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Business and Technology Incubators and their Role in Europe in Comparison to the GCC countries: an Analysis of Current Affairs

by

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Business and Technology Incubators and their Role in Europe in Comparison to the GCC countries: an Analysis of Current Affairs

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Abstract

Business and Technology incubators play an important role in the development of innovation and new business development structures of national economies. The way these incubators function and the impact they have on national development program varies from one region to another. In this paper we discuss the diverse roles played by business and technology incubators in two different regions of the world namely, the Gulf Cooperation Council (GCC) countries, (Kuwait, Bahrain, Qatar, UAE and Saudi Arabia) and Europe. That discussed also necessitated a look at the available management approaches to run the daily activities of these centers.

In this work, we analyzed the management paradigm required to run incubators in the context of an e-globalized economy and the open management paradigm is discussed as new way to run aggregates of firms. Finally, we coupled our discussion to issue of regional development and the importance of business and technology incubators to regional growth.

Keywords:

Incubators, business incubators, technology, venture creation, GCC countries, the Arabian Gulf, Europe, open management, open innovation management, open capital, internetisation management, e-globalised economy, e-globalisation

Introduction

Business incubation provides entrepreneurs with expertise, networks and tools that they need to make their ventures successful (Al-Mubarak 2008, Almubarak and Busler, 2009). The support they provide in the initial phase of business is essential since the first five years are very critical for their survival (Castrogiovanni, 1996; Monk, 2000). Incubation programs diversify economies, commercialize technologies, create jobs and build wealth. According to National Business Incubation Association (NBIA), business incubators help entrepreneurs translate their ideas into sustainable and functioning businesses by Guiding them through the starting and growing a thriving business (NBIA, 1996). With 20 to 25 years of history, business incubation has been a subject of numerous studies (Wagner, 2006). Incubators are driven by several objectives of significance for economic development including; technology transfer, acceleration of business growth, development of fast-track companies, reduction in the failure rate of new enterprises, empowerment / opportunities for specific groups of entrepreneurs and finally, development of an entrepreneurial culture / role models (ibid). Business incubators, especially the ones operated by governmental organizations, are used as tools to promote the economic development of a community, region or country (ibid). In the United States, in particular, such development strategies have been justified by the theoretical arguments and empirical evidence that innovation promotes economic growth (ibid).

Societies and their economies vary in their degree of entrepreneurial commitment. There are different types of capital which enhances the entrepreneurial capacity of a society. Basically, these include three basic ones: *Human Capital*, *Financial Capital*, and *System Capital* (see Abouzeedan and Busler 2006). These types of capital constitute vital ingredients of the complex input of activities in a society which is needed to create its entrepreneurial culture and environment. The combined capital formed by these three components is defined as the “*Innovation Capital*” (see Abouzeedan and Busler, 2006). In addition to that there is a fourth component of capital (Abouzeedan et al., 2009) which emphasizes the openness and open exchanges of ideas and resources, both tangible and intangible ones. This component, Open Capital, reflects the wealth in openness and transparency between organizations. Other researchers suggested alternative components to define the innovative capacity of society. Corely et al. (2002) emphasized the physical, R&D and human capital. These authors argued that variation in the rate of investment across countries and industries in the three types of capital explains the differences in productivity levels across EU and US industries. Moreover, expenditures in R&D may be a waste of resources if the firm does not have the skills to

transform them into commercial success (see Ballot and Taymaz (1997)). One way to enhance transaction capacities of firms is by investing in Information and Communication Technologies (ICTs). To understand how innovation could be managed in the era of Information Technology (IT), it is essential to consider issues related to transaction costs. In the open business model such transaction costs are far less than in the closed model. Awazu et al. (2009) stressed that ICTs facilitate and enhance the innovation process from idea creation through the commercialization process.

