RELEVANT THEORIES IN ENTREPRENEURIAL ECOSYSTEMS RESEARCH: AN OVERVIEW

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ABSTRACT

Entrepreneurial ecosystems have recently gained the attention of scholars, although the concept remains elusive, underdeveloped, under-theorised and with no generally accepted definition. There have been calls for further theorisation of the concept and the testing of existing theories. Despite these calls, it has been identified that some researchers failed to ground their research in specific, pre-acknowledged grounding theories. Perhaps, this could be because there are no verified studies that have focused on such theories. These theories include the cluster theory, process theory, resource dependence theory, social capital theory, systems theory, network theory, knowledge spillover theory, stakeholder theory and social capital theory. The purpose of this article was, therefore, to provide an overview of the theories relevant to entrepreneurial ecosystems due to the lack of research on such theories. The managerial implication of the findings is that the different actors and role-players within an entrepreneurial ecosystem should stay related and interconnected to function optimally and holistically. The theoretical implication of the paper is the outlining of the relevant theories which can be used as guidance when grounding entrepreneurial ecosystems research, as well as the various scenarios in which these theories can be applied. The research contributes by informing early researchers on the relevant theories which can be used in understanding entrepreneurial ecosystems.

Keywords: Entrepreneur, Entrepreneurship, Entrepreneurial Ecosystems, Theory, Stakeholders.

INTRODUCTION

Entrepreneurial ecosystems have recently gained attention from academics, policymakers, practitioners, and research forums (Alvedalen & Boschma, 2017; Audretsch et al., 2018; Spigel, 2017; Spigel & Harrison, 2018; Spilling, 1996; Stam & van de Ven, 2021). Ratten (2020a), who supports this assertion, adds that entrepreneurial ecosystems research has expanded since 2010 and it is one of the most popular areas of inquiry in the management field. This growth in entrepreneurial ecosystems research could be attributed to its ability to describe the locational and collaborative aspects of entrepreneurship. However, the entrepreneurial ecosystem is an ambiguous concept that requires further investigation (Ratten, 2020a). The aspect of theorisation, which is a buzzword in entrepreneurial ecosystems research, is highlighted in this additional investigation. The majority of research in entrepreneurial ecosystems has used a theoretical lens, focusing on a single theory (Ratten, 2020b). This is despite the multiplicity of theories that are available that can be used in grounding entrepreneurial ecosystems research. As a result, more studies are necessary to determine whether new theories on entrepreneurial ecosystems are needed in different parts of the world (Ratten, 2020b).

Again, whilst entrepreneurial ecosystems have attracted the attention of scholars, policymakers and the public at large, the concept remains underdeveloped (Cho et al., 2021;

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Spigel, 2017; Stam & Spigel, 2016; Stam & Van de Ven, 2018), under-theorised (Cho et al., 2021; Jones & Ratten, 2021; Kansheba & Wald, 2020; Spigel, 2017; Stam, 2015; Stam, 2018; Stam & van de Ven, 2021), with no generally accepted definition, no clear analytical framework (Alvedalen & Boschma, 2017), and unanswered questions on what exactly the concept is (Audretsch et al., 2019). For instance, ecosystems represent a conceptual umbrella of different perspectives on the geography of entrepreneurship, rather than a coherent theory and as a result, it remains underdeveloped and under-theorised (Spigel, 2017). Entrepreneurial ecosystems have attracted much attention, however the concept itself represents a paradox that both draws on a rich intellectual history, yet remains under-theorised and not well understood, especially in light of the mechanisms that govern its evolution (Cho et al., 2021; Stam & van de Ven, 2021). The terms "underdeveloped" and "under-theorised", or a combination of both, appear to be buzzwords in entrepreneurial ecosystems research since 2015.

In light of the aforementioned inconsistencies, scholars (Audretsch et al., 2019; Ratten, 2020b) call for the development of new theories to aid in understanding the phenomenon (entrepreneurial ecosystems) and for the testing of existing theories (Cunningham et al., 2017). Given the development of new theories, Ratten (2020b) highlights that it should not just be a new theory, but a "theory of entrepreneurial ecosystem that standardise key terms and meanings". This is because most studies mention the need for "new theories", but there is no theory of entrepreneurial ecosystems to cite. When testing existing theories (Cunningham et al., 2017), a recent systematic review conducted by Kansheba and Wald (2020) included 51 articles; the analysis indicated that only 12 of those articles grounded their research on theories. The remaining 39 articles (which is about three-quarters of the total articles analysed in their study) did not use theories in grounding their research, indicating i) much less testing of existing theories or ii) that some scholars are not aware of theories that can be used in grounding entrepreneurial ecosystems research.

Despite these calls to develop new theories and the testing of existing theories, there are no verified studies that have presented a compilation of such existing theories, which is a research gap in entrepreneurial ecosystems research. Identifying these theories is usually a major problem for nascent researchers (masters' students, PhD students, post-doctoral fellows, and faculty, in some cases). There is a need to anchor entrepreneurial ecosystems research in supporting theories as this in turn will encourage the development of new theories on the concept, as called for by Ratten (2020b). However, before new theories can be developed, there is a clear need to understand the existing theories that can be used in entrepreneurial ecosystems research. This is because scholars are constantly urging future research on entrepreneurial ecosystems to be conducted through the lens of another theory that has been under-researched. For instance, scholars (Alvedalen & Boschma, 2017; Purbasari et al., 2019; Purbasari et al., 2020b) are calling on future research on the entrepreneurial ecosystem through a network analysis and network theory lens.

With a focus on the aforementioned research gap, the purpose of this paper is to discuss some of the relevant theories in entrepreneurial ecosystems research. The paper will add to the scant literature on entrepreneurial ecosystems, while also outlining the relevant theories that can be used in grounding and understanding entrepreneurial ecosystems research.

