), and according to the MIT green future index Vietnam is ranked 70th out of 78 countries for GHGs emissions (Green, 2021).

1.1. Research problem and questions

The existing literature (Grafström & Aasma, 2021; Jaeger & Upadhyay, 2020) and recent research reviews (Kumar, Singh, & Kumar, 2021; Agyemang et al., 2019; Govindan & Hasanagic, 2018; Mangla et al., 2018) have identified several barriers inhibiting the adoption of CE within business organisations: financial constraints, lack of reliable information and business cases, lack of awareness among businesses and consumers, skills-gap pertaining to green strategy and management, technology adoption, lack of coordination between the stakeholders and beneficiaries when new laws promoting CE adoption are passed, lack of awareness and support from senior management and lack of coherent strategy to adopt innovative and eco-friendly practices within the business operations. Internal factors within the organisations such as leadership, skills and competencies, organisational culture and innovation mindset will limit the scalability and adoption among businesses, in any economy (Jaeger & Upadhyay, 2020; Mangla et al., 2018). The adoption of CE practices to achieve sustainable business performance will require overcoming organisational barriers posed by internal factors, which is less researched empirically within the academic and practitioners' literature (Kirchherr et al., 2018).

A study in Vietnam [commissioned by the The Netherlands Department/Ministry of Foreign Affairs] had discussed that lack of leadership, CE awareness, skills and experience among both the managers and workforce and organisational culture inhibit business model innovation (VNB, 2018), resulting in lack of effective strategies and actions to adopt CE. According to European Academies' Science Advisory Council, skills gap and lack of leadership and CE skills-based programmes promoting organisational innovation culture are potential barriers to adopting CE. Skills development and vocational training for SMEs managers will contribute significantly to upscaling CE practices and achieving goals of economic pillar (MacArthur, 2015).

Considering such conceptual, empirical, and contextual developments, the overarching aim of this paper is to bridge this knowledge gap in the business and management literature concerning the adoption of CE in Vietnam (a developing economy), which leads us to the following research questions motivating our current empirical investigation.

- RQ1: How does leadership influence innovation mindset, skills and competencies and organisational culture within Vietnamese SMEs for adopting CE practices?
- RQ2: How does the innovation mindset, skills and competencies, and organisational culture within employees of Vietnamese SMEs influence the adoption of the CE practices, and how do these practices impact on the SMEs' sustainable business performance?

1.2. Theoretical lens

We use the theoretical lens based on the tenets of dynamic capability theory (DCT) drawn from the organisational management literature to examine the research questions. The seminal article by Teece, Pisano, and Shuen (1997) and further literature (Alsawafi, Lemke, & Yang, 2021; Zahra, Sapienza, & Davidsson, 2006) on DCT have highlighted that the ability of a firm to implement new practices and strategies, and effectively manage these in a rapidly evolving environment will depend on the internal resources, skills and competencies, leadership, processes and organisational routines. Therefore, leadership, internal competencies and culture within the organisations are critical to reconfigure business model and operations to achieve sustainable business performance and competitive advantage (Prieto-Sandoval, Jaca, Santos, Baumgartner, & Ormazabal, 2019). The existing literature has also discussed that adoption of CE requires changes within the organisation to reconfigure business operations that will help in achieving corporate sustainability (Khan, Daddi, & Iraldo, 2020; Amui, Jabbour, de Sousa Jabbour, & Kannan, 2017), and internal organisational challenges will inhibit the adoption of CE business model (Scarpellini, Marín-Vinuesa, Aranda-Usón, & Portillo-Tarragona, 2020; Mousavi, Bossink, & van Vliet, 2018). Therefore, in our study DCT will help to conceptualise and examine the interplay between organisational factors (leadership, culture, innovation mindset, skills and competencies), and CE adoption (new business model) to achieve sustainable business performance (outcome variable).

1.3. Contributions

Answering these questions are important as management scholars and practitioners have indicated and acknowledged the importance of adopting CE practices in facilitating sustainable development at the micro (enterprises and consumers), meso (economic agents integrated into symbiosis) and macro (cities, regions and governments) levels (Geissdoerfer, Savaget, Bocken, & Hultink, 2017; Kalmykova, Sadagopan, & Rosado, 2018). This research contributes to the literature on green management strategy, operations and supply chain management (OSCM) and SMEs' sustainability in developing economies, to develop SMEs' capability and strategies for adopting CE. This will help to combat the negative impact of industrial practices in developing economies on the environment, which can address the grand challenges posed by climate change from a business perspective (Reimann, Xiong, & Zhou, 2019; Bhatia et al., 2020). The key contributions of this research as further outlined below.

- Firstly, we shape our theoretical contributions by integrating the principles of dynamic capability theory, CE and sustainability to add important insights on the influence organisational factors such as leadership, innovation mindset, culture, skills and competencies (which are often reported as barriers to CE implementation in developing economies) have on the CE adoption and sustainable performance of the SMEs. Therefore, this study will provide OSCM community, Vietnamese SMEs, and government policy makers with empirical evidence that will help to comprehensively understand and mitigate the organisational barriers.
- Secondly, our results extend the general findings of Dey et al. (2019a, 2019b; 2020) pertaining to the impact of circular economy practices on sustainable business performance of the SMEs (in the UK), enriching the management literature related to the highly relevant and understudied interaction between organisational barriers, CE adoption and sustainable business performance of the Vietnamese SMEs. Accordingly, our research contributes to past conceptualisations (Savaskan, Bhattacharya, & Van Wassenhove, 2004), and recent empirical work (Dey et al., 2019b; 2020), by including new constructs (i.e., leadership, culture, innovation mindset and skills) to examine CE adoption, and achieve sustainable business performance.
- Finally, the paper also contributes to enriching the OSCM literature by providing a set of recommendations to government policy makers and SMEs managers drawing from the organisational socialisation framework (Bush, 2016) and knowledge-based view theory (Grant, 2006), which will facilitate in enhancing the capability of Vietnamese SMEs to effectively adopt CE practices within their business operations by overcoming internal organisational barriers.

1.4. Summary

Accordingly, to answer our research question: Firstly, we consolidate the literature on CE practices, sustainable business performance, drivers and barriers to CE adoption (in Section 2). Secondly, we derive theoretical constructs from the literature to develop a conceptual model that will examine the relationships between the organisational constructs, CE practices, and sustainable business performance (in Section 2). Thirdly, we describe the research methodology in section 3. Fourthly, we employ Structural Equation Modelling (SEM) statistical technique to process the data and test the hypothesis derived from the proposed conceptual model (Section 4). SEM analysis shows the casual relationships between the research constructs (Section 4). Next, we discuss the results in the vein of the literature and conceptual model (Section 5), followed by the theoretical and practical implications of the research (Sections 6 and 7), and finally the conclusions and future research direction (Section 8).

2. Literature review and model development

Despite the traditional focus on economic performance as a measure for the survival of companies, there has been an increasing discussion in the literature about the role of sustainability in organisations (Kiefer, Del Rio Gonzalez, & Carrillo-Hermosilla, 2019), and recent research has been looking at the application of these factors to SMEs (García-Quevedo, Jové-Llopis, & Martínez-Ros, 2020). This section will provide a brief overview of background literature concerning CE and sustainability, followed by the development of the hypotheses supported by arguments drawn from the literature, and finally summarising the knowledge gaps addressed through our empirical investigation.

2.1. Circular economy and sustainability

The introduction of the Sustainable Development Goals (SDGs) by the United Nations has shed some light on the need to look beyond financial objectives to account for the impact of human activities (UN, 2015). The idea of sustainability was encapsulated by Elkington (1998) using the concept of the triple bottom line, which is underpinned by three pillars: the economic, social and environmental. Along with the traditional focus on financial success, sustainability involves looking at the perspective of society and the impact of human activities on the environment (Gunasekaran & Irani, 2014). The movement towards sustainability represents significant challenges for SMEs. It requires placing less attention on financial results and considering the social and environmental impacts, which can be daunting for risk-averse companies operating with constrained resources (Games & Rendi, 2019). Hence, SMEs are struggling to introduce sustainability practices (Dey et al., 2020), which leads to a delay in the development of these companies. SMEs have a key role on the implementation of the circular economy because of their combined contribution to the economy of different countries (Woodard, 2020). Hence, research is needed to understand the aspects impacting the implementation of sustainable practices and which aspects need to be enhanced to facilitate their transition. This section provides an analysis of the literature of sustainability and particularly the impact of circular economy practices to enhance sustainability performance.

