Circular economy: a conceptual model to measure readiness for manufacturing SMEs

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Abstract

Purpose – Over the last decade, circular economy (CE) has gathered interest from both industrialists and academics alike. Whilst CE research is widespread in such areas as supply chain and larger organisations, there is limited research into how small to medium enterprises (SMEs) can prepare for adopting CE. There is no comprehensive readiness model for SMEs adopting CE. The purpose of this paper is to explore the literature on change readiness and generate knowledge to fill this gap by developing a conceptual model to measure change readiness for SMEs' adopting CE.

Design/methodology/approach – This study is based on a comprehensive literature review of change readiness models and frameworks. The paper reviews publications from Science Direct, Web of Science, Emerald, Scopus and Google Scholar. The readiness for change models and frameworks from the selected publications are evaluated and synthesised to develop a comprehensive conceptual model for change readiness for SMEs adopting a circular economy.

Findings – A readiness conceptual model is developed by incorporating several factors as precursors to readiness, i.e. individual/collective difference, structural, contextual factors and related barriers. Eleven factors make up the individual/collective difference. Three factors make up the structural and contextual factors.

Practical implications – This paper develops a conceptual model that can aid academics and practitioners in better understanding SMEs readiness to adopt CE.

Originality/value – This paper makes a unique contribution by proposing a comprehensive conceptual model of readiness for SMEs adopting CE.

Keywords Readiness for change, SMEs, Circular economy

Paper type Conceptual paper

1. Introduction

The concept of the circular economy (from here on referred to as CE) has recently become popular with academics, industry and policymakers (Geissdoerfer *et al.*, 2017). According to Ruggieri *et al.* (2016), CE has emerged as a strategy within the scope of sustainability which seeks to enhance the concept of sustainability. Whilst Thakker and Bakshi (2021) suggest CE combines responsible consumption, extended performance, product and end of life usage, Murray *et al.* (2017) suggests CE needs careful definition, to facilitate real benefit to emerge for both environment and society. According to Kirchherr *et al.* (2017, p. 228), who systematically analysed 114 definitions of CE now define it as "an economic system that replaces the 'end-of-life' concept with reducing, alternatively reusing, recycling and recovering materials in production/distribution and consumption processes." CE appears to be a sound concept because it has been able to attract the business community to sustainable development work (Korhonen *et al.*, 2018).

CE is considered a new business model where no waste goes unrecovered. It is envisioning a future where nothing is wasted; a future where every "waste" becomes an asset, a future where all products at the end of their primary use are recovered and either reused, remanufactured or recycled for multiple generations (Bradley *et al.*, 2016). The largest share of CE research focuses on China, particularly in the fields of industrial ecology and

environmental science. Furthermore, most of the research articles have been either contextualised at Meso (industrial parks) or Macro (cites, regions) levels, with the smallest number of studies aimed at micro-level (single company or consumer) (Ghisellini *et al.*, 2016; Lieder and Rashid, 2016). At the micro-level, De Angelis (2020) argues that CE relates to organisational competitiveness and profitability, deeming it relevant to management practitioners. According to Modgil *et al.* (2021), big data analytics impacts circularity in many ways, such as value proposition, decision-making purposes, (Tang and Liao, 2021), develop appropriate action plans to meet their sustainable development targets (Bag *et al.*, 2021), which can shape their resource selection strategies (Dubey *et al.*, 2019), and act as a source of sustainable competitive advantage (Wamba *et al.*, 2017). Whilst Zheng *et al.* (2021) stress the capacity of IoT in improving product design from a (CE) perspective, implementing this CE paradigm lacks consolidated managerial directions according to Unal *et al.* (2019). Conceptual studies about circular economy would aid the conceptual development and practical implementation, given that how they can be implemented still needs attention (De Angelis, 2020).

Whilst Tripathi and Gupta (2021) discuss many micro readiness assessment models for change and evaluate industry-specific features such as human resource, transformation strategy and technology, Stentoft *et al.* (2021) discuss change readiness in terms of technology that goes from artificial intelligence to cybersecurity. This paper considers human aspects, specifically CE at the micro-level of SMEs, and how readiness for change is required from leaders, senior management and staff, for their transition to CE. A previous systematic literature review into CE and its various levels of readiness reveal that there is little research on organisational change for an SME adopting CE and more specifically, little research into SME readiness for organisational change (Thorley *et al.*, 2019). There are two models that associate loosely around change readiness. For example, Lopes de Sousa Jabbour (2018) propose two methods of circular economy implementation, adopting circular activity to optimise materials usage and developing new business models. Singh *et al.* (2018) adapt and extend the theory of planned behaviour to explore further two additional factors, environmental commitment and green economic incentives. Lopes de Sousa Jabbour (2018) assert that organisations should assess two aspects, willingness to adapt current business models or to adopt new ones. However, they accept a need for a certain level of organisational change, i.e. mindset, skills, corporate relationships, product design or technologies. Arguably, this demand for organisational change dictates readiness of an SME to engage in CE activity. Lopes de Sousa Jabbour (2018) also discuss options for assisting managers in conducting a CE assessment. Better management of relationships between organisations, suppliers and customers is paramount in the endeavour to develop circular practices by sharing information and engagement across the supply chain. Whilst Lopes de Sousa Jabbour (2018) generates some insights into factors for consideration in terms of SMEs readiness for CE, it does not discuss the needs of the organisation from a human perspective. It states that there must be better relationships but does not suggest how these relationships need to change and develop to enhance circular behaviour. They do state that the development of shared values between consumers and other organisations is a key to any strategy supporting circular practice. Whilst this paper offers some areas to consider for readiness, it does not offer any contribution to how an organisation may change its collective mindset, skills and relationship.

Singh *et al.* (2018) make the connection of barriers to CE, i.e. ineffective enforcement of relevant regulations, institutional support, lack of economic incentives, poor technical skills and low environmental awareness, to how this affects CE readiness in small firms. They suggest that both internal and external factors are responsible for a firm's circular economy behaviour. Singh *et al.* (2018) use the theory of planned behaviour to examine internal and external barriers. They relate the three areas of Ajzens's theory of attitude, social

pressure and perceived behavioural control to environmental commitment and green economic incentives. They hypothesise that attitude, social pressure and perceived behavioural control positively influence circular economy readiness based on previous work, using the same concept and the willingness to act for waste management, recycling and pollution prevention. Whilst this paper considers human factors, it does not address other factors associated with the broader concept of readiness, e.g. skills, relationships, structural factors and additional barriers to circular economy as identified in the present systematic literature review.

Ormazabal *et al.* (2018) explore the challenges and opportunities of Spanish SMEs adopting CE. They find SMEs are most concerned with law compliance and corporate image. They argue that there are two different categories of barriers, i.e. hard barriers and human-based barriers. The former can be addressed by financial stimulation, while the human-based barriers include issues like company leadership or the lack of customer interest in the environment. This paper does not constitute any kind of readiness for change in adopting CE.

Whilst there is no comprehensive readiness model for CE in SMEs, according to Rizos *et al.* (2015), numerous barriers (e.g. behaviour of suppliers, lack of technical skills and financial resources) can hamper the implementation of "circular" practices in SMEs and how they operate. Lack of knowledge about the benefits of the CE concept is another key issue. Some SMEs which are not familiar with the concept of CE have a lack of awareness or find it difficult to understand any benefits. Furthermore, SMEs are more concerned with the day-to-day running of their businesses rather than giving priority to sustainability and adopting circular economy practices (Rizos *et al.*, 2015).

Accelerating changes and new technologies give rise to unique and unforeseen challenges. (Kazancoglu *et al.*, 2021). Therefore, leaders' mindsets, attitudes and behaviours must also change. Imbrogiano and Nichols (2020) argue that leaders are able to set targets and deliberately incentivize the management of specific sustainability issues to create the desired performance outcome. In addition, Sharma *et al.* (2020) suggest there must be "management will" towards the adoption of CE. They continue to highlight the need for SMEs' innovation and technology as well as relevant training and motivation associated for staff to adopt CE practice. According to Kazancoglu *et al.* (2020), reluctance for acceptance of CE is the second most important barrier, pointing out, stakeholders within the network are not willing to adopt the new business model, and that the corporate culture does not support the SMEs in this direction. However, according to Holzer *et al.* (2021, p. 9) "to facilitate a true transition towards a CE, the 'late majority' group also requires consideration. This group is not yet convinced that a CE could provide them with business opportunities."