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LITERATURE REVIEW

Defining Entrepreneurial Ecosystems

Entrepreneurial ecosystems have gained much attention recently as a result of the publication of books; for instance, *Start-up Communities* by Feld (2020), first published in 2012, and the research by Isenberg (2010) in *Harvard Business Review*. Stam and Spigel (2016) emphasise the importance of these publications in informing policymakers and entrepreneurs about the critical role that a community and its culture play in the entrepreneurial process. However, despite its popularity and importance among researchers and practitioners, there is no widely accepted definition of an entrepreneurial ecosystem in the research domain (Stam & van de Ven, 2021; Stam & Spigel, 2016); implying a lack of consensus. This could be due to its (entrepreneurial ecosystems) emergence from different origins or because "ecosystems are defined in different ways, at different scales, and with different research designs and data" (Malecki, 2018).

Drawing on Shane and Venkataraman (2000), who state that entrepreneurship cannot exist without entrepreneurial opportunities, Stam and van de Ven (2021) report that the entrepreneurial ecosystem is composed of two separate words; *entrepreneurial* and *ecosystem*. The first component, *entrepreneurial*, refers to "situations in which new goods, services, raw materials, and organisational methods can be introduced and sold at a higher price than their cost of production" (Shane & Venkataraman, 2000). The second component, *ecosystem*, is a word that emerged from biology and describes the interaction of living organisms and their environment. Purbasari, Muhyi and Sukoco (2020a) comprehensively describe the ecosystem concept from biology as "the natural environment and its elements, including living organisms (biotic factors) in an area as well as the physical environment (abiotic factors), which function together as a single unit". In terms of applying this biological phenomenon to business research, an entrepreneurial ecosystem includes the surroundings, entrepreneurs and their businesses as the living organisms. This view from biology explains the complex relations and inter-decencies which shape entrepreneurial ecosystems (Brown & Mason, 2017). The entrepreneurial ecosystem represents a form of social interaction that occurs continually. It also represents an understanding of a combination of elements that are crucial for entrepreneurship (Jones & Ratten, 2021). Table 1 below is a presentation of some proposed definitions of an entrepreneurial ecosystem. However, one of the most widely accepted definitions of the concept has been proposed by Mason and Brown (2014) as:

> *A set of interconnected entrepreneurial actors (both potential and existing), entrepreneurial organisations (e.g. firms, venture capitalists, business angels, banks), institutions (universities, public sector agencies, financial bodies) and entrepreneurial processes (e.g. the business birth rate, numbers of high growth firms, levels of 'blockbuster entrepreneurship', number of serial entrepreneurs, degree of sellout mentality within firms and levels of entrepreneurial ambition) which formally and informally coalesce to connect, mediate and govern the performance within the local entrepreneurial environment.*

TABLE 1
PROPOSED DEFINITIONS OF ENTREPRENEURIAL ECOSYSTEMS

Author(s)	Definition
Spilling (1996:91)	"Entrepreneurial ecosystems are the complexity and diversity of actors, roles and environmental factors that interact to determine the entrepreneurial performance of a region or locality".
Cohen (2006:3)	"An interconnected group of actors in a local geographic community

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	committed to sustainable development through the support and facilitation of new sustainable ventures".
Stam and Spigel (2016)	Entrepreneurial ecosystem as "a set of interdependent actors and factors coordinated in such a way that they enable productive entrepreneurship within a particular territory".
Spigel (2017:2)	"Entrepreneurial ecosystems are combinations of social, political, economic, and cultural elements within a region that support the development and growth of innovative start-ups and encourage nascent entrepreneurs and other actors to take the risks of starting, funding, and otherwise assisting high-risk ventures".
Mujahid, Mubarik and Naghavi (2019)	An entrepreneurial ecosystem is defined by researchers as a collection of organised and interdependent factors that lead to the formation of a stimulating environment for entrepreneurial activities in a country.
Shwetzer, Maritz and Nguyen (2019:79)	…as "a set of interconnected entrepreneurial actors, organisations, institutions, and entrepreneurial processes, which formally and informally coalesce to connect, mediate and govern the performance within the local entrepreneurial environment, involving a dynamic and systemic nature, within a supportive environment".
Jones and Ratten (2021:2,3)	"The concept of an entrepreneurial ecosystem implies some form of social interaction that occurs continually". "Entrepreneurial ecosystems represent a way to understand the combination of elements required for entrepreneurship to exist in a designated space".
Stam and van de Ven (2021:810)	"Entrepreneurial ecosystems are systems that produce successful entrepreneurship, and where there is a lot of successful entrepreneurship, there is apparently a good entrepreneurial ecosystem"
Bendickson, Irwin, Cowden and McDowell (2021:2)	… "entrepreneurial ecosystem as the social and economic environment affecting local or regional entrepreneurship"

***Source**: Authors' compilation*

Most definitions of entrepreneurial ecosystem from the above table are centred on characteristics that include combinations (Jones & Ratten, 2021), interactions (Jones & Ratten, 2021; Spilling, 1996), collections (Mujahid *et al.*, 2019), interconnectedness (Cohen, 2006), systems (Stam & van de Ven, 2021) and interdependencies (Mujahid *et al.*, 2019; Stam & Spigel, 2016) which exist between the components of the ecosystem. Ignoring these characteristics may be detrimental to the success of the ecosystem (Isenberg, 2010).

