INCUBATORS SUCCESS MODEL AND THE MODERATING ROLE OF INFORMATION AND COMMUNICATION TECHNOLOGY TOOLS

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MODEL KEJAYAAN INKUBATOR SERTA PERANAN ALATAN TEKNOLOGI MAKLUMAT DAN KOMUNIKASI SEBAGAI FAKTOR MODERATOR

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DECLARATION

I hereby declare that the work in this thesis is my own except for quotations and summaries which have been duly acknowledged.

7 May 2018

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ABSTRACT

Incubators have become an important and necessary economic development instrument for developing countries. Their role is to develop new and emerging social and economic opportunities for the creation and commercialization of new products and processes that can increase the creation of new successful firms, thus increasing growth in employment. Previous studies have investigated incubator success factors. However, in the context of developing countries, more studies on success models are needed as the success rate of incubators in these countries has been dismal. Moreover, previous studies have ignored factors associated with the culture of the employees and managers of incubators, as well the influence of ICT tools. Therefore, based on these motivations, within the context of Palestine, the objectives of this research are to: (1) identify the main success factors that influence incubator success; (2) propose a model for the relationship between these factors and incubator success; (3) investigate the moderating role of ICT tools on the relationship between the success factors and incubator success, and (4) verify the applicability of the proposed model on active incubators in Palestine. To achieve these objectives, this study uses a mixed method approach. The data was collected from the incubator managers, teams, and experts of 23 Palestinian incubators by using questionnaire and semi-structured interview techniques. This study uses the Statistical Package for Social Sciences and the Structural Equation Modelling-Partial Least Squares methods to analyze the collected data. The results of the quantitative data analysis reveal that selection policy, networking services, incubator resources and services, funding and financial support, and corporate culture all significantly affect incubator success. However, mentoring services and incubator governance do not have any significant influence on incubator success. Moreover, the results show that ICT tools moderates the relationship between three factors (networking services, funding and financial support, and corporate culture) and incubator success, but does not have a moderation effect on the relationship between the other success factors (selection policy, incubator resources and services, mentoring services, and incubator governance) and incubator success. The qualitative study that was conducted to evaluate the proposed research model through its application to specific Palestinian incubators confirmed the applicability of the model for active incubators. The implications of this study are twofold. Firstly, this study's results will be valuable inputs for policy-makers in Palestine when designing appropriate policies to ensure the success of incubators. Secondly, it is expected that the implementation of this model will help to enhance the success of incubators and will assist incubator managers in structuring the priorities and strategies of their respective incubators.

MODEL KEJAYAAN INKUBATOR SERTA PERANAN ALATAN TEKNOLOGI MAKLUMAT DAN KOMUNIKASI SEBAGAI FAKTOR MODERATOR

ABSTRAK

Inkubator telah menjadi satu instrumen penting dalam pembangunan ekonomi negara-negara membangun. Ia berperanan untuk mewujudkan peluang baru dari segi ekonomi dan sosial menerusi penghasilan dan pengkomersilan produk, dan proses yang boleh meningkatkan bilangan syarikat yang berjaya sekali gus meningkatkan peluang pekerjaan. Kajian lepas telah mengkaji faktor kejayaan incubator, namun kajian mendalam masih perlu dilakukan terhadap model kejayaan demi untuk mengenal pasti faktor yang menyebabkan kegagalan inkubator khususnya dalam kalangan negara membangun. Kajian lepas juga telah mengabaikan faktor tertentu yang berkait dengan budaya pekerja dan pengurus inkubator dan peranan alatan ICT. Justeru, berdasarkan motivasi ini, dan berlatar belakangkan Palestin, objektif kajian ini adalah untuk: (1) mengenal pasti faktor kejayaan utama yang mempengaruhi kejayaan inkubator; (2) mengusulkan satu model yang menghubungkan faktor kejayaan dengan kejayaan inkubator; (3) menentukan peranan alatan ICT sebagai faktor moderator dalam hubungan antara faktor kejayaan dan kejayaan inkubator dan (4) menilai kebergunaan model yang diusulkan dalam pengendalian inkubator. Kajian ini menggunakan pendekatan kaedah bercampur. Data dikumpul daripada pengurus inkubator, pasukan dan pakar dari dua puluh tiga inkubator di Palestin dengan menggunakan soal selidik dan temubual separa berstruktur. Perisian Statistical Package for Social Sciences dan kaedah Kuasa Dua Terkecil Separa-Pemodelan Persamaan Berstruktur digunakan untuk menganalsis data yang dikumpul. Hasil analisis data secara kuantitatif menunjukkan bahawa, polisi pemilihan, perkhidmatan rangkaian, sumber inkubator dan khidmat, sokongan kewangan dan dana dan, budaya korporat semuanya mempunyai kesan signifikan terhadap kejayaan inkubator. Analsis juga menunjukkan bahawa alatan ICT berperanan sebagai faktor moderator dalam hubungan antara faktor kejayaan (perkhidmatan rangkaian, sokongan kewangan dan dana dan, budaya korporat) dengan kejayaan inkubator. Khidmatan malim dan faktor governans inkubator didapati tidak mepengaruhi kejayaan inkubator secara signifikan dan, alatan ICT juga tidak berperanan sebagai faktor moderator antara faktor kejayaan (polisi pemilihan, sumber inkubator dan khidmat, khidmat malim dan, governans inkubator) dengan kejayaan inkubator. Kajian kualitatif yang dilaksana terhadap beberapa inkubator khusus, untuk menilai kebergunaan model yang diusulkan ini menunjukkan bahawa ia boleh digunakan dalam pengendalian inkubator. Implikasi kajian ini boleh dihuraikan dalam dua aspek. Pertama, kajian ini memberi satu input berguna kepada pihak pembuat polisi khususnya di Palestin untuk merangka dasar yang sesuai untuk menjamin kejayaan inkubator. Kedua, faktor kejayaan yang dikenal pasti dalam model yang diusulkan ini boleh membantu pengurus inkubator untuk menentukan prioriti dan strategi inkubator masing-masing.

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LIST OF ABBREVIATIONS

AAUJ	The Arab American University-Jenin
AMOS	Analysis of a moment structures
ANU	An-Najah National University
AVE	Average variance extracted
BI	Business incubator
Bis	Business incubators
BTI	Business technology incubator
BWF	Business woman forum
BZU	Birzeit University
CB-SEM	Covariance based – structural equation modeling
CEO	Chief executive officer
CEOs	Chief executive officers
COC	Corporate culture
CR	Construct Reliability
CR	Critical ratio – value
CSA	Covariance structure analysis
CSF	Critical success factor
CSFs	Critical success factors
D2	Mahalanobis
f^2	Effect size
FCA	Financial consulting assistance
FFS	Funding and financial support
GCC	Gulf cooperation council
GDP	Gross domestic product
GSG	Gaza sky geeks
H	Hypothesis
ICT	Information and communication technology
ICTs	Information and communication technologies
ING	Incubator governance
INS	Incubator success
IU	Islamic University
IRS	Incubator resources and services
IT	Information technology
JD	Jordanian Dinar
KPI	Key performance indicator
KPIs	Key performance indicators
LR	Literature review
MAA	Management assistance
MENA	The Middle East and North Africa
MES	Mentoring services
MIS	Management information system
NaBIC	An-Najah national university business innovation and partnership
NBIA	National business incubation association
NES	Networking services
NGOs	None governmental organizations

NTBFs	New technology-based firms
OECD	Organization for economic co-operation and development countries
PBS	Professional business services
PCBS	Palestinian central bureau of statistics
PICTI	Palestine information & communications technology incubator
PIE	Palestinian incubator for energy
PITA	Palestinian information technology associations of companies
PLS	Partial least squares
PPU	Palestine Polytechnic University
PTUK	Palestine Technical University Kadoorie
Q2	Stone-Geisser - predictive relevance
QIF	Quality improvement fund
R2	R-squared - coefficient of determination
RD	Research and development
RQ	Research question
R&D	Research and development
SBS	Shared business support services
SD	Standard deviation
SEM	Structural equation modeling
SEM-PLS	Structural equation modeling-Partial least squares
SEP	Selection policy
SMEs	Small and medium enterprises
SPS	Shared physical services and facilities
SPSS	Statistical Package for the Social Sciences
TBI	Technology business incubator
TI	Technology incubator
UAE	The United Arab Emirates
UCAS	University College of Applied Science
UK	The United Kingdom
US	The United States
USA	The United States of America
VC	Venture Capitals
VIF	Variance inflation factor
VoIP	Voice over IP
WB	West Bank
Z-score	Standardized score
$	United States dollars

CHAPTER I

INTRODUCTION

1.1 OVERVIEW

In order to improve the quality of life for citizens and remain competitive in the global marketplace, more productive technology, entrepreneurship, and innovation are required (Khalil & Olafsen 2010; Elert et al. 2017). Innovation and entrepreneurship are also essential elements in the transition to a knowledge-based economy and for the success in future business competition (Almakenzi et al. 2015). Furthermore, the digital economy is one of the most important driver that helping in the growth of innovation and entrepreneurship competitiveness. The digital economy considered as a dominant force in the world economy, which has grown rapidly since the 1990s and now contributes up to eight percent of the GDP of G-20 major economies (Hamid & Khalid 2016). Hence entrepreneurship, business, and innovation need to be nurtured during their earliest stages of development, so that they will be more successful (M. Shepard 2013; Gozali et al. 2017). There is a strong relationship between innovation, entrepreneurship, incubators, and business. In fact, business incubators are an important economic strategy that is used to develop new and emerging social and economic opportunities for the creation and commercialization of new products, new processes, and new business models. This strategy leads to several elements such as creativity, innovation, and entrepreneurship that have a relationship with business incubation models (Al-Mubaraki et al. 2015; Alon & Godinho 2016).

Currently, developing countries, and especially Arab countries, are facing a very challenging economic situation. The unemployment rate in Arab countries, especially in Bilad El-Sham (the Levant), is very high compared to that in developed countries (for some examples, see Appendix E). Also, the gross domestic product

(GDP) in Arab countries is very low compared to that in developed countries (for some examples, see Appendix F). Palestine in particular has encountered a range of economic problems due to the Israeli occupation that began in 1967, which has made living conditions very difficult as a result of the many restrictions and policies imposed by the occupation upon all aspects of daily life, including the free movement of people and goods, and the export and import of products from and into Palestine. According to the latest statistics released by the Palestinian Central Bureau of Statistics (PCBS (2017)), the unemployment rate in Palestine is very high at 17.3% in the West Bank and 41% in Gaza, and the per capita level of income is very low: the average monthly household expenditure in Jordanian dinar (JD) in Palestine for an average household size of six people is 945.4 JD. A huge number of graduates every year (around 39,672 students graduated from Palestinian universities in the 2014–2015 academic year (PCBS 2017)), who are suffering due to the lack of jobs, which has resulted in a brain drain. In light of the above, one of the solutions that has been proposed to ameliorate the situation is the creation of small and medium-sized enterprises (SMEs) through the use of incubators (Theodorakopoulos et al. 2014).