In the absence of comprehensive change readiness models for manufacturing SMEs adopting CE as highlighted above, a practical model of readiness remains incomplete. This gap, therefore, requires the development of a conceptual readiness model for SMEs adopting CE. Therefore, this research paper endeavours to interrogate the literature to develop a conceptual model of readiness for SMEs adopting CE. This research process steps can be viewed in Figure 1 below. This readiness conceptual model is vital for practitioners and researchers to better understand the phenomenon of SMEs' adopting CE. Maldonado-Guzmán *et al.* (2020) conclude that a relationship between eco-innovation activities and the CE exists at the micro-level. Therefore, this paper reviews readiness for change models and their application to other disciplines such as eco-innovation, TQM, lean, cleaner production and reveals the potential to build a conceptual model of readiness for SMEs adopting CE. The proposed conceptual model considers barriers to CE as well as proven research around readiness drawn from other disciplines. The conceptual model adds to the knowledge around CE readiness and forms a framework for manufacturing organisations and practitioners to prepare for the adoption of CE. Justification for the proposed conceptual readiness model is deduced from a comprehensive literature review of readiness for change.
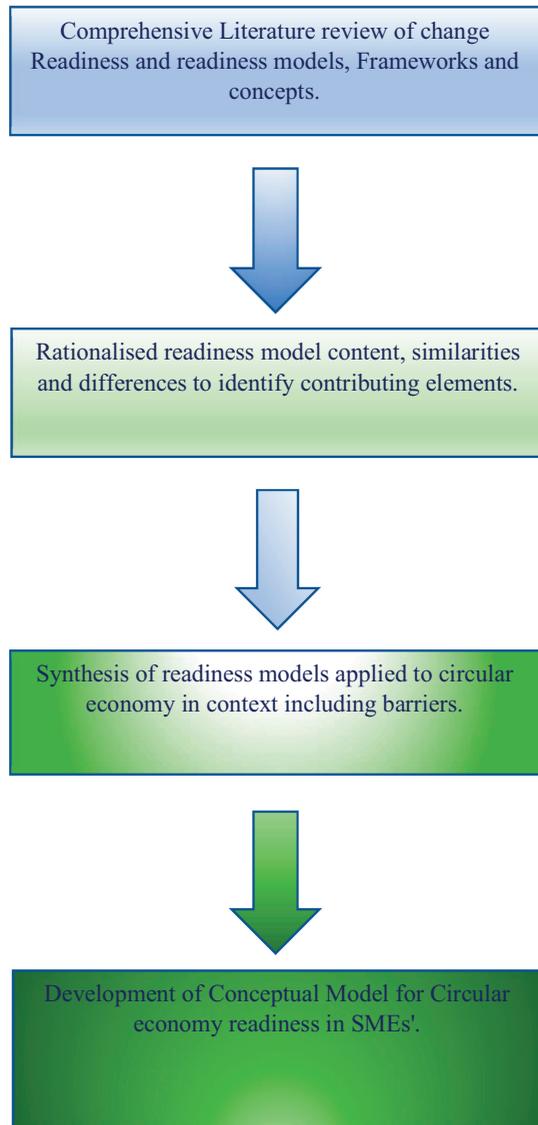
Figure 1.
Research methodology
overview

This model is further contextualised to CE by addressing the barriers for adopting CE. The model will help to further understand the complexity of change readiness for SMEs adopting CE.

The rest of the paper is structured as follows: Section 2 provides an overview of the methodology used to create the conceptual model and the rationale supporting and justifying its development; Section 3 presents a comprehensive literature review of change readiness models, frameworks and concepts, the rationalisation of the models and frameworks for contributing elements and subsequent synthesis and contextualisation as to the relevance to SMEs' adopting CE. It also includes the development of the conceptual model and supporting

instrument, illustrating and explaining the operation of the conceptual model. Section 4 presents a discussion evaluating and inferring links with readiness and resistance, justifying the factors incorporated in the building of the conceptual model. Section 5 offers a conclusion including the benefits to industrialists and academics, the novelty of the model, future research and limitations of this research.

2. Research methodology

This section displays an overview of the research methodology and development of the conceptual model, see Figure 1 below. The first step involved a comprehensive literature review carried out to interrogate the literature for change readiness. Research included previous published material on organisational change, resistance to change, sustainable change, individual readiness for change and generally readiness for change models, concepts and frameworks as well as models applied to other discipline areas such as TQM, lean and eco-innovation. This wide-ranging research around the application of readiness models and theory would act as theory triangulation to ensure the best possible pool of resources for developing a new conceptual model. The second step was to consider how this readiness for change models and frameworks would be relevant in the context of SMEs' transition to CE. The literature indicates that the context of where and how the change is happening in readiness to change models and concepts is imperative to the successful application of such a model. In this instance, a key element for the contextualisation of any future readiness model was the barriers SMEs face to adopting CE. These barriers were identified in previous research and are outlined in Table 3. Each model or framework was explored for any relevant factors that could contribute to this new conceptual model, see Table 1. The third step was to deconstruct some of the models and combine with useful elements from other models to develop a conceptual model of change readiness for SMEs' adopting CE. This process of deconstructing these models and frameworks and re-combining elements to form a new model is summarised in the specific criteria in Table 2. These elements forming the criteria within the model was contextualised by matching the perceived barriers preventing SMEs' adopting CE, see Table 4.

It seems perfectly sensible to address perceived barriers to SMEs' adopting CE when considering whether an SME is ready for change to adopt CE, i.e. this is the context for change readiness, making it a unique model. This new conceptual model was synthesised from viewing a variety of models, frameworks and concepts and utilising the most relevant components. This conceptual model has recognised contribution from individual change, collective change, emotional perspective, structural components and context.

2.1 Comprehensive literature review

This research initially included a comprehensive literature review of peer reviewed articles to ensure as much information pertaining to readiness for change models, and concepts as possible were captured. The application of these models and frameworks was inconsequential at this time and would be their likely relevance would be determined later. Key themes and search strings included: change management, readiness for change, organisational change, resistance to change and readiness for SMEs'. A boolean style was utilised to interrogate the following electronic databases: Web of Science (apps. webofknowledge.com), Science Direct (sciencedirect.com), Scopus (www.Scopus.com), Emerald (emeraldinsight.com), IEEExplore (ieeexplore.com), Business Source Complete (web.b.ebscohost.com) and Google Scholar. It was imperative to search as broad and wide as possible to gain a comprehensive understanding of the literature. Therefore, it was an inclusive piece of research extending over many months, emerging rather than a tight

Model	Author	Application
Theory of planned behaviour	Ajzen (1991)	Intentions to perform behaviours from attitudes towards the behaviour, subjective norms, and perceived behavioural control
Theory of planned behaviour	Tonglet *et al.* (2004)	This paper applies the TPB to identify what influences the behavioural choices that individual has to recycle
Extended theory of planned behaviour	Singh *et al.* (2018)	Used to explore a small firm's readiness towards circular economy
Interventions to promote mindfulness	Gondo *et al.* (2013)	For changing an individual's beliefs about change
Ten organisational dimensions	Douglas *et al.* (2017)	Used to measure the climate of readiness for lean, next phase (a case study)
Extended theory of organisational culture	Haffar *et al.* (2013)	Used for explaining the relationship among OC types, IRFC and TQM implementation
Survey questionnaire validated by the literature	Shokri *et al.* (2016)	Used for data collection to analyse the behavioural related critical success factors of lean six sigma readiness
Conceptual model of communication during organisational change	Elving (2005)	This aims at communication not only to inform but also to create a community
Determinants and outcomes for organisational readiness for change	Weiner (2009)	Organisational readiness is best suited for changes where collective, coordinated behaviour change is necessary to effectively implement the change and to produce anticipated benefits
Survey questionnaire previously adapted and validated through a pilot study to remove irrelevant questions and ambiguity	Garza-Reyes *et al.* (2015)	Used for data collection to ascertain if a company is indeed ready for lean implementation and sustaining
Theoretical model for change readiness for supportive behaviours of compliance, cooperation and championing	Rafferty and Minbashian (2019) theoretical model	This change readiness theoretical model uses elements from Holt including positive emotion to predict supportive behaviour for general compliance, cooperation, and championing
Expanded conceptualization of change readiness	Holt and Vardaman (2013)	This is arguably willingness and ableness at individual and organisational levels

Table 1.
Appraised readiness for change models

prescriptive focused systematic literature review. This approach was purposeful, in that it would enable the researcher to include relevant information from any potential source.

