Individual Creativity Towards Technology
Business Incubator Performance
Emergent Research Forum (ERF)

Muhammad Binsawad
King Abdulaziz University
Mbinsawad@kau.edu.sa

Osama Sohaib
University of Technology Sydney
Osama.Sohaib@uts.edu.au

Igor Hawryszkiewycz
University of Technology Sydney
Igor.Hawryszkiewycz@uts.edu.au

Asma Aleidi
University of Technology Sydney
Asma.i.aleidi@student.uts.edu.au

Abstract
Technology business Incubators in Saudi Arabia are working to bring innovative businesses promising to contribute in the nation’s technological growth. The Saudi incubators are for technology innovations, which are mainly established to serve as knowledge-based programs to produce opportunities that lead to transform the country to become a knowledge-based society and consequently contribute as knowledge based economy. This research develops a conceptual model for technology business incubators examined the influence of individual creativity of incubatees on technology business incubator performance in Saudi Arabia in particular. The significant outcomes of this research will benefit the technology business incubators in order to be capable to improve the efficiency of incubation performance.

Keywords
Technology incubator, Technology business incubator Business incubator, Creativity, Saudi Arabia

Introduction
An incubator is typically defined as a firm providing services in order to facilitate sustainable growth of start-up enterprises (Lin et al. 2012). As Corsi and Berardino explained, the incubator is essentially an example of business ingenuity (Corsi and Di Berardino 2014). That is, it is an approach which endorses and facilitates the production of enterprises with new technology, enhances the control of services and business sites and produces an environment where small business ventures can communicate with the outer partners. As a result, the incubators can enhance the chances of survival and success of start-up companies (Hsieh et al. 2014).

Governments in particular, but also private operators, initiate the creation of incubation environments to promote business and economic growth at the national, regional or community level (Salem 2014). For instance, governments of course can support start-up companies in a range of ways related to capital, human resources, market information, and technology. As Salem emphasized, this is recognized to be the case in Saudi Arabia where incubation program initiatives are now regarded by the government as an important tool to speed up the rate of growth in the nation and facilitate its transition to a knowledge economy (a point which is explored in greater detail throughout this literature review) (Salem 2014).

In turn, incubators provide governments and private operators with a direct way to support start-up business by giving them access to research and development (R&D) and operational support (Lin et al. 2012). An incubator’s basic support functions include: minimizing the quantity of the capital investment that is necessary at the time of start ups, as well as the number of risks; developing new technologies and products, along with implementing firm growth plans; giving the accessibility to results of R&D and places for the collaborations along with testing services for improving the product creation; and helping companies to train employees (Said et al. 2012).
This study focuses on the correlation between creativity and technology business incubator performance in Saudi Arabia. The following literature review explores occurring of the incubators related to business and technologies among others – in countries to support business activity and growth. Particular attention is given in this review to the prominent themes and issues found in the literature in context of relationship among the creativity and the performance of the incubators. The discussion of these themes and issues is framed within the context of diverse countries’ initiatives to create incubator environments to facilitate business and economic growth. However, particular reference is made when appropriate to the current initiatives in Saudi Arabia to create and maintain incubator environments to support economic growth and the nation’s transition to a knowledge economy.