Small and mid-sized enterprises are crucial in enhancing innovation, productivity, competitiveness, employment generation, and social cohesion (Mason et al. 2010; Theodorakopoulos et al. 2014). However, there are some challenges in Arab countries regarding the inefficiency of the labor force, financial markets, goods, and low level of technological adaptation and innovation (Elmansori 2014). According to Elmansori (2014), the solution to these challenges lies in the hands of SMEs which contribute to innovation and economic growth by providing employment opportunities, supporting the development of new forms of work organization, and fostering innovation and entrepreneurship. Moreover, SMEs are the main target of economic development policies in developed and developing countries locally, regionally and nationally. They are crucial for creating jobs (Verma 2004; Sungur 2015). Business incubators can help young firms to survive during their first years, and they are considered to be an entrepreneurial and economic development instrument that can increase the creation of new firms including SMEs and support them in the early stage of development which is the most vulnerable stage of their existence (Dee et al. 2011; Al-Mubaraki & Busler 2013; Elmansori 2014;

Theodorakopoulos et al. 2014; Lose & Tengeh 2015; Gozali et al. 2017). Yet, for incubators to be successful, it is important to understand the factors that underpin such success. Therefore, this study attempts to develop a success model that includes suitable success factors that can help these incubators to be successful.

This chapter presents the motivation for this study, the background to the study, problem statement, research questions, and research objectives. This chapter also describes the research method, the scope of the study, the significance of the study, and thesis structure.

1.2 BACKGROUND OF THE STUDY

This section discusses an overview of the main addresses that stated in this study. This section starts showing the definition of incubators and its role in supporting the economic development. Then, it shows the history of incubators including the numbers of incubators established worldwide. After that, this section shows a literature review about some main success models and success factors that were found in some studies in the world. Finally, this section also gives a background about incubators status in Palestine and discusses some attempts to support incubators in Palestine.

1.2.1 Definitions, Roles, and History of Incubators

Business incubators (BIs) are crucial for both developed and developing countries. Al-Mubaraki and Busler (2010) concluded that BIs play a key role in economic development by helping young companies to survive and grow regionally. Elmansori (2014) found that incubator programs in the United Arab Emirates (UAE) and Jordan are designed to accelerate the successful development of entrepreneurs and their businesses through the provision of supporting resources and services. Business incubators have also been proven to be very successful in promoting economic development and employment growth around the world (Allam Ahmed et al. 2014; Blok et al. 2017).

As stated before, business incubator (BI) has been described as an organization established to accelerate the success and growth of the entrepreneurial companies, through presenting a group of resources and services such as a physical space, capital, coaching, common services, and networking connection (Entrepreneur 2015). Moreover, a BI has been defined as “an environment formally designed” to stimulate the growth and development of new and early stage firms by improving their opportunities for the acquisition of resources aimed at facilitating the development and commercialization of new products, new technologies, and new business models (Eshun Jr 2009).

However, there are many difficulties in defining what an incubator is and what it does, not least because of the continuous evolution of the concept of business incubation and the diversification of incubator components (Voisey et al. 2006). Incubators have many definitions and are defined in various ways in the literature. This variation in defining business incubator is because of the diversity of incubators, their sponsors, and their purposes (Khalid et al. 2012). The role of the incubator has been defined by the national business incubation association (NBIA (2015)) as the provision of management guidance, technical assistance and consulting tailored to young growing companies and the provision to clients of the appropriate space and leases, resources, shared business services and equipment, technology support services and assistance in obtaining the financing necessary for company growth.

According to NBIA (2015), the first business incubator was established in 1959 in New York in the United States, but the idea of providing services and facilities for start-ups did not catch on until after the 1970s. In 1980 in the USA, there were just 12 incubators, but this increased to over 1250 by the end of 2012. Formally, the incubation definition got popular around the world in the media around 1999. At the end of 2012, there were nearly more than 7000 business incubators and programs worldwide, approximately 1800 of those incubators were in the USA and 900 in Europe. At the end of 2013, nearly 9000 business incubators were running worldwide (see Appendix D).

1.2.2 Incubator Success Models

Incubators or incubation success models have been adapted to meet a variety of needs, from fostering the commercialization of university technologies to increasing employment in economically distressed communities and to serving as an investment vehicle (NBIA 2015). Incubators are designed to provide a variety of resources that will increase the odds that a new business will succeed, and in that success, there will be some economic benefits derived from the sponsoring entity (O'Neal 2005). Furthermore, to study the effectiveness of incubators, Theodorakopoulos et al. (2014) stated that researchers have focused on identifying the key success factors for business incubation. These key success factors are defined as the main dimensions of a firm's operations that are necessary to its success, so key success factors must work together consistently to ensure that incubated firms are successful, and these factors can vary across industries, product lines and other dimensions of strategic relevance (Lee & Osteryoung 2004; Vij & Jhanji 2013).

Many success models and studies can be found in the literature (see point 2.4 in Chapter II). For an example, a previous study (Verma 2004) conducted an empirical investigation into 31 incubators in Canada by developing a prior model which used six success factors (shared services, facilities and location, funding and support, incubator governance, mentoring and networking, and entry and exit policies) to test the success of BIs through a combination of two moderators, namely the age and the size of the BI facilities. Furthermore, another success model developed by Khalid et al. (2017) for Malaysian ICT incubators detailed contrasting outcomes predicated upon four success factors which are: selection performance, monitoring and business assistance intensity, resource allocation, and professional management services. Their findings highlighted that while the importance of these four success factors was confirmed, a 'one-size-fits-all' approach is inappropriate.

For that, it has been concluded by Al-Mubaraki and Schrödl (2012) that, currently, industrialization is growing rapidly, particularly in developing countries, so studying the effectiveness of incubators from time to time is a promising way to understand and improve the industrial development process and also to determine

whether incubation programs effectively facilitate the economic growth of communities. Also, Theodorakopoulos et al. (2014) found that early research focused primarily on case studies, defining the physical facilities for business incubators and best practice in particular industries, these case studies are not enough to adopt in other countries and have some difficulties in defining what constitutes success, that needed to conduct more and more studies and success models. In another example, Lose and Tengeh (2015) stated that in developing countries such as South Africa business incubators (BIs) and SMEs face many difficulties including business failure and high unemployment; in 2013 the unemployment rate in South Africa increased from 25.2% in the first quarter to 25.6% in the second quarter. Another study, according to Gozali et al. (2015), in 2014 the unemployment rate in Indonesia was 4%, and the government still faced a major problem as it will need to increase welfare provision in the future.

Therefore, based on the literature that has been accessed, there are many studies and success models that were conducted in developing countries and Arab countries trying to support business incubators in order to help the graduated SMEs to be successful. These studies and success models still needs more attempts to conduct more case studies especially in Arab countries to find a suitable success model that can be adopted in these countries. Furthermore, most of the found success factors have been using since the beginning of incubators establishment until now, which is still need to find and study more new effective success factors that can contribute to increase the chances of incubators success in developing countries depending on the situation on the ground, taking into account the specificity of each country.

1.2.3 Incubator Success Factors

Many success factors were found in the literature that were used in many incubator success models in the developed and developing countries. The main factors are selection policy, networking services, incubator resources and services, funding and support, mentoring, and incubator governance.

The selection policy factor has been tested and used extensively in models in different countries and in different time periods. This factor was recommended as one of the important factors in helping incubators to be successful and has been widely used. This factor includes the selection of entrepreneurs who demonstrate high potential as an incubatee, who can create new jobs and create a new start-up company, have a professional business plan, have an innovative idea, and expect to generate good revenues (Obaji et al. 2014; Blok et al. 2017; Khalid et al. 2017).

The networking services factor has also been recommended and tested in different studies. Networking services are important because they have a positive impact on the incubation process of new technology-based firms and can enable the exchange of information and experiences between tenants within the incubator and with an external network (Schwartz & Hornych 2010; Blok et al. 2017).

Incubator resources and services was one of the earliest factors used in past studies on incubator success and it is still being used in the present day. Many previous studies have stated that incubator resources and services are still the most important part of an incubator's offering and that incubator managers should be investing in their infrastructural and resources capabilities because these resources and services are the most critical in supporting the operating and networking capabilities in incubators (Lin et al. 2012; Khalid et al. 2017).

Funding and financial support is very important for entrepreneurs undergoing incubation and this factor is considered to present a huge challenge for new technology-based firms as it is crucial to obtain an appropriate level of investment because real investments are generally required before revenue generation. Also, venture capital (VC) investors play a critical role not just in relation to funding, but also in the professionalization of entrepreneurs by mentoring and supporting the entrepreneurs' activities in order to secure their own investments. Therefore, making the incubated projects investment-ready and providing them with funding and financial support can be considered to be among the important factors that affect the incubation process (Campbell et al. 1985; McAdam & Marlow 2011; Bruneel et al. 2012; Houterman et al. 2014; Blok et al. 2017).

Mentoring services affect the performance of a firm's development in the early stages and also its graduation performance in an incubator. All types of mentoring services seem to play a key role in influencing the business development process of new technology-based firms in a positive way, but to make this support more efficient, mentoring should be customized to the demands and the development of the new firms over time and it should be provided alongside regular formal meetings to monitor and evaluate progress (Xiao & North 2016; Blok et al. 2017).

Incubator governance is considered to be another key success factor in an incubator's success and performance. Having an incubator governance structure is very important. This structure usually consists of an experienced incubator manager, a key board of directors, a noted advisory council, and concise program milestones with clear policies and procedures. Those types of governance play important roles in recommending, reviewing, evaluating and selecting tenants (Verma 2004; Obaji et al. 2014; Shannxi 2016).

Nowadays, ICT fosters the creation and development of new businesses, and it is also considered as a tool that can lead to increased productivity, market reach and transparency across all sectors (TechTerms 2015). Therefore, using ICT in an effective way has become a core requirement for international competitiveness because it is critical in supporting and enhancing information sharing using new channels of communications instead of traditional ones, that ICT start-ups try to attract technology professionals more than business experience (Davies 2009). So business incubators play a critical role in providing access to these technologies and services in an effective way through the use of ICT tools and in teaching entrepreneurs and incubator staff how to use these tools and services effectively (InfoDev 2009). In the same context, ICT BIs may be a very good way to ensure the survival and promotion of businesses as well as an effective economic development strategy especially for developing countries (Obaji et al. 2012). Therefore, this study intends to discover the effect of ICT tools on the relationship between success factors and incubator success and whether these tools facilitate incubator success.

1.2.4 Issues of Palestinians' Business Incubators

In Palestine, the first two business incubators were established in 2004. They are the Palestine Information & Communications Technology Incubator (PICTI) and the Business Technology Incubator (BTI) (Rajab & Omar 2014; BTI 2018; PICTI 2018). Currently, there are about twenty-three incubators, accelerators, and centers of excellences as well as incubation and pre-incubation programs that are running in Palestine and offering incubation facility (Alsaed 2017). Appendix K, displays a map of Palestine that depicts the locations of the 23 incubators that are currently active in Palestine. The numbers on the map represent these incubators' names. Currently, Palestinian incubators and SMEs are suffering from many problems and failing, especially at the beginning of establishment, such as the absence of technical and managerial expertise and funding for these incubators and start-ups (Alsaed 2016).

Dahleez (2009) identified the role of business incubators in developing entrepreneurship and creating new business ventures in the Gaza Strip. Many data collection tools such as workshops, interviews, and questionnaires were used in the study. A total number of 451 respondents were interviewed in order to collect the data needed for this study. The study findings showed that business incubators still need more help in their development and establishment. Furthermore, entrepreneurship, new venture creation, and business incubators are connected to each other in supporting the economic development and unemployment reduction.