Relevant Theories in Entrepreneurial Ecosystems

Cluster Theory

In his seminal works, *Principles of Economics* published in 1890 and *Industry and Trade*, published in 1919, the Cambridge school leader, Alfred Marshal introduced the concept of clusters, which has become an interdisciplinary term that is central, especially in understanding economic geography (Malecki, 2018; Porter, 2000; Vorley, 2008). Marshal also made a comparison between economic returns resulting from the division of labour in one large firm and returns from small, localised firms which he termed industrial districts. Vicente (2018), who comprehensively describes this comparison, highlights that Marshal's intuition was that the location of similar small firms in one specific geographical area could yield more returns compared to all activities carried out in one large firm. Also drawing from Marshal's seminal works, Vorley (2008) reports that the increase in returns of specialised firms in a specific location is explained by their socio-cultural relationship; implying that such relationships provide

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resources and knowledge that increase firms' abilities to compete and, as a result, yield high returns. Furthermore, firms that exist in isolation have a reduced ability to compete and will yield little or no returns. Although Marshal's seminal works have sparked debates on clusters, it is in itself not the cluster theory.

Though his works also stem from the Marshallian discussions, Porter has been cited by scholars (Motoyama, 2008; Vorley, 2008) as the founder of the cluster theory and he comprehensively defines clusters as the **"**geographic concentrations of interconnected companies, specialised suppliers, service providers, firms in related industries, and associated institutions (e.g., universities, standards agencies, trade associations) in a particular field that compete but also cooperate" (Porter, 2000). The definition of clusters proposed by Porter (2000) is somewhat similar to the definition of entrepreneurial ecosystems set forth by Cohen (2006) - "as an interconnected group of actors in a local geographic community committed to sustainable development through the support and facilitation of new sustainable ventures". Motoyama (2008) summarises Porter's definition of clusters in two short points, namely elements that make up the clusters and their interconnectedness to produce competitiveness and growth. Consistent with this assertion, Cohen's definition of entrepreneurial ecosystems can be summarised in two similar points, i) components that make up the ecosystem and ii) their interconnectedness to result in productive entrepreneurship.

Drawing on the above discussions, entrepreneurial ecosystems research can be underpinned on the cluster theory. In line with the Marshallian idea that firms clustering in a specific area increases their ability to yield high returns through their socio-cultural relationships, entrepreneurial ecosystems will be more successful if the components of the system remain related and interconnected as opposed to when they function in isolation, just like the interconnectedness of the firms in clusters as explained by Porter (2000). This assertion is supported by Malecki (2018), who reports that entrepreneurial ecosystems are very similar to industrial districts, innovation systems, and clusters. In this regard, small similar firms may be components of the entrepreneurial ecosystem, while the cluster of small firms may represent the ecosystem itself. As a result, the cluster theory is relevant in entrepreneurial ecosystems research.

Process Theory

Scholars have continuously used the term process theory, but there is no clear definition of what it is. A Google search of the term 'process theory' will produce too many results, which makes it exceedingly difficult to identify which of the results to relate to management research. As a result, process theory has been used across different fields of inquiry, such as computer science (Ralph, 2016), biomedical science (May, Mair, Finch, MacFarlane, Dowrick, Treweek, Rapley, Ballini, Ong & Rogers, 2009), psychology (Groves & Thompson, 1970; Turner, 2005) and business in general; implying that there are different process theories. In line with this assertion, Van de Ven and Poole (1995) identify 20 process theories of change used in social, biological, and physical sciences and categorise them into four schools of thought, namely life-cycle, evolutionary, dialectical, and teleology process theories. All four schools of thought on process theory account for the change processes that take place within an entity as it evolves. Van de Ven and Poole (1995) refer to process theory as "an explanation of how and why an organisational entity changes and develops"; therefore, a process theory simply explains the evolution of organisations, businesses, systems over time.

The life-cycle process describes the process of change that an organisation undergoes as it progresses from one stage to the other. The teleological perspective sees development as a

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process of goal formulation, implementation, evaluation, and goal modification based on what an organisation has learned. The dialectic process posits that conflicts emerge between entities and are resolved after a consensus is reached. The evolutionary process is characterised by scarce environmental resources which leads to interactions between entities to share the scarce resources (Van de Ven & Poole, 1995). In line with this assertion, Spigel and Harrison (2018) posit that:

Rather than seeing ecosystems as tangible things, they can be better understood as ongoing processes through which entrepreneurs acquire resources, knowledge, and support, increasing their competitive advantage and ability to scale up. As these new ventures grow, they strengthen the overall EE [entrepreneurial ecosystem]. In this sense, we can talk about ecosystem processes—the mechanisms through which start-ups and scale-ups gain a competitive edge from their regional environments—as well as ecosystems as processes: how ecosystems are reproduced and transformed over time.

The availability of resources in entrepreneurial ecosystems is a major distinguishing factor for poor and well-functioning entrepreneurial ecosystems alike. This implies that entrepreneurial ecosystems which have available resources will be very productive compared to an ecosystem with scarce resources. Drawing on the different schools of thought on process theory, entrepreneurial ecosystems usually undergo different processes, which can be related to a life cycle process. For instance, in nascent entrepreneurial ecosystems, there is much less interaction among the players in the entrepreneurial ecosystem, implying less flow of resources, perhaps due to the lack of such resources since the ecosystem is still emerging. However, as the ecosystem changes as it grows and develops (Van de Ven & Poole, 1995), resources become available due to the increase in the number of entrepreneurs present, as well as their increased interactions. Hence, the development of an entrepreneurial ecosystem follows a process as the ecosystem moves from one stage in the life cycle to the next stage, until it finally develops and becomes sustainable.

