

Employee Innovativeness in Organizational Ecosystems: An Initial Study

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ABSTRACT

The aim of this paper is to compile an up-to-date and academically grounded study into organizational ecosystems in terms of employee innovativeness. Here we are concerned with the dimensions of innovation involving traditionally measured forms of innovation, hidden innovation and social innovation including interactions and relationships. The methodology used involved systems model formulation following the stages of the identification of the main structures, relationships and components, model building, development of an evolved organizational ecosystem model, and analysis of the model. The research question addressed 'what are the main components of organizational ecosystems in terms of employee innovativeness?' The contribution of the paper is to bring together findings on the characteristics of organizational ecosystems in terms of the dimensions of employee innovativeness.

Keywords: organization, ecosystem, employee, innovativeness

INTRODUCTION

Organizational ecosystems are characterised by various structures, relationships, variables and levels. With regard to levels Parsons (1960) enunciates a useful framework with three levels in the hierarchical structure of complex organisations which are technical, organizational and institutional or community levels. The technical level involves an organization's performance concerning many activities utilizing knowledge, such as research and development (Parsons, 1960). Within complex organizations technical tasks are undertaken by professionals, experts, skilled and unskilled workers (Kast and Rosenzweig, 1972).

Secondly, the organizational level integrates and co-ordinates the technical system (Parsons, 1960). Thirdly, the institutional level links activities of the organization to its environment with supporting inputs from society to undertake transformation activities (Parsons, 1960). Thompson (1967) stipulates that "under norms of rationality, organizations seek to seal off their core technologies from environmental influences. Since complete closure is impossible, they seek to buffer environmental influences by surrounding their technical cores with input and output components" (Thompson, 1967, p.24). At institutional level an

organization faces a large degree of uncertainty concerning inputs from its environment with no or little control (Kast and Rosenzweig, 1972). For the three levels the activities, interactions and relationships involve technical core activities, intra-organizational interactions and inter-institutional relationships (Kast and Rosenzweig, 1972). The levels apparent in organizational ecosystems involve the dimensions of employee innovativeness. As well as traditionally measured forms of innovation there is also hidden innovation and social innovation.

The overall objectives and mission of the paper are to compile an up-to-date and academically grounded study into organizational ecosystems in terms of employee innovativeness. Here we are concerned with the dimensions of innovation involving traditionally measured forms of innovation, hidden innovation and social innovation including interactions and relationships.

Due to changes in the way organizations function in contemporary society, through the use of new ideas, techniques and modern technology, business scholars are beginning to see organizations as ecosystems instead of discrete units (Boutros, 2014). Here the concept of the ecosystem not only focuses on how

organizations develop or how new ideas, innovation and technology can be adopted for greater efficiency, but moves attention to the ecosystem model where every activity of an organization affects the rest of the system (Boutros, 2014). With the organizational ecosystem we are not only concerned with the ecosystem of individual organizations but the activities of organizations in the organizational environment. Here organizational ecosystems comprise many organizations and actors, participating in exchanges and entering into relationships with a wide intentional range (Mars et al., 2014, p.75). Such ecosystems tend not to be concerned with goals that are pre-determined, although individual organizations develop and pursue such goals, and resource and information flows connect the organizations in the ecosystem despite competing and diverse objectives (Mars et al., 2014, p.75). Therefore with organizational ecosystems we are concerned with both formal and informal relationships. We are also concerned with developing the concept of organizational ecosystem, investigating variables that affect it, developments associated with it, both vertical and horizontal relationships, and relationships between organizations and organizational subsystems. Important aspects of these relationships are the dimensions of employee innovativeness, including hidden innovation and social innovation, involving trust, collaboration, cooperation, as well as network ties (Murphy, 2011).

The methodology used involves systems model formulation following the stages of identification of the main structures, relationships and components, model building, development of an evolved organizational ecosystem model, and analysis of the model. The research question has addressed 'what are the main components of organizational ecosystems in terms of employee innovativeness?' The potential contribution of the paper will be to bring together findings on the characteristics of organizational ecosystems in terms of the dimensions of employee innovativeness (traditionally measured forms of innovation, hidden innovation and social innovation). The paper is structured according to sections on background, research methodology involving systems model formulation, findings in terms of the development of an evolved organizational ecosystem model, discussion of the findings and conclusions for the study. The next section provides the background to the study.