**Literature Review**

**Incubators**

The incubators are divided in various types that are based on the manner where the services are properly delivered, their organizational structure, and the types of clients being served (Hackett and Dilts 2004; Long and Andrews 1981). Incubators were introduced as a highly adaptable concept; hence with every new goal of catering to a diverse regional economy, they provided careers to the youth, enhanced wealth of local regions, and transferred research and technology from universities and other organizations to the mainstream. In any case, the clients being served by incubators are at the forefront of developing innovative technologies, creating products, and providing support and services to the individual in order to improve the life quality in the society all across the globe. These incubators may indulge firms that are knowledge-intensive; however, they may be comprised of the firms with low technologies working in the manufacturing of services and light. Technology incubators are the incubators which aim to bolster the technology development stage of enterprises and new businesses being promoted by business incubators (Smilor 1987a; Smilor 1987b). That is why they are often categorized as a subtype or a variant of the latter. The primary objectives, which gives them an individual identity is their more specific role in promoting technology-based enterprises and to help in the completion of technologies under development. Technology incubators are usually present near research and development institutes, universities, and science technology parks. The major types of incubators in literature are thus business incubators and technology, although technology incubators are considered a type of business incubators (Lewis et al. 2011). The very first incubators were established in Saudi Arabia by BADIR-ICT and it was launched in the year of 2008 in the month of January. (Corsi and Di Berardino 2014). Being the first incubator to become operational within a short time, the incubator that was first generated started working in the primary projects and the technology of National Badir incubator was started after doing research at the National institute of Saudi Arabia in the city of Abdul Aziz for the exhibition of science and technology. The country of Saudi Arabia has invested 8.6 billion $ in the research and development part of the plan science and technology for 20 years. (Al-Mubaraki et al. 2010). Till now it has developed several projects, which work particularly as business and technology incubators including the science park of King Abdullah Bin AbdulAziz (KASP), Saudi Organization for Industrial Estates and Technology Zones (SOIETZ), Information Technology and Communication Complex (ITCC), King Saud University Science Park (KSSP), city of Abdul Aziz for the science and technology, as well as many technology incubators.

**Creativity and performance of incubators**

Creativity having a direct correlation with innovation and positive organizational change, is a crucial factor impacting the performance of incubators. Creativity for the success of an organization like a technology incubator or any of its types must mean that it involves an understanding of certain parameters: person, situation, product and the situation related to creativity where they interact (Greene and Butler 1996). Payne and colleagues carried out a research to identify the factors, which impact the amount of creativity i.e., creative performance of the organization; they deduced the availability of resources, effective leadership, manageable group size, cohesiveness, patterns of communication, and diversity in the team are all crucial factors that impact creativity and thus the performance of an organization (Payne 1990).

Keeping the aforementioned factors in mind, the Saudi technology business incubators can especially reap the benefits by improving on individual creativity. Previous research has proved the usefulness of
Individual Creativity Towards Technology Business Incubator Performance

creativity and it is worthwhile to be employed in Saudi Arabia for the success of its technology incubators. For instance, Andrews revealed that only one parameter, group diversity, in an organization was responsible for the variances in the scientific recognition that is 10% of the total number. This includes the effectiveness and records of the publication in terms of research and developmental team [8]. Thus the technology incubators in Saudi Arabia should consider manipulating group compositions and characteristics for a positive influence on their creative processes, how the groups working within technology incubators approach problems, and solve them.

A review of current literature shows that many different factors like group composition, individual's characteristics, and leadership are all significant for the creative outcomes in the groups working within an organization. King and Anderson have enlisted few groups of creativity and innovation in context of group, cohesiveness, leadership, composition of the group and the structure of the group. (King and Anderson 1990). They summarize their findings by asserting that the likelihood of creative ideas to occur and to be presented by a working team that can be highest at the time of autonomous leadership and their concerted, moreover, the leadership framework is highly suggested for being organic than the mechanistic. The groups were composed with the individuals, who are selected from different fields and functional backgrounds. On the other hand, the cohesiveness and longevity of working groups represents the characteristics of groups and their relationship in creativity is important but problematic. The evidence found has discovered that there is a curve and linear relationship among the group cohesiveness and the performance creativity of this is more fruitful since it allows a flexibility in their adapting to newer situations, ideas, and members (Nyström 1979).

For the creative process to flourish, it is essential that individuals lose their tendency to work on specific lines of work; multidisciplinary teams help individuals to overcome their hindrances created by their expertise in a particular field only because such teams can link various concepts and problems arising together in one technology (Damanpour 1996). Basically, a development of these teams in technology incubators along with fulfilment of other parameters that aid in inculcating creative performance can help ensure the successful working of the incubator. According to Twiss and Times, diverse teams help to increase the effectiveness of an organization because it eliminates the mental constraints that may exist otherwise (Twiss 1992).

