Diversification of the economic base in the UAE

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Abstract

This paper discusses the implementation of the national innovation policy in the United Arab Emirates. The country is in transformation from a resource-based economy to a knowledge-based economy, and innovation and renewal of the economic base are among the key attributes to this transition. The visionary leadership of the country has made significant investments in developing innovation policies and strategies for nurturing innovation and entrepreneurship in the country, and this paper discusses the status of the implementation of these strategies to date. The paper will apply actor network analysis in describing the national entrepreneurial ecosystems and compare the ecosystems to earlier documented state of the art systems in literature, and global benchmarks. The paper applies institutional theory in describing the inhibiting factors for the development, namely the cultural, institutional and cognitive factors prevailing in the UAE. It further analyses the existing ecosystems, and the specific characteristics and strengths that the UAE can draw on and leverage in the implementation of the strategy. The paper concludes that local culture and tradition play a major role in the initiation of entrepreneurial activities in the UAE. Development is path dependent, and the context works in the favor of incremental innovations. The country has invested in the resources ad capabilities that enable innovation, but to date the exploitation of these resources has been limited. The paper makes recommendations for improved use of these investments. The paper increases understanding of the context related enablers and obstacles to the implementation of the policy in the UAE and contributes to innovation policy and entrepreneurial ecosystem literature with a case study from a less published context. On practical level, the paper increases awareness of the UAE entrepreneurial opportunities, and can help increase investments and start up activities in the UAE.

The Introduction

Innovation has been recognized as the key attribute to growth especially during times of rapid change, because it provides more efficient and effective procedures and tools to run different industries (Škerlavaj et al., 2016). Innovation is a two-way process, in which businesses advance by creating new product and processes, while public sector works on providing the necessary enabling conditions (Edquist, 2011). Kogabayev and Maziliauskas (2017) describe innovation as central for the development of any economy and economic activity. Innovation on national level is a long and cumulative process including a considerable number of decisions with long term impacts on the national development, resulting in the dynamic growth of the economy, increasing employment opportunities, and creation of pure profit for business (Kogabayev & Maziliauskas, 2017). In knowledge economies the most impactful innovations are science based and enhance social activities and apply social production (Kogabayev & Maziliauskas, 2017).

Innovations are increasingly created in collaboration and co-creation between various organizations, which together exist and evolve in an ecosystem of mutual interdependencies. The emergence of such dependencies inherently leads to changes in the roles and dynamics among the participating firms and government organizations. Dynamics and corporate strategies in engaging in such ecosystems or platform based production has been studied extensively in recent years, However, most studies have failed to recognize the importance of the adaptation to the existing institutional environments, or alternatively, the need for institutional change in the ecosystem of the involved organizations and actors.

Research has tended to focus on impartialness and neutrality of the institutional environment rather than on the dynamism and change, how the prevailing arrangements, norms, values and beliefs either enable or hinder the successfulness of service development projects and the implementation of the finalized and commercialized service (Gronum et al., 2012). Due to its constructive impact on information flows, trust-based behaviour is cited as a crucial factor in enhancing open innovation through inter-firm collaboration (Pittaway et al., 2004, Gronum et al 2012) and a fundamental reason for longevity for inter-firm networks.

The operating environment is specifically important for SMEs seeking to exploit their explicit knowledge (Jørgensen & Ulhøi, 2010). Gronum et al (2012) study the impact of innovation breadth on firm performance and, subsequently, the impact of network heterogeneity and strength of network ties on firm performance for SMEs. Results confirm that both innovation breadth and networking activities have a subsequently positive impact on SMEs' performance (Baldwin & Gellatly, 2003).

Majority of companies in the UAE are SMEs, so the focus on enabling environment for this sector is of essence in Arab Emirates' context. There is limited research focusing on innovation in the Arab world, and the root causes of the low rates of innovation. Iqpal (2011) argued that Arab countries apply certain systems of innovation but there are many factors that weaken this compared with other countries. Ababneh & Hatamleh (2013) stressed that Arab countries differ from other countries, including in the level of science, technological development and technological capabilities, all of which affect the level of innovation. Badran and Zoubi (2010) concluded that there are some systems that stimulate innovation in the Arab countries, but these are often poor, and affected by many factors that reduce their effectiveness, such as poor infrastructure, low technological achievement index, and weak capacity.