Also, as pointed out e.g. by Turban et al. (1999), Information Technology (IT) has become the major facilitator of global business activities. IT catalyses fundamental changes in the structure, operations, and management of organizations by facilitating and enhancing a variety of functions and capacities. Such capacities include; performance of high-speed high-volume calculations and interactions; generation of fast, accurate and inexpensive communication between organizations and actors; storage of easily accessible amounts of information and increasing the efficiency of the working force. According to Fredberg et al (2008), *open innovation* has merged into a system model where enterprises commercialize their internal and external ideas and technologies and use both their external and internal resources. Basically, these authors pointed out three significant roles of the ICTs. The first role is to help organizations to *understand the sources* of ideas. The second role of ICTs is to help capturing ideas from the sources-the i.e., the *documentation* role. The third role of ICTs is to enable the *distribution* of ideas. Dana et al. (2002) introduced the term *Internetisation* to describe and capture “the process of adoption and diffusion of e-business systems and Internet technologies by innovative entrepreneurs.” As such, this new term is of significance for understanding open innovation systems. Dana et al. (2002) argued that there are six stages of “*Internetisation*” which include: *non-adoption*, *trial Internet use*, *reactive Internet trading*, *active exploration of Internet*, *integration of operations with the Internet* and finally *Internet portal development*. Related to the paradigm *Internetisation* is also the issue of openness in the innovation activities. Utilizing full capacities of the ICTs, firms and organizations can readily coordinate their innovation efforts via an open innovation management system using the techniques and tools of *Internetisation Management*. The internetisation management paradigm as proposed by Abouzeedan and Bulser (2007) express the ability of firms and organizations in the new e-globalised economy to arrange their administrative and operative operation on a platform of ITCs with Internet as the main component of that platform.

This paper opens with an introduction. In the second section we discuss the role of business incubators while in the third section we reflect on their historical origins and development. In section (4), we assess the incubators in Europe and in section (5), we look at incubators in the GCC countries. In section (6), we look at the innovation capital and its four components. In section (7), we introduce the concept of open management and in section (8), we draw our conclusions on the relevance of this development.

The role of business incubators

Business incubator nurture or adopt the businesses, supporting them in their infancy until they can fly on them own. Further “though some investment groups call them selves incubators (Campbell, 2001). Business incubators leads to economic development effort intended to stimulate the economy; create jobs; develop local economic diversity; support the commercialization of research and the transfer of technology into new and different commercial applications leading to enhancement of small business success (Greene and Busler, 1996 ; NBIA . 1990 ; Smilor and Gill, 1986). According to NBIA (1996), business incubators also reduce the risk of small business failures. Statistics show that 87- 90% of businesses that come out of incubator programs were successful over time as contrasted with approximately 20-30% of non-incubated businesses that were still in business after the same length of time (NBIA, 1996) .

Business incubators can play an active role in local, regional and national economic development efforts. Business incubators however can not transform an economy and must be integrated into broader economic policy reform infrastructure (Al-Mubarak et al., 2010). Also, incubators can be divided into several types.

Mixed-used incubators

Mixed – use incubators represent 43% of all incubators in North America (NBIA,1996). This type of incubator accepts clients from a wide variety of business areas and are largely created by local governments to spur economic growth and create jobs (Burger,1999) . Mixed use incubators contain a variety of different types of enterprises including service companies, general contractors, specially foods vendors, marketing firms, staffing companies, and financial service advisors (JBV,2002).

Technology incubators

Technology incubators comprise approximately 25% of all incubators in North America (NBIA, 1996). Such incubators “ focus on enhancing community research and development in high-tech, rapid-growth industries that have a good chance of attracting capital and can have a long – term impact on spurring economic growth and creating jobs “(Burger , 1999). While firms in all types of business incubators show similar increases in their annual gross vales, firms from technology incubators create more jobs than other types of incubators (CPAC , 1998).

Manufacturing incubators

Manufacturing incubators which comprise 10% of business incubators, provide physical space and technical assistance for businesses in the manufacturing industries (usually lighter manufacturing industries) . These incubators must often provide ample, large production spaces in order to accommodate the manufacturing needs of their clients (Al-Mubarak et al., 2010).