2.2 Rationalising material content and contribution

When considering the next theoretical step in the methodology, the approach was to identify whether to adopt a model, theory or framework. In the first instance, it would be sensible to understand the difference. Nilsen (2015) argues that there are now too many theoretical approaches and sets out to propose a taxonomy that distinguishes between different approaches to enable researchers to choose the most appropriate. He suggests that it is possible to delineate five categories of theoretical approaches used in implementation science: process models, implementation theories, classic theories, determinant frameworks and evaluation frameworks. A conceptual model is often used interchangeably with terms such as

theories and frameworks for implementation science. The notion of implementation science has more recently recognised the need to establish the theoretical bases of implementation and strategies to facilitate implementation as oppose to empirical driven research (Nilsen, 2015). According to Eccles (2006), theories can be defined by their scope, and often, grand theories are used interchangeably with conceptual models. A conceptual model typically involves a deliberate simplification of a phenomenon and do not have to be completely accurate representations of reality. Based on this judgement, a conceptual model is designed from a review of model, concepts, theories and frameworks. Therefore, the rationale was to examine the literature in all of the forms from models, concepts, theories and frameworks from application in many different contexts. This approach would provide the best possibly chance of identifying as many contributing factors as possible into this new conceptual model. It then enabled the identification of which factors could be merged, combined, dismissed or modified to produce a unique contextualised readiness model.

2.3 Synthesis of readiness models, concepts and frameworks
These readiness models, concepts and frameworks from the literature review were analysed for their suitability and contribution for use as a readiness conceptual model for CE. Whilst there were a number of models and frameworks, it was clear that there was no comprehensive model or framework that would be entirely suitable. As a foundation for the new conceptual model, the model that was deemed to include the greatest number of significant factors of readiness elements was chosen to build upon rather than start from

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Discrepancy – a belief that there is need for a change. That there is a difference between the current end future state (Rafferty and Minbashian, 2019; Holt *et al.*, 2007)
Appropriateness – the change is an appropriate response to organisational or external issues (Holt and Vardaman, 2013)
Personal valence – an individual's belief that change has intrinsic and extrinsic benefits including the perceived benefits of a change for an individual (Holt and Vardaman, 2013)
Positive emotions about change – the emotions that are present in response to change, such as joy, happiness, excitement, curiosity, enthusiasm, and pride (Rafferty and Minbashian, 2019)
Change self-efficacy – confidence in your personal ability to affect change (Holt and Vardaman, 2013)
Principal support – provisional support from a range of leaders, moreover senor leadership, direct line management, formal, informal and one's peers (Holt and Vardaman, 2013)
Awareness and mindfulness – being attentive to, aware of and mindful of how a change is unfolding in the present, awareness of their routine behaviours and how they need to change (Gondo *et al.*, 2013)

Organisational factors/valence
Collective commitment – shared belief and resolves to pursue courses of action that will lead to successful change implementation. Commitment based on "want to" motives reflects the highest level of commitment to implement organisational change. It is these I want to motives, that the instrument questions are based (Holt and Vardaman, 2013; Weiner, 2009)
Collective efficacy – shared belief in their conjoint capabilities to organize and execute the courses of action required to implement change successfully (Holt and Vardaman, 2013)
Collective trust – shared belief that leaders will act in the best interest of the organisation's stakeholders (Holt and Vardaman, 2013)

Structural and contextual factors
Knowledge and skills alignment – the degree to which the employees' knowledge, skills and abilities align with the change (Holt and Vardaman, 2013)
Support climate – sufficient tangible (e.g. funding, reward, and incentive systems) and an encouraging intangible environment (i.e. culture and climate) to support implementation (Holt and Vardaman, 2013)
Facilitation – a set of clearly articulated goals and objectives that are supported by a detailed implementation plan defining roles and system to measure progress (Holt and Vardaman, 2013)

Table 2.
Explaining the criteria/ definitions of meaning

Barriers definition	References
Lack of support supply and demand network/constraints to adopting new circular business models	Rizos *et al.* (2016), Ormazabal *et al.* (2018) and de Jesus and Mendonça (2018)
Lack of capital/financial support Government support/ economic and financial drivers, support from public institutions and misaligned incentives	Rizos *et al.* (2016), Ormazabal *et al.* (2018), de Jesus and Mendonça (2018) and Singh *et al.* (2018)
Administrative burden	Rizos *et al.* (2016) and Ormazabal *et al.* (2018)
Lack of technical know-how/technical resource/Lag between design and diffusion or lead time to market	Rizos *et al.* (2016), Ormazabal *et al.* (2018), de Jesus and Mendonça (2018) and Singh *et al.* (2018)
Lack of information/information management systems	Rizos *et al.* (2016), Ormazabal *et al.* (2018) and de Jesus and Mendonça (2018)
Company environmental culture/internal conflict	Rizos *et al.* (2016), Ormazabal *et al.* (2018) and Singh *et al.* (2018)
Lack of customer/consumer interest in the environment/ Rigidity of consumer behaviour and business routine	Ormazabal *et al.* (2018) and de Jesus and Mendonça (2018)
Lack of qualified personnel in environmental management	Ormazabal *et al.* (2018)
Lack of leadership commitment	
Lack of environmental awareness, training and support	Singh *et al.* (2018) and de Jesus and Mendonça (2018)

Table 3.
Categorised barriers to SMEs' uptake of circular economy

Barriers definition	Readiness criterion
Lack of support supply and demand network/constraints to adopting new circular business models	Appropriateness, awareness and mindfulness, and collective efficacy
Lack of capital/financial support Government support/ economic and financial drivers, support from public institutions, misaligned incentives	Organisational valence, collective efficacy and support climate
Administrative burden	Collective commitment
Lack of technical know-how/technical resource/Lag between design and diffusion or lead time to market	Change self-efficacy, collective efficacy and knowledge and skills alignment
Lack of information/information management systems	Support climate, facilitation and collective efficacy
Company environmental culture/internal conflict	Support climate, principal support and collective efficacy
Lack of customer/consumer interest in the environment/ rigidity of consumer behaviour and business routine	Appropriateness, awareness and mindfulness
Lack of qualified personnel in environmental management	Facilitation and principal support
Lack of leadership commitment	Collective trust, collective efficacy and principal support
Lack of environmental awareness, training and support	Knowledge and skills alignment and collective trust

Table 4.
Connection of CE barriers to readiness model criterion

nothing. Then, from a variety of models and frameworks, other attributes and elements could be combined to develop a new contextualised and comprehensive model. A list of models and frameworks that were considered and formed a significant part of the literature review for change readiness can be seen in Table 1 with a brief overview of the application. As previously stated, the most comprehensive model that would form the basis of this new conceptual model was that of Holt and Vardaman (2013) and was chosen as a basis to be further developed. These factors incorporated into the model which covered both individual readiness, collective readiness as well as structural factors, all of which was deemed relevant.

This model would be modified and developed using elements from other models and frameworks from the literature. For instance, positive emotions about change, (Rafferty and Minbashian, 2019), awareness and mindfulness (Gondo *et al.*, 2013). In Table 2, there is a list of criteria which has a definition of each of the terms used in this new conceptual model. In Table 3, there is a list of perceived barriers preventing SMEs adopting circular economy which were identified in previous research (Thorley *et al.*, 2019). These barriers were used in contextualising this readiness conceptual model. The literature suggested any model or framework that must be contextualised to the specific change requirement. Therefore, based on reasoning and analysis, in Table 4, the barriers from Table 3 were mapped and connected to the readiness criteria in Table 2 that made up the conceptual model. This decision was made based on the reasoning that an organisation would need to be prepared and ready to oversome such barriers if it were to become successful in this transition to CE.