This paper analyses the factors enabling, hindering innovation, and the implementation of the national innovation policy in the UAE. The analysis is performed through investigation into the entrepreneurial ecosystem in the country with actor network analysis (ARA), including analysis of the key stakeholders (actors), their relationships and activities. The paper reviews the earlier research on entrepreneurial ecosystems and identifies the factors that are specific to the UAE context. The paper gives recommendations on enhancing the ecosystem efficiency and targeting of the support instruments, as well as increase awareness of the context specific variables in the UAE. The paper contributes to the academic discussion on entrepreneurial ecosystems, and specifically on ecosystems in emerging economies in the middle of societal and economic transition. The paper will support policy makers in adjusting support instruments for the implementation of the national innovation agenda, as well as help assess the status of the implementation of the UAE innovation policy. The paper increases awareness of the UAE entrepreneurial ecosystem and opportunities for new companies and investors in the region. The paper further initiate's discussion on the role of culture, cognition and legal frameworks in ecosystem based economic production.

Literature review

Innovation reduces the cost of undertaking tasks and provides new and different ways to perform a task already performed by an existent process (Melchor, 2013). Innovation is important in a dynamic technological phase as it leads to more efficient and proactive procedures and tools to run various industries. The most successful economies in the world are driven by technological advancement that is enhanced by innovation. According to Matta and Ashkenas (2003), the reasons why many ideas and innovations have failed over the years vary depending on the scale of the implementation, the location and the time involved. This again highlights the importance of the local context, and the quality and amount of interaction among local stakeholders.

The following chapters will focus on entrepreneurial ecosystem as the vehicle to deliver the needed socio-techno-economic transitions needed for effective implementation of innovation policies. The chapter first discusses the entrepreneurial ecosystem literature on global level, and later the national level in the United Arab Emirates.

2.1 Entrepreneurial ecosystems

Context plays a pertinent role in ecosystem situating the entrepreneurial phenomenon in a broader field that incorporates temporal, spatial, social, organizational, and market dimensions of context (Zahra, 2007; Zahra et al., 2014).

Too often context is "taken for granted, its influence underappreciated or…controlled away" (Welter, 2011: 173-174). Consequently, it leads to a generalized model of entrepreneurship. Recent literature on entrepreneurship has stated that context plays a pivotal role in the success of entrepreneurial activities and should not be treated as a simple control variable or a proxy. This has led to a call for a deeper examination of the cultural, social, political, and economic structures and processes associated with location. A context like location is not a cause of particular entrepreneurial practices but rather reflects a much more complex influence on entrepreneurship (Johannisson, 2011).

Entrepreneurial ecosystems focus on the cultures, institutions, and networks that build up within a region representing the values and priorities of an institution or the government. Entrepreurial ecosystems consist of the relevant government institutions, innovators, educational institutions, anchor companies, local SMEs and startups. Also, the legal framework, the culture, norms, values, basically the whole socio-techno-economic regime, plays a role in the way the entrepreneurial ecosystem is structured and operates. This can be organic, self-emerging system, or a purpose-built operation. There is a need to develop knowledge and improve the environment within the public sector, and this has provided much opportunity for creativity and innovation (Kozáková, 2013). The trend is that government takes an active role in stimulating entrepreneurial ecosystems in developed countries.

The ability of organisations to effectively participate in these ecosystems has been identified as a key ingredient for open innovation for the following three reasons put forward by Konsti-Laakso et al. (2012):

1. The network is vital for the development of internal innovation capability to consult with other actors in the process (Jørgensen & Ulhøi, 2010).

2. The network is necessary to involve external partners to help promote the development of R&D ideas (Tidd, Bessant & Pavitt, 2009).

3. Other firms need to be involved during the implementation of new innovation (Tidd, Bessant & Pavitt, 2001; Prahalad & Ramaswamy, 2004).