Targeted incubator

Targeted incubators, 9% of all incubators, are those that focus on specific industry segments such as software, food manufacturing, multimedia, the arts, etc. (NBIA, 2000). They may also target populations of specific interest groups such as the Houston Women’s Business Center. This Women’s Business center targets contemporary women business owners and career professionals and bills itself as the first incubator to teach entrepreneurship and intrapreneurship to women “(Campbell, 2001).

Service incubators

Service incubators, which constitute 6% of business incubators, are those that focus their product and physical space offerings to businesses in service industries, including professional services.

Empowerment incubators

Empowerment incubators make up some 5% of all incubators and are also sometimes referred to as “micro enterprise “or “community” incubators in the literature. Such organizations tend

to focus on assisting targeted populations in their efforts to develop and grow small business enterprises.

In the USA, the National Business Incubation Association Classifies incubator programmes in various ways, with the primary distinction between non-profit and for-profit-organization. Non-profit incubators represent about 85% of the US incubator population of around 950 incubator (Decarlo, 2001) and fall under one of three general categories of organizational structure : stand alone incubators : incubators that are programs or departments of large tax-except entities and operate within their tax statuses such as university or government – run incubators or incubators work closely with other organizations whether for profit or not for profit to achieve their mission.

Business incubation – A historical background

While business incubators has developed into a tool to ensure the success of new entrepreneurs through the provision of resources, the first business incubator was born of economic necessity (Burger, 1999) though it allowed tenants of the building to share the expense of various office service . The idea soon caught on as more and more people become a ware of Mancuso’s development strategy and its potential impact job creation in their own communities. Implementing an economic development, John Mancuso has been considered not only the father of business incubators but he is also credited with inventing the term “incubator “(Micelle, 2003). The first formal incubator to host an incubation function, as we now define it, was established around 1980 at Renssealer Polytechnic Institute. The Renssealer incubator developed into a program to produce for students, faculty, and community residents who desire to start their own business enterprise (Burger, 1999). Currently, there are more than 1,000 business incubators North America as compared to only 12 such organizations in 1980 (NBIA, 2002). According to Clark and Minor (2000) incubators started to appear during the recession that occurred in early 1980’s where a number of large corporations were shut down, leaving behind empty plants and jobless residents . Further and according to the two writers as a business incubators popped up, people began to see them as a means to alleviate economic distress by renovation and utilization of idle manufacturing buildings, generating income for investing parties and creating job opportunities. According to the NBIA’s 1998 “state of the Business Incubation Industry

study”, incubators in North America have added 19,000 companies and more than 245,000 jobs to the economy (NBIA 2002) that are classified into 7 main categories : Mixed use (43%), Technology (25%), Manufacturing (10%), Targeted (9%), Service (4%) , Empowerment (5%), and Other (2%) (ibid)

Business incubators in Europe

The European governments have established serious programs to develop and promote technology-based incubators and incubators in general (UNIDO, 1999). The incubators in Europe are playing an increasing role in its economic development. New types of incubators are being financed such as the e-incubator, which is internet-based (Business Eastern Europe, 2000). Europe is way ahead in certain areas such as the wireless technologies with Nokia and Ericsson are two such actors (Hickes, 2000). Their success is due to the good transformation of research into commercial products and the cooperation between research institutes and industry. One of the new approach to face the challenges of the increasing R&D costs used in tapping the out innovation resources (suppliers, customers, universities, research institutes) is via cooperative incubators. Corporate incubators have emerged recently as a new and powerful organizational form of R&D management. Corporate incubators are specialized corporate units that hatch new businesses by providing tangible and intangible resources and support (Hansen et al, 2000; Colombo and Delmastro, 2002). The European Commission (Directorate general XVI) subsidizes 50% of the costs for operating selected number incubators for two years (UNIDO, 1999). In the less developed regions of Europe the period can be extended to three years (ibid). The European Commission uses four types of performance indicators to evaluate the support deserved by the incubators. These indicators are: operational efficiency, financial performance, research and technology transfer, and business development (Ibid). According to Gassmann and Becker (2006), the resource-based view can be used to analyze the activities of corporate incubators once the corporate incubators are distinguished from the independent, for-profit incubators. To understand the types of resources provided by such construct, one needs to examine the flow of resources between the corporate incubators and the parent corporation as well as between the corporate incubator and its technology venture (ibid).