The main aim of circular economy is to reduce waste and increase energy and resource efficiency (Navarro, Cantero, Valls, & Puig, 2020, Willersinn, Mack, Mouron, Keiser, & Siegrist, 2015, Katz-Gerro & López Sintas, 2019). This can be achieved through closing loops of nutrients that can re-enter the biosphere or materials that can be circulating in the economic activities, along with the reduction of overall resource consumption through the transformation of processes (Haas, Krausmann, Wiedenhofer, & Heinz, 2015). That is the origin of the concept of the 3Rs – reduce, reuse and recycle. Reduce involves finding opportunities to modify raw materials, improving production and consumption processes, and modifying process design (Goyal, Esposito, & Kapoor, 2018, Geng & Doberstein, 2008). Reuse comprises of practices through the reintroduction of end-of-cycle products to reduce the use of raw materials along with other resources involved on the design, manufacture and use of products or components (Goyal et al., 2018). In cases in which the products cannot be reused or reduced, recycling becomes a useful alternative. It is the most widespread strategy because it allows reduced exploitation of limited resources through the transformation of end-of-life items into useful materials (Haas et al., 2015, De Corato, 2020). The combination of the 3Rs with approaches such as eco-innovation (Kiefer et al., 2018) enables the efficient use of resources leading to economic, environmental, and social benefits (Stewart & Niero, 2018, Prieto-Sandoval, Jaca, & Ormazabal, 2018, Govindan & Hasanagic, 2018).

There have been valuable contributions in the literature about the factors affecting the adoption of CE practices. Govindan and Hasanagic (2018) undertook an in-depth analysis of the drivers, barriers and practices supporting circular economy adoption in supply chains. The content analysis of 60 articles included in their systematic literature review found drivers and barriers associated to the internal and external environment. The drivers can be classified into policy and economy, health, environmental protection, society and product development, whereas the barriers are clustered in issues related to government, economy, technology, knowledge and skill, management, CE frameworks, culture and society, and market. The findings highlight the importance of job potential, climate change, and population growth as motivators for the implementation of CE, whereas technological limitations seem to be the most common barriers. The emphasis on the importance of economic factors affecting the adoption of CE has been reflected in different studies. Gusmerotti, Testa, Corsini, Pretner, and Iraldo (2019) use cluster analysis to look at the level of implementation of CE practices and logit regression to highlight the most relevant drivers for implementation in the manufacturing industry. They identify economic efficiency as the most influential factor, commonly trying to find CE practices that address environmental concerns at the same time as these provide financial benefits. Additionally, they conclude that organisations using natural resources are more prone to adopt CE practices.

Using the context of automobile manufacturing in Pakistan, Agyemang et al. (2019) highlight the importance of economic factors driving the implementation of CE practices. They apply a combination of interviews and surveys to explore the drivers and barriers affecting the implementation of CE. They gathered 112 survey responses and complemented them with 28 interviews to identify profitability, cost reduction and environment appreciation as the main factors driving the implementation of CE in companies.

Additionally, it is important to consider the context surrounding the company, as found by Tura et al. (2019). Their comprehensive categorisation of drivers and barriers affecting the implementation of CE uses reports from the literature to create a framework tested in four organisations using 36 interviews. They state that individual drivers are context-specific, and that information technology plays a crucial role in the introduction of CE practices. From the perspective of emerging economies, Patwa et al. (2021) use a sample of 183 consumers to identify the need for extending the lifetime for products using the 3Rs, the use of big data to improve information flows, and government policy as significant factors for the adoption of circular economy in developing countries.

Despite the potential of CE practices to support the SDGs (Kristoffersen, Blomsma, Mikalef, & Li, 2020), Liu and Bai (2014) express that organisation have several concerns about the potential barriers for implementation. In fact, Gusmerotti et al. (2019) stress that several companies are barely aware of most of the potential benefits of CE. This has been reflected on the low adoption rate of circular economy practices in companies (Fehrer & Wieland, 2021), particularly in the case of SMEs despite the large consumption of resources attributed to these organisations globally (Meath, Linnenluecke, & Griffiths, 2016). It is important to consider the conditions and the context of these organisations to provide insights to support their implementation of CE practices.

Looking into the factors affecting adoption for SMEs, Prieto-Sandoval et al. (2018) employ a Delphi panel to assess the degree of CE implementation for SMEs classified in three categories: circular economy fields of action (take, make, distribute, use, and recover), industrial symbiosis, and environmental certifications. Their findings suggest recover is the most important field of action for managers, followed by sustainable design strategies. Bassi and Dias (2019) use multilevel orbital probit models to analyse data from 10,618 interviews from the Flash Eurobarometer 441 to explore different CE practices in European countries. They found that, among organisations introducing CE practices, variables such as size, turnover, percentage of turnover devoted to R&D, and type of activity affect the intention to adopt green behaviour. At the same time, they mention that SMEs can implement practices such as reduction of waste, but they might be unable to introduce more ambitious redesigning practices. García-Quevedo et al. (2020) use the same Flash Eurobarometer Survey 441 from 2016 to conclude that regulatory obstacles, cost of meeting regulations and limited human resources are barriers for the adoption of CE in SMEs.

2.2. Hypothesis development

Leadership has been identified as a crucial aspect to achieve successful innovation (Lukoschek, Gerlach, Stock, & Xin, 2018, Busola Oluwafemi, Mitchelmore, & Nikolopoulos, 2020), which can have an effect on circular economy. Moktadir, Rahman, Rahman, Ali, and Paul (2018) use graph theory with a matrix approach to quantify the impact of CE knowledge, customer awareness, leadership and governmental support on CE practices in the leather industry in Bangladesh. Their findings suggest knowledge about CE from managers is a very important factor, followed by leadership and commitment from top management and customer awareness in large organisations, with less impact on smaller organisations. Moktadir et al. (2020) agree with these findings and identify leadership and top management commitment as key factors affecting the implementation of CE in supply chains. Similarly, Wang, Shen, Chen, and Carmeli (2021) show the effect of environmentally responsible leadership in achieving environmental innovation. Leadership seems to be an influential component affecting individual factors and behaviours in the organisations (Lukoschek et al., 2018, Wood, Logar, & Riley, 2015). Internal factors suggested in the literature affect the implementation of CE and sustainable practices include innovation (Bertassini, Zanon, Azarias, Gerolamo, & Ometto, 2021, Brown, Von Daniels, Bocken, & Balkenende, 2021, Imoniana, Silva, Reginato, Slomski, & Slomski, 2020), skills and competencies (Govindan & Hasanagic, 2018, Gelhard & Von Delft, 2016), and culture (Jerónimo, Henriques, de Lacerda, da Silva, & Vieira, 2020, Veronica, Alexeis, Valentina, & Elisa, 2020). However, more empirical analysis is needed to understand the impact of these organisational factors in CE practices.

The existing organisational studies and management literature has discussed the role of leadership and senior management in enhancing the innovation capability of organisations in achieving competitive advantage, especially in developing economies (Lei, Gui, & Le, 2021). In this context, previous studies have also shown the decisive role of leadership in developing and shaping a positive culture within the organisation, which is conducive to implementing and managing new strategies (Le & Lei, 2019; Le, 2020). Such environment helps to create a supportive culture within the organisation that will enhance motivation and commitment of the employees to embrace innovative ideas, processes and strategies, helping the organisation to dynamically adapt and evolve (Lei et al., 2020; Al-Husseini, El Beltagi, & Moizer, 2021). Therefore, leadership practices within the organisation will influence psychological immunity of the employees (job satisfaction and productivity), which will also enhance the capability of both the employees and organisation to embrace new practices, innovation and business processes (Gui, Lei, & Le, 2021). Leadership plays an important role to intellectually stimulate employees' ability to perform their tasks and embrace change, through career development programmes (Nguyen & Mohamed, 2011). It also helps to develop appropriate conditions, strategies, and resources within the organisation, which will allow employees to harness new skills building on existing knowledge, facilitate access to relevant knowledge and expertise base, and finally encourage sharing this knowledge with peers (Le & Lei, 2018). Considering these perspectives stemming from the literature, we formulate the following hypotheses.