Alshukri (2012) conducted the study to explain the role and importance of business incubators as a potential tool for recovery, development of the local economy by encouraging young people, university graduates who were initiators to create small businesses. The study concluded that there were obstacles facing business incubators in Palestine, the most important one that relates to the plan of sustainability, maintaining continued financing of the necessary activities, in addition, lack of awareness among the young in the role of incubators and the importance of entrepreneurship establishment.

Furthermore, Skaik (2013) summarized this situation depending on a local case study conducted in order to identify the reality of business incubators in the West Bank in Palestine, and its role in supporting SMEs. This study used the descriptive analysis method in order to collect the required data, through using the survey with all 42 incubators staffs and incubated projects in the West Bank. The findings of this study highlighted those small enterprises are suffering from many problems that can cause them to fail especially at their early stages. For an example, business incubators still working in a mechanical way rather than scientific way, which cannot support small enterprises to solve their problems. As well as, because of the lack of incubators services, facilities, and expertise, incubators still cannot support midsize enterprises to be more successful, that most of these services are human resource services, development, subsequent secretarial services, and some advisory services. Finally, this study recommended the need to follow up and help the graduated enterprises to promote their work even for a limited period of time and offering them more financial and marketing services. Furthermore, in order to help those incubators to succeed, they need to benefit from incubators past experience in developed countries and some developing countries such as Arab countries, by the integrating and to entering into partnerships with each other, in order to spread expertise, money, and effort to ensure the success of incubated projects.

Business incubators are the umbrella that provides the required care for the entrepreneurial ideas and provides them with the requirements of innovation and technology acquisition, enabling them to move beyond the starting stage and gradually push them to become capable of growing and qualified for the future. Economic experts emphasize the importance of injecting more incubators into the Palestinian territories to develop new ideas that contribute to creating a new creative project or developing the existing project and enabling innovators and inventors to reflect their ideas on marketable products or processes, stressing the importance of providing support and funding (Isleem 2016). Isleem (2016) also stated that incubators in the Palestinian territories need the support of many relevant authorities concerned, the most important of which are government agencies, academia as well as the private sector. Our incubators need financial support, some laws that encourage entrepreneurs rather than hinder them, and directives and partnerships from the private sector and

academia towards the scientific horizons required to facilitate people's lives. It is not healthy for our incubators to rely on donors as is the case now.

The Chamber of Commerce and Industry of Hebron established a business incubator in order to receive all the energies and creative ideas that exist within this industrial and economic governorate. In 2015, the Chamber of Commerce succeeded in obtaining support from the Cooperation Foundation of $ 200,000 for this incubator, which opened in May 2016. This incubator provides the incubatees with technical, administrative, financial support, guidance, supporting entrepreneurship, creating job opportunities and changing the culture of job search to create new jobs in the Palestinian society. For that, this incubator aims to reduce failure in the start-up business and to receive all ideas and creative projects and turn them into works and projects on the ground. These ideas and projects will be integrated after implementation with the industrial sectors in the local market and provide them all services to start in the initial stages. Now, more than 50 projects have been registered, which was a surprise for the incubator team, which has been filtered to 20 projects through the committees working in the incubator. Where the incubator started to train the approved projects, to choose eight projects to be hosted by the Chamber of Commerce and providing them with various services to convert them from ideas to investment projects (Alsaed 2016).

In a similar vein, Baidoun et al. (2018) conducted a study to examine the factors that lead to success or failure of small business in the West Bank of Palestine. This study used a survey research testing the Lussier Model of business success and failure with a sample of 246 small businesses (90 failed and 156 successful) to better understand the reasons for their success or failure. Results indicate that having adequate capital, keeping good records with financial controls, making plans, and getting professional advice on how to manage the firm are the most important factors for the viability and success of small businesses. Any firm focuses on these important factors will increase their odds of success. Thus, avoiding failure, firms better utilize resources that contribute to economic growth. This study also added that it is the first study that looks at success and failure of small businesses in Palestine. There is no one single accepted theory that may be applied to small businesses.

1.2.5 Issues of Some Middle East Business Incubators

Elmansori (2014) conducted a comparative case study of BIs in Jordan and the UAE in order to determine whether the economic conditions and business strategy in Arab countries are suitable for business incubation or not, and to suggest some directions for establishing and implementing more business incubation activities. The findings showed that businesses that have been established through an incubator programme are far more likely to succeed in the long term. Also, the incubator programmes in the UAE and Jordan are designed to accelerate the successful development of entrepreneurs and their businesses through an array of support resources and services. And finally, launching an incubation programme is important for the technology innovation ecosystem and for exporting technology-based products.

The Egyptian experience in the field of business incubators is distinguishing especially the government incubators, which was established in order to help the entrepreneurs to transform their innovative ideas into successful projects. The private sector founded the Flat 6 Labs incubator that has left its impress in the world of entrepreneurship and has moved to a number of Arab countries. Civil society has played a role in the establishing a number of incubators, such as “Gesher”, “Abni”, the incubator of social works. Universities also established a number of incubators such as “AUC FabLab” incubator, “ITTU's Hema” incubator. Flat 6 Labs, the incubator of new technology companies, is an incubator for emerging IT companies; it was created by “SawariVentures”, in collaboration with the AUC Business School. Flat6Labs has contributed over the past six years to the establishment of more than 100 companies with the creation of more than 1000 jobs. Flat6Labs was launched in Cairo in 2011, in Jeddah in 2013, in Abu Dhabi in June 2014, and as well as branches in Tunis and Beirut. Flat6Labs offers a three-month incubation period, during which all means of work are available from a place equipped with all the staff and space needed to turn their ideas into reality and provide them with the highest level of entrepreneurship training, with the participation of professional mentors, entrepreneurs and investors. Incubation support starts from $10,000 up to $15,000, for a share of 10% to 15% of Sawari's share value, giving entrepreneurs the opportunity to face the challenges they face when establishing, with additional support for these projects to enter the world of

investment. At the end of the three months, a successful project presentation ceremony will take place in which companies will be present in the presence of investors and media representatives. Each winning project will receive an additional $40,000 to finance its project (Alnazer 2017).

The importance of SMEs in Jordan is their ability to effectively contribute to the development and achievement of economic and social objectives. SMEs in Jordan warranty sufficient income for individuals, personal satisfaction, and self-realization for small enterprises owners and their family. They also contribute to the development of new jobs and reduce unemployment levels in the Jordanian society. SMEs in Jordan met the terms of success at the local level. According to the Ministry of Planning data for 2016, they contribute in more than 50% of GDP, with a size of 98.5% of the total institutions. According to the Amman Chamber of Industry, the number of SMEs are 107175 projects with more than 99% of the Jordanian projects. The Jordanian trend towards establishing business incubators is relatively new, as the Kingdom gives more interest towards the development of knowledge economy as a primary platform for fields sustainable development of Jordanian society, development of small project sector to increase its contribution in local production, then generate ways of sponsoring and organizing. Therefore, many universities and industrial cities in Jordan it established a number of incubators. The goals of Jordan creativity centers in taking care of and developing creative ideas and transferring them from ideas and studies to successful business projects of profit and high value. The Jordan Innovation Centers network consists of currently six various incubators. Where incubators provided standardized services, but that each one is unique in which it offers to the target audience of entrepreneurs (Abu-Jalil 2017).

The UAE is witnessing a steady increase in the number of business incubators and the accelerators to keep pace with the steady increase in the number of start-up companies. In 2002, the "Mohammed Bin Rashid Establishment for SME Development" established the "Business Incubators Center" in the "Business Village" as the region's first incubator to provide logistics and business assistance for a maximum of three years to support the SMEs. This incubator is a unique platform for the rehabilitation of entrepreneurs and the expansion of the SME sector. In less than

three years, it has been successful in graduating a number of projects between 18 and 24 months. Some projects have started with a capital of 5,000-50,000 AED, and some of them started without employees. The capital when they graduated was ranging from 500 to 750 thousand dirhams, and the number of employees was more than five people. Furthermore, the UAE University of Science and Technology has also launched the "Entrepreneurial Incubators Program" for entrepreneurs. The UAE will be among the 10 most innovative and distinctive countries by 2021. The incubator represents an opportunity to finance selected projects and ideas at a reasonable cost and provides them with guarantees to transform these ideas into services, products, and systems (Alnazer 2017).

Al-Kuwait has witnessed great interest in entrepreneurship and provides significant government support through some ministries and agencies. The state has announced the establishment of the "Business City" project as the largest incubator for SMEs in the GCC countries to support the Kuwaiti youth with a large capacity. In addition to 30 virtual incubators for the special needs projects. The project is designed to combine modernity, beauty, spaciousness and flexibility in use at an operational area of more than 33,000 square meters and a building area of 8125 square meters spread over three floors and parking lots, providing all services for people with special needs, elevators, interiors of the building and all the services available. In the same vein, the "Brilliant Lab" technology accelerator was established in 2013 to enable technology entrepreneurs to develop their projects and reach the largest number of users and provide the most important training tools for entrepreneurs in Kuwait. Brilliant Lab has accelerated the development of emerging technology projects through private companies, relying on a long-term, sustainable strategy to make these large companies close to emerging projects to create opportunities for rapid development or early investment. Over the past 4 years, this accelerator has implemented several international programs and conferences, and has provided more than 780 initiatives to participate in various international acceleration and conference programs. 76 initiatives have been accepted and included in training camps in Kuwait, and other training programs at international universities such as the San Francisco-Silicon Valley, United States, Algeria, Egypt and Qatar (Alnazer 2017).

Finally, as a summary, this research background is focusing on increasing the success of incubators in developing countries due to their significance in supporting the economy and decreasing the unemployment rate in these countries by helping to establish successful firms as stated before.

1.3 PROBLEM STATEMENT

As mentioned in the background of the study, currently, developing countries especially the Levant countries are facing a very challenging economic situation and there are very few jobs available for the thousands of students graduating every year. For example, some Arab countries, has an unemployment rate that is very high and a GDP that is very low (see Appendix E and Appendix F, respectively) when compared with developed countries.

In Palestine, as an example, the economic growth rate is not enough to raise living standards and reduce high unemployment. The economy has witnessed a sharp deceleration in economic growth, from over 8 percent during 2007-2011 to 3 percent during 2012-2015. The sharp decline in growth has stifled the economy's ability to create jobs for a growing youth population. The economy has long suffered from the restrictions and political instability that continue to constrain private sector activity. In addition, the decline in donor funding from 32 percent of GDP in 2008 down to 6 percent in 2015 has significantly contributed to the recent economic weakening (WorldBank 2017; Baidoun et al. 2018).