On national level, government institutions define and instrument innovation policies that stipulate national innovation priorities, strategic objectives and means to measure progress. The most commonly used measurement framework is the Global Innovation Index by INSEAD. The framework defines a number of domains needed for successful innovation ecosystems and means to measure these dimensions. This framework is used also in the United Arab Emirates. The national innovation policy stipultes target areas for innovations, which are then measured by the Global Innovation Index. The focus is on creating environment that is conducive of innovations, especially on home grown innovations as opposite to the legacy of importing innovations to the UAE.

2.2 Entrepreneurial ecosystems in the UAE

In the last decade, the UAE has experienced very rapid growth in its economy. The GDP jumped from 510 billion dirhams to 1.47 trillion dirhams in 2014. In 2015, GDP reached 1.8 trillion dirhams, a growth of 3.6%. The country is paying significant attention to the non-oil sector to support the national economy and to compensate for the low performance of the oil sector (Ministry of Economy, 2017). The UAE has joined the innovation trend, as detailed in the national innovation agenda and knowledge society development goals. His highness Sheikh Mohammed bin Rashid Al Maktoum, Vice-President and Prime Minister of the UAE and Ruler of Dubai launched a National Innovation Strategy on October 2014 with the aim of making the UAE one of the most innovative nations in the world. The first priority is to establish a stimulating environment for innovation in the form of supportive institutions and laws. The main purposes behind encouraging innovation can be summarised as implementing a sustainable investment plan in the UAE's human capital, driving economic development away from the oil sector, enhancing the UAE's global competitiveness and introducing corporate methodologies and a culture for innovation (UAE Innovation strategy).

The national innovation strategy includes numerous short terms and long-term goals, specific activity lines and clear key performance indicators to evaluate the implementation and impact of the activities. The principal approach for the implementation of the strategy is through government lead public private partnerships and consortium research. In majority of cases the context is smart city development with concrete and direct benefits to local businesses and citizens.

The UAE is an oil-producing country, and it is currently impossible to develop this industry effectively without innovation (Indradewa, Tjakraatmadja, & Dhewanto, 2017). At present, innovation programs are stimulated by the government in seven different sectors, including renewable energy, transportation, education, health, water, technology and space (UAE Cabinet, 2018). The UAE government has included innovation and innovative development in the curriculum for students and schoolchildren to enrich the national culture (EduKid, 2016). This means that, in the long term, innovation will be encouraged even more in industry and private enterprises. A recent national innovation strategy aims to position the UAE as one of the top twenty most innovative countries in the world by 2021 (vision2021, 2016). This comprehensive strategy is designed to serve as an engine for the growth and the development of distinctive skills and capabilities across the country. In 2016, the UAE was ranked 41st in terms of its total innovation capabilities (INSEAD, 2015). In the same year, the government of the UAE launched Dubai Future Accelerators to drive innovation in healthcare, transportation, renewable energy, sustainability, education, security, and urban planning. This position today is 37th.

The government invested significantly in sectors such as information and communication technology (ICT) and non-oil industries to create a knowledge-based economy (El-Sokari, Van Horne, Huang & Al Awad, 2013). The UAE government is putting USD 1.2 billion into these initiatives (Schilirò, 2015). The country is moving toward a knowledge-based economy by establishing an environment and culture that fosters innovation and builds innovative capabilities. There are already a number of success stories of innovative projects in the UAE, including projects that have solved problems and reduced government expenditure.

Overall the Arab countries are not well prepared to deal with the challenges of innovation. First of all, there are fewer researchers in the Arab world than elsewhere (Twati & Gammack, 2006). Global innovation indicators show an average of 3.3 researchers with doctorate and master's degrees for every 10,000 people in the workforce of Arab countries (Nah & Tan, 2016). There has also been a continuing legacy of dependency and underdevelopment in the region resulting in distorted development progress, and a focus on consumption instead of production (Hill, Loch, Straub, & El-Sheshai, 1998). Studies have suggested that the Arab countries lag behind mainly because of their attitude towards innovation and technological development (Boeing, 2013). In the past, entrepreneurs and private owners in Arab countries have focused mainly on non-innovative or zero-risk investments (Blanchard & Allard, 2011). Arab organizations do not face much competition to encourage innovation (Rudowicz, 2016). Local inestors did not invest in industrial sectors that involved a significant amount of risk, innovation and application of technical knowledge (Nakata, 2009). Investment tendencies have, however, transformed significantly more recently.