- H1:*Leadership* has a significant impact on innovation in Vietnamese SMEs
- H2:*Leadership has a significant effect on organisational culture in Vietnamese SMEs*
- H3:*Leadership has a significant effect on skills and competencies of employees in in Vietnamese SMEs*

2.3. Innovation

Management innovation involves implementation of new management practices in a firm to enhance business productivity (Mol & Birkinshaw, 2009). Innovation can take various forms and aspects such as business model, service, process, product, technology and human capital. CE involves closed-loop supply chain innovation, which can be defined as the process of designing, implementing, and managing the activities combining the upstream and downstream of supply chain, which will maximize value creation over the entire life cycle of a product with dynamic recovery of value from different types and volumes of returns over time (Reimann et al., 2019; Krug, Guillaume, & Battaïa, 2021). Therefore, CE involves process, product, digital and service innovation across the supply chain spectrum. CSLC innovation will allow using the waste as an alternative resource in the supply chain ecosystem (through waste management and conversion practices), thereby offering new business opportunities to enhance profitability, while at the same time environmentally low carbon friendly practices (Xu & Wang, 2018). The primary goal of innovation is to gain and retain

sustainable competitive advantage in the dynamic business environment, improve the quality of products and services offered to consumers and conceptualising new practices and strategically aligning them to business priorities in order to make sustainable impact through goal-oriented activities (Suchek, Fernandes, Kraus, Filser, & Sjögrén, 2021). Based on these perspectives stemming from the review of literature, we develop the following hypothesis.

H4: Innovation has a significant effect on adopting Circular economy practices in Vietnamese SMEs

The role of organisational culture and its impact on business processes, strategies and productivity has been widely studied in the extant literature (Anning-Dorson, 2021). It represents the deeply seated values and beliefs shared by employees in an organisation. In this context, work practices, how they evolve over time, and how this evolution is managed internally within the organisations are integral to the construct of organisational culture (Martins & Terblanche, 2003). It is also an integral part of how an organisation functions in the business environment. The culture within organisations forms the basis of communication, mutual understanding, and meaningfulness in the context of jobs, tasks and work practices, which will significantly impact the efficiency of an organisation, and its ability to adopt new practices and business model innovation (McLaughlin, Bessant, & Smart, 2008; Barrett, 1998). In this context culture helps to bridge the gap between strategy and its implementation within the organisation using resources and processes to guide and manage change (Anh Vu, Plimmer, Berman, & Ha, 2022; Filipczak, 1997). The importance of leadership to create a suitable and conducive organisation culture has been comprehensively discussed in prior literature (Bass & Avolio, 1993; Ogbonna & Harris, 2000; Sarros, Cooper, & Santora, 2008; Sarros, Gray, & Densten, 2002). Recent work reported in the literature (Anning-Dorson, 2021; Tung & Dung, 2022) shows that organisation culture is critical for human resource orientation to achieve productivity and improvement orientation to evolve management processes, and business operations. Against this background, we formulate the following hypothesis.

H5: Culture has a significant effect on adopting Circular economy practices in Vietnamese SMEs

Skills and competencies of the employees within a firm are considered strategic tangible resources to achieve business productivity and sustainable competitive advantage in the market environment (Mousavi et al., 2018). These attributes make organisations dynamically capable to implement sustainability-driven innovation practices such as CE (Khan et al., 2020). Therefore, human resources within the firm are critical to create, redesign, adapt, and diffuse environmentally friendly practices within business organisations. In this context, there is a need to strike a balance between design-specific knowledge and trans-disciplinary skills (systems thinking) to effectively engage in and implement circular economy practices (Charnley, Lemon, & Evans, 2011). In this context, De los Rios and Charnley (2017) have discussed the significance of skills and competencies within organisations to develop capabilities internally that will help to achieve resource and process optimisation. The skills gap is likely to be even more significant in developing economies, due to limited policies and government strategies to reskill and upskill a workforce in line with green strategies to attain sustainable development within the economy (Mangla et al., 2018). According to Schroeder et al. (2019), the wider adoption and diffusion of CE practices within the business organisations facilitating business model innovation will be influenced by the technical skills of both employees and entrepreneurs. Remanufacturing companies optimising product design (design to make products last longer) and business operations (resource and process optimisation and innovation) will require specific skills training, capacity building programs and multi-stakeholder partnerships, to facilitate adoption of CE in the SMEs (Bourguignon, 2016). Considering these perspectives, we propose the following hypothesis.

H6: Skills and competencies of employees will have a significant effect on adopting Circular economy practices in Vietnamese SMEs.

Traditionally, performance has been linked to financial metrics. However, organisations have increasingly started to balance economic metrics with social and environmental performance (Epstein & Roy, 2003) to account for the different benefits that can be gained in different dimensions (Katz-Gerro & López Sintas, 2019). It is important to link the implementation of CE practices with sustainable performance to ensure real improvements are produced (Harris, Martin, & Diener, 2021), especially to facilitate and guide the transition of SMEs (Nguyen et al., 2020). Reported benefits such as improved business productivity and enhance reputation (Dey et al., 2019, Sarkis, Zhu, & Lai, 2011, Sauvé, Bernard, & Sloan, 2016) can encourage SMEs to invest in CE practices. There has been analysis about the link between CE practices and environmental performance, and the implications of sustainable practices on environmental and financial performance, but literature about the topic remains inconclusive (Lee & Raschke, 2020, Wagner, 2015, van Loon, Diener, & Harris, 2021). It is important to understand more about the overall impact of CE practices on the dimensions of sustainable performance. That impact is key to deliver useful insights for SMEs, especially considering their aversion to risk and the limited resources they have to invest (Games & Rendi, 2019). Accordingly, we formulate the following hypothesis.

H7: Circular economy practices have a significant effect on sustainable performance of Vietnamese SMEs

2.4. Research gaps

The literature review has investigated the current state-of-the art regarding the factors affecting the successful implementation of circular economy practices and the impact of these practices on sustainable performance. As a result, different gaps have been identified. Although Govindan and Hasanagic (2018) recognised the existence of internal and external factors affecting the implementation of CE practices, and there are studies suggesting the value of internal capabilities, most of the research has focused on external factors and pressures. New research could therefore consider the impact of managerial competencies on engagement in SMEs (Lara & Salas-Vallina, 2017, Wood et al., 2015), the value of internal factors such as leadership, culture, innovation and skills and competencies, provide empirical evidence about their role in the implementation of CE practices. Despite claims that the factors affecting CE practices are context-dependent (Tura et al., 2019), less research has been focused on the conditions faced by SMEs (Bassi & Dias, 2019). Research about the factors facilitating the successful implementation of CE practices and their effect on the performance of SMEs is necessary to provide further insights to guide and inform SMEs to make decisions. SMEs need to be aware of the impact of CE practices on the three dimensions of sustainable performance to support decision-making. Nevertheless, the link between CE and performance is still unclear (van Loon et al., 2021) especially focused on sustainable performance. As a result, more research is required to provide insights about the impact of CE practices and sustainable performance for SMEs. Fig. 1 depicts the relationships between the constructs (internal organisational factors, CE practices, and sustainable business performance) covering all the proposed assertions.

3. Methodology

This article investigates the relationship between the organisational internal factor and their impact on CE adoption and achieving sustainable business performance. We have used primary research employing

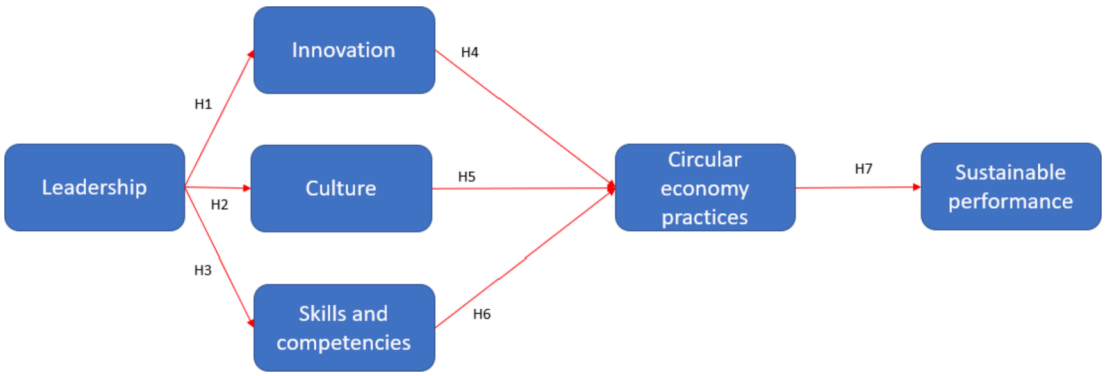

Fig. 1. Theoretical Model.

survey methodology to empirically test and validate the conceptual model, which is presented in Fig. 1. Survey-based primary research methodology has been employed in several studies reported in the contemporary literature investigating the adoption of CE practices, impact of the CE adoption on business productivity and firm performance and factors impacting the adoption of these practices from managers' and employees' perspective in the business organisations (Dey et al., 2020; Saha, Dey, & Papagiannaki, 2020; Dolgui & Ivanov, 2020).