After scanning the related literature, one of the proposed solutions to this situation that developed and developing countries believed in, is by establishing successful SMEs through incubators (Gozali et al. 2015; NBIA 2015). SMEs are widely recognized as engines of economic growth and key contributors to sustainable GDP of all countries, including those in the Middle East and the developing countries (Ashraf et al. 2015; Gozali et al. 2015; Sungur 2015; Baidoun et al. 2018). SMEs play a vital role in the economy specifically by creating employment opportunities (Daoud 2015). Furthermore, these SMEs strengthen the independence of countries through reducing their dependency on foreign markets. Not only do SMEs initiate creativity

and innovation globally, they also account for a large percentage of employment in many nations, resulting in a rise in wealth and high standards of living (Marom & Lussier 2014; Baidoun et al. 2018). In the USA, one of the world largest economies, SMEs make up 99.7 percent of US employer firms providing 48.5 percent of private-sector employment. Equally, in the EU, 99% of economic activities can be traced back to SMEs (Falkner & Hiebl 2015; Baidoun et al. 2018). In Palestine, there are many incubation programs running that are offering good facilities and services to their incubated corporates (Alsaed 2017). These active incubators and incubation programs are graduating hundreds of corporates and SMEs every year (Alsaed 2017). In Palestinian statistics, SMEs represents more than 98% of the Palestinian economy. Nearly, more than 9977 SMEs (which are also named family organizations) are officially registered and are employing from 5-19 employees in each enterprise (Alsaed 2016; PMA 2016). Unfortunately, too many SMEs fail especially at the beginning of their establishment (Shannxi 2016). In Palestine, from 50-75% of the created SMEs fail mostly in the first and second year of their establishment according to global statistics (Alsaed 2017). This state of events reduces the impact of these SMEs in Palestine on the number of jobs created and the value of GDP.

From the academic standpoint, via a review of the literature on success models for incubators and SMEs, it is revealed that most research are done on developed countries like the United States of America (USA) and Europe, and only a limited amount of studies are done on Arab countries like Palestine (Alshukri 2012; Elmansori 2014; Theodorakopoulos et al. 2014). According to the literature, the failure occurs because of the lack of experiences in management, marketing, market study, producing, financial transactions, technological, legal, and others for SMEs owners (Abu-Jalil 2017; Baidoun et al. 2018). However, due to the different geopolitical and economic situations between Palestine and other Arab countries with that of USA and Europe, the applicability of these success models in the context of Palestine in particular, and Arab countries in general will have to be investigated further. It is thus necessary to find other pertinent factors that affect the success of these incubators and subsequently develop a new suitable and success model for incubators in Palestine and other Middle East countries (Cantu 2015; Carvalho & Galina 2015; Sungur 2015; Khalid et al. 2017). Furthermore, existing models are

concerning in incubators resources, services, financing, and others, but they all exclude two important factors which are the ICT tools and corporate culture. Information and communication technologies are crucial tools that are used in daily life and can encourage the creation and developing of new businesses, that can help incubators and SMEs to be more successful (InfoDev 2009; Almakenzi et al. 2015; TechTerms 2015). ICT tools have rarely been used as a success factor in incubators; however, they have been used as a success factor in studies on organizational and corporate success (Li 2012; Taylor 2015; Lee & Lio 2017). Furthermore, corporate culture has also been used in the literature to measure the success and the sustainability of organizations and yet it has been used very rarely in investigating the reasons for the success of incubators. This factor was suggested by some experts and managers of incubators in Palestine through the email interview conducted to achieve part of this study's objectives, as a real case on the ground (see Chapter II).

Figure 1.1 displays the three main issues that leads to the problem. The figure summarizes the bad economic situation in Palestine, which can be solved by establishing SMEs through incubators. There are many SMEs are graduating every year through incubators, but there are still limited success stories and limited researches and case studies about incubators in the Arab countries.

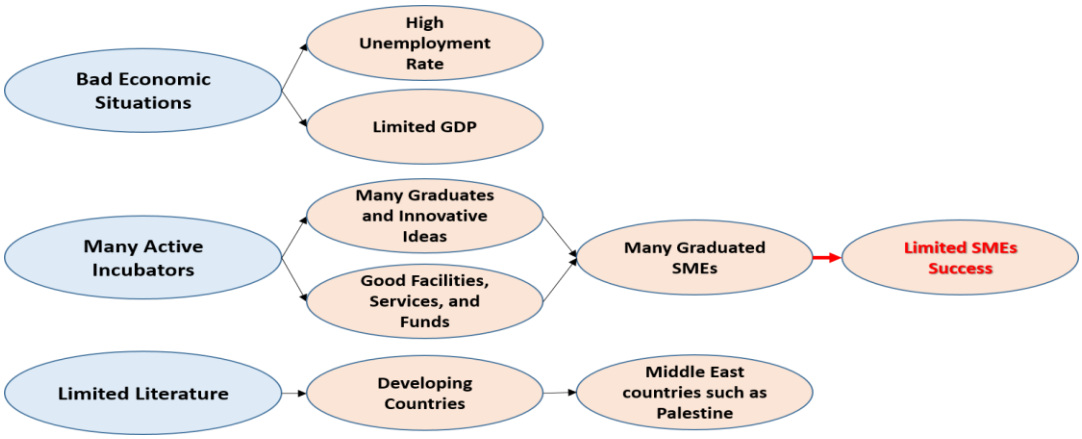

Figure 1.1 Problem statement and gaps

Therefore, the main aims of this research are to bridge these research gaps by developing a new success model including the suitable factors that affect the success of BIs in the Levant countries, and to test this model empirically in Palestine. A

review of literature shows that many factors and models have been used to try to assess the success of incubators in developed and developing countries. These existing models are not relevant to use in Palestine as it is, because some factors can be used as success factors in some countries but they cannot be used in other countries due to different social, political and economic contexts.

1.4 RESEARCH QUESTIONS

Based on the problem statement outlined above, the main research questions are as follows:

RQ1: What are the critical success factors (CSFs) that contribute to the incubator's success?

RQ2: How do the factors affect the success of incubators?

RQ3: What is the nature of the role of ICT tools on the relationship between success factors and incubator success?

RQ4: How can the applicability of the proposed model among active incubators be evaluated?

1.5 RESEARCH OBJECTIVES

The research objectives, which are based on the above-mentioned problem statement and research questions, are:

RO1: To determine the CSFs that contribute to incubators' success;

RO2: To develop a model that describe the relationship between the factors and the success of incubators;

RO3: To investigate the moderating role of ICT tools on the relationship between the success factors and incubator success; and

RO4: To verify the proposed model and to identify the applicability of the proposed model.

1.6 RESEARCH METHOD

The research method was mainly designed to address the research questions, and then to achieve the research objectives. This research study was conducted in seven main phases, as illustrated in Figure 1.2.

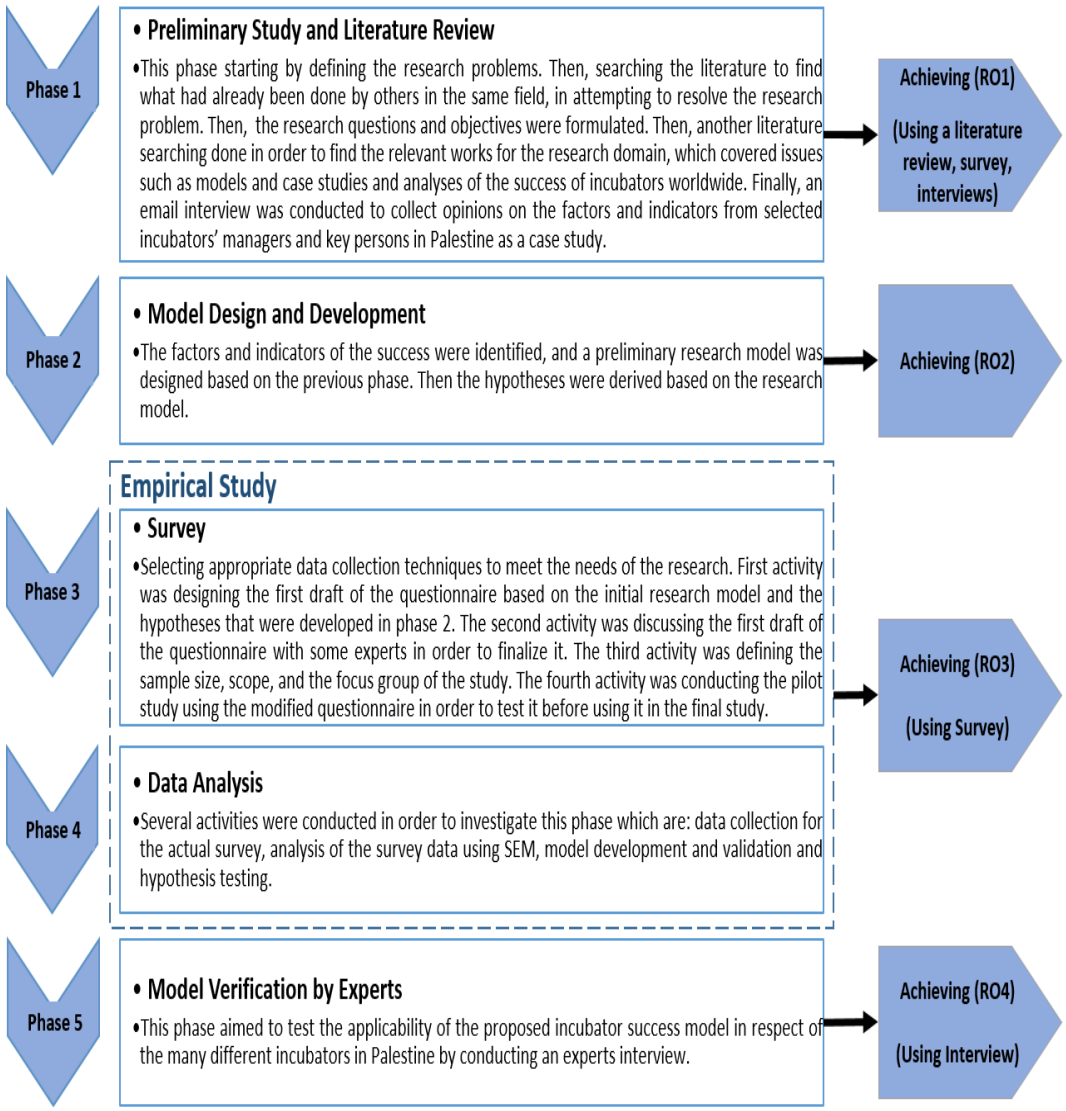

Figure 1.2 The research method

1.7 SCOPE OF THE STUDY

This study mainly focuses on investigating the factors that affect the success of incubators in Palestine as well as the moderating role of ICT tools on the relationship between these success factors and incubator success.

Setting the scope of this research helped in providing a guideline to achieve the aims of this research. This study targets all types of incubators, accelerators, canters of excellence, incubation and pre-incubation programs that are operating in Palestine. The focus group members involved in this study were all managers, decision-makers, directors, steering committee members, evaluators, and other persons who had a good knowledge of and participated in incubator activities.

In Palestine, there are 23 incubators (see Appendix C) currently operating in the West Bank and Gaza. This research targets these incubators and other key persons working in organizations that are similar or related to incubators and their activities.

Palestine is selected as the context for this research because it is one of the developing countries that has made significant efforts in developing BIs and yet it still has a limited number of success stories and continues to suffer from a very bad economic situation. Therefore, the presence of successful incubators may help in solving these problems. In addition, very few studies have focused on incubator success in Palestine. Therefore, this study's results will offer important guidelines for incubator decision-makers and managers that may help them to improve and increase the success of their incubators.