Research methodology

The authors take a qualitative approach to data collection and analysis, studying non-numerical or unquantifiable elements such as words, feelings, emotions, or sound. These methods are used to identify trends in thought and opinions, and to examine problems more deeply. They are used in situations that involve unquantifiable data such as the meaning of certain behaviors (Cooper, Schindler, & Sun, 2006), (Creswell and Clark, 2007). The outcomes of qualitative research are often not conclusive and may not automatically be used to make generalizations, because they may have been developed subjectively. These methods are, however, essential to provide a broad base of insight (Creswell & Clark, 2007). Special efforts will be made to make conclusions based on broad data collection and pattern building among the research group and making use of grounded theory approach (Strauss & Corbin, 1990).

This paper builds on conceptual literature review. The articles have been selected in google scholar with search words of innovation policy in the UAE and entrepreneurial ecosystem. Interesting findings have been followed further and enriched with deeper reading into the articles that were cited in the primary data sources. In the future research, the objective is to make thorough content analysis to

determine patterns, meaning, and inference of purpose from texts, often alongside examination of statistical relationships between variables (Johnson & Onwuegbuzie, 2004), and bibliometry to reveal patterns in scholarly communication. In the future work, the data will be enriched using the case study protocol, as described in Yin (2014). Case study method is used to describe the characteristic of a particular organization or phenomenon under study. A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident and in which multiple sources of evidence are used (Yin, 2014). The analysis begins by developing theory-based framework for the critical capabilities for innovation. This exercise will allow us to develop categories of innovation characteristics which will further strengthen the analytical structure of the analysis and produce compelling analytical conclusions to rule out alternative interpretations (Yin, 2014).

In academic literature Value network analysis (Halinen & Törnroos, 2005) is a popular method for ecosystem mapping. The ARA model traces the different actors in the network, their roles, and finally activities within the network. This division will be used to map the actors in the UAE context based on the future case studies. However, the investigators acknowledge that the framework has been criticized for the lack of attention to external linkages. Therefore, the analysis is complemented with other methods.

Institutional theory (Scott, 2004) is used as a framework for presenting the results in clear and structured way. This theory divides barriers and inertia in implementing changes and innovations into cultural, cognitive and legal barriers. The entries falling into the category of legal factors include issues that relate to laws, the legal system, and the practical interpretation of laws. Cultures provide people with ways of thinking--ways of seeing, hearing, and interpreting the world. Thus, the same words can mean different things to people from different cultures. Understanding and appreciating these "cognitive constraints" constitutes a critical success factor innovation. On normative side the main barriers included the scarce use of public demand as a tool to support innovation, and the existence of alternative-to-classic-procurement. This includes cognitive barriers of lack of competences and knowledge.

Findings/results

The literature review revealed several means to support innovation ecosystems in the UAE context. These include the need to focus on reducing potential risk by removing ambiguity and better assessment of opportunities, as well as starting to promote entrepreneurship within or through large organizations. Enabling legal and regulatory environment with sufficient policy and program coordination and conducive laws and regulations, and stimulation of Entrepreneurship Culture and strengthening business support services (Fontana et al, 2012).

In academic literature entrepreneurship ecosystems are treated as value creation systems, they are not networks nor industry working groups (Lamberton & Rose, 2012). Ecosystems are systemic interlinked networks of components that facilitates and generate innovations and focuses on developing the underlying factors determining innovation capacity in ecosystems. Their survival and growth capacity cannot be reduced to the characteristics of single participants (Franke & Shah, 2003). There is a small but quickly growing body of research on platform-driven ecosystems (see e.g. Deschryvere 2014). The results so far and the tentative pre-published results show that:

1) open, approach to ecosystem creation can predict regional economic growth two years in advance,

2) different ecosystem tools need to be taken for different maturity levels of the ecoystem (coordinating at an early stage, complementing at a mature stage), and

3) ecosystems where 'dominant design' or 'big 5' overtake real competition tend not to produce socio-economic prosperity (micro- or macro-market domination replace the favourite choice of the users) (Chen et al, 2011). Policy propositions include e.g. for public funders to only support ventures that strive to change the old ecosystem.