3.1. Sample selection

According to our web search using the key words – (Vietnam AND Circular Economy) in SCOPUS, Web of Science and Google Scholar, research studies examining the CE adoption in Vietnam and its impact of sustainable business performance is extremely limited (five results and these do not report empirical investigation). According to practitioners' literature, government policy makers and Vietnamese Chamber of Commerce have acknowledged the importance of implementing CE practices within the SMEs (98% of all enterprises). In this context, government has introduced several initiatives and reforms such as carbon pricing tools to reduce greenhouse gas emissions, carbon tax for businesses and economic incentives for low carbon businesses (VNT, 2019; CEV, 2018). According to MIT technology review measuring the commitment towards green and low carbon economy of 76 global economies, Vietnam ranked 52nd in Climate policy (effectiveness), ranked 70th for very high carbon emissions, and 12th for adopting sustainable practices to preserve the environment (Green Index, 2021). These ranking shows that although there are policies and initiatives to build a sustainable and low carbon economy, their uptake by the business organisations is questionable and effectiveness is very poor, which warrants further empirical investigation, making the country a suitable candidate for our study. For this study, we included a wide range of sectors in Vietnam, whose business activities and practices contribute to environmental degradation and pollution, according to the UN climate change report.

For the purpose of this study, we have followed the definition of SMEs put forward by the Vietnamese National Assembly (Law 04/2017/QH14 – SME law), i.e., employing not more than 200 employees, total turnover does not exceed VND100 billion (for current and preceding year), and are registered with the state social insurance scheme (VNB, 2018). Inclusion criteria was included as a set of screening questions in the survey to ensure that that all participants: (1) worked in SMEs; (2) had at-least two-five years of experience working in the same organisation (to have a good understanding about the organisational leadership, culture and CE practices); (3) were employed in a full-time/permanent position and in the business operations team; (4) had knowledge and understanding about CE practices, sustainable business performance of the organisation; (5) the organisation was implemented CE practices. The purpose was to have respondents with first-hand knowledge and the capacity to make decisions that could deliver meaningful information for analysis.

3.2. Design of the survey

The data collection instrument took the form of a research survey, which was designed using different constructs derived from the hypothesis, and proxies to measure each construct was derived from the research literature discussed in the sections 2 and 3. Surveys are a useful and economical way to gather information and analyse it using statistical techniques to understand the relationships between different variables (Saunders, Lewis, & Thornhill, 2009). The questionnaire was developed through careful review of the literature to identify the constructs and scales necessary to propose hypothesis and test them. Specifically, information was gathered about organisational leadership, culture, innovation mindset, skills and competencies amongst the workforce in the context of adopting and implementing CE practices and sustainable performance of the SMEs. The proxies were measured using a 5-point Likert scale (1 = completely disagree; 2 = disagree; 3 = neither agree nor disagree; 4 = agree; 5 = completely agree). The survey was pre-tested with five academics, and an online workshop was conducted with 15 SMEs employees in the Vietnam, and revised by the research team to incorporate changes suggested by the respondents during the pilot. The aim of the pilot workshop with SMEs employees was to: (1) choose a selected set of proxies to measure CE practices, which are popular in the Vietnamese SMEs; (2) examine whether the statements representing each proxy is clear and can be easily interpreted correctly; (3) the inclusion criteria for the respondents and business sector was sensible and meaningful considering the SMEs classification and distribution in the country; (4) the statement representing performance measures will accurately reflect the economic, social and environmental performance (derived from the academic literature in operations and supply chain management, green supply chain management and CE) of the SMEs.

3.3. Data collection

This research has used purposive sampling involving employees with first-hand knowledge about CE practices in their organisation, similar to the methodology employed in existing studies examining CE adoption, and technology adoption. For data collection an online survey questionnaire was set-up digitally by the authors and administered by Qualtrics (www.qualrics.com), adhering to the inclusion criteria in Vietnam (Oct 2020- Dec 2020). The SMEs were targeted from the pool available through Qualtrics, the existing contacts of Hanoi University of Science and Technology (HUST) collaborating in CE projects, and SMEs' list available from Vietnam Chamber of Commerce and Industry to the academic partners in Vietnam (HUST and VNUK Institute for Research

and Executive Education, the University of Danang). The structured questionnaire used in this research can be seen in the Appendix A. Following recommendations from Wolf, Harrington, Clark, and Miller (2013) and Sideridis, Simos, Papanicolaou, and Fletcher (2014), for a model with strong factor links and medium complexity, the questionnaire was applied to 205 SMEs employees in Vietnam to gather their insights.

The total number of SMEs' organisations (one employee from each SME) targeted was 285 (each from distinct SME in Vietnam). We received 262 responses, and based on our first screening (reverse questions) 235 were deemed as useful (i.e., complete). A second screening was conducted, where we found 30 outliers (pertaining to subjective questions, knowledge about CE, and items measuring performance). Finally, 205 responses were used for validating the model (deemed usable). The data was captured anonymously in the platform and prepared for analysis using SEM. All the responses considered were complete to undertake the analysis without missing values. The demographics of the sample obtained are shown on Table 1. There is a spread across different sectors with most of the companies involved in manufacturing and construction. The majority of SMEs sampled have turnover over 3,200,000,000 (Vietnamese Dong). At the same time, most of the participants have roles involving overseeing other staff, which can be useful to provide insights about their internal operations and the links between different departments of the company.

3.4. Data analysis

Structural equation modelling (SEM) is a statistical modelling method broadly used in social sciences to analyse the relationships between constructs using quantitative information (Dadeliene, Dadelo, Pozniak, & Sakalauskas, 2020). It has the advantage that variables can be measured directly, latent (i.e. not directly measured) or a combination of both (Kalapouti, Petridis, Malesios, & Dey, 2020). SEM has been used to test the different hypothesis presented in the model proposed to identify significant relationships and discuss the findings. For the analysis, maximum likelihood has been used as the extraction method. SEM visualises the relationship between the latent variables (constructs) and the outcome variables (predicted using the latent variables) using intuitive graphs known as 'SEM path diagram', which helps to understand the strength and significance of the latent variables on the outcome variables. The assessment of the model proposed and its fit to the data will be tested using goodness-of-fit measures.

Table 1
Demographics of the sample.

Sector	
Agriculture Forestry and Fishing	10
Mining and Quarrying	5
Manufacturing	26
Electricity Gas Steam and Air Conditioning	9
Water Supply Sewerage Waste	6
Construction	37
Wholesale and Retail Trade Motor Repair	11
Transportation and Storage	14
Public Administration and Defence	6
Human Health and Social Work Activities	17
Other Manufacturing/Production/ Service Operations Activities	64
Turnover (Vietnamese Dong)	
Less than 300,000.000	17
Between 300,000.001 and 600,000.000	21
Between 600,000.001 and 1,200,000,000	22
Between 1,200,000,001 and 3,200,000,000	33
Between 3,200,000,001 and 6,200,000,000	34
Between 6,200,000,001 and 12,200,000,000	20
Between 12,200,000,001 and 30,000,000,000	36
Over 30,000,000,000	22
Frequency managing staff	
Always	88
Most of the time	70
About half the time	19
Sometimes	25
Never	3

4. Results

The sampling adequacy in the study for a statistical power (at least 0.8) to ensure that the empirical insights derived from the statistical analysis is valid was tested using the recommendations in Wolf et al. (2013) and Sideridis et al. (2014), using the package semTools in the R software. The null RMSEA was set to 0.00, alternative RMSEA to reject the null hypothesis was 0.08 for the degrees of freedom of the model (21) and a confidence level of 95%. The results showed that the sample size required to achieve desired statistical power and significance in results is 160, which is smaller than the sample size used in our study (205 respondents), demonstrating adequate sample size is used in our study. Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy for the model was also calculated showing that the sample size is excellent to conduct SEM analysis (0.9). Bartlett's test rejects the null hypothesis, i.e., the correlation matrix formed by the constructs is an identity matrix, indicating that the constructs are suitable for SEM analysis to model the casual relationships between them. Maximum likelihood has been used as estimation method for structural equation modelling (SEM) in AMOS.

4.1. Reliability

The reliability of the constructs has been tested using Cronbach's alpha (Bollen, 1989). The results presented in Table 2 show very good values of Cronbach alpha (above 0.8) indicating a high level of reliability of the scales used.