2.4 Development of the conceptual model
This conceptual model can be viewed in Figure 2 and has underpinning design as highlighted in Table 2 in terms of the definition of the content of the model. When designing the comprehensive model, care was taken to develop and justify the criteria used to design an application to SMEs and transition to CE. When considering readiness for change, one significant factor is the context that is present when the change is initiated. Context comprises of the conditions and environment and arguably the culture within which employees' function (Holt *et al.*, 2007). It is for this reason that for a conceptual model of SMEs' change readiness for CE should consider SMEs' perceived barriers to adopting CE as highlighted in Table 4.

This conceptual model of readiness for SMEs' adopting circular economy is adapted from conceptual models of readiness and research by Holt *et al.* (2007), Holt and Vardaman (2013). This is used to form the basis of the model as it incorporates well-established content around individual change such as appropriateness, personal valence, self-efficacy and principle support. It also includes collective differences such as: collective efficacy, commitment and trust as this change in SMEs transition to CE requires collective mindsets and collective coordinated action in order to be successful. Success is reliant on the collective and coordinated actions of many interdependent individuals whom each contribute to the change effort. "In cases like this, when interdependence is high, a shared psychological sense of
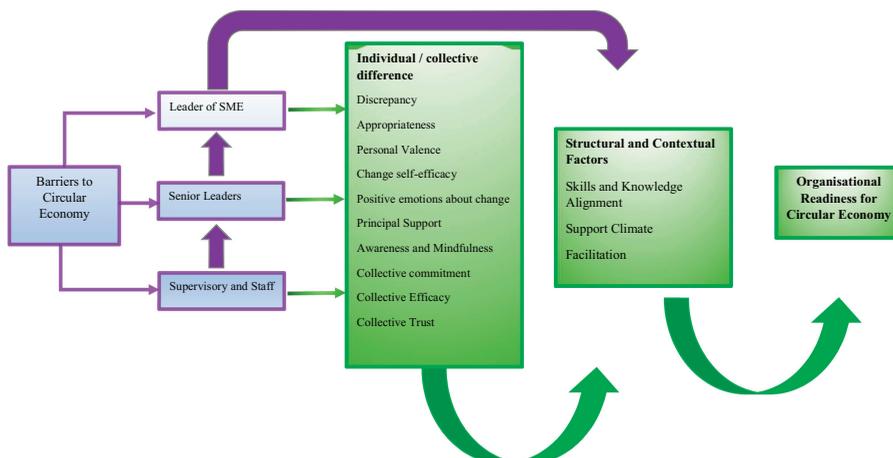

Figure 2.
A conceptual model of readiness for circular economy

confidence in collective capabilities may be a much stronger indicator of readiness for change than individuals' confidence in their own capabilities" (Holt and Vardaman, 2013).

3. Comprehensive literature review

If manufacturing SMEs are to make a transition to CE, there must be the will to change on the part of the leaders of those organisations and also management and staff. CE requires collaboration among supply chains and various stakeholders in the market, which means active engagement, cooperation and mutual understanding between them (Kazancoglu et al., 2020).

Understanding what the factors are that enable individuals to act in a certain way that have the desired outcome is necessary to ensure this transition will take place. Therefore, a thorough understanding of individual, collective and organisational change readiness is paramount in predicting and subsequently intervening to facilitate this transition. This literature review explores readiness for change models and frameworks to establish any suitable strategies for manufacturing SMEs adopting CE.

"For over 30 years, interest in change readiness has been growing among researchers and practitioners of organizational change" (Caldwell, 2013). While change may often be instigated by external events, internal processes within the organisation will shape a successful response. A key challenge for these organisations is to motivate their members to support and work towards the successful implementation of change. Whilst most changes are often a result of external forces and pressures, internal change has to deal with these pressures to shape an organisation's response (Neves, 2009).

Kurt Lewin is considered the father of planned change with his proposed three-step model of unfreeze, Move, Re-freeze in 1947 Phil and Bakari (2017). Lewin's first step of "unfreeze" is often related to the concept of readiness for change (Armenakis et al., 1993). According to Holt and Vardaman (2013), the transtheoretical model proposes that change occurs in five cognitive stages namely, pre-contemplation, contemplation, preparation, action and maintenance. Readiness for change compares to the preparation stage, in which individuals hold positive perspectives towards a change and signify an inclination to act in the immediate future. Pieroni et al. (2021) have developed a comprehensive model based on circular economy business model innovation (CEBMI). This four-step model, prepare, sense, seize and transform has recommendations of institutional practices (including activities, tools, interdependencies, decision gates and recommended mindset and attitudes). It is this preparation stage that is recommended to make the organisation ready for the development of new circular economy business models (CEBMs) engaging the leadership with a CE-thinking/mindset. Whilst Pieroni et al. (2021) recommends behaviours, mindset and attitudes that can act as catalysers for CEBMI, it does not measure these. Their comprehensive work continues to support the need for a readiness model as they highlight a lack of readiness from companies to cope with the institutional aspects, noting difficulties in adjusting ability or motivation to question the linear status-quo of their business models (BMs) and scepticism about disrupting linear BMs due to their limited influence over established value chains. Schlosser et al. (2021) conclude that an organisations' behaviour may be influenced by policy and pricing if the recycled resource used to produce a product is less expensive than the virgin resource, then an SME has an incentive to invest in recycling.

3.1 Preparation stage or change readiness

According to Abdel-Ghany (2014), agents of change can identify gaps that may exist between their own expectations about the change outcome and those of other organisational members by assessing individual readiness for change. If significant gaps are perceived and no action

is taken to close those gaps, resistance is likely and successful change compromised. Holt *et al.* (2007) maintains the direction of change which the leaders' desire must align with the beliefs and cognitions of organisational employees they wish to follow and that any conflict must be addressed. The question remains, how to get "buy-in" or a commitment from individuals' within the organisation. "Factors such as creating a vision and a sense of urgency, empowering broad-based action, communicating the change vision, and mobilizing energy and commitment are all perceived as essential to change readiness" (Galagan, 2010, p. 4). Employee intentions to engage in change-related behaviours based on benefits, duty and cost-based perceptions are represented by a commitment to change (Phil and Bakari, 2017). Commitment is considered a significant pillar in John Oakland's model of change readiness. Phil and Bakari (2017) assert that enhancing employee commitment to change and creating readiness for change is fostered by authentic leadership, resulting in behaviours of compliance, cooperation and championing.

3.2 Authentic leadership

Moutousi and May (2018) contend that ethical leadership can support the successful implementation of organisational change and unethical leadership may trigger resistance. Authentic leaders share factual information, accept responsibility, avoid deceptive practices and lead by integrity and authenticity (Phil and Bakari, 2017). Honest leaders know that the future is uncertain (Moore, 2021). One of the most accepted theories in leadership is the transformational leadership style that according to Islam *et al.* (2021), influences trust, which in turn affects employee championing behaviour during organisational change. Building trust and developing transparent, open communication is fundamental for a healthy work setting (Sinclair *et al.*, 2021). Authentic leadership must consider communication in building readiness to change. McKay *et al.* (2013) conclude that communication alone does not reduce resistance to change; moreover, if communication is to be effective it must convey the aims and outcomes and appropriateness of the change in a timely fashion. "Practitioners are encouraged to foster a creative and open communication environment in their organizations based on existing scientific finding" (Iqbal *et al.*, 2021, p. 11).

According to Susanto (2008), researchers' perception towards change readiness efforts includes a vision for change, mutual trust and respect, change initiatives, management support, acceptance and how the organisation manages the change process. However, "change cannot be implemented in an organization if employees are unwilling to support and participate in change initiatives" (Samal *et al.*, 2020, p. 1505). Therefore, the leaders of SMEs making the transition to CE will be instrumental in terms of readiness.

Shou *et al.* (2020) discuss behavioural theory of the firm, and how organizations fail to achieve their environmental performance aspirations, stating that they would suffer from a perception of failure, attempt to change this loss situation, search for the remedy and prefer to copy behaviours of better-performing organisations. According to Iqbal *et al.* (2021), sustainable leaders have core attributes of sharing a vision, supportive of ideas generation, knowledge sharing, long-lasting relationships and ethically and socially responsible behaviours. According to Moore (2021), over confident leaders can lead to complacency, whilst wise or authentic leaders may express confidence in the face of adversity, but at the same time, telling the truth. Authentic leadership predicts employee positive belief about appropriateness of change. According to Men *et al.* (2020, p. 9), "when executive leaders articulated a compelling vision for change, communicated personal positive affect, including excitement, energy, passion, and confidence about change, and expressed care, support, and empathy towards employees during change, employees tended to trust the organization more."