Resource Dependence Theory

According to Johnson (1995), resource dependence theory is an organisational theory that explains inter-organisational and organisational behaviour concerning critical resources that must be available for the organisation to survive and grow. A similar view is shared by Kholmuminov, Kholmuminov and Wright (2019), asserting that resource dependence theory relates to how the external resources of an organisation affect the behaviour of the organisation. All organisations depend on resources for survival and these resources are produced by other organisations. Based on this, Johnson (1995) suggests that organisations rely on other entities that control resources that are critical to their operations but over which they have limited control. In light of this, all components of an entrepreneurial ecosystem rely on resources for survival, and these resources can be obtained through interactions in the ecosystem.

Strategic decision-makers determine how to allocate such resources, which may be internal or external. Internal resources, such as human capital, financial resources, and assets, are under the control of the organisation and can help the organisation gain a competitive advantage (Nemati, Bhatti, Maqsal, Mansoor & Naveed, 2010). External resources are those that are managed by an external organisation and as such are not readily available to other organisations, implying that organisations must interact in order to acquire such resources. As a result,

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resources produced by one firm are only valuable if they can be used by another organisation (Kholmuminov *et al.*, 2019). This leads to interdependence among organisations to gain access to such resources. Additionally, the successful performance of small and medium-sized enterprises is dependent on resources and networks (Premaratne, 2002).

Resource dependence theory focuses on resources, the flow and exchange of resources between entities, organisational reliance on other entities for resources, managers' and strategic decision makers' efforts to acquire the necessary resources, and one way in which these resources can be acquired or exchanged is through networks. Therefore, resource dependence theory is relevant in understanding entrepreneurial ecosystems since most of these resources are exchanged or availed through the component's interaction with one another.

Social Capital Theory

The social capital theory holds that social relationships can be resources that contribute to the development and accumulation of human capital (Machalek & Martin, 2015). According to Claridge (2004) social capital is a multidisciplinary theory that stems from three prominent authors (Bourdieu, 1986; Coleman, 1988; Putnam, 1993), who focused their research and publications on social capital between the mid-1980s and early 1990s. In line with this assertion, social capital theory (which emerged from the sociology of education) (Bourdieu, 1986), has quickly spread and it is used in grounding research across different fields of inquiry including economics, political science, community development, and anthropology (Claridge, 2004; Coleman, 1988; Perkins et al., 2002). Social capital which is defined based on its function (Coleman, 1988), has been defined differently by scholars, implying the lack of a definitive consensus on the concept. For instance, Putnam (1993) posits that "social capital refers to features of social organisation, such as networks, norms, and trust, that facilitate coordination and cooperation for mutual benefit"; while Machalek and Martin (2015) define it as any "feature of a social relationship that yields reproductive benefits".

As a result, social capital can simply be defined as all social relationships and social structures that provide members of a network with resources such as knowledge, human capital, and information. Social capital is also concerned with certain social structures, which facilitate the actions of individuals and like other forms of capital (cultural capital, physical capital, and human capital) makes the achievement of certain ends possible which would be unachievable in its absence (Coleman, 1988). Scholars (Bourdieu, 1986; Claridge, 2004; Coleman, 1988; Machalek & Martin, 2015; Putnam, 1993) have emphasised one important aspect of social capital: its ability to provide resources that benefit a specific group of people who are in a relationship, such as members of a network.

The above exposition must be related to an entrepreneurial ecosystem. The ecosystem is made up of elements that correlate to drive entrepreneurship development in a specific area; we can view an entrepreneurial ecosystem as a network whose members depend on each other for survival. In line with the definition of social networks advanced by scholars, entrepreneurial ecosystem components cooperate through relationships (social relationships, which are already a resource) for a productive and mutual benefit; moreover, social capital exists in the relationship between and among actors (Coleman, 1988). In other words, if there is a lack of coordination and cooperation (interconnectedness) among the ecosystem's components, there will be no mutual benefit such as the sharing of resources, knowledge, and human capital that aids the overall development of the entrepreneurial ecosystem. Again, social capital exists in the relationships

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among the ecosystem elements. Considering this assertion, entrepreneurial ecosystems research can be grounded in social capital theory.

Systems Theory

First introduced by Bertalanffy (1969) in the 1940s, systems theory is a model which was developed to enable the exploration of a complex phenomenon across different fields of inquiry (Teece, 2018). This view is supported by scholars (Mele et al., 2010; Wilkinson, 2011) who note that systems theory has been applied across different fields of research including mathematics, social, and natural sciences, marketing, management, and technology. Scholars (Daniel, Medlin, O'Connor, Statsenko et al., 2018; Mele et al., 2010; Teece, 2018; Wilkinson, 2011) assert that the idea of systems theory dates as far back to Aristotle, who contended that "the whole is more than the sum of its parts"; implying that a better understanding of a system is not guaranteed if its components are studied in isolation. As such, Wilkinson (2011) comprehensively defines systems theory as "a conceptual framework based on the principle that the parts of a system can best be understood in the context of the relationships with each other and with other systems, rather than in isolation".

Isenberg (2010) asserts that entrepreneurial ecosystems are made up of elements such as customers, capital markets, leadership, and culture that interact in complex ways, and ignoring the interconnectedness of an entrepreneurial ecosystem's elements can have unintended consequences. As a result, for a well-functioning entrepreneurial ecosystem to be sustainable, its elements must interrelate with one another. Systems theory is relevant in entrepreneurial ecosystems research because entrepreneurial ecosystems are made up of elements (components) that cannot function well in isolation and must interrelate with one another to result in a successful or well-functioning entrepreneurial system, just as the elements in a system do. When drawing on Purbasari et al. (2019), an entrepreneurial ecosystem framework consists of different components that relate in complex ways and as a result, are presented as a system. As such, applying systems theory to entrepreneurial ecosystems allows for a better understanding of how the entire ecosystem, like a system, functions (Daniel et al., 2018). Therefore, a better understanding of entrepreneurial ecosystem is guaranteed, if the components of the ecosystem are studied as a whole, and not in isolation.