4.2. Convergence and discriminant validity

The convergent validity for each dimension was tested using average variance extracted (AVE) calculations using the individual proxy loadings (obtained in the CFA), and the discriminant validity for each factor was obtained using scale composite reliability coefficients (SCR) which were calculated using the AVE values. Table 3 shows the matrix of correlations of the main constructs and the diagonal shows the square root of AVE

The AVE for each construct is greater than 0.5 and CR is greater than 0.7 (Table 4), which are acceptable and reasonable to show validity of the constructs, according to the literature. We also found that square root of the AVE is greater than all the inter-construct correlations, providing evidence of sufficient discriminant validity (Chen & Paulraj, 2004).

4.3. Goodness of fit

Typical thresholds for Goodness-of-fit (GoF) are used in this study. These include goodness-of-fit index coefficients (GFI), Tucker-Lewis Index (TLI), and comparative fit index (CFI) with good fit considered

Table 2
Cronbach's alpha valued of the constructs.

Construct	Cronbach's α	AVE	CR
Leadership (LEADER)	0.857	0.668	0.858
Innovation (INNOV)	0.884	0.720	0.885
Culture (CULTURE)	0.895	0.744	0.897
Skills and competencies (SKILL)	0.864	0.761	0.864
Circular economy practices (CEP)	0.919	0.742	0.920
Sustainable performance (SP)	0.928	0.766	0.929

Table 3
Inter-correlations among major constructs.

	SKILL	LEADER	CEP	SP	INNOV	CULTURE
SKILL	**0.873**					
LEADER	0.81	**0.817**				
CEP	0.535	0.688	**0.861**			
SP	0.612	0.726	0.855	**0.875**		
INNOV	0.848	0.815	0.671	0.781	**0.848**	
CULTURE	0.742	0.759	0.76	0.85	0.807	**0.863**

Table 4
Goodness-of-fit values.

Indicator	Value
CFI	0.967
GFI	0.881
TLI	0.961
RMSEA	0.061
Normed X^2	1.761

for values above 0.9 (Malesios, Dey, & Abdelaziz, 2020, Doll, Xia, & Torkzadeh, 1994), and root mean square error of approximation (RMSEA) values considered acceptable below 0.08 (Hair, Black, Babin, Anderson, & Tatham, 1998). Additionally, reliability of the scales used in the model has been tested using Cronbach's alpha with a threshold of 0.6 as suggested by (Hair, Ringle, & Sarstedt, 2013). The model tested in this research delivered the goodness-of-fit values shown on Table 4.

The values of CFI, TLI, RMSEA and Normed X^2 show very good fit, whereas values of GFI $\geq$ 0.8 are accepted as evidence of reasonable fit (Doll et al., 1994). Overall, the revision of GoF metrics allow us to conclude that the model seems to fit the data well. Hence, it was used to test the hypothesis presented in this research.

4.4. Structural equation model

Given the different types of SMEs included in the study, consideration was given to the use of Industry as a control variable. After running the analysis, this variable did not show any significant relationships with the constructs and the changes in the standardised regression weights were 0.002 or less. Hence, for parsimony the model presented below does not include the control variable. All the items loading to the constructs had coefficients above 0.7, which is considered acceptable in the field (Queiroz & Wamba, 2019). The standardised estimates from the path analysis are presented on Fig. 2. The continuous lines with coefficients show significant relationships, whereas the dashed lines represent non-significant relationships.

The results allow us to provide insights about the different hypothesis tested in this research. The importance of leadership is reflected in the results, showing a significant positive impact on innovation (path coefficient = 0.907, p-value $\leq$ 0.001), culture (path coefficient = 0.839, p-value $\leq$ 0.001) and skills and competencies (path coefficient = 0.875, p-value $\leq$ 0.001), which support hypothesis H1-H3. Innovation has a significant positive effect on circular economy practices (path coefficient = 0.410, p-value $\leq$ 0.01) supporting H4, whereas Culture also affects circular economy practices (path coefficient = 0.687, p-value $\leq$ 0.001) and skills and competencies does not have significant impact on circular economy practices at $p < 0.001$, supporting H5 and rejecting H6, respectively. Circular economy practices have a significant positive effect on sustainable (path coefficient = 0.893, p-value $\leq$ 0.001) performance, supporting H7. The summary of the hypothesis tested in this research and the outcome of the analysis is shown on Table 5.

Table 5
Summary of the hypothesis.

ID	Hypothesis	Significance	Conclusion
H1	Leadership has a significant effect on Innovation	0.907***	Supported
H2	Leadership has a significant effect on Culture	0.839***	Supported
H3	Leadership has a significant effect on skills and competencies	0.875***	Supported
H4	Innovation has a significant effect on Circular economy practices	0.410**	Supported
H5	Culture has a significant effect on Circular economy practices	0.687***	Supported
H6	Skills and competencies have a significant effect on Circular economy practices	Not significant	Not supported
H7	Circular economy practices have a significant effect on sustainable performance	0.893***	Supported

5. Discussion

The findings of the empirical investigation outlined in the preceding section answer the research questions by showing the relationship between internal organisational factors – leadership, innovation, culture, skills and competencies on CE practices and sustainable business performance.

RQ1 (*organisational factors)* - The results show the positive and significant effect of leadership traits and strategy practiced in SMEs' on innovation, culture, and skills and competencies. Existing research both theoretical and empirical have shown that organisational leadership can significantly influences organisations' capability to engage with innovative practices (Shahbazi, Wiktorsson, Kurdve, Jönsson, & Bjelkemyr, 2016; Liu & Bai, 2014). This will be dependent on the knowledge, skills and understanding of the managers with regards to the innovation (Su, Heshmati, Geng, & Yu, 2013), impact of the innovation on the business productivity and employee performance, and its alignment with the business priorities and goals of the organisation (Jawahir & Bradley, 2016). Innovative mindset within the organisation resulting from the leadership practices within the SMEs will significantly and positively influence CE practices. This can be attributed to the fact that the aims of

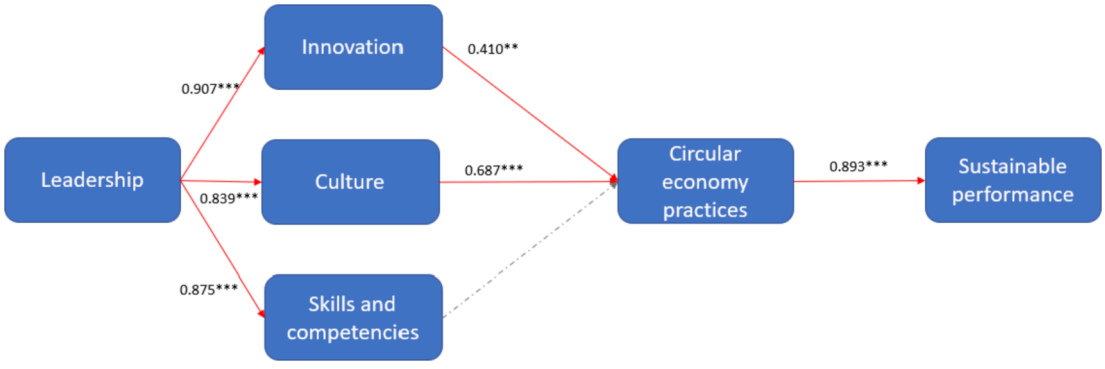

Fig. 2. SEM Model. ***: $p < 0.001$.

CE practices are to optimise the business processes through lean management and achieve resource efficiency through sustainable oriented innovation (Dey et al., 2020). Organisational culture is also influenced by leadership, which will depend on how the employees are involved in the strategic decision-making process, and communication as well as collaboration between the managers and employees to outline the impact of strategic initiatives on business performance and employee productivity (Bakker, Oerlemans, & Ten Brummelhuis, 2016). According to the organisational socialisation framework, leadership, and communication efforts from senior management (or managers) help to develop a collaborative organisational culture and a conducive job environment (Klein & Polin, 2012), which leads to better understanding and adoption of strategic initiatives by the employees. This enhances employees' job satisfaction because of better clarity pertaining to their job roles and minimal apprehension with regards to business model reconfiguration (Bauer, Bodner, Erdogan, Truxillo, & Tucker, 2007). According to Roger's diffusion theory and Hall's Concerns-based adoption model, leadership within the organisations is key to provide knowledge, clarity and relevance on the strategic initiatives, by addressing concerns of the adopters (employees in the organisation who will be affected as a result of the innovation and strategic roadmap) (Straub, 2009). CE practices within SMEs will result in strategic changes aligned to the business priorities of the organisation, incorporate both lean management and sustainable innovation, and these changes and innovative practices are put forward by the senior management (Kirchherr et al., 2018). These theoretical perspectives help to explain our findings with regards to the influence of leadership on innovation, culture and skills and competencies.