Business incubators in GCC countries

In developing countries including Kuwait and other GCC member states, business incubators might be particularly valuable in developing local economies, promote technology transfer, create new enterprises and generate new Jobs. In the GCC member states, there are increasing efforts to support entrepreneurship through business incubators and similar facilities.

The Kingdom of Bahrain

The Bahrain Development Bank and United Nation Industrial Development Organization (UNIDO) have established a business incubation centre. The country is the first GCC member to implement the program in 2003. The main objectives of this program are to affect policy making, commercialize research, create companies, create jobs, develop profitable enterprises and raise the awareness of potential entrepreneurs. The specific category of this incubation center is a mixed use and governmental not-profit type. The number of client firms on site is 35 with 265 employees (Al -Mubarak, 2008).

Kingdom of Saudi Arabia

In Kingdom of Saudi Arabia, BADIR-ICT is the first ICTs' incubator to be established as a part of the national Badir technology incubator initiative of Saudi Arabia's National Research Institute at King Abdulaziz City for Science and Technology (KACST). The Badir-ICT initiative was launched in January 2008 and it is first operational Saudi Arabian incubator program. It accepted its first tenants and affiliates in November 2008. Badir-ICT incubator focuses – on ICTs and ICT-related enterprises supporting both technology and services companies with flexible services suited to each segment. Badir – ICT currently operates as a unit of KACST under a supervisory committee chaired by the (KACST) vice president HH prince Dr. Turki Al saud. Other committee members represents major stakeholders in the venture including Saudi Telecom Company (STC) , Saudi Credit and Savings Bank, Mowhiba , Ministry of Commerce , and Saudi Arabian Government Investment Authority (SAGiA) . The key strategy is focused on best practice incubation finance and sustainability as well as quality clients and investor relations. The Badir – ICT facility is based in Riyadh and comprises 30 suites with over 100 rooms for up to 30 incubator business tenants (Al-Mubarak et al., 2010). The Total number of client firms on site is currently 10 with 20 employees in client the firms (ibid).

State of Qatar

The Qatar Science and Technology Park was established in 2008 with the main objectives to commercialize research, create companies and jobs, develop profitable enterprises and raise the awareness of potential entrepreneurs. Other objective are to promote applied research technology development and commercialization in Qatar and to diversify Qatar's economy through applications of technology and acceleration of the formation and growth of start up technology companies, creating high – value employment opportunities, in particular for Qatar's university graduates . The model of the program is a governmental not-for-profit with focus on information and communication technologies sectors (Al-Mubarak el al., 2010).

United Arab Emirates

United Arab Emirates has established Dubai Business incubation center to foster the development of technology ventures involving the internet, information technology and other related technology sectors (Al-Mubarak et al., 2010).

Sultanate of Oman

Oman established its business incubation programs as a joint venture with U.K technology park programs with a main focus on business information, finance and technology transfer. The program was established as a non-profit governmental program (Al-Mubarak et al., 2010). The said is summarized in Table (1).

Innovation capital

Traditional Innovation Capital

Innovation Capital represents a combined concept which encompasses the three previous types of capital, i.e. *Human Capital*, *Financial Capital*, and *System Capital* (see Abouzeedan and Busler, 2006). The classical innovation capital concept is presented graphically in Figure 1. Hypothetically, when the components of the *Innovation Capital* are in balance, contributing in optimal proportion to the total input, such an environment is likely to promote an entrepreneurial development.