BACKGROUND

Ecosystems

According to the World Resources Institute, ecosystems can be described as "the productive engines of the planet" (WRI, 2000: 3), and every ecosystem "represents a solution to a particular challenge to life" (WRI, 2000, p.3). Further to this, ecosystems are viewed as "real equilibrium systems" (Kauffman, 1995, p.22). Also, the "divisions between ecosystems are less important than the linkages between them" (WRI, 2000, p.11). To what extent ecosystems are within the ordered regime can be determined by how readily they "freeze into evolutionary stable strategies" (Kauffman, 1995, p.228). With regard to business studies and the social sciences a number of different ecosystems are studied and these include business ecosystems, enterprise ecosystems, industrial ecosystems, the economy as an ecosystem, digital business ecosystems (DBEs), social ecosystems (Peltoniemi and Vuori, 2005), and organizational ecosystems. Of particular interest to the authors are organizational ecosystems.

Organizational Ecosystems

With regard to organizational ecosystems organizations can be seen as nodes in networks of relationships (Peltoniemi and Vuori, 2005) and each organization is held within a niche to pursue the same goal according to the "technological information it carries" (Rothschild, 1990: 213). According to Peltoniemi and Vuori (2005, p.4), in Rothschild's ecosystem, efficiency is rewarded by survival (Rothschild, 1990, p.224). Also, there is a considerable competitive advantage for an area or region if small organizations within them adopt digital business early on (Nachira, 2002, p.21). In an ecosystem it is considered that organizations are always co-evolving since "each organization is a fully participating agent which both influences and is influenced by the social system made up of all related businesses, consumers, and suppliers, as well as economic, cultural, and legal institutions" (Mitleton-Kelly, 2003, p.30). It is further argued that functioning like an ecosystem is a critical success factor (CSF) for an organization since "when firms and institutions cease to function like a community or social ecosystem they may break down" (Mitleton-Kelly, 2003, p.31). Therefore, an organizational ecosystem consists of organizations and can take the form of a complex system. Similar to a business

ecosystem an organizational ecosystem is “an economic community supported by a foundation of interacting organizations and individuals – the organisms of the business world” (Moore, 1996, p.9). Also, it is an “extended system of mutually supportive organizations; communities of customers, suppliers, lead producers, and other stakeholders, financing, trade associations, standard bodies, labour unions, governmental and quasi-governmental institutions, and other interested parties. These communities come together in a partially intentional, highly self-organizing, and even somewhat accidental manner.” (Moore, 1998, p.168). The lifecycle of such an ecosystem can be divided into: a) the birth stage, where it is important to more than satisfy customers, b) expansion stage, during which the scale up of the concept is tested, c) leadership stage, where the ecosystem achieves profitability and stability, and d) the last stage of death or self renewal which results from emerging new ecosystems (Moore, 1993, p.76). Here, the ecosystem is close to the concepts of value network and cluster, as analysed by Peltoniemi and Vuori (2005).

Iansiti and Levien (2004a, p.46) report three critical success factors (CSFs) in an ecosystem. These are: a) productivity, which is a basic factor and will define success, b) robustness, involving the capability to survive a shock from outside or within, by drawing on competitive advantage and transforming in response to environmental changes, and c) create a niche and opportunities requiring change in attitude to being co-operative from a protectionist stance (Iansiti and Levien, 2004a). Four different roles organizations can take are given by Iansiti and Levien (2004a), being keystones (small number of organizations that are enablers which impact the whole system), niche players (making up most of the system), dominators and hub landlords which are organizations attracting system resources but not functioning in a reciprocal way (Iansiti and Levien, 2004a). Through these roles ecosystems aim to deliver innovations (Peltoniemi and Vuori, 2005).

According to Power and Jerjian (2001, p.3) it is not possible to manage an organization or business by itself since the entire ecosystem needs to be managed. Although there needs to be technological connectedness, in order to become a networked organization this means not just having a presence on the Internet but changing everything that is undertaken by the organization (Power and Jerjian, 2001, p.247). Here there are four stakeholders to an

organization: the concern itself, employees, customers, and shareholders (Power and Jerjian, 2001, p.18). While considering the advantage of co-operation the standpoint of the ecosystem needs to be taken into account. Further to this, Gossain and Kandiah (1998, p.4) consider the ecosystem to be similar to an integrated value chain, and emphasize a symbiotic relationship amongst organizations and relationship involvement. Through interconnectedness a change in landscape of one organization will cause a change in the landscape of another in the ecosystem (Lewin and Regine, 1999, p.208).