There are several means to measure entrepreneurial ecosystems. Global Startup Ecosystem Ranking 2015 publishes an index ranking ecosystems along five major components: Performance, Funding, Talent, Market Reach, and Startup Experience. Global startup ecosystem index identifies actionable areas based on 9 key factors: Performance, Funding, Talent, Resource Attraction, Market Reach, Startup Experience, Global Connectedness, Corporate Involvement, and Founder Issues.

Global Innovation Index provides a comprehensive assessment of national innovativeness focusing on knowledge inputs and outputs. OECD publishes annually global innovation index, and world bank tracks entrepreneurial activity with its' indexes. All indexes conclude that entrepreneurial activity is directly related to national competitiveness and growth.

On practical side, Global Start up ecosystem consortium has collected practical activities that have been listed among best practices in the most successful entrepreneurial ecosystems as i) build innovation centers (as opposed to research facilities which typically lack commercial focus), ii) increase cross-border collaboration, iii) reform education policies to keep pace with the knowledge and skills required for young people to participate in the emerging 'third-wave industrial revolution', iv) promote the successes of domestic entrepreneurs to foster an entrepreneurial culture, v) recognise which start-ups are more likely to succeed and channel the resources to them instead of trying to support as many start-ups as possible, vi) combine financing with commercial mentorship, and vii) support the government in creating a modern workforce for the future.

Entrepreneurial ecosystem in the UAE

The authors reflected the global best practices to the UAE context in an effort to derive context specific factors and opportunities for improving the systems based on this global benchmarking. Entrepreneurship is still a new and emerging profession in the UAE. According to Global entrepreneurship barometer (2016), the Total Entrepreneurial Activity score for the UAE was at 4% among the lowest in the world. The implementation barriers for the new policies are well known, and described here using institutional theory-based framework (Scott, 2004, Kraft et all, 2007):

Cultural Barriers:
UAE nationals still have high dependence on Public Sector for Employment with more than 90% of the employed nationals work in the public sector.
Youth (15-35 yrs) represents 42% of the UAE's national population. With less public sector jobs youth unemployment rate in the UAE has risen to 18%
Women have bias to family commitments and limited work hours
The UAE culture has high power distance, collectivistic traits and masculine attributes
Fear of failure is strong
Cognitive Barriers:
Curriculum based entrepreneurship education is limited
There are few local role models
Business support services are underdeveloped
Local peer networks and associations are limited
Legal Barriers:
Anti-bankrupt laws are severe
Challenges obtaining visa
Cost of registering a legal entity
Requirements for local partners

Table 1. Barriers for innovation in the UAE

Addressing these challenges requires a holistic approach to developing the UAE entrepreneurial ecosystem as a whole. The term 'entrepreneurial ecosystem' describes the role of independent factors working together to enable entrepreneurs and allow innovation to occur in a sustained way in a particular location (Hwang & Horowitt, 2012). However, analyzing how they develop differently in different places can enable policymakers and business leaders to provide a more supportive environment (Spiegel, 2017). Such ecosystems consist of tangible elements like regulatory environment, local institutions, universities, standardization bodies, large anchor companies, small and medium size companies and business support organizations, as well as intangible elements like cultural self-confidence, competences, attitudes, norms and values.

Discussions and conclusions

The objective of this paper was to increase understanding of the dynamics between the institutional, cultural, social, political and economic actors, structures and relationships that constitute the

local entrepreneurial ecosystem in the UAE and propose means to enhance the effectiveness and innovativeness of these systems.

Studies have shown that innovation is directly related to and influenced by national culture, which can either encourage or hinder innovation. Culture has a significant influence on the capacity of a society to innovate. Research suggests that Arabs have a low tendency to take risks and a fear of change. Development in many Arab countries is therefore very slow compared to other nations.

In addition to the entrepreneurs' life stages, the analysis needs to also take into consideration the lifecycle of the local ecosystem. Life cycle model helps to measure the performance and stage of ecosystems to provide local stakeholders with strategic guidance on focus areas at every growth stage. This knowledge empowers regions everywhere to take timely, informed actions that guide the most impactful use of limited local resources, and to propel through the lifecycle's four phases: Activation, Globalization, Expansion, and Integration.