Table 1: Business incubators in the GCC countries

Country	Incubator	Focus
The Kingdom of Bahrain	Incubation center	Diverse sectors
Kingdom of Saudi Arabia	BADIR-ICT	ICTs and ICT-related services
State of Qatar	The Qatar Science and Technology Park	Information and communication technologies sectors
United Arab Emirates	Dubai Business incubation center	Internet, information technology and other related technology sectors
Sultanate of Oman	Several programs	Business information, finance and technology transfer

Human Capital

The essential components of quality human capital can be expressed in different ways, one of them being labour productivity. Basically, this means that better quality of labour will result in a more productive organization. Abouzeedan and Busler (2006) argued that innovation expressed as R&D can be incorporated with human capital. Romer (1986) postulated that R&D leads to the creation of knowledge which may have a direct affect on technological change since investment in R&D can create spillovers. Empirical evidence shows that countries with higher R&D per employee have higher levels of total factor productivity growth (see Coe and Helpman, 1995). Technical change increases the relative productivity of human capital if education and other skills assist in a more rapid application of new technology (Adams, 1980). Referring to Ballot and Taymaz (1997), R&D and human capital are typically merged under the categories of “receiver competence” (Eliasson, 1990), “knowledge base”, or “absorptive capacity” (Cohen and Levinthal, 1989, 1990). Understanding the value of investments in education as a way to enrich *Human Capital* in

societies resulted in studies deriving methods to estimate private returns from knowledge (Becker, 1975).

Financial Capital

According to Corley et al. (2002), some early studies assumed that short-term growth was largely driven by capital investment, while growth in the long-run was assumed to be due to exogenous technological change. Lichtenberg (1992) explained the productivity differences between countries by using investment in physical, R&D and human capital. Lichtenberg's perspective, however, is limited to the manufacturing sector and does not take into consideration cross-country effects. Other studies have shown that even when tangible and intangible investment is taken in consideration there are still cross-country differences in productivity. Hall and Jones (1999) found that such tangible and intangible factors may be institutional and relate to differences in social structures. Such differences affect the economic environment and the ability to acquire skills and accumulation of the different forms of capital. In agreement with this, Abouzeedan and Busler (2006) pointed out that availability Financial Capital availability is of great importance to firm survival and growth of Small and Medium-sized Enterprises (SMEs).

System Capital

The third type of capital, *the System Capital* (see Abouzeedan and Busler 2006) is an indicator of the level of support that individual firms receive from various governmental and non-governmental sources. The non-governmental institutions include public establishments, private firms, unions, associations etc. The form of such support is varying in accordance with the structure and aims of such institutions. However, Abouzeedan and Busler (2004) emphasized that their definitions of System Capital is excluding any financial support coming to the individual firm as this is covered within the Financial Capital concept. In short, this type of capital looks at the macro-environment of the society and its ability to secure the non-financial needs of the firms.

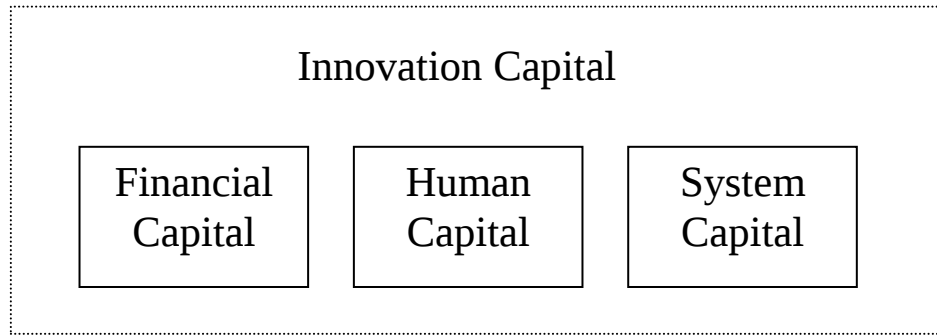


Fig 1. Traditional components of the Innovation Capital

Open Capital, the Fourth Component of Innovation Capital

Innovation richness of an economy requires a more open and interactive attitude. In the traditional definition of Innovation Capital as proposed by Abouzeedan and Busler (2006), this component is absent. This aspect of innovation was introduced in a later work by Abouzeedan et al (2009) as a fourth component of the Innovation Capital, and was termed, *Open Capital*. Abouzeedan et al (2009, p. 291) defined *Open Capital* as:

“The Open Capital includes, and not restricted to, all the networking resources which facilitates for the various actors to share and fully benefit from each others’ tangible and intangible assets in a trust-worthy and open manner. This type of capital thus represents the texture that binds the other components within the Innovation Capital and gives them the ability to impact the innovation processes.”