1.8 SIGNIFICANCE OF THE STUDY

There are many significant points offered by this study. Firstly, this study identifies the strengths and weaknesses points of incubators in Palestine by developing and applying a new success model, and by making some final recommendations to support and enhance incubator operations, which will in turn also enhance the graduated

companies that will supporting living conditions in Palestine and other similar countries in the Middle East.

Secondly, there are many studies in the literature have investigated a wide range of factors that may influence incubator success. However, this study tries to select the most suitable factors by studying the many successful models that have been proposed in the literature for different developed and developing countries and also by consulting some experts in this field in the country under study in order to select those factors that have resonance among practitioners in the real world.

Thirdly, the need to understand the factors that affect incubator success and also the role of ICT tools in this success is of great importance. This study aims to add value by offering a way to improve incubator success, from the beginning stages of incubation, by proposing a suitable model that can be adopted easily by all types of Palestinian incubators and those in other developing countries that are similar to the Palestinian context.

Fourthly, this study's results and recommendations are anticipated to illuminate the reasons for the success and failure of incubators so that managers and decision-makers can improve their services and their successes in Palestine and in other similar Middle Eastern countries, and so that innovators can make their ideas more successful.

Finally, it is hoped that this study will be valuable to the researcher's university and to his country because this topic is considered to be relatively new in Arab countries and in some other developing countries, and because of the bad situation and lack of jobs in Palestine supporting these incubators may provide good opportunities for creating jobs, supporting the local economy, and creating new companies, and the work presented in this thesis can also be compared with that by other studies carried out in other contexts and other countries.

1.9 THESIS STRUCTURE

This Chapter introduces the context of this research covering issues such as the research background, problem statement, research objectives, research question, research method, research scope, and the research significance. To explain the further insight of this research, this thesis is organized and presented other five chapters. These chapters are briefly outlined as follows:

Chapter II: the 'literature review' chapter examines the main success models and identifies the gaps, which formulate the conceptual model of this research. This chapter also provides a review of the previous literature on the construction incorporated in this study. This chapter displays different definitions of popular incubators' types, and the growth of SMEs barriers are discussed along with an overview of SMEs and the incubators around the world. This is followed by a discussion about the importance of incubators in supporting the country's economy in particular for increasing employment. Then, different incubators' models from around the world and success factors were discussed. This chapter also described and defined all the success factors that are used in this study. Finally, other related topics discussed in this chapter are some definitions of the ICT and the ICT tools, followed by the importance of ICT, and the relation between ICT, start-ups, and incubators.

Chapter III: the 'research methodology' chapter discuss the research method that is used in this study, starting with the introduction, the phases of the research operational framework, and the research design. It is also followed by the questionnaire design phases and the population and the sampling frame of this research. Furthermore, this chapter displays the quantitative data collection phases including the pilot study and the final study. Then, the quantitative data analysis stages were discussed, and also the qualitative data collection tools and the qualitative data analysis phase. Finally, the conclusion of this chapter was stated.

Chapter IV: the 'research model and hypotheses development' chapter describes the proposed model development stages propsed for this study for investigation of the factors that are affecting the success of incubators. Then, the

research hypotheses are developed based on the problem statement and the literature review in order to answer the research questions and to achieve the research objectives.

Chapter V: the ‘data analysis and results discussion’ chapter displays the descriptive statistics, the pilot study analysis, the sample profile, the exploratory factor analysis and the confirmatory factor analysis using Statistical Package for Social Sciences (SPSS) version 22 and the structural equation modeling-partial least squares (SEM-PLS) using Smart PLS version 2 software. Also, the chapter discuss the validity and the reliability of the research instruments, and testing hypotheses stages. Finally, a thematic analysis is conducted on the qualitative data obtained from the semi-structured interviews.

Chapter VII: the ‘discussion and conclusion’ chapter revises the conclusion and some recommendations for future work, starting with an introduction which presents a summary of the work, and the achievement of the objectives and the contribution to the theoretical and practical knowledge of the field. Finally, the chapter discusses the limitations of this research study and makes some suggestions regarding future work.

CHAPTER II

LITERATURE REVIEW

2.1 INTRODUTION

The objective of the literature is to obtain a clear overall picture of the background of the study. For this study, the literature is organized in order to develop a clear understanding of the development of the economic landscape in which incubators operate, to explore the success factors that affect incubator success, to develop a new success model that might help in solving economic problems in developing countries, and to study each of these factors individually in different countries and different time frames. In this chapter, a large number of previous studies about incubator success models are reviewed and the importance of these studies is analyzed in the context of both developing and developed countries.

Before moving on to a more in-depth discussion of incubators, this chapter provides some different definitions for the popular incubator types, such as the general incubator, BI, TI, university incubators, science and technology parks, incubation process, and also for the small and medium-sized enterprises (SMEs), their growth barriers, and an overview of SMEs and incubators around the world is provided.

The remainder of the chapter contains a discussion of the importance of incubators in supporting a country's economy and increasing employment. Then, some different incubator models and success factors as well as different incubator types in different time frames around the world are discussed. After that, all the success factors that are used in this study and that were gathered from the literature are described and defined and discussed. Finally, other related topics that are discussed in this chapter include some definitions of information and communication

technology (ICT) and ICT tools, the importance of ICT, and the relationship between the ICT, start-ups, and incubators.

2.2 MAIN DEFINITIONS OF INCUBATORS TYPES

There are many difficulties in defining business incubators, not least because of the continuous growth in business incubation and the diversification of incubator components (Voisey et al. 2006). In the literature, a large number of studies have come up with similar definitions for incubators (Bergek & Norrman 2008). Incubators (for business, technology, information and communication technologies (ICT), etc.) have many definitions and are defined in various ways in the literature. This variation in defining business incubator is because of the diversity of incubators, their sponsors, and their purposes (Khalid et al. 2012).

There is no one standard definition and type of business incubation. Thus, conceptually, a first-generation business incubator started as resource-sharing initiatives, then became an important tool offering many business services such as coaching, training, consulting, access to funding, networking, etc. Moreover, in the literature, the many definitions and types reflect different aspects of national policies and cultures and there are many types of business services, approaches, and objectives that are covered by business incubators (Özdemir & Şehitoğlu 2013).

2.2.1 Science and Technology Parks

Science and Technology Parks considered as a policy-driven body, concerned in fostering the creation and growth of innovative start-ups, managed by professional management teams. The importance of science and technology parks have grown in many countries in the scientific community in parallel together with the weight that parks have achieved in the technology and innovation policy scenarios, which considered as an effective instruments of innovation policy (Huang et al. 2012; Albahari et al. 2017).

Many scientists and economists proved the importance of science parks and incubators in the performance and the survival of start-ups during a long time (Mian et al. 2016; Diez-Vial & Montoro-Sanchez 2017). Furthermore, Diez-Vial and Montoro-Sanchez (2017) summarized that, science and technology parks and incubators can help in establishing localized mechanisms for knowledge development and shared resources. The base development of these parks and incubators in the world are that innovation activities are not distributed equally in the space, but the new scientific and technological knowledge production has a predominant tendency to cluster spatially. Also, these parks and incubators are providing start-ups with support to transmit the complex and uncertain technological knowledge form to distances, which is representing high communication costs.

There are many establishments or definitions appeared related to these definitions doing the same activities such as Technopark, Industrial parks, Technopolis, etc. These establishments have the same characteristics but vary on relatively minor points. Figure 2.1 displays some differences between various definitions where different derivatives are placed on a continuum ranging from low to high technological level and from low to high management support services (Commission 2000; Akçomak 2009).

Currently, most incubators are creating from multipurpose business incubators that have been established since the 1970s. These incubators offering a highly selective admission criteria, hands-on business, and management assistance for their incubated ventures that have a high technological continuum, can generate a high revenue and can create jobs. For that, as understood in the current terminology, the incubator is represented in the blue shaded area in Figure 2.1 (Akçomak 2009).

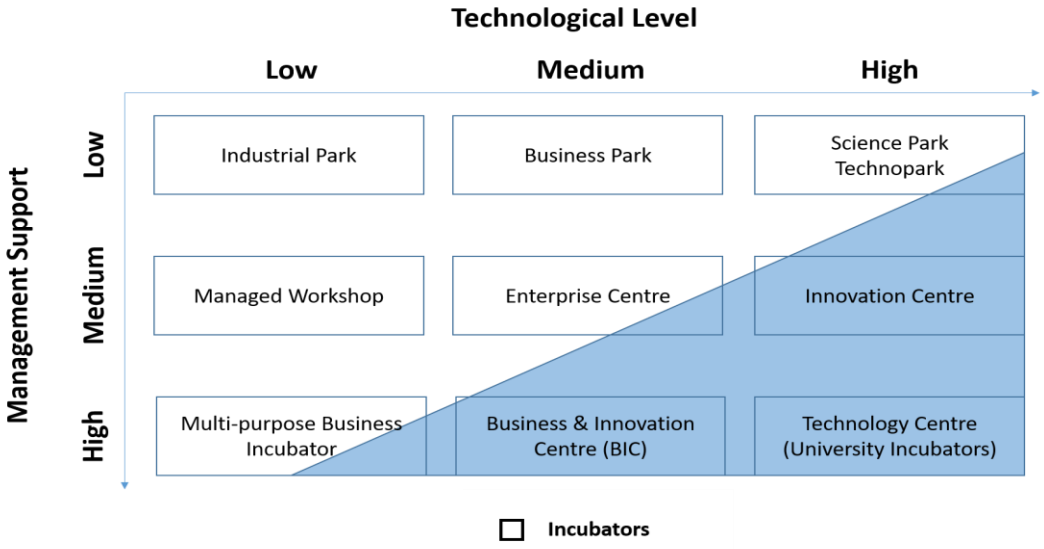

Figure 2.1 Identifying incubators among other forms of similar establishments

Source: (Commission 2000)

2.2.2 General Incubator

Generally speaking, an incubator can be defined as a physical location where an incubation process takes place. In the context of this study, the general type of incubator offers a set of services to individuals and/or small companies. Figure 2.2 displays the general incubator system of the European Business Innovation Centers Network (AlKhatib 2010). From the it can be seen that an incubator should be connected with a group of professional networking connections consisting of research centers, academia, industry, and venture capitalists. This network should work together within a science or technology park infrastructure in order to help successful companies graduate from the incubator to the next level.