Network Theory

The multidisciplinary network theory has its roots in graph theory (Oh & Monge, 2016). Some disciplines that use network theory include statistical physics, electrical engineering, mathematics, sociology, economics and management, neurosciences, economics, and climatology (Bassett & Sporns, 2017; Fredericks & Durland, 2005; Harris, et al., 2009; Oh & Monge, 2016). In mathematics, networks are called graphs (Oh & Monge, 2016). Network theory is important in social sciences since it examines the relationships which exist among actors and not the individual characteristics of the actors; as such, it focuses on a multilevel analysis (Fredericks & Durland, 2005). This assertion is supported by Oh and Monge (2016), who add that networks capture only the relationship between individual components of the entire system and nothing else. Oh and Monge (2016) also posit that "a network is a collection of points linked in pairs by lines, no matter how large or complicated it is".

Relating the above to entrepreneurial ecosystems research, networks express the interaction between the elements of an entrepreneurial ecosystem. Purbasari et al. (2020b) who

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supports this assertion add that networks are made up of actors that connect. The actors' connection or interrelationship enables them to achieve a common goal, such as the sharing of knowledge, ideas, and resources, which in turn drives the development of the ecosystem. The application of a network theory in the entrepreneurial ecosystem is thought to be relevant since an ecosystem is made up of distinct components that interact with various network setups (Purbasari et al., 2020b). Also drawing on Purbasari et al. (2019) and Alvedalen and Boschma (2017) the entrepreneurial ecosystem framework consists of different components that relate in complex ways and as a result, is presented as a network. Thus, network theory can be used to describe the relationships that exist between individuals, firms, components, elements, and organisations, as well as how critical resources required for the development of businesses in an entrepreneurial ecosystem are made available to needy parties through such relationships or interactions.

Knowledge Spillover Theory

There has been a consensus in the past few decades that spillover (knowledge spillover, market spillover, network spillover) drives economic growth (Van Stel & Nieuwenhuijsen, 2004). Knowledge is an invaluable resource for all organisations, but it needs to be shared so that others can benefit from it (Jones & Ratten, 2021). Compared to large businesses, their small counterparts are more dependent on knowledge spillover for survival. Interactions between individuals and businesses and being close to each other produce the greatest chances of knowledge spillover (Van Stel & Nieuwenhuijsen, 2004). Alvedalen and Boschma (2017), who support this assertion, state that "knowledge is not just in the air in clusters but it rather circulates in structured networks". This implies that knowledge spillover occurs only when individuals or businesses interact with one another, as opposed to when they exist in isolation or with no interaction or interconnectedness.

Van Stel and Nieuwenhuijsen (2004) posit that three spillover theories were proposed by Marshall (2009) (first published in 1890), Arrow (1971); Romer (1986). All three scholars believed that knowledge spillover is more effective between similar firms. Fairly recently, scholars (Acs et al., 2013; Acs et al., 2009; Lattacher et al., 2021) have given credit to the seminal work of Audretsch (1995), who introduced the Knowledge Spillover Theory of Entrepreneurship (hereafter KSTE). The theory has been used in understanding concepts such as absorptive capacity, economic growth (Van Stel & Nieuwenhuijsen, 2004), and more recently, entrepreneurial ecosystems and university spinoffs (Bendickson et al., 2021; Cetindamar, Lammers & Zhang, 2020; Jones & Ratten, 2021; Prencipe, et al., 2020).

Acs et al. (2009); Acs et al. (2013) who comprehensively discuss the KSTE, posit that the theory is based on the "proposition that entrepreneurial behaviour is a response to profitable opportunities from knowledge spillover". They report that people are likely to start entrepreneurial ventures if they have access to knowledge spillover, implying that in an entrepreneurial ecosystem and based on the interactions of the different elements of the ecosystem, new firms are likely to be formed, because knowledge circulates in the interactions of the ecosystem's components, not just in the air. Also drawing on the definition of the KSTE advanced by Acs et al. (2013) and the definition of entrepreneurial ecosystems by Roundy, Brockman and Bradshaw (2017) "communities of agents, social structures, institutions, and cultural values that produce entrepreneurial activity", Bendickson et al. (2021) posits that any information that can be shared to assist entrepreneurs in creating, innovating, and contributing economically to entrepreneurial ecosystems should be regarded as a potential source of

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knowledge spillover, perhaps because of the interconnectedness of the components of the ecosystem.

Concerning the assertion by Acs et al. (2013) that the access to knowledge spillover explains why people start new ventures; the whole entrepreneurial ecosystem can develop and become sustainable if new ventures are developed by entrepreneurs since the interaction of the components provides access to knowledge spillovers. Moreover, the survival of the entrepreneurial ecosystem is dependent on knowledge spillovers that result from the interaction of the components with one another. In light of this view, "knowledge communities are a form of an ecosystem as they enable mutual interaction around acquiring and disseminating knowledge to be undertaken" (Jones & Ratten, 2021). Universities and research institutes that are part of an entrepreneurial ecosystem, therefore, play a significant role in knowledge spillover (Prencipe et al., 2020).