Based on this definition one can deduct two projections. Firstly, Open Capital operates both at the micro as well as the macro levels of economy. Secondly, Open Capital as a term should not confused with the Open Capital concept known in the financial management literature. The new Innovation Capital with its four components is represented in Fig 2.

It is important to emphasize that the four components of Innovation Capital are in reality well-connected and they feed to each other enriching, in a total way the innovation activities. To emphasize the nature of this new Open Capital we propose specific dimensions related to it.

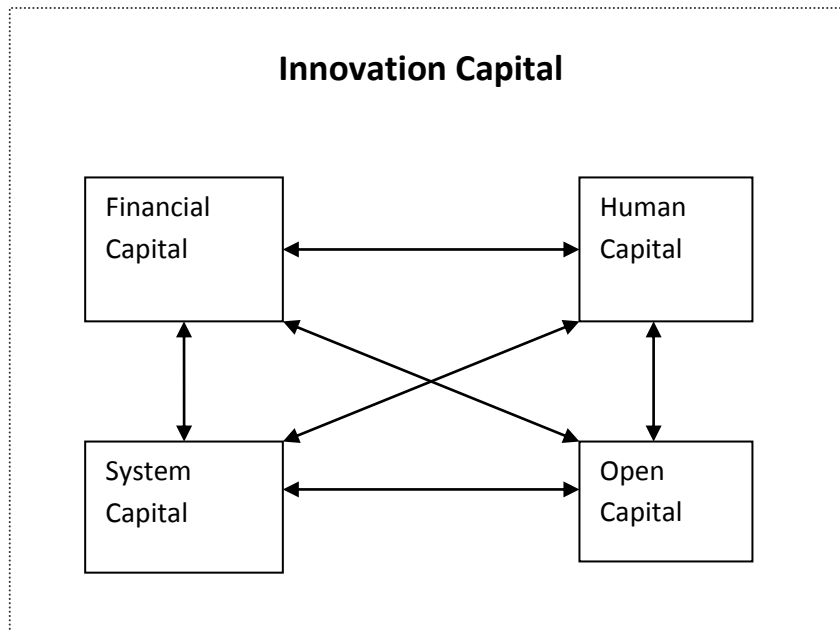


Fig. 2: Components of the Innovation Capital including the Open Capital

Open Innovation Management

IT and Open Organizational Structures

Information and Communication Technology (ICT) is increasingly causing organizations to adapt an open structure, in contrast to the classical closed structure (see Scott, 2003). According to Fink and Kazakoff (1997), the potential benefits that an organization can obtain when it utilizes ICT may be extensive and include efficiency gains, increased management effectiveness and improved business performance. Although this is valid in the context of smaller firms, the same reasoning goes for larger organizations. IT developments are able to reduce transaction costs for firms and organizations. The falling costs of computer hardware, software and telecommunications and associated performance improvements have enabled organizations to re-examine the way they conduct business and come up with more cost-effective practices. This lead firms and organizations to be more open in running daily activities of including innovation programs. According to Globerman et al (2001), Internet has dramatically reduced the transaction costs in respect to costs of “point to multipoint”

communication, making it easier for brokers and other information providers to supply information to their customers. Allarakhia (2009) argued that the vertically integrated organizational structure facilitate innovation activities which are internally-focused while the new forms of organizational structures are more fluid and open, allowing for integration of the internal and external sources of innovation. Abouzeedan and Busler (2007) adapted the terminology “Internetisation” (see Dana et al, 2002) to propose and anticipate another type of firm management which is more suitable to open organizational structures. He called it “*Internetisation Management*”. According to this concept, the market place is global and there are no geographical borders or physical barriers for exchanging ideas and resources except for the ability of the firm to absorb the “*Internetisation*” technologies. It is worth stressing that *Internetisation Management* is more concerned with management techniques and tools in the IT era and not the philosophy of management embedded in other paradigms such as *Open Innovation Management*. This innovation paradigm stresses openness and cooperation in the innovation activities. It demands the adaption of an open business model. The internetisation management paradigm is focused on the micro level of the single organization managerial activities. Researchers indicate that recent biotechnology firms, such as *Genentech*, *Amgen* and *Genzyme*, are using an open model rather than the older closed business model (see Chesbrough, 2003). Lakhani and von Hippel (2003) listed types of incentives which are driving the firm to use open source management.