**Theoretical Background and Research Model**

Conducting a conceptual model based on the understanding of previous theories related to the studies and empirical researches linked the occurrence of this study. Consequently, this part of the papers briefly discusses numerous relevant models and theories to the adapted proposed model. These theoretical foundations include existing models related to individual creativity. Literature available on research carried in technology incubators is limited, so studies conducted in organizational setting are also cited that could provide a theoretical foundation for the study. Figure 1 shows research model and Table 1 presents definition of each factor.

Previous studies highlight a range of conditions required for fostering individual creativity in general (Woodman et al. 1993). However, at the level of individual, Amabile 1997) extensive research of the body recommended three major factors for individual creativity of employees within organizations: like, expertise, thinking skill of creativity, and motivation of intrinsic task (Abuhamdeh and Csikszentmihalyi 2009; Amabile 1997; Amabile et al. 2005). Studies verify that the higher the creativity is if higher the level of each of these three factors. Thus, Ambaline’s individual creativity is adopted in this study.

In relation to the incubator performance of the business incubators, the measurement of incubator performance has no definite and single standard. (Phan et al. 2005). Different studies are there that are discussed for various incubators for determining incubators performance (M’Chirqui 2012). Rothaermel and Thursby have tested the university based on the incubators by the performance of tenant, revenue generated, funds raised in total, funding of venture capital achieved and if the company failed, graduated and stayed within the incubators. (Rothaermel and the flowers, 2005). Mian defines four categories of the outcomes of the performance for the business incubators that are sustainability and growth of program, survival and growth of the firm and the contributions related to the mission of the university. In regard of current study, it has been found that the researcher has used the assessment of Mian for the performance of the incubator (Mian 1996; Mian 1997).
Individual Creativity Towards Technology Business Incubator Performance

**Figure 1: research model**

**Hypotheses Development**

**Individual Creativity**

Studies highlighted that higher the level of each of the Amabile’s individual creativity factors (Such as, skills of creative thinking, expertise and motivation of intrinsic task (Amabile 1997), the higher will be creativity in the organizations: Creativity creates a superior performance (Grewal et al. 2009). Researchers have suggested that has vital impact on organizational performance (George and Zhou 2002; Oldham and Cummings 1996). It is suggested that the creativity of individual needs to be exactly related to the performance of the incubators in context to technology business. Accordingly;

H1: Intrinsic Motivation has a significant positive impact on technology business incubators business performance in Saudi technology business incubators.

H2: Expertise has a significant positive impact on technology business incubators performance in Saudi technology business incubators.

H3: Creative Thinking Skills has a significant positive impact on technology business incubators performance in Saudi technology business incubators.

**Approach**

Methods of the surveys were applied for the study for collecting the data from incubatees in Saudi technology business incubators. The sample was taken from 130 participants and survey was done among 150 participants. The incomplete responses were removed and only 110 replies in the data analysis process. The data collection was done from the month of November 2016 and continued till January 2017. This sample includes incubates at technology business incubators consisting of King Abdullah Bin AbdulAziz Science Park (KASP), King Saud University Science Park (KSSP) and city of King Abdul Aziz for Science and Technology (KACST) as well as BADIR-ICT, the Saudi Organization for Industrial Estates and Technology Zones (SOIETZ), and the Information Technology and Communication Complex (ITCC) technology incubators. The survey was developed in English and Arabic. Participants were required to fill in a questionnaire that contained closed ended questions that require replies based on five point Likert scale has been used. The model of the research is measured by using (PLS-SEM) which is a statistical method by using SmartPLS version 3 (Hair et al. 2011) that suitable for the study. PLS has allowed the researchers for evaluating the model of structural coefficients and the measurement apparatus. In this research model, all the constructs were designed as per the indicators of reflective due to the effects if latent variables.

**Discussion and Conclusion**

Saudi technology incubators that are essentially founded to serve as knowledge-based programs to produce opportunities that lead to change the country in order to become a society of knowledge based and consequently contribute to knowledge based economy. Creativity, along with knowledge and expertise, is one of the central human resources that can help to achieve the technological commercialization competence. This research is unique in the sense that it examines technology business incubator performance by studying the incubation process, such as individual creativity, which is
important in the developmental process of new ventures. This is the primary research that investigated the incubators of business technology of Saudi Arabia in the context of incubation techniques between the creativity.

References