Stakeholder Theory

The concept of stakeholders in organisations has become widely accepted, particularly in professional and academic management literature based on the stakeholder theory (Donaldson & Preston, 1995; Goyal, 2020; Miles, 2019). Stakeholder theory, which to date is one of the most controversial theories in management (Goyal, 2020) was introduced by Freeman (1984), in his book titled *Strategic Management -A Stakeholder Approach*, first published in 1984. Stakeholder theory has since then been used as a grounding theory in various management fields, including social entrepreneurship (Kusyk & Lozano, 2007) and accounting (Miles, 2019), as evidenced by the growing number of books and articles on the theory. Most journal articles and books give credit to Edward Freeman as the father of stakeholder theory. Freeman (2018) posits that stakeholder theory emphasises the interconnected relationships that exist between a business and its stakeholders, which include suppliers, customers, employees, investors, communities, and others who have a controlling interest or are affected by the business's activities. As a result, the theory contends that organisations should generate value for all stakeholders, not just shareholders (Freeman, 2018; Freeman, 1984; Freeman & McVea, 2001; Goyal, 2020; Miles, 2019). Other authors have shared different views on what stakeholder theory is- for instance; according to Phillips, Freeman and Wicks (2003), stakeholder theory is a concept of ethics and leadership in an organisation. While Gaur (2013) posits that stakeholder theory is a concept which describes the parties who are stakeholders of a program or project. These different views align with the assertion of Donaldson and Preston (1995), who state that:

> *Unfortunately, anyone looking into this large and evolving literature with a critical eye will observe that the concepts stakeholder, stakeholder model, stakeholder management, and stakeholder theory are explained and used by various authors in very different ways and supported (or critiqued) with diverse and often contradictory evidence and arguments.*

This assertion confirms the lack of a definitive consensus on what stakeholder theory is. Perhaps, as a result of the different definitions, stakeholder theory is also applied differently across different disciplines. A stakeholder is "any group or individual who can affect or is affected by the achievement of the firm's objectives" (Freeman, 1984).

Stakeholder theory is based on organisational decision-making processes, ensuring that stakeholders' interests (Smith et al., 2013) and the effect stakeholders can have on corporate performance (Kusyk & Lozano, 2007) are taken into consideration. Therefore, a firm's different stakeholders must be involved in the decision-making on a given problem that arises within the

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firm (Kusyk & Lozano, 2007). Involving stakeholders in the decision-making process is very important since stakeholders are also the main players who provide the human and financial resources needed by the venture to achieve its objective (Smith & Woods, 2015). Consistent with the assertion that stakeholder theory emphasises the interconnected relationships that exist between a business and its stakeholders (Freeman, 2018); entrepreneurial ecosystems emphasise the interconnected nature of its components (Brown & Mason, 2017; Malecki, 2018; Mason & Brown, 2014; Purbasari et al., 2020b; Spigel, 2017; Spigel & Harrison, 2018). Ignoring the interconnected nature of the ecosystem components can result in negative outcomes (Isenberg, 2010). As such, an entrepreneurial ecosystem can be seen as an organisation, while the components of the ecosystem are the stakeholders of the organisation. In line with the assertion that value should be created for all stakeholders rather than just shareholders, the ecosystem can only function optimally if all, not just some, of the ecosystem's components remain interconnected. As a result, successful entrepreneurship necessitates the collaboration and coordination of a wide range of stakeholders, including start-ups, large organisations, small businesses, public institutions, private institutions, and enthusiastic individuals (Singh, Sinha, Das & Sharma, 2019). A favourable entrepreneurial ecosystem is critical to the success of new ventures, and the collaborative efforts of various stakeholders or ecosystem components can aid in the development of new ventures within the entrepreneurial ecosystem.

Social Network Approach

Social network and social network analysis have attracted the curiosity and attention of scholars in the last few decades (Fredericks & Durland, 2005; Jaafar, Abdul-Aziz & Sahari, 2009; Wasserman & Faust, 1994; Wetherell, 1998). Wasserman and Faust (1994) attribute this interest to the focus of social network analysis in explaining the relationships among social entities and the implications of such relationships. Social network analysis is a perspective within behavioural and social sciences (Wasserman & Faust, 1994). Fredericks and Durland (2005) support Wasserman and Faust (1994) assertion, however, they argue that it differs from other social science theories because "it focuses on the social context and behaviour of relationships between actors rather than on the rational choices individual actors make, as seen in disciplines such as economics and the social and decision sciences". This difference can be attributed to the inability of traditional social sciences in recognising the social aspects as relevant data.

Since the 1930s, social network analysis has had three main parallel influences; first, the sociometric approach which employs graph method theory, second, the mathematical analysis used by Harvard researchers after Kurk Lewin, and third, anthropologists in Manchester who studied the relationship structure among communities in villages (Fredericks & Durland, 2005; Liu et al., 2017). Social network analysis matured in the 1970s and 1980s as sociologists, psychologists, and anthropologists developed analytical concepts and measures to exploit new forms of data related to the modern world (Wetherell, 1998). As a result, social network analysis is a multifaceted concept. The network theory and social network analysis are frequently confused; however, the network theory maintains that social network analysis is a separate theory and model that can be used independently (Wetherell, 1998).

Social network analysis examines the relationships between entities (Wasserman & Faust, 1994). These entities could be organisations, individuals, groups, industries, and components (Jaafar et al., 2009). Premaratne (2002) asserts that the logic of social network analysis in understanding management unfolds at a juncture where two individuals create a relationship with each other. More recently, Claywell (2021), who reports that social network

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analysis explains how organisations, people, businesses, and other groups interact with each other, adds that it is easy to understand the theory by examining smaller pieces starting from the whole, which is from networks to individual actors. Consistent with this assertion, and relating social network analysis to entrepreneurial ecosystems, it is easy to understand an entrepreneurial ecosystem by starting from the interactions of the ecosystem's components. Entrepreneurs must build reputable relationships with other resource providers in order to have access to and share scarce resources. This is possible through social networks. All actors in social networks are interdependent rather than independent (Wetherell, 1998), just as the components of an entrepreneurial ecosystem are. Thus, interactions in social networks channel information and resources, facilitating action within the network. As such, entrepreneurial ecosystems can be studied from the lens of the social network theory. Table 2 is a summary of the theories and their relevance in entrepreneurial ecosystems research.