RQ2 (*CE adoption*)- According to our findings, skills and competencies among the workforce won't have any impact on the CE practices. The existing research has outlined and reported the importance of skills and competencies within the organisations to adopt CE, however there is no conclusive empirical evidence in this regard (Lieder & Rashid, 2016; Ilić & Nikolić, 2016). SMEs are, by their nature, highly specialised. Especially in the manufacturing sector, employees have specific technical skills which are harnessed from years of training, and on-the-job learning as new processes and technology are deployed within the business ecosystem (Edwards, Delbridge, & Munday, 2005). Moreover, specialised skills gained in one sector (or area of work activity) are often non-transferrable to others, therefore tacit experience (implicit knowledge according to the knowledge-based view theory) possessed by the SMEs employees are highly valuable, provide competitive advantage, imperfectly imitable and cannot be easily replaced (Grant, 1996). Therefore, the skills and expertise of the SMEs employees helps SMEs to achieve sustainable competitive advantage, adapt quickly to emerging and uncertain market conditions through business process reconfiguration and re-engineering. However, CE is a philosophy (i.e. a set of practices) that will help organisations to practice lean management and sustainable-oriented innovation to achieve sustainable performance. The strategy to adopt, practice and manage CE model in the SMEs or any business organisation is laid out by the senior management and managers, which means that the employees will need to follow the strategic goals. Therefore, we believe that skills and competencies acquired through tacit experience and explicit knowledge exchange within the organisations will influence the understanding of CE strategic goals and business model, which will impact the CE practices within the SMEs, and this warrants further investigation. This result does not fully support the existing research studies which have reported limited skills and competencies as potential barriers to effective CE implementation. Therefore, a separate investigation is required to model the relationship between knowledge and skills based antecedents, CE practices, and sustainable business performance. In this context, the influence of knowledge management strategies such as codification and personalisation, processes, platforms, and partnerships (derived from information management and knowledge-based view theories) on the effective implementation of CE practices, can help to understand suitable practices and interventions for developing human resource expertise and competencies within SMEs.

RQ2 (*impact on sustainable business performance*)- CE practices strongly and positively impact sustainable performance of SMEs. Thus, the results of the analysis for the current dataset is fully aligned with the suggestions in previous theoretical and empirical studies on the argument that CE practices (reduce, reuse and recycle) will enhance sustainable performance of business organisations (Geissdoerfer et al., 2017). The strength coefficients (beta values) representing the relationships between CE practices and the performance construct is very high, which can be attributed to the measurement scale, which has used specific items (appropriate for Vietnamese SMEs) to examine sustainable performance. The results clearly showed that through a combination of lean management practices, sustainable process innovation, and resource optimization, i.e., reducing consumption, sustainable performance of the SMEs engaging is CE practices will be enhanced. This is in line with existing CE literature which suggests that lean management leads to high economic productivity, as a result of reduction in operational costs, however to achieve higher sustainable performance, organisations need to adopt environmentally friendly practices, which will not only reduce the negative impact on the climate, but such practices will lead to creation of new jobs, which is beneficial for both economic growth and society. According to van Loon and Van Wassenhove (2018), recycling and waste management will create low skilled jobs in the areas of waste handling, collection and processing, where-as reuse practices will created more jobs requiring higher skills when compared to recycling (MacArthur, 2012). According to a report compiled by European Union press, decrease in resource consumption will lead to 1.4 million −2 million new job opportunities (Ilić & Nikolić, 2016). Therefore, CE will lead to sustainable performance in SMEs organisations' supply chain as it will foster environmental and social well-being in addition to economic productivity.

6. Theoretical implications

The attempt to understand the role of internal organisational factors to adopt circular economy practices within business organisations in developing economies, which will enhance sustainable business performance, is less discussed and empirically examined in the current management literature (Patwa et al., 2021; Kalmykova et al., 2018). While many studies in the research literature and practitioner-based publications have reported the potential of CE to create business value, through process efficiency and achieving sustainable goals in the organisations (Geissdoerfer et al., 2017), very few of them adopt a theoretical lens to provide empirical evidence examining and explaining the relationship between organisational factors in the context of CE (Agyemang et al., 2019).

From a theoretical perspective, firstly our study has developed a robust theoretical model deriving constructs from a wide range of literature such as human resource management, strategic management, innovation management, and operations management. It examines the relationship between organisational factors such as leadership, innovation, culture, human resource skills and competencies, CE practices, and how these impact on the Vietnamese SMEs' sustainable performance. Our findings from the empirical study have demonstrated that CE practices such as eco-design, reuse, recycle and reduce are significantly influenced by organisational culture, skillset, and innovation, i.e., strategy and initiatives from the senior management and the impact of these strategies on job design. These findings complement the literature concerning DCT, and demonstrate how internal organisational factors and resources make firms dynamically capable to implement new business models and pursue innovation, contributing to sustainable development.

Secondly, this study extends CE research in response to the grand challenge (climate change) contributing to the business and management literature by opening a new stream focussing on the role of internal

organisational resources and capabilities to reconfigure and repurpose business operations to achieve sustainable performance. The results obtained through validation of the proposed model bring new empirical insights which are important because adoption of CE and its successful implementation will be significantly influenced by the internal capabilities within the organisation. This echoes the arguments and discussions reported in the existing literature showing that business process reconfiguration is driven by strategic leadership, competencies, innovation and supportive culture within the organisations. In this context, CE and sustainability have emerged as the top priorities for SMEs in both emerging and developed economies. This stems from government initiatives and policies to reduce the negative impact of SMEs' business practices and activities on the environment and reduction in raw materials consumption. According to reports of the Ellen MacArthur Foundation, implementing CLSC innovation in circular business models can reduce the consumption of raw materials, 32% by 2020, and 53% by 2050, when compared to the current use (MacArthur, 2017a, 2017b, 2013 and 2012. The adoption of low carbon practices within SMEs is also motivated by the promise of job growth and community engagement, which are keys to building sustainable societies and economic resilience within the geographical regions, post pandemic.

Finally, our theoretical model thus consolidates three very different concepts— internal organisational capabilities (stemming from leadership, skilled workforce, organisational culture and innovation mindset), CE practices (reduce, reuse and recycle across the upstream and downstream, reduce waste, energy and raw material consumption) and sustainable business performance (business economic productivity, socially responsible practices, and environmentally friendly operations), and findings outline how they collectively can enhance economic performance of businesses through environmentally friendly practices and socially responsible strategies.

7. Managerial implications

By providing empirical insights on the relationship between organisational factors influencing CE practices in the SMEs, and its significant impact on sustainable business performance, this research will help government policy makers, SMEs' managers, and senior leadership to develop an organisational wide strategy for managing and adopting CE philosophy. The existing literature on CE has reported the importance of organisational leadership, commitment from senior management to shape organisational culture and innovation mindset for adopting CE practices, however there is lack of understanding and strategies on how this can be achieved by SMEs (Govindan & Hasanagic, 2018).

Our research findings have several implications which are discussed below.