3.3 Theories around change readiness
Armenakis *et al.* (1993) draw upon factors such as individual cognitive change, collective behaviour, social information processing and mass communication for creating organisational readiness. In terms of the message, they discuss this notion of discrepancy and appropriateness. That is, discrepancy being the need for change, from the present state to future state and that change is necessary. The appropriateness being that employees agree that the approach being conveyed is indeed the correct approach. They also discuss efficacy based on work by Bandura (1982) that is referred to as confidence that employees must hold in their capability to make the transition to the future state. They also discuss the dynamics of social information processing deemed to be the organisations' collective readiness, which is in turn impacted by the individuals that comprise this organisation. These aspects are further supported by the theory of planned behaviour and the theory of reasoned action (Ajzen, 1991). The notion of an individual's intention to perform a given behaviour is at the core of this theory. It is based on individual intentions, which are assumed to capture the motivational factors that influence behaviour. They argue that the stronger the intention to engage in a behaviour, the more likely should be its performance. This intention is underpinned by three factors: attitudes, subjective norms and perceived behavioural control. Essentially, the attitude pertains to whether an individual has a favourable or unfavourable evaluation of the behaviour in question. Social norms are interpreted as the degree of perceived social pressure to carry out the behaviour. Finally, there is perceived behavioural control which is the perceived ease or difficulty of performing a behaviour based around personal capability. These aspects concur with that of Armenakis, i.e.:

$$Perceived\ Behavioural\ Control\ =\ Self\ Efficacy$$

$$Attitude\ =\ Discrepancy\ and\ Appropriateness$$

$$Social\ Norms\ =\ Social\ information\ processing$$

Neves (2009) draws upon work of Armenakis and Bedeian (1999), in terms of five components: (1) discrepancy, (2) principal support, (3) self-efficacy, (4) appropriateness and (5) personal valence, progressed out of Lewin's ground-breaking work and Bandura's social learning theory. Neves (2009) suggests that personal valence emphasises the positive and negative outcomes, including benefits and fairness of change, arguing it can be operationalised through employee's affective commitment to change.

Holt and Vardaman (2013) propose a conceptual framework to guide scholars and practitioners by considering three main areas of organisational change readiness. These include: (1) psychological factors (i.e. characteristics of those being asked to change), (2) structural factors (i.e. circumstances under which the change is occurring) and (3) the level of analysis (i.e. individual and organisational). Holt and Vardaman (2013) reason that the individual difference factors of readiness may be manifested through specific attitudes and beliefs regarding the need for, appropriateness of, management support for and value of the change, both individually and collectively. Holt and Vardaman (2013) include in their research and conceptual model self-efficacy, appropriateness and discrepancy as individual factors that echo the extent to which individuals hold core beliefs associated with change, an awareness that a problem needs to be tackled and agree with the changes that individuals and the organisation must make. They also include structural factors that reflect the circumstances under which change is occurring and the extent to which these circumstances enhance or inhibit the implementation of a change, i.e. the context and process aspects of change. However, although this concept of readiness for change comprises five different components, the relevance and weight of each factor may depend on the type of change organisations face (Neves, 2009). This is pertinent to applying any model of change readiness

to SMEs adopting circular economy practices. For example, the leaders' attitude and beliefs around such organisational transformation will have significantly more impact than that of an employee. So, comparison of the two attitudes and beliefs would need to be interpreted differently with regard to the level of readiness of indeed resistance.

Rafferty and Minbashian (2019) focus on change recipients' change attitudes and their change readiness. They argue researchers have failed to consider positive emotions about change as a precursor of change readiness. Furthermore, Rafferty and Minbashian (2019) assert that positive emotion is a key source of variation in change readiness. Using the works of Holt *et al.* (2007) and Armenakis and Bedeian (1999), they redefine discrepancy as a "belief that change is based on legitimate reasons and is needed to address a deficiency in the current state relative to a desired future state" (Rafferty and Minbashian, 2019, p. 1625). Emotion is a key contributor to motivation of an individual and subsequent action. If employees or management believe the changes are not based on legitimate reasons, they are likely to hold negative attitudes towards the change which may have an impact on that individual's motivation and actions towards the change.

Rafferty and Minbashian (2019, p. 1625) remain consistent with previous definitions for appropriateness, self-efficacy and principal support based on the works of (Armenakis and Bedeian, 1999; Harris and Armenakis, 2002; Armenakis *et al.*, 2007), where they agree that appropriateness is defined as an "individual's belief that a change is an appropriate response to organisational issues". Change self-efficacy refers to an individual's perceived capability to implement a change initiative and has been consistently defined as an individual's confidence that he/she has the capability to implement a change. Finally, Rafferty and Minbashian (2019, p. 1626) redefine principal support "as an individual's belief that support is provided by formal organisational leaders such as senior leaders and immediate supervisors as well as one's peers and personal valence, as the belief that change is perceived to be personally advantageous for an individual". However, in addition to these aforementioned aspects of individual change readiness, Rafferty and Minbashian (2019, p. 1627) contend that "joy and interest represent core aspects of employees' positive emotional responses to organisational change and focus on the broad factor assessing employees' positive emotional responses to change, which encompasses the joy and interest emotion families".

"When readiness for change exists, the organisation is primed to embrace change and resistance is reduced" (Bouckenooghe *et al.*, 2009). Various authors consider readiness for change a significant factor for successful change (Haffar *et al.*, 2013; Harris and Armenakis, 2002; Elving, 2005). However, Vakola (2013) raises concern that the literature does not differentiate between individual and organisational readiness to change. Moreover, Vakola (2013) argue that this creates confusion for both research and practice as there is a lack of definitional and conceptual clarity. It is therefore imperative to recognise and distinguish between both individual readiness and collective readiness and how together they both contribute to organisational readiness.

Further, this literature review includes contributions from the work of (Gondo *et al.*, 2013), in terms of awareness and mindfulness and structural factors from (Weiner, 2009). Gondo *et al.* (2013) argue that developing a readiness for change model should be expanded upon to include not only an understanding of how change recipients cultivate a readiness to change routine behaviours, but also of how they develop a readiness to change their implicitly held assumptions and beliefs about those routines.

Weiner (2009) reconciles the structural and psychological views by arguing a relationship between them. He asserts that organisations' resources and other structural attributes only represent factors that organisational members' form change efficacy judgements and that efficacy judgements focus on the capability to marshal resources, formulate and execute plans to produce an effective performance. Essentially, that the term organisational valence is the collective belief about whether the organisation is capable of the change in question.

Weiner (2009) concedes that organisational readiness for change has not been subject to extensive empirical study, unlike that of individual readiness for change. Furthermore, there is conceptual ambiguity about the meaning of organisational readiness for change. Weiner (2009) interprets organisational readiness for change as a multi-level construct that can be more or less present at the individual, group, unit, department or organisational level. Specifically, organisational readiness refers to organisational members' change commitment and change efficacy to implement organisational change. This definition followed the ordinary language use of the term "readiness," which connotes a state of being both psychologically and behaviourally prepared to take action (i.e. willing and able). From this comprehensive literature review, the key models and frameworks that have been given consideration are summarised below in Table 1.

3.4 Rationalisation of models and frameworks

The next stage in the process is to deconstruct the models and frameworks and identify contributing elements from them that could be related to and combine to form the basis for a new conceptual model for organisational readiness of SMEs adopting CE. From the evaluation of models and frameworks and the readiness for the change literature, it seemed sensible to start from the broadest base possible from previous research and build a new model using existing concepts. The two theories/models that produced the broadest of bases were that of Ajzen (1991), theory of planned behaviour and Armenakis *et al.* (1993), organisational readiness for change. As previously evaluated, there are similarities with these two theories, but it is the modification of the latter theory by Holt and Vardaman (2013) that was deemed the most relevant model due to the flexibility to extend and add to this model. To further this conceptual model in a different context, other elements were added.