TABLE 2
SUMMARY OF THEORIES AND THEIR RELEVANCE IN ENTREPRENEURIAL ECOSYSTEMS RESEARCH

Theory	Theory Description	Theory's relationship to entrepreneurial ecosystem
Cluster Theory	The geographic concentrations of interconnected companies, specialised suppliers, service providers, firms in related industries, and associated institutions (e.g., universities, standards agencies, trade associations) in a particular field that compete but also cooperate (Porter, 2000)	The companies and specialised suppliers may be components of the entrepreneurial ecosystem, while the cluster of small firms may represent the ecosystem itself. As a result, cluster theory is relevant in entrepreneurial ecosystems research.
Process Theory	Process theory accounts for the change processes which occur within an organisation as it grows and develops from one stage to another. Therefore, it is an explanation of how and why an organisational entity changes and develops (Van de Ven & Poole, 1995). Process theory simply explains the evolution of organisations, businesses, systems over time.	Process theory is relevant in the study of entrepreneurial ecosystems because ecosystems can be understood as ongoing processes through which entrepreneurs acquire resources, knowledge, and support, increasing their competitive advantage and ability to scale up (Spigel & Harrison, 2018). As these new ventures grow, they contribute to the overall strength of the entrepreneurial ecosystem (Spigel & Harrison, 2018).
Resource Dependence Theory	All organisations depend on resources for survival and these resources do not appear from space, these resources are produced by other organisations. Therefore, organisations rely on other entities that control resources that are critical to their operations but over which they have limited control (Johnson, 1995)	The resource dependence theory is relevant in understanding entrepreneurial ecosystems because the ecosystem's components rely on resources for survival, and the majority of these resources are exchanged or obtained through the interaction of the ecosystem's components.
Social Capital Theory	The social capital theory holds that social relationships can be resources that contribute to the development and accumulation of human capital (Machalek & Martin, 2015). One important aspect of social capital is its ability to provide resources that benefit a specific group of people who are in a relationship, such as members of a network (Bourdieu, 1986; Putnam, 1993).	In line with the definition of social capital advanced by scholars, entrepreneurial ecosystem components cooperate through relationships (social relationships, which are already a resource) for a productive and mutual benefit (Neumeyer, Santos & Morris, 2019); moreover, social capital exists in the relationship between and among actors.
Systems Theory	It is a conceptual framework based on the principle that the parts of a system can best be understood in the context of the relationships with each other and with other systems, rather than in isolation (Wilkinson, 2011)	Systems theory is relevant in entrepreneurial ecosystems research because entrepreneurial ecosystems are made up of elements (components) that cannot function well in isolation and, as a result, must interrelate with one another to result in a successful or well-functioning entrepreneurial system, just as the elements in a system do (Daniel *et al.*, 2018)
Network Theory	Network theory examines the relationships that exist among actors rather than their characteristics	The application of a network theory in the entrepreneurial ecosystem is thought to be relevant

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	(Fredericks & Durland, 2005); as such, it focuses on a multilevel analysis. It captures only the relationship between individual components of the entire system and nothing else.	since an ecosystem is made up of distinct components that interact with various network setups (Purbasari *et al.*, 2020a).
Knowledge Spill Over Theory	The interactions between individuals and businesses, as well as their proximity to one another, produce the greatest likelihood of knowledge spillover (Van Stel & Nieuwenhuijsen, 2004). Knowledge does not just float around in the air; it circulates in networks (Alvedalen & Boschma, 2017). Entrepreneurial behaviour is a response to profitable opportunities from knowledge spillover (Acs *et al.*, 2013).	Entrepreneurial ecosystems imply some form of social interaction that occurs continuously between the ecosystem's components (Jones & Ratten, 2021). New firms are likely to form in an entrepreneurial ecosystem based on the interactions of the ecosystem's components because knowledge circulates in the interactions of the ecosystem's components.
Stakeholder Theory	Stakeholder theory emphasises the interconnected relationships that exist between a business and its stakeholders, which include suppliers, customers, employees, investors, communities, and others who have a controlling interest or are affected by the business's activities. The theory contends that organisations should generate value for all stakeholders, not just shareholders (Freeman, 2018)	Entrepreneurial ecosystems emphasise the interconnected nature of their components (which can be the stakeholders) and failing to recognise this interconnected nature of ecosystem components can result in unfavourable outcomes. This implies that all of the components must remain connected for the entrepreneurial ecosystem to develop and grow as a whole.
Social Network Theory	Social network analysis examines the relationships between entities; these entities could be organisations, individuals, groups, industries, and components (Jaafar *et al.*, 2009; Wasserman & Faust, 1994).	In the entrepreneurial ecosystem, the entities could be the ecosystem's components, and the relationships between the components could be viewed as social network relationships, which provide resources to the ecosystem (Apa, Grandinetti & Sedita, 2017; Cowell, Lyon-Hill & Tate, 2018).

Source: *Authors' compilation.*

Table 2 suggests that most of the theories are similar in nature, focusing on comparable characteristics as identified from the definitions in Table 1, implying that the theories can be applied in similar scenarios, however, they can also be applied separately. For instance, the network theory and social network analysis are frequently confused, perhaps because they have similar characteristics; however, they are separate theories that can be applied separately (Wetherell, 1998). The theories in Table 2 focus on characteristics like relationships, interconnectedness, processes, systems, interdependencies, and interactions. Consequently, the theories can be applied when the focus of the research relates to these different characteristics. Figure 1 demonstrates this assertion.