Complexity in Organizational Ecosystems

The reason for considering an organizational ecosystem as a complex system has been made by Peltoniemi (2004). Peltoniemi and Vuori (2005) note that the Santa Fe Institute consider complexity to refer to “systems with many different parts which, by a rather mysterious process of self-organization, become more ordered and more informed than systems which operate in approximate thermodynamic equilibrium with their surroundings” (Peltoniemi and Vuori, 2005, p.9). Also, “complex systems contain many relatively independent parts which are highly interconnected and interactive” (Cowan, 1994, pp.1-2). According to Peltoniemi and Vuori (2005) there is an ambiguous relationship between complexity and systems theory, and they have differences. “Complexity builds on, and enriches systems theory by articulating additional characteristics of complex systems and by emphasising their inter-relationship and interdependence” (Mitleton-Kelly, 2003, p.25). Peltoniemi and Vuori (2005) say that systems theory is included in complexity. Lewin (1999) further reports that a complex system has properties that are not fully explained by understanding the parts, and this emphasises the reductionist approach is not able to show the dynamics from interaction between a complex system’s parts. Investigation of complex systems requires understanding of the whole as well as studying the parts (Peltoniemi and Vuori, 2005). A comprehension of organizational dynamics is an important avenue of investigation in the complexity science field (Lewin and Regine, 1999, p.198).

Peltoniemi and Vuori (2005, p.10) outline complexity concepts and these include self organization, emergence, co-evolution and adaptation. With self-organisation it is suggested by Mitleton-Kelly (2003) that it

involves the ability to create coherence and a new order by complex systems. Mitleton-Kelly (2003, p.40) further notes that “emergence is the process that creates new order with self-organization”. Here Peltoniemi and Vuori (2005) report that an ecosystem is more than the sum of the parts, and interactions between entities cannot be produced individually, which is especially the case with research and development (R&D). Co-evolution in ecosystems is the evolution of one organization which affects the evolution of other organizations (Peltoniemi and Vuori, 2005). Changes of a strategic nature in one organization and the decisions made will affect other organizations in the ecosystem and there will be an impact on the overall ecosystem (Peltoniemi and Vuori, 2005). Adaptation creates “structures of progressively higher performance” (Holland, 1992, p.159) and it is suggested by Holland (1992, p.4) three associated components include measurement of performance, adaptive plan, and environment. Through organizational ecosystems being considered to be complex evolving and adaptive systems their interdependence, evolution and formation can be understood (Peltoniemi and Vuori, 2005).

Definition of Organizational Ecosystem

An organizational ecosystem can be defined as “a dynamic structure which consists of an interconnected population of organizations. These organizations can be small firms, large corporations, universities, research centres, public sector organizations, and other parties which influence the system” and further defined as “either consisting of several organizations or of only one organization. In the latter, (an) individual organization should operate as an ecosystem, in order to survive.” (Peltoniemi and Vuori, 2005, p.13).

Relevant Concepts in Relation to Innovation

In relation to innovation relevant concepts identified in the review of the literature, concerning organizational ecosystems, include linkages, networks of relationships, community, value networks and clusters, co-operation, innovations, and the networked organization. According to the World Resources Institute (2000, p.11) the linkages between ecosystems are more important than the divisions between them, and organizations can be seen as nodes in networks of relationships (Peltoniemi and Vuori, 2005). Additionally, with regard to linkages and networks, when institutions cease

to function like a community or social ecosystem, the organizational ecosystem may break down (Mitleton-Kelly, 2003, p.31). Here, the community needs to be supported by a foundation of interacting organizations and individuals (Moore, 1996, p.9), and the ecosystem needs to be close to the concepts of a value network and cluster (Peltoniemi and Vuori, 2005). For the success of the ecosystem there is a need to create a niche and opportunities which requires a change in attitude to a co-operative stance (Iansiti and Levien, 2004a). While considering the advantage of co-operation the standpoint of the ecosystem needs to be taken into account. By doing this an ecosystem will aim to deliver innovations (Peltoniemi and Vuori, 2005). Also, there needs to be technological connectedness, in order to become a networked organization, and this means changing everything that is undertaken by the organization (Power and Jerjian, 2001, p.247). Here, the ecosystem will be similar to an integrated value chain, with an emphasis on symbiotic relationships amongst organizations and relationship involvement (Gossain and Kandiah, 1998, p.4).