Whilst many readiness for change models focus purely on structural factors and functional related aspects, it is the internal processes within the organisation and the motivation of their members to support and work towards the successful implementation of change that is paramount (Neves, 2009). Moreover, Rafferty and Minbashian (2019) suggests that change readiness is indeed a cognitive and emotional construct, which requires that researchers consider both antecedents when defining and assessing change readiness. It is for this reason positive emotion has been included in the conceptual model. Lastly, convincing recipients of the need to change is considered a common element known as discrepancy. This discrepancy is a firmly held belief by change recipients that there is need for a change (Holt *et al.*, 2007; Rafferty and Minbashian, 2019).

Understanding of how change recipients develop a readiness to change their implicitly held assumptions, their habits and beliefs is significant as this has an impact on organisational change (Gondo *et al.*, 2013). They suggest this process of changing habits and beliefs is optimised when individual change recipients are mindful. They continue to suggest that mindfulness will enhance change during the change process. This aspect of mindfulness may not be applied in equal measure, but maybe more applicable to leaders and senior management within an organisation rather than employees. It could be argued that the level of mindfulness in leaders and senior management must be optimised to facilitate understanding of employees' challenges in overcoming assumptions, beliefs and changing habits. Lastly, increasing organisational change valence is a crucial factor according to Weiner (2009). Organisational valence is the appraisal of whether employees believe this change is needed, important and worthwhile but also for helping organisational employees to appraise the match of task demands, available resources and situational factors. Essentially, organisational valence is do employees collectively believe in the capability of the organisation. This has been considered and has been deemed to be consolidated into Holt and Vardaman (2013), base model in terms of organisational factors or organisational valence. Therefore, this comprehensive literature research defines a new conceptual model based

on previous work by Holt *et al.* (2007), Holt and Vardaman (2013), Rafferty and Minbashian (2019), Gondo *et al.* (2013) and Weiner (2009). In support of this conceptual model, the criterion for the development can be seen in Table 2.

When considering the development and application of a readiness conceptual model, the context for which it is intended is imperative. Context comprises of the conditions and environment and arguably the culture within which employees' function (Holt *et al.*, 2007). The success of an organisational change effort can also be influenced by the internal context (organisational conditions that influence employee beliefs, attitudes, intentions and behaviours (Armenakis and Harris, 2009). However, context suggests that organisational leaders must be vigilant about the context in which their organisations operate and must also be attentive to changes in the external environments. It is for these reasons that for a conceptual model of SMEs' change readiness for CE should consider SMEs' perceived barriers to adopting CE. A list of barriers to SMEs' adopting CE is outlined in Table 3 (Thorley *et al.*, 2019). It is this list of perceived barriers that will be used to contextualise the readiness for change model.

3.5 Development of conceptual model context
The conceptual model requires an instrument for which to measure this organisational level of readiness. The instrument will be in the form of a questionnaire that will be administered to three different categories, the leader of the organisation, senior management and staff and employees. The questions will vary as different criteria may carry more weight in one category than another, or the questions will need to be framed differently depending on their relevance to the recipient. In order to address all of the perceived barriers to organisations adopting CE, each barrier definition is matched to one or more elements of the conceptual model. The linking of these criteria can be seen in full in Table 4 below. An example for illustration as to the integration of questions into the instrument can be seen in Appendix.

3.6 The conceptual model and instrument explained
This conceptual model is best explained from left to right and can be viewed below in Figure 2. Starting with the barriers to CE, these barriers contextualise the model which is a significant part of the readiness model. These barriers are connected to criterion in the conceptual model which is illustrated in Table 4 above. Next, consideration is given to the players in the SMEs and their influence in terms of readiness. It is designed such that the leaders of the SME would be first to complete the questionnaires, (which is the instrument) associated with the model. Second, would be the senior management and lastly, employees. If the level of readiness were not sufficient at the leader stage, it could be argued there is little point in any continuation of assessment. The next stage is the individual and collective differences. These criteria underpin the questionnaire and form the basis for readiness from an individual perspective but also a collective perspective. These specific elements of the model have been used before and have formed part of other readiness models. The definitions and explanations of the terms in the conceptual model can be seen in Table 2. Elements such as positive emotion and mindfulness have been qualified by different authors who argue their value in determining readiness. As an industrialist and instigator of change for many years, the author accepts these arguments wholeheartedly. It is clearly recognised that emotion plays a significant role in motivation, and that mindfulness is pivotal in changing paradigms and ultimately beliefs. The next stage is the structural factors and more contextual factors. These contextual and structural factors pertain to the level of confidence staff have in their leadership and supporting structures and the ability for the organisation to facilitate

such changes. Depending on the questionnaire application, it also refers to the confidence leaders may have in staff skills, competences and knowledge. This gives the model perspective about how other groups of individuals are viewed and the broader understanding of attitude towards organisational capability.

However, it is also evident that some of the readiness criteria stands alone and can be directed generally to aspects associated with CE barriers. For example, change self-efficacy can be related to most barriers from beliefs about the company culture to beliefs about leadership. The concept of this integration is ensuring that the individual and collective readiness is robustly assessed with a view to understanding their organisational level of readiness to overcome typical obstacles and barriers associated with this transition to circular economy.

The instrument (questionnaires) will be split into three independent surveys for the leader, functional senior leaders and supervisory and staff. Largely, the questions will be the same, but there will inevitably be some differences around how the questions are framed. Just to be clear, this conceptual model is not designed to identify a Yes/No or a Go/No Go in terms of organisational readiness. It is designed to identify areas where readiness levels are deemed sufficient or where areas may need to be improved. At this point, various interventions can be administered to improve the level of readiness. As indicated in the literature, readiness is not necessarily a moment in time but on a continuum and being in a continuous state. It could be argued that these surveys be used on several occasions.

In order to evaluate the feedback, the questions adopted a Likert scale in terms of the response. The range was from strongly disagree, disagree, not sure, agree and strongly agree. The numeric value given to the responses are below:

Strongly Disagree = -5, Disagree = -2, Not sure = 0, Agree = 2, Strongly agree = 5.

The points are added up to provide an actual score for each participant for each readiness factor. Most questions are rated as 5 points for a strongly agree response. However, for some questions, the 5 points are given for a strongly disagree response and are denoted by – symbol on the questionnaire. Then all of the scores are added for all participants that were completed by general staff to provide an average score of readiness for the entire sample of questionnaires for each readiness factor. The same can be applied to the leader of the organisation and the senior management team. There would be more significance to shortfalls from the leaders' questionnaires and then the senior management as opposed to staff. Without leadership readiness, any change is unlikely to be successful. The leadership questionnaire and their scoring interpretation can be found in Appendix.

4. Discussion

A "good theory" provides clarity of how and why specific relationships lead to specific events. A conceptual model is often used interchangeably with terms such as theories and frameworks for implementation science (Nilsen, 2015). This conceptual model was developed through research into other models, frameworks and theories which were used to adapt and shape this new conceptual model. According to Nilsen (2015), there are numerous theories that have been developed or adapted for potential use in implementation science to heighten understanding of certain aspects of implementation. Some of these have been developed by modifying certain features of existing theories or concepts. It is on this notion that this conceptual model was developed. This conceptual model is concerned largely with SMEs' internal factors and the human side of an organisation. Whilst policy and external factors impact and influence the need for change, it is the leaders and senior team who respond to these factors.

4.1 Theoretical implications
This model was formulated on a model based on the work of Holt and Vardaman (2013). It also includes contribution on positive emotion from Rafferty and Minbashian (2019) and mindfulness from Gondo *et al.* (2013). It also considers context for which the model is applied, in this case SMEs transition to CE and the perceived barriers to this endeavour. Organisational change usually impacts employee beliefs and, subsequently, behaviours because of an emerging situation from the known to the unknown. Recipients of change to the unknown face uncertainty creating anxiety among employees (Abdel-Ghany, 2014). This conceptual model is underpinned by research from Armenakis and Harris (2009), whose five beliefs are: (1) discrepancy, (2) appropriateness, (3) efficacy, (4) principal support and (5) valence. Further work by Holt and Vardaman (2013) include both individual factors and organisational factors. Holt and Vardaman (2013, p. 12) label individual differences as "factors that reflect the extent to which members of the organization are cognitively and emotionally inclined to accept, embrace and implement a particular change." These differences include collective beliefs around trust, commitment and organisational capability. They differ in that, those individuals reveal what they feel the group can do together rather than what each individual feels he or she is capable of doing. These dimensions are particularly salient when a change has system wide aspects (Holt and Vardaman, 2013, p. 13). For an SME adopting CE, it is evident that changes will have system wide implications and often be reliant on supply chain cooperation. It is this aspect that justifies the inclusion of this part of the conceptual model.