- Firstly, government policy makers should develop a framework and onboarding plan that will help managers and decision-makers in organisations to develop better understanding about the CE concepts, practices and strategies, which will facilitate in cultivating skills and competencies to manage the adoption and change within the organisation. The existing research has reported that poor leadership and lack of commitment from senior management is a potential barrier to effective CE implementation, and our research has demonstrated that leadership will significantly impact antecedents to effectively adopt CE practices in the SMEs. Therefore, the framework and onboarding plan should include training materials, access to information and coaching (perhaps partnering with higher education institutions). In this context, a hub and spoke framework can support the adoption of CE practices, where 'hub' will determine strategies (business process assessment, business process reengineering, employee training and support, technology selection and interventions), which are aligned to the business priorities and sustainability development goals. While 'spokes' will be responsible for realising these strategies, i.e., employees will be embracing the strategic changes by actively participate in the decision-making processes and implement the CE practices to help SMEs achieve sustainable business performance. Building this culture will require a shift to an organization that enables interdepartmental coordination, interdisciplinary collaboration, data-driven decision making, risk proclivity, and an agile, experimental, and adaptable mentality, through transformative leadership.
- Secondly, managers must create mechanisms that will facilitate knowledge sharing, co-creation and exchange among the employees about CE practices, its purpose, benefits, and contexts of implementation within the business processes and activities. This mechanism should also involve appropriate interventions to store information, which can be accessed by employees conveniently and readily. This will require creating a knowledge and digital platform management strategy that will consider and invest in the technical resources (such as information systems and platforms) necessary to store and disseminate information among employees. The strategy should also help to create new knowledge through the process of restructuring, merging and synthesising, and evolve this knowledge in an incremental and iterative manner (learnings from contemporary practices and successful business cases among other SMEs). These initiatives will help to develop a collaborative and sharing culture, where employees can learn from each other, and therefore dynamically adapt to business process innovation (aligned to strategic priorities) within the SMEs. According to organisational socialisation framework, knowledge sharing and a two-way communication between managers and employees will also help to develop a collaborative and cooperative culture within the organisations. Such a culture will facilitate business model innovation through process re-engineering and optimisation, which according to our findings will effectively influence CE adoption. Furthermore, these initiatives will enhance employee performance due to job satisfaction, positive psychological outcomes and emotional states among the employees.
- Thirdly, SMEs in same geographical locations should form a CE working team, where each SME is represented by one or more employees. The working team will help to foster collaboration between the SMEs (i.e., learn from each other, share knowledge and business cases), which will drive CE adoption and according to academic reviews on CE, this is currently a barrier. Such peer learning can facilitate faster adoption of sustainable practices within the geographical region and provide a forum for early adopters to consult with experienced members (MacArthur, 2015). The working team will also help to strengthen partnership with higher education institutions, and benefit from academic consultation and research underpinning evidence-based strategies to optimise business processes, enhance employee performance, decrease waste and carbon emissions, and increase their social sustainability through job creation, supporting and encouraging entrepreneurial activities, and thus help build a sustainable society.
- Finally, our results have showed that CE practices will positively influence SMEs' sustainable performance. However, lack of information systems often makes it difficult for SMEs organisations to keep track and reflect on the impact of CE practices on sustainable business performance (Kalmykova et al., 2018). Therefore, government policy makers, SMEs managers and higher education institutions in Vietnam should come together and work towards developing a digital decision support system that will facilitate adoption, implementation, evolution and strategizing the Circular Economy (CE) practices within the industry. Such a decision support system (DSS) can include many functionalities, further outlined below:
- Assess the current state of CE practices in the organisation and map the organisation in the CE maturity model;
- Compare the organisational practices with other organisations [through a method of clustering];

- Visualise the strategic interventions and recommendations for the organisation;
- Visualise the pre-implementation and post-implementation (i.e. recommendations) impact on business sustainability, competitiveness, alignment between business goals, priorities and key performance indicators.

The DSS will: facilitate developing case-studies for HE institutions and students to reflect on the current CE practices, maturity within the industry that will facilitate developing and co-creating new knowledge for both industry and policy makers; inform government policy makers to the needs of the SMEs, and help to develop policies and inquiries that will enhance CE practices, by providing a knowledgebase; help SMEs managers and employees to understand and compare the impact of CE practices pre and post implementation, which will facilitate in business process reengineering, modifying job configuration and enhance their reputation among the stakeholders, trading partners and competitive business environment.

8. Conclusion and future work

This study was motivated by the surge of interest to adopt CE practices in SMEs that will help to achieve sustainable development goals, in particular responsible consumption of materials and reducing the impact of SMEs' business practices on environment and society (MacArthur, 2013 and 2015), in line with the Vietnamese government initiatives to reduce carbon emissions (low carbon initiatives) and job creation. Although, the existing literature has reported and, in many cases, empirically demonstrated the impact of CE practices on sustainable business performance, examining the relationships between lean management practices, sustainable oriented innovation, market pressure, digital readiness, government initiatives and information dissemination (related to CE business model and cases), studies focussing on SMEs' business activities (contributing negatively to the environment not individually), maturity of adoption in the emerging economies, and internal organisational factors impacting CE adoption, has been less researched (Panwar & Niesten, 2020; Moktadir et al., 2020). Despite the interest of both practitioners and academics, and government initiatives across the globe, there is still lack of empirical evidence on impact of internal organisational factors in SMEs on CE adoption and achieving sustainable business performance, which will help government policy makers and SMEs' decision-makers to develop appropriate evidence-based initiatives and strategies which will help to overcome organisational barriers (Mura, Longo, & Zanni, 2020; Dey et al., 2020).

Building upon the existing research reported on CE, lean management practices, sustainability, green supply chain management, strategic management, and organisational management literature, we have proposed a theoretical model. The model was validated by designing a survey instrument and conducting primary research with SMEs' employees in Vietnam, demonstrating that organisations can develop their capability to effectively adopt CE practices within the industry through innovation, and a collaborative and enthusiastic culture to adopt change, which are influenced by the leadership and commitment from senior management, and will help them realise gains in terms of business productivity, and sustainability. Our work therefore provides an initial step for researchers to understand how internal organisational factors can be combined to understand and examine antecedents influencing CE adoption in practice, which will result in organisationally valued outcomes.

We believe that including new constructs and corresponding proxies to measure these constructs (Golicic & Davis, 2012) to predict the direct and mediating effects influencing understanding and explicit knowledge of employees and their impact on firm performance, organisational resilience and dynamic capability and absorptive capacity can further enrich our model and provide novel empirical insights for the managers and employees alike. Such variables can include constructs drawn from the technology acceptance model to assess digital readiness– performance expectancy, effort expectancy, technology affinity, social influence, institution theory – market pressure, external influencers, regulations and government guidelines, human resource management theories –job satisfaction, and knowledge-based view – knowledge sharing, creation, dissemination, tacit experience, and training programmes, all of this in the context of impact of CE adoption on sustainable business performance. This will further expand our model, which will open new avenues of research pertaining to job design, organisational structure, task mastery, digital information systems, skills framework for managers and employees, and therefore making a significant contribution to the CE literature.

The type of leadership practiced in an organisation, can have substantial impact on business activities, employees' mindset, adoption of new practices, innovation, culture and change management (Alblooshi, Shamsuzzaman, & Haridy, 2020). The significance of leadership and its impact on organisational practices is well articulated and clear, especially in both academic and practitioner literature. Another limitation of this study is that the impact of leadership types on CE adoption, and organisational factors influencing this adoption is not explored. Future studies can address this gap, by adapting our model by including constructs drawn from leadership, strategic innovation, decision-making and employee motivation literature to provide empirical evidence that will aid in understanding their impact on CE management strategy, sustainable business performance, organisational culture, employees' job satisfaction, employees' psychological outcomes and emotional states and innovation mindset. Such empirical insights will equip managers with information to develop strategies that will help to effectively create a collaborative and conducive working environment for adopting and managing circularity in the business models. Similarly, drivers and barriers to adopt hub and spoke framework in the context of adopting and implementing CE practices within SMEs, can be potentially examined in future empirical investigations through a mixed method approach. In this context, statistical models can help understand and examine the relationships between the constructs (impact of drivers and barriers on sustainable business performance), whereas case-studies can help validate the effectiveness of the proposed framework through real-life pilot projects in the SMEs working environment.

Although we took precautions by employing suitable methods during the data sampling, collection and analysis to minimize the impacts of common method bias and endogeneity (which are limitations of survey-based primary research), we argue that future research can design longitudinal studies drawing samples from more industries, countries, and informants with more diverse backgrounds to address the CMB and endogeneity effects (Jordan & Troth, 2020). Once a model is validated using quantitative data, we suggest case-based research can be used to further test and validate the theoretical outcomes, thus examining CE adoption, and implementation through ethnographic studies, to provide more comprehensive insights.

Our model was tested in a developing economy, and we purposely chose to study the SMEs organisation in manufacturing sectors. Although, purposive sampling and inclusion criteria employed in our study have increased the internal validity of our investigation, this strategy may often limit external ecological validity, i.e., in other geographical locations, and industrial sectors and generalizability (Mweshi & Sakyi, 2020). The issue with generalizability can be addressed by conducting more empirical investigations (surveys, case-studies, and pilot implementation) across the globe in other business sectors, which will aid in comparing the results (further contributing to the research in this area). While comparing these results in different contexts and sample, the recommendations and implications should be applied with caution to ensure applicability and reproducibility. Our study provides a pathway to further develop the research on the interplay between internal organisational factors and CE adoption, which will help SMEs to improve their sustainable performance, adaptive capability, and adsorptive capacity through evidence-based strategies

conducive to the needs (priorities and sustainable goals) of both the organisations and their workforce.