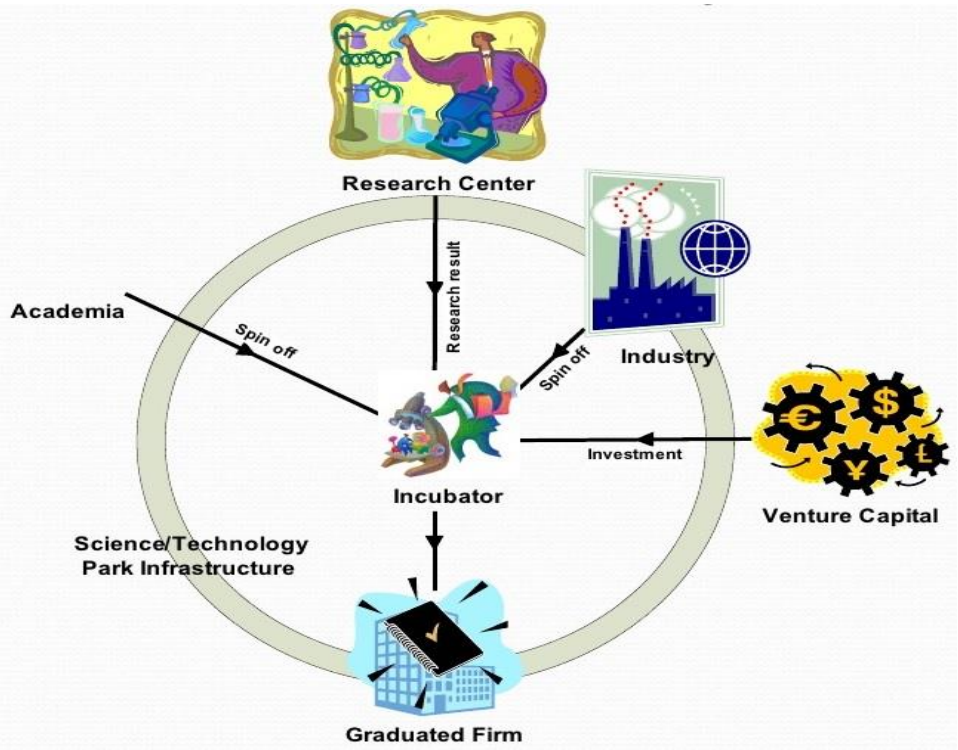

Figure 2.2 General incubator system

Source: (AlKhatib 2010)

The most popular definition of an incubator is that stated by the National Business Incubation Association (NBIA 2015), which describes an incubator's activities as the provision of management guidance, technical assistance and consulting designed to young growing companies. Incubators provide clients with access to an appropriate space and leases resources, shares business services and equipment, and offers technology support services and assistance in obtaining the financing necessary for company growth. Incubators vary in type and in the way that they deliver their services to incubatees in their organizational structure.

Furthermore, NBIA (2015) added that incubators have differing goals, including diversifying rural economies, providing employment for and increasing the wealth of depressed inner cities, and transferring technology from universities and major corporations. Also, incubator clients are at the forefront of developing new and innovative technologies – creating products and services that improve the quality of life in communities around the world.

2.2.3 Business Incubator (BI)

A business incubator or BI can be described as an organization that offers a group of business development services and a well-facilitated space on flexible terms, to meet the needs and foster the success of new firms in order to maximize those firms' impact on economic development (Verma 2004; Cantu 2015).

It is defined by Özdemir and Şehitoğlu (2013) as a facility founded to create a conducive environment to new ventures to help them to cope with the difficulties that exist in the initial stage of the business lifecycle, to help them to survive and grow to become successful mature businesses.

According to NBIA (2015), business incubation is a business support process that accelerates the successful development of start-up and fledgling companies by providing entrepreneurs with an array of targeted resources and services. These services are usually developed or orchestrated by incubator management and are offered both in the BI and through its network of contacts.

2.2.4 Technology Incubator (TI)

A technology incubator or TI is a type of BI, which as the name implies, is specifically concerned with supporting technology companies. The Organization for economic Co-operation and development stated that TIs have been an important policy tool since the 1980s in countries that are members of the OECD as well as in non-OECD countries because they increase the chance of new technology-based firms (NTBFs) surviving as start-ups and generating wealth and jobs. Technology incubators are one specific type of BI that provide a range of services to tenant businesses and start-ups such as a physical infrastructure as well as management, technical, financial, legal, market, and networking support. Furthermore, TIs have four main objectives: economic development, technology commercialization, property venture/real estate development, and entrepreneurship (Co-operation & Development 1997).

A TI is sometimes also known as a technology business incubator (TBI) and it is a very important type of BI for both developed and developing countries because it supports a country's economy. Özdemir and Şehitoğlu (2013) stated that TBI programmes include components of innovation and the entrepreneurship policies of all countries should be closely aligned with the stages of TBI development.

Furthermore, Mahmood et al. (2015) defined a TI as an entity that assists and stimulates innovation, seeking to combine technology, resources and initial knowledge to improve entrepreneurial talent, speed up the development of nascent business, and expedite the commercialization of technology. Small and medium-sized enterprises, especially those in technology-based industries, have become an essential part of contemporary economies around the world. Thus, the TBI is very important to this group of firms.

2.2.5 University Business Incubators

A university business incubator also is another type of business incubators, that concerning of offering tangibles assets, logistical services, and the main market commodities at low prices. University business incubator also offers support to new knowledge-based spin-offs, by transferring the scientifical and technological knowledge and providing effective techniques for solving the weaknesses of traditional incubators (Chan & Lau 2005; González & Arcelus 2018).

Furthermore, Chan and Lau (2005) and González and Arcelus (2018) stated that the relationship between university-technology start-ups is more powerful and useful than the relationship between science park-technology start-up, especially in the product development processes.

Albahari et al. (2017) summarized that, universities considered as important external sources of knowledge for start-ups innovation since the 1980s. Furthermore, universities are considered as one of the important producers of the knowledge, which are expected to engage in interactions with industrial and regional partners, in order to help in the innovation and social change. Also, universities are playing an important

role in facilitating commercialization of academic research in the science and technology parks, legitimizing their knowledge transfer activities related to their commitment to contribute to society, and internalizing financial returns of academic research.

2.2.6 Incubation Process

There are many definitions for the business incubation process in the literature. In the following, some definitions for the incubation process are presented.

Firstly, Adegbite (2001) defined business incubation as a method of creating new small businesses by providing SMEs with a group of services such as office space, common services (such as enterprise counselling and training, shared secretarial support, start-up financing and assistance with product development and marketing), strict admission and exit rules (to help innovative and fast-growth business start-ups that are likely to have a significant impact on the local economy), hands-on assistance (including research and development (R&D), advice and risk capital), and professional management (which involves monitoring tenant businesses closely against their business plans, and ensuring that the incubator itself operates in a business-like fashion with the prospect of becoming financially self-sufficient).

Incubation is considered one of the single most important global innovations of the twenty-first century. It is a process which can be activated whenever there is a need to support entrepreneurs in creating and developing their own business and transforming it into a viable and sustainable activity (Giordano et al. 2010). Giordano et al. (2010) also stated that there are three stages in the incubation process: pre-incubation, incubation, and post-incubation (see Figure 2.3).

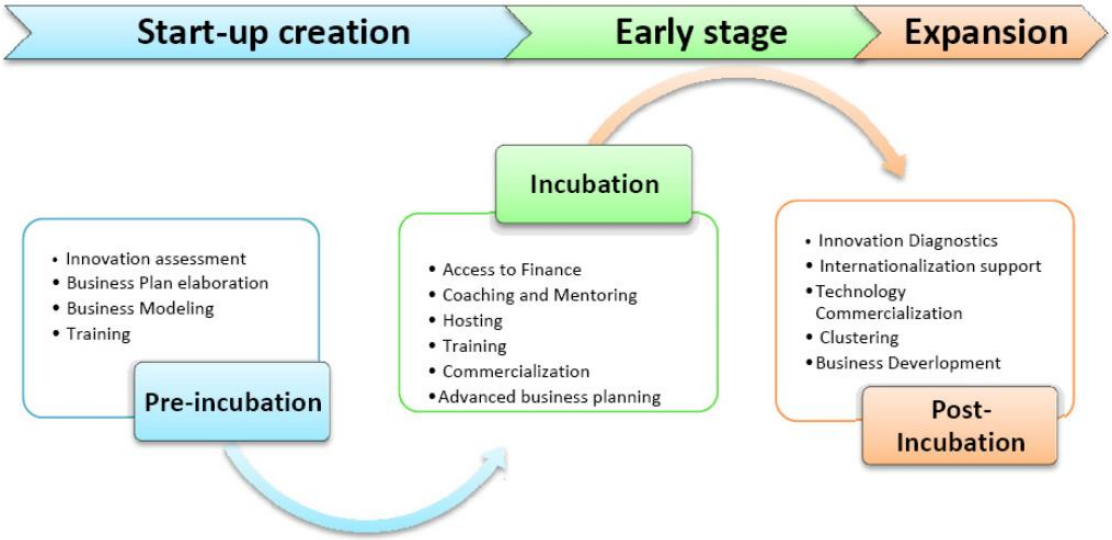

Figure 2.3 The incubation process

Source: (Giordano et al. 2010)

The pre-incubation stage (as summarized in Figure 2.4) considers all the activities that are needed to support the potential entrepreneur in order to develop his/her business idea, model, and plan until the actual creation of his/her start-up. In this stage, usually the first assessment of the idea, training, and direct one-to-one assistance are provided in order to help the entrepreneur to write a full business plan.

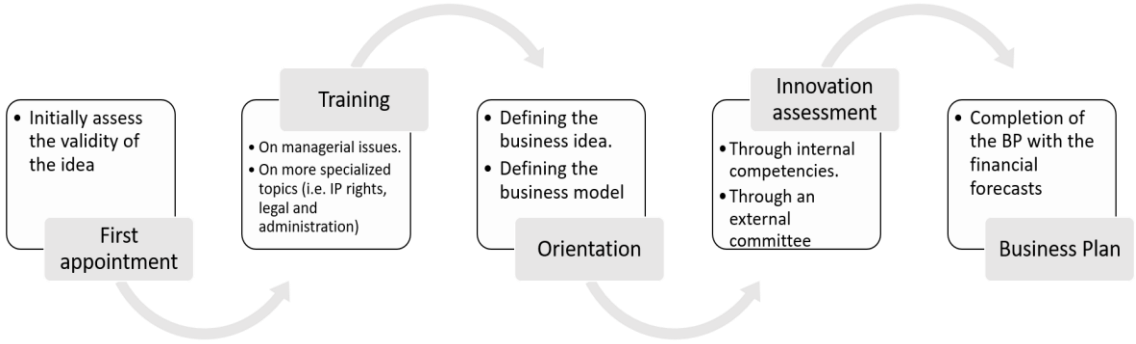

Figure 2.4 The pre-incubation stage

Source: (Giordano et al. 2010)

The incubation stage (as summarized in Figure 2.5) represents the entire range of support that is given to the entrepreneur, from the start-up phase to the expansion phase. This stage usually lasts for the first 3 years of the newly established company. This time frame is considered the most suitable for coming to a decision on whether the new company is showing signs of success and can be developed into a fully

mature company or not. The main activities during this stage are physical incubation, facilitating access to finance, coaching and mentoring services, hosting services and specific training.