RESEARCH METHODOLOGY

The research methodology followed used systems model formulation following the four stages of: a) identification of the main structures, relationships and components from the literature, b) investigation through analysis and synthesis to inform model building, c) development of an evolved organizational ecosystem model, and d) analysis of the model. Using a systematic process (Umphrey, 2002) for the four stages of the research (Table 1) appropriate methods for the research stage were used (Schumaker and McMillan, 1993). Analysis for each stage used the most suitable method, taking into account potential downfalls through not relating some hidden underlying trends. The research question addressed ‘what are the main components of organizational ecosystems in terms of employee innovativeness?’ In order to answer this question, primary sources (literature) and secondary sources (reports) were investigated in the first stage to obtain an understanding of organizational ecosystems in terms of the main concepts, structures, relationships and components. Analysis of these and synthesis of information were undertaken in the second stage for the different concepts, structures and relationships in organizational ecosystems to determine the nature of the main components.

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The third stage involved the development of an evolved organizational ecosystem model and the last stage undertook analysis of the model

examining in detail the nature and importance of concepts to formulate conclusions. Table 1 shows the research strategy adopted for the study.

Table 1. Research Strategy

Focus of the study into Organizational Ecosystems		
Research Stage (RS)	Research Focus	Research Methods
RS1	Review of organizational ecosystems in terms of the identification of the main concepts, structures, relationships and components.	Use of existing research and secondary data sources.
RS2	Determine the nature of the main components of organizational ecosystems.	Investigation through analysis and synthesis to inform model building.
RS3	An evolved organizational ecosystem model.	Development of an evolved organizational ecosystem model by assembling the different components.
RS4	Analysis of the model.	An analysis of the model examining in detail the nature and importance of concepts to formulate conclusions.

The research stages described in Table 1 considered the following aspects of the nature of the main components of organizational ecosystems in terms of employee innovativeness:

RS1 – A review of organizational ecosystems in terms of the main concepts, structures, relationships and components

The research set out to obtain an understanding of organizational ecosystems in terms of the main concepts, structures, relationships and components. It has drawn primarily on existing research and secondary data sources. Secondary data sources have included literature in the area.

RS2 – Investigation through analysis and synthesis of information to determine the nature of the main components

This part of the research consisted of an investigation through the analysis and synthesis of information to determine the nature of the main components of organizational ecosystems.

RS3 – Development of an evolved organizational ecosystem conceptual model

The third stage involved the development of an evolved organizational ecosystem conceptual model assembling the different components.

RS4 – Analysis of the model and the nature and importance of the concepts involved

The objective of the last stage of the research has been to undertake an analysis of the model examining in detail the nature and importance of concepts to formulate conclusions. This was determined from information, concepts and factors identified in the literature, and findings from the conceptual model formulation.

The results of the research are presented in the following sections of the paper under the

headings of findings, discussion, conclusions and future research directions.

FINDINGS: CONCEPTUAL MODEL

Introduction

In order to reveal the dynamics of organizational ecosystems, in terms of the dimensions of employee innovativeness, a conceptual model has been developed to enable greater understanding of the concepts and to provide the foundation for further investigation. Through introducing a conceptual model, illustrating the dynamics, it can be deployed as a basis for analysis of the components and networks involved (Baghbadorani and Harandi, 2012). Organizations that form an organizational ecosystem will come from many areas of activity and these will involve those in competition, regulatory agencies and universities (Moore, 1993, 1996; Iansiti and Levien, 2004b). The model explains the configuration of an organizational ecosystem according to its nature and the dimensions of employee innovativeness, and these are discussed below before illustrating the main concepts in the conceptual model.

Organizational Ecosystems

A conceptual model of organizational ecosystems provides a dynamic system view comprising organizations, companies, competitors, financial institutions, media, regulatory agencies, and universities, for example (Moore, 1993, 1996; Iansiti and Levien, 2004b; Anggraeni et al., 2007; Yu, Li and Zhao, 2011; Baghbadorani and Harandi, 2012). Since there will be interactions between organizational ecosystems (Hearn and Pace, 2006), it will not be clear where their borders

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are drawn (Gueguen and Isckia, 2011). Three criteria for assessing organizational ecosystems are innovation, productivity and robustness (Iansiti and Levien, 2004a). According to Baghbadorani and Harandi (2012), an ecosystem conceptual model consists of the four layers of environment, contributors, leaders and users. Surrounding contributors, leaders and users, the environment forms the conditions for the organizational ecosystem to evolve (Baghbadorani and Harandi, 2012).