The stage of entrepreneurial ecosystems can be measured using various maturity models. In business ecosystem maturity model, the stage is defined by six characteristics. The following table applies these dimensions to the UAE entrepreneurial ecosystem.

Strategic Dimension	The UAE Ecosystem Situation
Strategy & stakeholder engagement: ecosystem awareness, partnership and adaptation strategy, stakeholder participation, public engagement	The awareness and engagement of the various ecosystem actors is in a high level. National policies are clear and vigorously implemented top down. Less bottom up and civic initiatives.
Community support: developer programs, education, accessibility, community engagement	There are several support mechanisms and funding for startups is available. However, this is typically reserved only for local Emirati innovators, which leaves foreign nationals without support.
Ecosystem openness: value chain positioning, cross sector awareness and support, open sources strategy, openness of business models	Ecosystems are typically vertical with little cross-sector analysis and open innovation. This is changing through consortium research initiatives by the government.
Technology advancement: technical richness, simplified complexity, technical readiness	Technological readiness is good by legacy systems that have been sourced internationally. Local production is still to pick up in this respect.
Marketplace mechanism: monetization mechanism, business models, privacy, security and trust, legislation	Local business environment is vibrant with high level of competition, clear business laws and political stability. Very attractive market due to the location and access to the other GCC countries. Local market small.
Technology inclusivity: Supported standards, devices, interoperability, validation, verification, testing, certification	Technology inclusivity is still developing. There are several initiatives for the use of latest AI models and data-based optimization technologies. In addition, investment in research are immense.

Table 2. The UAE entrepreneurial ecosystem maturity analysis

It is particularly important to create an environment supporting innovation in small- and medium-sized enterprises, because of their business prominence and substantial economic benefits in Arab countries. National governments need to consider whether changes are necessary in education, technologies, ICT-related financial incentives, and social awareness. Below listed selected practical recommendations for the UAE context, derived from the international benchmark ecosystems including Silicon Valley and London.

Innovative financing approaches to technology infrastructure should be developed from sources including government budgets, revenues from telecommunications monopolies, investors, and international financial institution projects. These can include competitive subsidies, aggregate demand, and private funding guarantees. Administrative barriers should be removed to encourage funding. The Arab countries support a legacy of extensive bureaucracies and administrative operations and administrative reforms ae called for. Public–private partnerships should benefit from local and national cultural, social, and traditional values, as these can affect funding priorities and approaches. Governments should innovate by engaging in productive practices that could help national development.

National authorities should enable competition to encourage private sector innovation. It is also important to share regulatory and legislative data emerging from technological innovation. The recently developed Arab Regulators Network is considered to be a promising new regional project that is addressing data exchange across the entire Arab region. Support for the development and innovation in Arab countries is needed. There is currently a shortage of accurate data for research. Governments should enable business opportunities such as offshore call centers. National authorities aim to support a number of characteristics that stimulate innovation, including organizations with both public and private membership, financial incentives, innovation levels, and liberalization-based flexibility.

Limitations and direction for future research

The research will help to increase investment opportunities in Arab countries. It will also help to sensitize governments and organizations in the Arab world to improve innovation by influencing cultural change. The research can be used by policymakers to guide the innovative practices that are needed to create and sustain Middle Eastern economies. Economists and managers of organizations in the Arab world as a guide to help them create modern organizations that emphasize the active role of employees in the innovation process can also use it. Companies around the world that seek to invest in Arab countries will benefit from this research by obtaining information about the cultural barriers that can hinder innovation.

The major theoretical implication is increased understanding of the UAE innovation context, and the characteristics and maturity of the local entrepreneurial ecosystems. This research study contributes to current knowledge by suggesting areas of further study in the UAE context. It also presents a study of a less published case context for the literature base on entrepreneurial ecosystems.

The limitation of the study is the lack of empirical evidence. This is the planned next phase of the research. The authors will investigate local ecosystem actors and representative cases in order to collect evidence to support the literature-based analysis of the local ecosystem maturity and development pathways.

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