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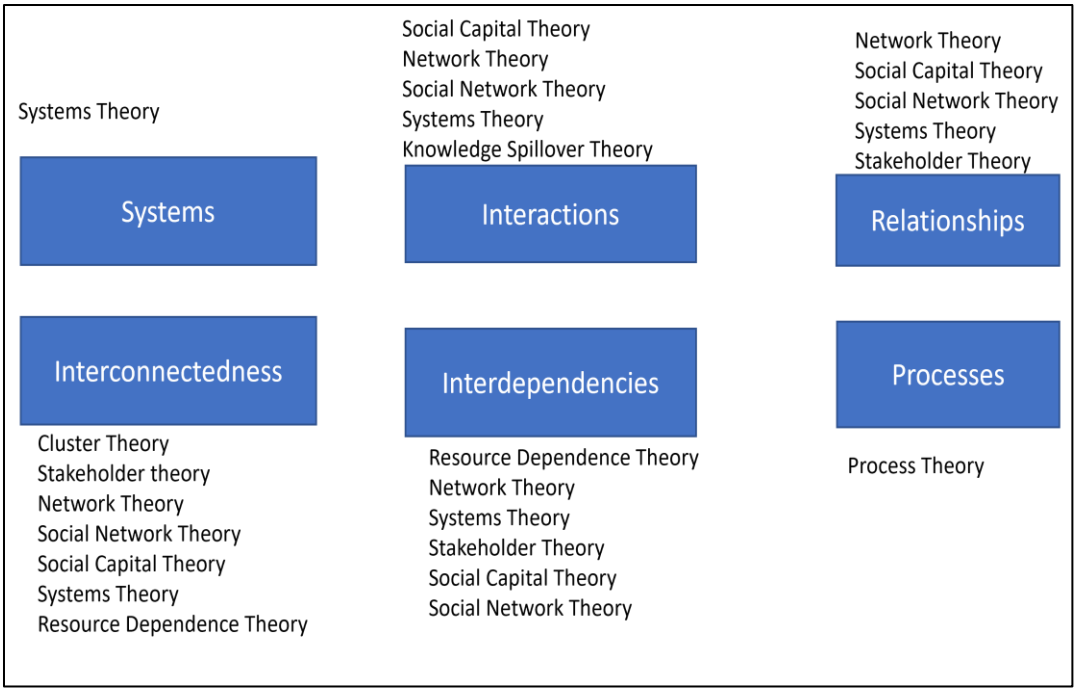

Source: *Authors' own formulation.*

FIGURE 1
COMPARABLE CHARACTERISTICS OF RELEVANT THEORIES IN ENTREPRENEURIAL

Process theory can be used in entrepreneurial ecosystems' research when the focus is on the ecosystem's growth, development, and evolution. The entrepreneurial ecosystem does not develop overnight; it takes time to progress from one stage to the next and thus follows a process (Spigel & Harrison, 2018). When researching entrepreneurial ecosystems, cluster theory (Porter, 2000) can be applied when focusing on a group of related, interconnected, or similar firms located in a specific geographical location. When researching a specific area with an uneven distribution of resources or scarce resources (human capital, finance, knowledge, information), resource dependence theory (Johnson, 1995), knowledge spillover theory (Acs *et al.*, 2013), stakeholder theory (Freeman, 2018), social network theory (Fredericks & Durland, 2005; Wasserman & Faust, 1994), network theory (Fredericks & Durland, 2005), system theory (Wilkinson, 2011), and social capital theory (Bourdieu, 1986; Putnam, 1993) can be applied. Social network theory will be used to monitor actor relationships and interactions, as well as how scarce resources can be made available to actors via such networks. Social capital theory posits that relationships are a resource and resources can easily be distributed in a system through networks to the various stakeholders of the system, who in this case are the components of the entrepreneurial ecosystem.

Managerial and Theoretical Implications

This paper's findings have managerial as well as theoretical implications. The managerial implication of this paper is that actors in an ecosystem must recognise that they cannot function well in isolation; they must remain connected with one another to function optimally and holistically. This is consistent with the assertion that operating in isolation or ignoring the

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relationships and interconnectedness between the elements of an entrepreneurial ecosystem is detrimental to the overall functioning of the ecosystem (Isenberg, 2010).

This paper's theoretical implications are as follows: this paper outlines and provides theoretical guidance on grounding entrepreneurial ecosystems research on relevant theories, as well as the various scenarios in which the theories can be applied in entrepreneurial ecosystems research. The paper also contributes to the available body of knowledge on entrepreneurial ecosystems research. These theories, despite their multiplicity, have largely originated from the West. Though they can be applied in any context, there is a need to develop a theory of entrepreneurial ecosystem that can be applied in specific contexts, such as the African context. As Ratten (2020b) points out, any new theories developed on entrepreneurial ecosystems must be adaptable to changes in the business environment. This is because the entrepreneurial ecosystem is dynamic, and as such, it is constantly changing as it progresses from one stage to the next.

CONCLUSION

In conclusion, this paper highlighted the relevant key theories which can be used in grounding entrepreneurial ecosystems research. This is not an exhaustive list of the relevant theories. While there is a need to develop new theories and most especially a theory of entrepreneurial ecosystems (Ratten, 2020b), future research should not only focus on developing new theories that are adaptable to changes in entrepreneurial ecosystems across different contexts - they should also focus on testing existing theories. Some strategic management theories, for example resource-based views and KTSE, already have a substantial body of knowledge that can be directed towards entrepreneurial ecosystems research. Additionally, organisational theories such as agency and transaction costs could benefit from an ecosystem perspective as well (Ratten, 2020b). Little or no reference has been made to the network theory in ecosystems research (Alvedalen & Boschma, 2017; Purbasari et al., 2019). Thus, more research on entrepreneurial ecosystems is needed to adopt a knowledge spillover perspective and investigate the role knowledge spillover plays in the development of an entrepreneurial ecosystem (Jones & Ratten, 2021).

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