In addition, structural factors according to Holt and Vardaman (2013, p. 13) are "factors that reflect the extent to which the circumstances under which the change is occurring enhance or inhibit the acceptance and implementation of change." These structural factors are addressed from both the individual and organisational perspective. From the individual level, they relate to the individual's knowledge, skills and ability to perform during change and to what extent people's knowledge, skills and abilities match their revised jobs (Holt and Vardaman, 2013). From the organisational perspective, the two factors included in this conceptual model are support climate and facilitation. Support climate suggests specific tangible aspects such as funding, reward and incentive systems). Facilitation factors can be perceived as communication channels, leadership style and power balance.

Given that beliefs play such a profound role in readiness for change, it seems inconceivable to discount the need to change firmly held assumptions often at the sub-conscious level. Gondo *et al.* (2013) asserts that since mindfulness is essential for changing routine behaviours, it therefore must follow that the readiness construct should address how to shape beliefs about change; Charoensukmongkol (2017) states that employees who show a higher degree of mindfulness exhibited a higher level of general self-efficacy. This argument for including mindfulness is further strengthened by Michel *et al.* (2013), who state the discussion around change is moving away from structure, process and a tick box approach to one around motivation, ethics, values, identity and culture, through individuals and groups. In addition to mindfulness, positive emotions about change are included in the model and discussed below.

Resistance to change is interpreted as the opposite to readiness for change in that they are often discussed interchangeably. According to Abdel-Ghany (2014) and Armenakis *et al.* (1993, 2007), there is agreement that readiness for change and change beliefs are precursors for resistance to or support of change. Piderit (2000) suggest a multidimensional view of responses to proposed organisational change whilst discussing resistance to change. As well as a cognitive and intentional perspective, they propose including an emotional perspective. Rafferty and Minbashian (2019, p. 1635), "identified change readiness as a motivational state that drives people to behaviourally support change." They assert that it is not only cognitions but positive emotions about change that are direct antecedents of the overall evaluation of

change readiness. This notion is further supported by Oreg (2003), through their project to establish and validate a scale for the measurement of individual differences in resistance to change. Their results of seven studies included emotional reaction to imposed change as a key contributor. The inference here is that resistance and readiness are inextricably linked, and therefore, emotion is significant to readiness. Lastly, Bouckenooghe *et al.* (2009) reason readiness for change is a multifaceted attitude towards change also comprising emotional readiness for change. The last factor to be discussed as a contribution to the model is context.

Armenakis *et al.* (1993) suggest that as well as individual and cultural differences having influence for change readiness efforts with regards to internal context, they also suggest a model for change readiness should also focus on external context facing the organisation. Armenakis and Harris (2009) highlight the requirement for external context as well as internal context. Whilst the internal context has been given great consideration in the conceptual model, through the individual and collective differences, the external context must be commensurate. Buchanan *et al.* (2005) state that the organisation's external context concerns degree of turbulence and uncertainty. Further support for readiness to be considered in context is concluded by Holt and Vardaman (2013), stating the importance of context in shaping readiness. Therefore, the context for this conceptual model was a collection of barriers that are perceived to be preventing an SME adopting circular practices and a circular economy. This new conceptual model brings together research on CE but also a change on readiness. This new conceptual model will enable researchers to further understand the links between change readiness in a contextualised approach and the SME's transition to CE, considering the levels of authority and responsibility in an SME. The way that it is operationalised also has implications of a practical consideration highlighted below.

4.2 Practical implications

Galagan (2010) argue that change management should focus on performance rather than conformance and for the concept of continuous change readiness. Furthermore, they argue that change management should focus on facilitating continuous change readiness rather than implementing and managing specific change efforts. In addition, Holt and Vardaman (2013) claim that their concept should be expanded to reflect complex interactions and simultaneous organisational changes that go beyond a single static change. This idea is further supported by Jansen (2015), who concludes readiness for change is indeed a dynamic process representing different levels of readiness along a continuum. It is clear that there is a wide and complex array of the literature. One concludes that the idea that a change readiness model can be applied once and then success will prevail seems naive. Therefore, the operation of such a readiness model must be used periodically as part of the change process. This would allow for additional interventions as appropriate based on feedback from the model at various points in time through the change transition.

This conceptual model is different to other models around SMEs adoption of CE insomuch, it considers the whole organisations' attitude to change based on their beliefs, the way they feel both individually and collectively. It considers attitudes about their own capability and their perceived capability of the organisation. It also considers different attitudes, from the leader to senior leaders, and employees and their attitudes regarding each other. It considers contextual and content criteria by using the barriers to SMEs adopting circular economy in the model. According to Holt *et al.* (2007), readiness for change is a comprehensive attitude influenced simultaneously by the content (i.e. what is being changed), the context (i.e. circumstances under which the change is occurring) and the individuals (i.e. characteristics of those being asked to change). Further they argue a fourth factor of process (i.e. how the change is being implemented), which will be captured around employees' beliefs covered by collective trust, efficacy and commitment. The practical implications are

that it is relatively easy to disseminate and will illuminate an organisations level of readiness. The different categories, termed "readiness factors" will enable discussion, strategy and change to occur to further ready the organisation. It is not intended to "get a score", moreover, to guide thinking and action. The scoring mechanism will act as an indicator that will contribute to other information known to the organisation, best plotted on a radar chart. To suggest that leaders of an organisation have no prior knowledge would be ingenuous. It is deemed important that the model is applied to all areas of an organisation, but with a view that the first in the hierarchy "leader" is the most significant parameter. If there is little or no commitment from the organisations' leader, then the remaining part of the survey pales into insignificance. This is arguably the first hurdle to negotiate. Gigliotti *et al.* (2019) bring the role of trust into clearer focus, suggesting the delivery of support is associated with building trust towards management. Change recipients may accept or reject change, based on their perception of trust, from change agents or management, implying trust also plays a pivotal role in readiness to change. According to Sinclair *et al.* (2021, p. 298), "communication, support, and trust-building are critical factors for success in achieving employee engagement", which of course are all attributes of the leader. Men *et al.* (2020) state that leaders must be aware that they are not just the leaders in the organisation who make decisions, form strategy and the direction of the organisation but are most powerful communicators. These communication behaviours, styles or messages can affect employee perceptions, attitudes and actions towards the organisation, especially in the midst of change. The next are senior leaders, followed by all employees and staff. In practical terms, this is a tool that can be applied and re-applied during the change transition. However, what the leaders and change agents do with this knowledge, and how they take appropriate and decisive action to implement interventions will be critical to the success of the change. To simply roll out the questionnaire is not an option.

5. Conclusions, limitations and future research
In light of the pending sense of urgency around climate change and plastic waste amongst other things, CE as a driver for sustainability has never been more relevant. Whilst there is much research around CE, there is little support for SMEs to make this transition. This conceptual model has been developed from examination of the literature around change readiness and specifically models and frameworks. This conceptual model seeks to address the barriers to SMEs' adopting CE which is essentially the context of the change. For decades, society, industry and SMEs' have resisted change in many areas such as waste, pollution and environmental challenges. It is clear that a change to a CE is a huge paradigm shift in the way that leaders, senior management and employees think about new ways of doing business.

This conceptual model is novel as it includes individual readiness for change as well as collective perspectives of readiness. It also includes structural factors, such as facilitation and the general support climate. However, it is not based on the facts of these matters, but based on the cognition of employees, insomuch, it considers their perception, emotion, attitude and awareness of such factors. To enable this conceptual model to work, there is an instrument that is used to operationalise the model. This instrument is a questionnaire designed, slightly different for the three groups it is intended, leaders, senior management and employees. The results from these questionnaires will give valuable feedback to practitioners, change agents and leaders as to the short falls in organisational readiness and identify gaps that need attention prior to executing the change. This instrument consists of questions that elicit a response from participants in relation to the specific aspects from the change model, i.e. discrepancy, appropriateness, etc, but also this criterion equally correlates to the barriers to SMEs adopting CE.