Innovation

In organizational ecosystems innovation can be contextualised amongst the activities of an organization. These include product, process, service or social innovations. This has strategic/competitive and value implications for a business organization (Porter, 1990; Centre for Urban and Regional Development Studies, 2002; Jones, 2002; Henry, 2001; Tidd, Bessant and Pavitt, 1997). ‘Value’ is given prominence by Drucker (2001, p.133) – who proposes innovation to be “changing the value or satisfaction obtained from resources by the consumer”. West and Farr (1990) approach the issue of value from a slightly different angle, and they believe innovation to be designed to ‘significantly benefit’ a host of organizational stakeholders. A further linkage between innovation and value is provided by Manley (2003, p.33) “the process of creating value is one of developing innovations using the resources immediately available in the user-producer value chain”. Similarly, the centre of attention of the definition of innovation by Ahmed and Shepherd (2010) is added value. They believe that both product and process innovation ‘embodies’ the notion of value

added. It can be stated that the ‘heart of innovation’ is a linkage between business development/offering and the market place.

Employee Innovativeness and Social Dimensions

Social capital may be considered to be a crucial element in an organization’s bid to become more innovative (OECD/Eurostat, 2005) in an organizational ecosystem. It may be the case that trust via cooperation is also of importance to innovation. Indeed, Landry et al. (2002) describe social capital as being an “essential ingredient to understand innovation”. With regard to social capital as a factor affecting innovation, research undertaken by Cooke et al. (2005) reveals that innovative organizations will make use of non-local networks. Research by Landry et al. (2002) shows structural social capital in the form of networks and other forms of relational assets has a positive relationship with innovation. As the quantity and quality of structural social capital increases, so does the likelihood of innovative activity.

Conceptual Model

The organizational ecosystem conceptual model in Figure 1 illustrates the main concepts including the organizational level (involving inputs and outputs) and innovation. With regard to the organizational ecosystem important aspects are the environment, contributors, leaders and users. Central to the model is the organizational level involving goals and values, technology, structure, social and managerial factors. With the dimension of innovation there are product, process, service and social innovations, and employee innovativeness. This involves co-operation, linkages and networks.

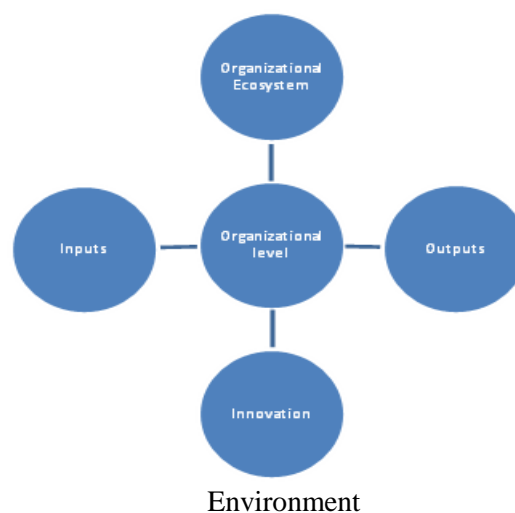


Figure1. Organizational Ecosystem Conceptual Model involving the dimension of innovation and employee innovativeness

The model shows inputs and outputs for the organizational level and this involves a transformation system involving the flow of information and material (Kast and Rosenzweig, 1972). Here the organizational level can be seen as a socio technical system within organizational ecosystems relating activities of the organization to its environment (Kast and Rosenzweig, 1972).

DISCUSSION

Greater dynamism in organizational structure within organizational ecosystems can result from the level of competition in the market (Rumelt, 1974). There is therefore a good link between the environment outside, the strategies adopted and the organizations (Miller and Friesen, 1983). Many individuals and organizations will contribute to the evolution of an organizational ecosystem (Iansiti and Richards, 2006). Here, an organizational ecosystem leader provides the platform to form the ecosystem providing frameworks and tools to help improve and drive innovation and performance (Baghbadorani and Harandi, 2012). An important component of an organizational ecosystem is the user, who as an organization or individual will purchase products and services produced by the ecosystem (Zhu and Iansiti, 2007).