CRediT authorship contribution statement

Soumyadeb Chowdhury: Conceptualization, Data curation, Formal analysis, Writing – original draft, Funding acquisition, Validation, Investigation. **Prasanta Kumar Dey:** Conceptualization, Writing – original draft, Funding acquisition, Validation, Investigation, Supervision. **Oscar Rodríguez-Espíndola:** Writing – original draft, Visualization, Validation, Software, Methodology, Formal analysis, Data curation. **Geoff Parkes:** Writing – review & editing, Project administration, Investigation, Conceptualization. **Nguyen Thi Anh Tuyet:** Funding acquisition, Investigation, Validation, Writing – review & editing. **Dang Duc Long:** Writing – review & editing, Resources, Project administration. **Tran Phuong Ha:** Formal analysis, Project administration, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Survey instrument

Construct	Proxies measuring the construct	
Leadership	• Manager takes risks even when he/she is not certain of the support from senior management • My manager holds me and my colleagues responsible for the way we handle a job • Organisation employs change management through formal and informal communication • Organisation employs creative thinking for faster decision-making in strategic, tactical and operation level	Gelhard & Von Delft, 2016; Geng & Doberstein, 2008; Govindan & Hasanagic, 2018; Lara & Salas-Vallina, 2017; García-Quevedo et al., 2020; Jerónimo et al., 2020
Innovation	• Senior management support the introduction of innovative practices/products/services • Our organisation is often consulted by other organizations for advice and information. • Senior management in my organisation involve employees in the decision-making process. • My organisation is willing and ready to accept outside help when necessary.	Gelhard & Von Delft, 2016; Geng & Doberstein, 2008; Gusmerotti et al., 2019; Kirchherr et al., 2018; Lara & Salas-Vallina, 2017; Nguyen et al., 2020
Culture	• In my organisation significant time is spent planning and thinking things through • Communication from management is clear, transparent and frequent • In my organisation we apply vertical extension of responsibilities (job enrichment), that is, obtain more decision-making authority over activities to be performed. • In my organisation we apply horizontal extension of responsibilities (job enlargement), that is, we are able to perform a broader repertoire of activities (job rotation, increase interchangeability of positions).	García-Quevedo et al., 2020; Gelhard & Von Delft, 2016; Jerónimo et al., 2020; Kirchherr et al., 2018; Lara & Salas-Vallina, 2017; Lukoschek et al., 2018
Skills and competencies	• My organisation provides Circular Economy related training to our employees. • My organisation recruits new employees who have good exposure to Circular Economy practices • Managers in my organisation have strong understanding of the circular economy philosophy. • Managers in my organisation are able to coordinate effectively with all intra departments, suppliers and customers in the context of implementing and adopting circular economy practices.	Govindan & Hasanagic, 2018; Kirchherr et al., 2018; Lara & Salas-Vallina, 2017; Nguyen et al., 2020
Circular Economy practices	• We work with clients/suppliers for ecological design of products/services • During the design stage we consider the possibility to reuse products after they have served their initial purpose • We are using recycled materials as inputs in our processes • We have policy and practices in place to dispose machineries and equipment on time	Dey et al., 2022; Dey et al., 2020; Dey et al., 2019b; Saha et al., 2020
Sustainable performance	• We have reduced our manufacturing costs in recent years • We have increased average return on net assets from green products • We have reduced Inventory carrying cost. • We have reduced Cost of transportation and handling. • We have reduced business waste across our processes • We have improved compliance with environmental standards • We have decreased carbon emissions • We increased revenue from green products and practices • We have improved work safety in recent years • We have improved work environment in recent years • We have commitment from employees and managers towards incorporating environmental management • We have created jobs to support the community and thus contributed to nation's entrepreneurial growth.	Dey et al., 2020; Saha et al., 2020; Epstein & Roy, 2003; Dey et al., 2022; Dey, Malesios, De, Chowdhury, & Abdelaziz, 2019a

Appendix Table R.1 Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	11.434	60.177	60.177	11.434	60.177	60.177	8.203
2	1.658	8.727	68.904	1.658	8.727	68.904	9.046
3	0.839	4.416	73.320	0.839	4.416	73.320	7.668
4	0.674	3.546	76.866	0.674	3.546	76.866	7.830
5	0.601	3.164	80.031	0.601	3.164	80.031	8.492
6	0.488	2.569	82.600	0.488	2.569	82.600	6.601
7	0.406	2.136	84.736				
8	0.377	1.987	86.722				
9	0.317	1.669	88.391				
10	0.307	1.617	90.008				
11	0.281	1.480	91.488				
12	0.259	1.361	92.849				
13	0.235	1.234	94.083				
14	0.233	1.225	95.308				
15	0.205	1.079	96.387				
16	0.195	1.025	97.412				
17	0.186	0.980	98.392				
18	0.173	0.910	99.302				
19	0.133	0.698	100.000				

Extraction Method: Principal Component Analysis.

Appendix Table R.2 Comparison of Regression Coefficients

Our results demonstrated that the industry did not affect the results. Initially, as it can be seen in Table below, we compared the model presented in the paper with a model using the industry as a controlling variable. We found that the industry (Sector) does not have a significant effect in any of our endogenous variables, which means the industry does not confound the relationships in our model.

Relationship			Significance model with control (p-value)	Significance model without control (p-value)
INNOV	<—	LEADER	***	***
CULTURE	<—	LEADER	***	***
SKILL	<—	LEADER	***	***
INNOV	<—	Sector	0.072	N/A
CULTURE	<—	Sector	0.162	N/A
SKILL	<—	Sector	0.261	N/A
CEP	<—	INNOV	***	***
CEP	<—	CULTURE	***	***
CEP	<—	SKILL	0.014	0.014
CEP	<—	Sector	0.704	N/A
SP	<—	CEP	***	***
SP	<—	Sector	0.278	N/A

*** $p < 0.001$.

Appendix Table R.3. Comparison of standardised estimates

We also compared the standardised coefficients of the relationships between constructs to find relevant differences about changes that could be generated by the control variable. The comparison can be seen in the Table R.3 below. The difference in the standardised coefficients between both models is extremely small, as expected because of the lack of significant relationships between Sector and the constructs of the study.

			Estimate with control variable	Estimate without control variable
INNOV	<—	LEADER	0.909	0.907
CULTURE	<—	LEADER	0.840	0.839
SKILL	<—	LEADER	0.876	0.875
INNOV	<—	Sector	0.087	N/A
CULTURE	<—	Sector	0.073	N/A
SKILL	<—	Sector	0.058	N/A
CEP	<—	INNOV	0.412	0.410
CEP	<—	CULTURE	0.686	0.687
CEP	<—	SKILL	−0.263	−0.263
CEP	<—	Sector	0.018	N/A
SP	<—	CEP	0.891	0.893
SP	<—	Sector	0.045	N/A

Appendix Table R.4 Pattern Matrix

Initially, the correlation matrix between reliability analysis for each one of the items was undertaken using SPSS to exclude very high correlations. Then, reliability analysis in SPSS was used for each one of the scales to explore the effect of erasing items on the overall value of the scales. Next, exploratory factor analysis was undertaken after deleting redundant variables as shown in table below below. Values above the cut-off point of 0.6 were accepted for further analysis.

Appendix 1. Pattern Matrix[a]

	Component					
	1	2	3	4	5	6
CEP3	0.916					
CEP2	0.890					
CEP1	0.856					
CEP4	0.657					
SP2		0.871				
SP3		0.821				
SP1		0.821				
SP4		0.641				
Lead3			0.857			
Lead1			0.846			
Lead2			0.773			
Innova3				0.841		
Innova2				0.782		
Innova1				0.636		
Culture2					0.871	
Culture1					0.823	
Culture3					0.770	
Skill1						0.873
Skill2						0.788

Extraction Method: Principal Component Analysis.

Rotation Method: Promax with Kaiser Normalization.

a. Rotation converged in 8 iterations.

Appendix Table R.5 Standardized Regression Weights

The different items delivered adequate loading values, which was posteriorly confirmed through confirmatory factor analysis (CFA) which was also used to remove items with low loadings. The results of the final loadings are shown in Table R.5 below, which were accepted for the analysis:

			Estimate				Estimate
Lead1	<—	LEADER	0.848	CEP1	<—	CEP	0.891
Lead2	<—	LEADER	0.813	CEP3	<—	CEP	0.854
Skill1	<—	SKILL	0.880	CEP4	<—	CEP	0.841
Skill2	<—	SKILL	0.865	SP2	<—	SP	0.880
Innov3	<—	INNOV	0.833	SP4	<—	SP	0.865
Innov2	<—	INNOV	0.828	SP1	<—	SP	0.893
Innov1	<—	INNOV	0.883	SP3	<—	SP	0.862
Culture3	<—	CULTURE	0.842	CEP2	<—	CEP	0.858
Culture2	<—	CULTURE	0.857	Lead3	<—	LEADER	0.790
Culture1	<—	CULTURE	0.888				

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