IT and Open innovation Management and innovation

The nature of the open innovation model facilitates for the firms to adapt their business model in favor of research and development (R&D) activities and technical change that take place outside the firm. As such, the innovation effort is distributed between various parties (von Hippel, 1988). Many notions and concepts were introduced to the innovation literature in relation to the rise of the spatial organization. Among such notions are; *innovative environments* (Aydalot, 1985), *clusters* (Porter, 1990), *innovative milieu* (Camagni, 1991), *regional innovation systems* (Cooke, 1992) and *learning regions* (Florida, 1995). Laven (2008) identified the three theories of innovation systems, clusters and triple helix as theories of innovation-producing arrangements. This is because these theories emphasize the interaction between organizations in innovation production. Open-source R&D is another approach to conduct research allowing scientists and academicians to interact across organizations by offering their competence freely in order to facilitate the solving of various common problems (Munos, 2006).

The emergence of the open innovation concept and its promotion as a new notion comes as a result of the increasing complexity of innovation processes as well as how innovation management should cope with this complexity (Teirlinck and Spithoven, 2008). In open innovation, external knowledge relations are considered as vital elements and being complementary to the internal research (Cohen and Levinthal, 1990; Veugelers, 1997; Chesbrough et al., 2006). Traditionally, high-tech business models tended to be closed systems. However, there are emerging concepts of how open business models do support open innovation (Chesbrough, 2006). One way to tackle increased innovation complexity is to involve more individuals in the decision-making processes, “The Wisdom of Crowds” (Surowiecki, 2009). In his works, Surowiecki (2009) gave three areas of applications for the wisdom-of-crowds, namely: *Prediction markets*, *Delphi methods* and *extensions of the traditional opinion poll*. Openness in the innovation process brings up the discussion of the fourth component of the Innovation Capital in the coming section of this paper.

In this paper to take the works related to open innovation management further by expanding the concept to be of a more general nature. We do that by proposed the terminology “open management” as a contrast to “internetisation management” with open innovation management as a specific case of open management. We defined open innovation as:

“A management approach to address the administrative and operational needs of an aggregate of organizations or firms, being physical aggregate or a virtual one, at the macro level in an open context and exchange of knowledge and resources. Achieving this openness required total internetisation of the single organization or the firm”

The internetisation management and open management concepts are shown in figures (3) and (4). All activities of a group of organization or firms can be coordinated using the open management approach. When we are concerned with the innovation activities, then we are talking about open innovation management as thus narrowing the concept and restricting its extension only to invention and innovation efforts. In table (2), we displayed the differences between the two concepts, internetisation management and open management.

Conclusion

Business incubators represent an effective tool for economic development of a region. Incubators can be classified according to different levels including 1) main objective (e.s. job creation, real estate, social inclusion) 2) Main sponsor / stakeholder (e.g. university, corporate, public/private) 3) Geographical focus (e.s rural, urban) 4) Target sector (e.g biotechnology, arts) 5) Target – development, stage (e.g start-up, growing business) and 6) Financial Structure (e.g profit, not for profit). Business incubators can facilitate and build confidence within the finance community and support start-ups, help to foster a culture of entrepreneurship and assist companies outside the incubator by acting as a catalyst for the development of wider business support structures. There is a clear awareness to the value generated from business incubation in regions such as the GCC countries and Europe. Importantly, there are variations in the activities of incubators in their role from different countries, depending on the local economic environment and culture.