Drucker (1991) states “innovation is both conceptual and perceptual”, meaning it has an organizational locale coupled with an acceptance in the organizational ecosystem. Innovation can also be categorised in terms of outcomes. Such outcomes can be product, process or service innovation. Product innovation has been described as being the development of a firm’s products or services (Bessant and Tidd, 2007), whilst process innovation occurs when a firm improves or develops its creation and or production of goods and services (Bessant and Tidd, 2007). A slightly different definition of process innovation has a focus upon cost reduction and improvements in production efficiency (NESTA, 2008). Communication and teamwork are also considered to be important aspects of innovation (Morgan and Nauwelaers, 1999); Henry (2001); Manley (2003). Cooke, Roper and Wylie (2002) agree with this view adding a regional dimension; they consider innovation to be “not solely technical, but is a social process within a region”. With regard to the social aspect of innovation, the European Commission (2006) recognises the economic and social consequences of innovation. For innovation to occur there is a need for

something novel, which has an impact economically and socially (Phillis et al, 2008).

Kaasa (2009) describes organization level social capital as being focused on Putnam et al.’s (1993) view involving trust, norms, and networks, and at organizational level within an organizational ecosystem, these are associated with an individual person (Kaasa, 2009). Additionally, Putnam et al. (1993) link social capital to social organizations since they can both be constituted of trust, norms and networks. Alternatively, further factors which influence social capital include cultural differences (Coleman, 1988). Coleman (1988) considers cultural differences to impact the likelihood that benefit or aid will be lent and requested and the subsequent knock-on effect to the closure of social networks (closure may be interpreted as completing/joining up loose ends of a network). It could be relevant to question the impact of the provision and expectation of state support upon social networks and consequently upon social capital. Coleman (1988) identifies an issue of social contact logistics, and the topography and transport linkages may impact upon social capital linkages.

In order to support and/or promote employee innovativeness, networks need to be open, efficient and effective in information/knowledge exchange (Fountain, 1998) within organizational ecosystems. Here, Fountain (1998) refers to productive networks as a ‘mesh’ of ‘flexible peer-to-peer’ relationships, and states this is a source of social capital. The peer-to-peer meshed network according to Fountain (1998) can be an enabler of innovation. This can be the case if organizations and/or individuals become more adaptable as an outcome of a network. Fountain describes a meshed network as having the capability to enhance organizational and/or individual awareness and understanding of the organization’s environment. Greater understanding and awareness can result in increased capability to identify opportunities or threats, identify and implement solutions, and increase levels of employee innovativeness. However, Fountain (1998) provides a note of caution, since information sharing resulting from networks is not as valuable as social capital produced. Social capital rather than information capital is more likely to produce useful, innovation-focused outcomes. Fountain (1998) expresses support for the formation of horizontal networks as opposed to vertical networks; horizontal networks seemingly being

more supportive of the formation of social capital and consequential innovation outcomes. The view that proximity matters in social capital construction is supported by Fountain (1998), with key social capital leaning to innovation being the lowering of transaction costs (Landry et al., 2002).

CONCLUSIONS

The potential contribution of the paper has been to bring together findings on the characteristics of organizational ecosystems in terms of the dimensions of employee innovativeness (traditionally measured forms of innovation, hidden innovation and social innovation). The research question investigated 'what are the main components of organizational ecosystems in terms of employee innovativeness?' In order to answer this question, primary sources (literature) and secondary sources (reports) were investigated in the first stage to obtain an understanding of organizational ecosystems in terms of the main concepts, structures, relationships and components. Analysis of these and synthesis of information were undertaken in the second stage for the different concepts, structures and relationships in organizational ecosystems to determine the nature of the main components. The third stage involved the development of an evolved organizational ecosystem conceptual model and the last stage undertook analysis of the model examining in detail the nature and importance of concepts to formulate conclusions. The paper has therefore presented the conceptual model involving the dimensions of employee innovativeness. The aim of the model is to clarify the structure of organizational ecosystems in terms of the main concepts involved (organizational level, innovation and environment), involving networks and interdependencies. It is envisaged that the model will provide greater understanding to the body of knowledge in this area of study. Those involved with organizational ecosystems will be able to identify the relationships, position, role and context within which their organizations function.

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