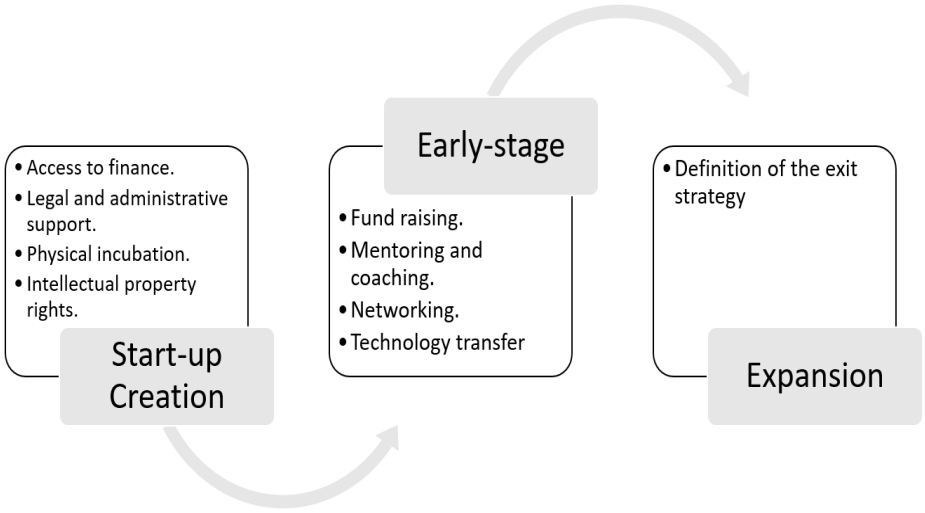

Figure 2.5 The incubation stage

Source: (Giordano et al. 2010)

The post-incubation stage consists of all the activities that are carried out for the incubated company when it has reached the mature phase. The company leaves the incubator after it has been physically incubated. However, during this stage, the company might still need various services such as help in increasing its sales or improving its production processes, among others. An incubator that is involved in this stage is sometimes called an ‘accelerator’.

Furthermore, the European Commission also defined and divided the incubation process into three stages, as displayed in Figure 2.6. These stages are the pre-incubation, core incubation and post-incubation stage. The pre-incubation stage starts with the business idea and then progresses into many activities such as training, assessment, and business plan preparation. The core incubation stage offers many services such as access to finance, coaching, mentoring, space, etc. The post-incubation stage offers the most important services to its graduates, such as business development, clustering, and networking, among others (Commission 2014).

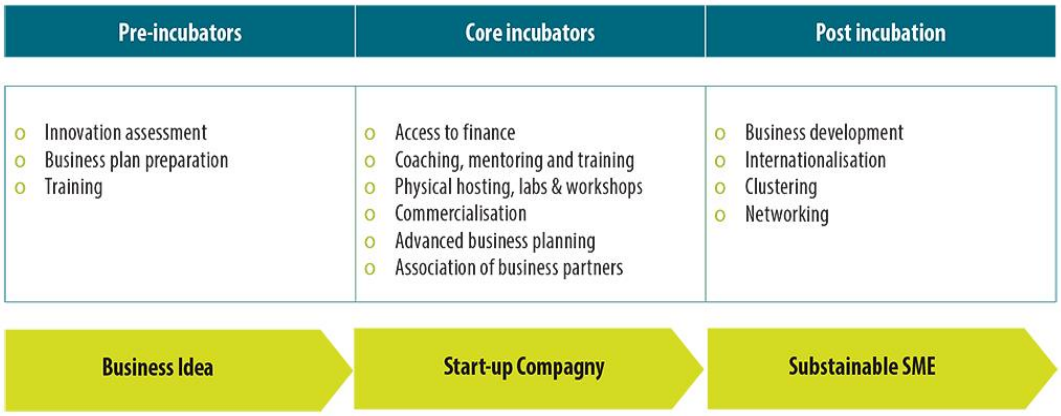

Figure 2.6 The incubation process

Source: (Commission 2014)

2.2.7 Small and Medium-Sized Enterprises (SMEs)

This subsection provides some information garnered from the literature about start-up SMEs, the reasons for their importance and failure, and how BIs can play a key role in supporting them.

Davies (2009) stated that start-up SMEs are vulnerable in their early years, especially in developing countries such as those in Africa, where a higher percentage of inexperienced people start their own businesses. It is well known that SMEs play a critical role in many national economies, the main problem is that these SMEs provided adequate office space and facilities, these spaces and facilities do not explain the expected value of this initiative or what makes it so unique. The lack of mature corporate governance in the formal sector's and the high rates of unemployment means that there is a higher percentage of people or inexperienced entrepreneurs who try their luck at starting up a company.

Furthermore, Davies (2009) added that most SMEs and businesses in Africa are facing many difficulties in their growth and operations. Thus, business incubation projects should be designed to address the following challenges, especially in the case of ICT enterprises: (1) appropriate office space and infrastructure, including electricity, water, professional internet access, flexible lease terms, an attractive location, individual resources such as electricity generations, security, kitchens, etc.; (2) appropriate support services covering aspects such as planning, markets,

commercialized products, good corporate governance, finance, training, support programmes, etc.; and (3) professional networking, both internal and external, which is useful for sharing ideas, techniques, visions, and criticisms.

Al-Mubaraki and Busler (2010) found that incubators play a critical role in helping start-ups to grow and be successful in particular markets, create jobs, and contribute to the development and growth of a local, regional or even national economy. Studies on BIs in the USA found that on average around 70%–90% of SME graduates remain successful in the first stage of their life cycle. In the same context, Olaopa and Siyanbola (2012) stated that SMEs account for a large percentage of the total number of enterprises in many developed and developing countries because of their contribution to GDP, employment, and socioeconomic development. Thus, SMEs need to receive special attention to help them survive especially in the early stage of life and to compete in the global marketplace due to their limitations in terms of size and resources. For that reason, technology business incubation is a constructive process to establish a suitable environment that can help technology-based SMEs to achieve sustainable development.

Also, Riunge (2014) found that ICT SMEs are very important to the Kenyan economy in terms of their capability of creating employment and their contribution to GDP and exports. In the same context, Mahmood et al. (2015) concluded that business incubation has been successful worldwide in terms of its effectiveness in enabling a conducive environment for the development of SMEs. An effective incubation system plays an important role in supporting local, national and regional economies especially in developing countries such as Pakistan, by producing employment opportunities and facilitating the development of SMEs. In sum, SMEs are playing an important role in supporting national economic growth and job creation. Therefore, many developing countries are following the same strategy as developed countries in developing and creating business incubation facilities.

Business incubators work in a similar way to an organization or company, so studying and comparing BIs with organizations is very important (Mian et al. 2016). Sungur (2015) stated that examining and studying BIs and also comparing them with

other SMEs and determining the factors behind the success and failure stories of BIs is of great importance. Moreover, SMEs contribute more than 50% of global GDP, provide 40-80% of the total employment and help to reduce unemployment. For these reasons, some countries such as France and Malaysia did their best to support SMEs (El-Naby & Ashour 2015).

2.2.8 Corporate Culture

There are many different ways to define culture in virous research fields, such as sociology, anthropology, and the humanities. For instance, Hofstede et al. (1991) defines culture as something that is inherited from the mind of people and is influenced directly and indirectly by society and can be programmed into the human mind early in life. Denison and Neale (1996) stated that the term ‘culture’ appeared in late nineteenth-century and early twentieth-century studies in the field of social anthropology. Culture has generally been defined in a very broad and holistic sense as the qualities of any specific human group that are passed from one generation to the next because they are believed to be useful for survival and adaptation. They also added another definition from The American Heritage Dictionary, which defined culture as socially transmitted behavior patterns, arts, beliefs, institutions, and all other products of human work and thought characteristic of a community or population.

Some years later, Hofstede and Hofstede (2001) defined culture as a joint programming of the mind that differentiates the members of one group or category of people from another. In the context of this study, the term culture has been used by many researchers to explain a new phenomenon in the economy, namely entrepreneurship. According to Soetanto (2005), the cultural aspect is used to explain why people in some countries differ in terms of their openness to new things, tend to innovate faster, are more entrepreneurial, and dare to open or invest in new business more than other people in other countries (Soetanto 2005). He also added that entrepreneurial culture is closely related to and can explain the differences in entrepreneurial growth across countries. Others define culture as a shared system of beliefs and values that have an effect on the behavior of organizational managers and stakeholders (Vella & Melewar 2008; Abdullah & Abdul Aziz 2013). Furthermore,

Kaasa (2016) defined culture based on the sociological approach as a pattern of shared values, beliefs and behaviors of a group of people.

Corporate culture, which is a rich system of values and beliefs, is a very important driver in building a corporate identity and is a key indicator in building and securing corporate reputation (Abdullah & Abdul Aziz 2013), as summarized from many types of research studies.

In the literature culture has been classified into many different sets of dimensions, but the most famous and widely used is that of Hoftstede (1980), where he classified culture into four dimensions: power distance, uncertainty avoidance, individualism-collectivism, and masculinity-femininity. Hofstede's dimensions are viewed as a grounded approach for describing culture, and have been widely used during the last three decades (Kaasa 2016).

Many types of culture can be found in the literature, such as organizational culture, entrepreneurial culture, innovation culture, risk-taking culture, and others. For example, Organization culture defined by Denison and Neale (1996) which is referred to the beliefs and principles that serve as a base to the organization's management system, and a set of management practices and behaviors that both exemplify and reinforce those basic principles, which represent strategies for survival. A good understanding of these types of culture is very important for all leaders because it has an effect on the way that their organizations react to the changing demands of the business environment, and is strongly influenced by past successes and past learnings about how to adapt and survive.

2.3 IMPORTANCE OF INCUBATORS

Business incubators are very important for start-ups, especially technology-based companies, and can offer many services and tools to them. Start-ups and SMEs play a major role in supporting a country's economy and in increasing employment. Therefore, studying and evaluating the services provided by BIs can contribute to a

better understanding of the role of BIs in business growth, survival, and networking (Sungur 2015).

Davies (2009) concluded that, currently, incubation has become an interesting way to accelerate the development of technologies, industries and business skills in developing countries. The needs of communities in developing countries can often be completely different to those in a more mature company's environment where education, business training, and public institutional support may be completely different, such as in Europe and the USA. Also, Al-Mubaraki and Busler (2010) concluded that BIs play a key role in economic development by helping young companies to survive and grow regionally. In developing countries, such as Kuwait and other GCC member states, BIs can help in developing local economies, creating jobs, creating new firms, cultural transformation, and promoting technology transfer. Furthermore, Chen (2011) stated that the main reason for the existence of a BI is that owners of NTBFs could face many difficulties in relation to successful commercialization due to their small size and inexperience.

Currently, there are many innovation incubators in existence around the world. They are connected with innovation universities, institutes, governments, businesses, and others, and support innovators and students, Al-Mubaraki and Busler (2012) stated that an innovation incubator is designed to be a laboratory to encourage innovation primarily through the use of technology. In the same context, Özdemir and Şehitoğlu (2013) reviewed many studies in the literature on the importance of incubators and found that in recent years BIs have come to be considered as a tool to shape and create new businesses, to avoid businesses failures, and to create a viable innovative and entrepreneurial sector in developed and developing countries.

Elmansori (2014) defined business incubation as a tool for fostering and strengthening innovation and entrepreneurship, so businesses that have been through an incubation programme are more likely to succeed in the long term. In this regard, the incubator programmes in the United Arab Emirates (UAE) and Jordan are designed to accelerate the successful development of entrepreneurs and their businesses through the provision of supporting resources and services. Launching

incubation programmes is important for technology innovation and exporting technology-based products. Furthermore, Whitt (2014) stated that a business incubation system can provide access to entrepreneurial firms, and facilitate entrepreneurial access to markets, capital, technology, training, networking, facilities, and shared services. He also defined an entrepreneur as a specialized learner needing special facilities and training. In light of this definition, the BI can be defined as a specialized school that provides access to training, networking, and counselling to improve the sustainability and profitability of their clients.