This tool has been designed for easy dissemination to enlighten an organisations' leadership as to how to make an intervention to enable readiness. It is also designed with scholars and academics in mind to further their understanding and facilitate future research in this area. Future ideas for research beyond the verification and validation of this model are potentially areas of change associated with beliefs, habits, culture and paradigms, both individual and collective. These areas would be covered researching such aspects as mindfulness, neuroscience and cognitive disciplines. Furthermore, this conceptual model could be used by others, academics researching readiness for other disciplines or adapted for larger organisations adopting CE. Reviewing this conceptual model may allow academics to apply the model to similar context or they may further develop the model for this original cause.

The limitations of this concept are that it has not been empirically tested, and therefore, further work is necessary in testing through a case study. For future research, this model must be verified and validated for it to become a useful tool for gauging readiness in order for an SME to gauge their readiness and subsequently conduct interventions to enhance their readiness and develop a better chance of change success.

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Appendix
Questionnaire – organisational leader (only)
Questions: Responses are based on a Likert scale. Note: where a question is denoted by –, then this is where strongly disagree will accumulate the +5 points, reverse of normal loaded questions.

Discrepancy

(1) There is an impending need for our organisation to adopt circular economy principles as we are behind other similar companies.

(2) Currently our organisation has a gap between what it currently does and what it could and should do in terms of circular economy activity?

(3) Other companies are far better than ours in terms of meeting sustainable goals and implementing circular economy.

(4) We need to improve our performance in sustainability by implementing an organisational change for circular economy.

(5) The time we should be spending on change should not be sustainability and circular economy but something else.

Appropriateness

(1) Given the external pressures for sustainability in today's world, this kind of change to adopt circular economy is the right response for our organisation.

(2) The change in our operations towards circular economy will improve the performance of our organisation.

(3) There is support from the supply and demand network to support new business models. (1)

(4) Our customers and/or consumers have a real interest in the environment and are ready to positively change behaviour or business routine. (1) (7)

(5) When I think about these changes to our sustainable practices and circular economy, I realise it is appropriate for our organisation.

Personal valence

(1) This change to adopt circular economy will benefit me.

(2) With this change in my job based around circular activity, I will experience more self-fulfilment.

(3) I will earn higher pay from my job after this change to circular economy.

(4) The change in my job assignments will increase my feelings of accomplishment.

(5) When this change to circular economy is implemented, I do not believe there is anything for me to gain.

Positive emotions about change

(1) I feel elated that our company is now getting involved in more sustainable and more specifically circular economy activities.

(2) I am curious about adopting circular economy practices.

(3) It makes me happy to know my organisation is a heading towards a circular economy and more sustainable approach.

(4) I am up for the challenge that a circular economy will present in my organisation.

(5) This new change to circular economy is exciting.

Change self-efficacy (confidence)

(1) We have adequate resources to administer whatever is necessary to achieve a transition to circular economy. (3)

(2) I have the skills to lead this organisation in this field. (9)

(3) As an organisation we have the capability and technical knowhow to adopt circular economy. (4)

(4) As an organisation we will find the funding and also invest significantly to build our business around circular economy. (2)

(5) Our suppliers and customers are also onboard and there will not be any constraints with our transition to circular economy. (1)

(6) There will be minimum internal conflict with this type of change. (6)

(7) Our customers and/or consumers have an interest in this area and will easily change their business routines/behaviour. (7)

(8) We have the right number of qualified people in environmental management. (8)

(9) Our IT systems and information systems will be able to easily support this transition to circular economy.

(10) As an organisation we are very aware of what is needed and trained and primed ready to act. (10)

Principal support

(1) There are not enough qualified personnel in environmental management to respond positively to change to a circular economy. (8)

(2) Our company culture is adaptable and will easily make the change to circular economy practices. (6)

(3) I have full confidence in my senior management team in their skills, ability and knowledge make the necessary changes to adopt circular economy. (10)

(4) This organisation's most senior leader is committed to this change. (9)

(5) We are spending a lot of time on this change to circular economy, when the senior managers do not even want it implemented. (9)

(6) We do not have the support of customers and suppliers with any endeavours for adopting circular economy. (1)

Awareness and mindfulness

(1) There is a lack of awareness in the supply and demand networks of the supply chain to adopting new business models around circular economy. (1)

(2) I am completely aware of how my leadership, congruency and communication impact the behaviour of senior management and staff. (9)

(3) Our customers and/or consumers have a lack of awareness of the need to change their behaviours and business routines. (1) (7)

(4) I am fully aware of what behaviours I must change in order to satisfy the organisational shift to a circular economy.

(5) I am mindful of the behaviour changes being asked of us and mindful of how some employees may struggle with the behavioural changes required.

Organisational factors

Collective commitment

(1) I have a good relationship with my team and I know they are ready to follow my lead on a change transition to circular economy.

(2) When my organisation has committed to change in the past, they see things through, and this change transition to a circular economy is no different.

(3) As an organisation we are committed to making the necessary changes to adopt a circular economy.

(4) I want to encourage all staff to be involved with Circular economy practices.

(5) The company culture is primed to step up and commit to the changes necessary to achieve a circular economy.

Collective efficacy

(1) This organisation has the capability to find the capital through Government funding and/or financial means internally necessary to successfully follow through and change to a circular economy. (2)

(2) I am confident our senior leaders will be steadfast in their resolve to implement all that is necessary to adopt circular economy. (9)

(3) Our organisation has the technical knowhow and ingenuity to develop new skills to adapt to circular economy practice. (4)

(4) Our management information systems will cope with any demands from a transition to circular economy. (5)

(5) Our company culture, (the way we do things) is supportive of a transition to circular economy. (6)

Collective trust

(1) My leadership style is authentic towards circular economy which engenders out the organisation. (9)

(2) I'm passionate about circular economy and associated activity that will be evident from the way I communicate to my organisation. (9)

Structural and contextual factors/valence

Knowledge and skills alignment

(1) All of the organisation's employees have the appropriate skills, knowledge and ability or capability to step up for their revised role as we transition to a circular economy. (10)

(2) This organisation has enough qualified staff in environmental management. (8)

(3) This organisation has the technical knowhow and resource to adopt circular economy. (4)

Support climate

(1) There are financial incentives to promote a transition to circular economy. (2)

(2) There is sufficient capital to contribute and invest in circular economy business models and activities. (2)

(3) There are financial drivers that make a circular economy and associated activity attractive. (2)

(4) We have sufficient information to administer circular economy activities. (3)

(5) There is little internal conflict in our company which in turn makes it adaptable to change to the circular economy. (6)

(6) We can count on funding to assist with investment costs for circular economy. (2)

(7) Our management information systems are flexible enough to cope with circular economy activities. (5)

Facilitation

(1) I am clear about the strategy I am moving this organisation in terms of circular economy.

(2) There is a detailed implementation plan around the transition to circular economy.

(3) There is clear expertise and strong leadership around the environmental issues and challenges we face. (8)

(4) All new roles have been clearly defined and align to this new circular strategy.

	Readiness factor	Maximum score	Actual score	Sample average
1	Supply network constraints	30		
2	Capital, finance and finance options	30		
3	General administration	10		
4	Lack of technical knowhow	15		
5	Poor information systems	10		
6	Company culture	20		
7	Customer/consumer behaviour/routines	15		
8	Qualified personnel	20		
9	Leadership	35		
10	Awareness and training	15		
11	Discrepancy	25		
12	Appropriateness	25		
13	Personal valence	25		
14	Positive emotions about change	25		
15	Change self-efficacy	50		
16	Principal support	30		
17	Awareness and mindfulness	25		
18	Collective commitment	25		
19	Collective efficacy	25		
20	Collective trust	10		
21	Knowledge and skills alignment	15		
22	Support climate	35		
23	Facilitation	20		

Table A1.
Evaluation from the
leader's questionnaire

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