Increasingly, innovation activities in the modern economies need to be more interconnected and open in their nature. In incubator structures the traditional innovation capital encompasses three components, human capital, financial capital, systems capital (Abouzeedan and Bulser 2006) and open capital (Abouzeedan et al, 2009). The various forms of capital will be vital ingredients in building business innovation as an ingredient of regional economic development

We also introduced the open management paradigm as a way to operate and run aggregate (whether physical or virtual) of organizations or firms with the ITCS dominating the tools used to facilitate such management philosophy. We stressed that open management is a wider concept than open innovation management as the latter is only more concerned with the way to manage innovation activities. In the closing of this paper, we contrasted open management and internetisation management and concluded that internetisation management is more concerned with management operation at firm level (micro level) while open management is more interested in aggregates of firms of organization.

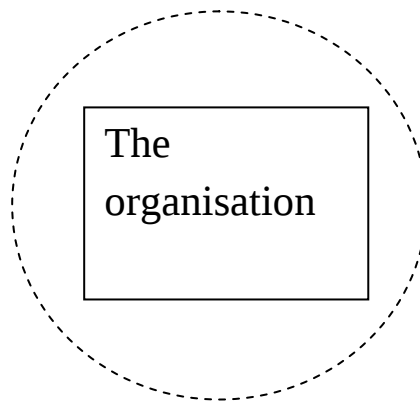


Figure 3: Graphic presentation of the paradigm “internetisation management”

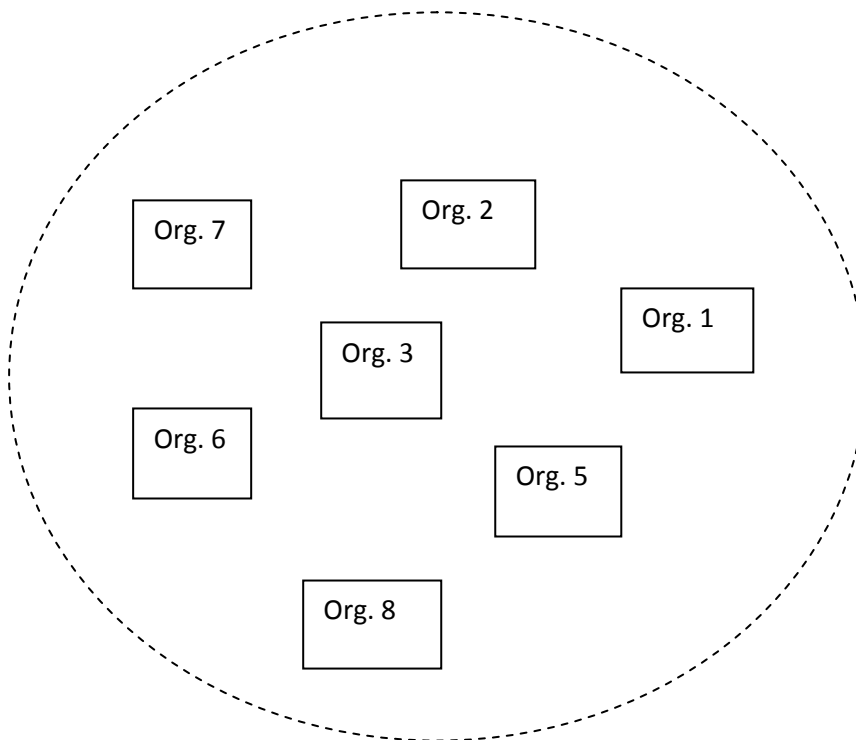


Figure 4: Graphical presentation for the paradigm “open management”

Table 2: Differences between “internetisation management” and “open management”

The differentiation aspect	Internetisation management	Open management
focus	internal	external
Level of analysis	micro	macro
IT system requirements	very high	very high
The objective	managing the organisation	managing network of organisations
Aggregation	Single organisation	Group of organisations
Performance models	micro example: Z- Scores, ZETA Scores, SIV model, Business Platform	macro examples: Hazard models, stochastic models, neural networks (NN)
Theoretical tool of analysis	Organisation theory, Innovation Theory	Networking theory, Innovation theory
Nature of analysis	microeconomic	macroeconomic

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