Also, Mahmood et al. (2015) stated that BIs provide support to start-ups firms to help them to survive and grow during their early stages with new technological innovations and by integrating a range of business services such as office space, access to financial resources, counselling and training, R&D and risk capital, presentation skills, and others. Moreover, BIs in rich countries help start-up companies, especially nascent companies, to develop their own businesses. On the other hand, universities play a very good role in motivating graduates to become entrepreneurs, and these entrepreneur graduates together with BIs help can reduce the unemployment rate and increase the number of jobs by creating new start-ups through incubators (Al-Mubaraki & Busler 2013; Gozali et al. 2015).

According to Lose and Tengeh (2015), nowadays many studies have confirmed that the concept of incubation has enabled a number of developed countries to initiate business policies that support economic development and sustainable economic growth, and to convert those policies into business, which is an important step in minimizing unemployment. Also, Mahmud and Hilmi (2015) found that many previous studies have identified the vital contribution that SMEs make to employment, GDP, rural development, and overall economic development. As an example, in Malaysia, the contribution of SMEs to economic development is projected to generate more than 99.2% of total business establishments, a 41% share of GDP, a 62% share of employment, and a 25% share of total exports by 2020. Incubator goals and objectives have been summarized by NBIA (2015), where the main goal of the BI is to produce successful start-ups that will leave the program financially viable and freestanding. These graduate start-ups have the potential to create jobs, revitalize

neighborhoods, commercialize new technologies, and strengthen local and national economies. Furthermore, BIs help entrepreneurial companies in their development, enabling them to survive and grow during the start-up period, when they are most vulnerable.

In the email interviews conducted by the researcher, some key persons highlighted the importance of incubators, especially in Palestine. As an example, the president of Palestine Technical University – Kadoorie in Palestine stated that incubators offer students and faculties an opportunity to seed their creative/innovative ideas/projects and test their eligibility to be transformed into start-ups. In Palestine, this is significant as it will serve to create new opportunities especially in a country where unemployment among youth has reached appalling levels. Furthermore, the chief executive officer (CEO) of Glow Innovations in Palestine stated that the solution to the high unemployment rate, especially among youth who represent more than 50% of population, and the existing socio-economic and geopolitical restrictions and other factors caused by the occupation, the limited and small market as well as the connected and donor-dependent economy lies with SMEs and developing an innovation/knowledge economy.

Also, the CEO of Enterventures in Palestine stated that creating a new culture of entrepreneurship and starting one's own business due to the high unemployment rate could also help in developing an ecosystem that includes equity-fund vehicles for investment for early stage financing. Furthermore, the accelerator manager of Arabreneur in Palestine also added that entrepreneurship is the key to the success and evolution of the Palestinian economy, and also for the Middle East and North Africa (MENA) region. However, entrepreneurs lack the know-how and the technical skills, so they need mentorship, guidance, and door-opening assistance not to mention seed money that can help them to boost their business. Incubators provide that kind of support, helping entrepreneurs to structure their businesses, build their business plans, create their team, and gain access to seed money. By the end of the incubation period, each entrepreneur should have his/her own clear innovative idea, some may have a prototype or a beta product, and a team, and he/she should also have a clear idea of the next steps he/she needs to take to launch his/her start-up.

Also, the incubator manager at Palestine Polytechnic University (PPU) stated that most of the BIs in Palestine coordinate the development of education and entrepreneurship so that young and ambitious people are empowered to lead their post-conflict society into prosperity. Also, the university business incubator supports the development of start-ups by providing them with advisory and administrative support services. To produce successful and financially viable firms that could survive on their own, the early incubators focused on the ICT field, but newer incubators work with a combination of industrial and service companies across diverse industries.

Thus, a business incubator is a tool that can support entrepreneurs in establishing their start-up companies which then create more jobs. According to the NBIA, what can be achieved in business by entrepreneurs in three years can be achieved in only one year with support from a business incubator. Also, the success rate of new start-ups is higher through incubation (NBIA 2015).

2.4 SUCCESS FACTORS AND MODELS OF INCUBATOR SUCCESS

Before discussing success factors, it would be useful to refer to the definition of the critical success factors (CSFs) and the key performance indicators (KPIs). In order to create high levels of performance of any organization or project, the management needs to take care about the CSFs of this organization or project, which are representing the areas that are vital to its success. CSFs have proved an important value for linking qualitative and quantitative aspects of processes and organizations. While, KPIs represents the level of successfulness of organizations or projects from various perspectives (Jahangirian et al. 2017).

Furthermore, Flourishing (2015) website summarized the difference between CSFs and the key performance indicators (KPIs) as follows: CSFs are the cause of success, whereas KPIs are the effects of actions. Therefore, if the CSFs can be identified, and the KPIs are also properly identified, then KPIs should be met or nearly achieved. Thus, CSFs represent what one must do in order to be successful, and KPIs represent what indicates that one is winning.

Also, Flourishing (2015) added, that the use of KPIs can be strict or loose, where strict means that there is a determination of a baseline, for example as a KPI, there is a baseline for sales of a specific reaching $10k in a month, so if the target of $10k sales in that product line is reached in a month, the KPI is being met. On the other hand, loose means that the data trends should be watched to determine whether the indicator is performing better, for example, sales data for a specific product line during a month can be watched because it is a clear indicator of performance.

Theodorakopoulos et al. (2014) stated that researchers have focused on identifying the key success factors for business incubation. Key success factors are defined as the main dimensions of a firm's operations that are necessary to its success, so key success factors must work together consistently to ensure that incubated firms are successful, and these factors can vary across industries, product lines and other dimensions of strategic relevance (Rockart 1978; Dickinson et al. 1984; Lumpkin & Ireland 1988; Lee & Osteryoung 2004; Vij & Jhanji 2013).

2.4.1 Incubator Success

Success can be defined in terms of lease space and in terms of the entrepreneur's ability to meet monthly expenses. Success has also been defined in terms of tenant company expansion and the company's ability to eventually stand on its own. Furthermore, the success of the TBI in this regard depends on how the incubator is designed and managed (Smilor 1987; Olaopa & Siyanbola 2012).

Reviews of the literature on business incubation have found that many different success criteria and case studies have been used. For instance, Theodorakopoulos et al. (2014) found that early research focused primarily on case studies, defining the physical facilities for business incubators and best practice in particular industries, these case studies are not enough to adopt in other countries and have some difficulties in defining what constitutes success, that needed to conduct more and more studies.

However, researchers face the same problem in measuring the indicators of incubator effectiveness as they do in assessing the effectiveness of BIs, Molnar (1997) stated that in order to realize the power of measuring incubator impacts there must be a widespread and standardized benchmark for performance in the industry. Al-Mubaraki and Schröl (2011) concluded that very few studies have used the same measures, which makes it difficult to compare the results, and most studies on incubator outcomes have focused on showing the appropriateness of the measures and performance indicators. Furthermore, Özdemir and Şehitoğlu (2013) concluded that one of the main problems in assessing the impact of BIs is that although there is a vast amount of empirical studies on the performance of BIs, there is still a lack of consensus on how to measure the performance of business incubation, and there is no one standard method to measure performance, which makes it difficult to measure incubation performance and make comparisons.

Some studies on BIs and TIs discussed the effectiveness indicators in the same way as success factors. For example, Lish (2012) found that many BIs and TIs measured their success by the number of jobs created, the number of incubated companies that raised capital, the increased tax revenue and the number of incubated companies that generated profits. On the other hand, some university incubators defined success as the number of university-developed technologies that turned into a commercial success. Furthermore, other types of incubator defined success by the number of companies that graduated from the incubator. All these abovementioned factors and definitions are measures of success from the standpoint of the incubator.

Another example of a study that sought to measure the success and effectiveness of incubators was that conducted by Al-Mubaraki and Schrödl (2012), who tried to identify and assess the critical dimensions of business incubation in the GCC. They proposed a model for measuring the effectiveness of business incubation that combined the Hackett and Dilts (2004) success factor model and their own BI effectiveness measurement model (see Figure 2.7), which they created based on the literature in order to discuss the GCC model in the international context. They found that if the incubator has well-defined goals for graduation (i.e. an exit policy), then graduation rates could be a useful tool for tracking incubator success. The big bold

arrows in Figure 2.7 represents the relationship between the measurement factor and the success factor, for example, in order to increase the jobs creation by incubators, the mentoring and business assistance intensity in the incubation process should be increased.

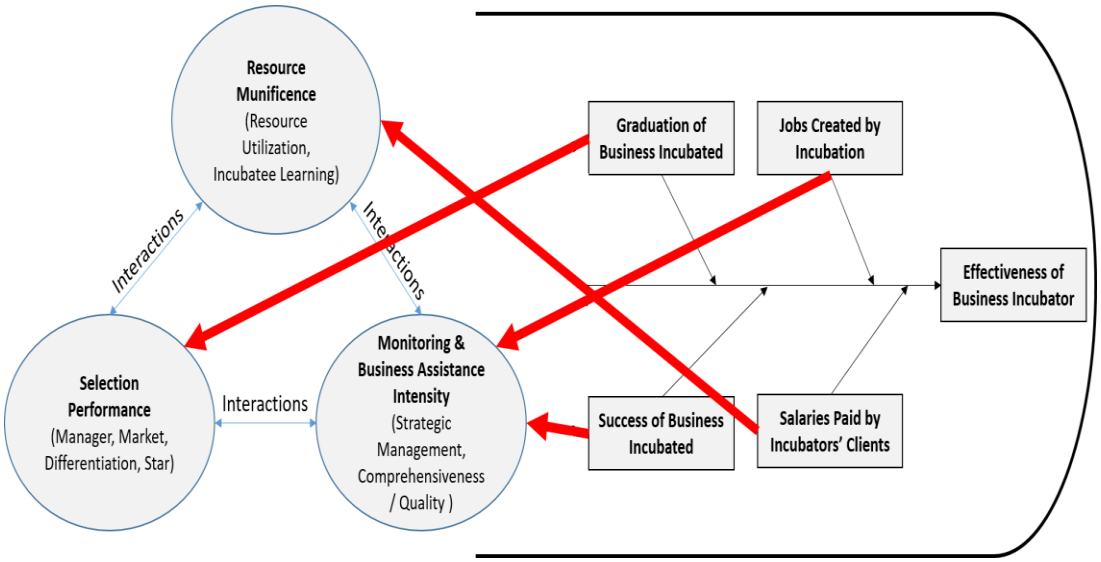

Figure 2.7 Measuring the effectiveness of business incubation model

Source: (Al-Mubaraki & Schrödl 2012)

2.4.2 Previous Models of Incubator Success

The following paragraphs review some studies that used different key success factors, models, and case studies in different periods of time starting from 1985 until the present day in different countries and regions throughout the world.

Research work conducted by Campbell et al. (1985), which they developed a framework that considered the first linkage of the incubator-incubation concept in the business development process of incubator tenants, as shown in Figure 2.8. To make the incubation process create value, this framework suggests consideration of four dimensions: the diagnosis of business needs, the selection and monitored application of business services, the provision of financing, and the provision of access to the incubator network. This framework was useful because it suggested for the first time how different the components of, and activities within, the incubator are applied to facilitate the converting of a business proposal into a viable business. Although this

model was the first suggested model in the incubation field, this framework assumes that all incubator tenants succeed, and this framework description was guided to the private incubators only.

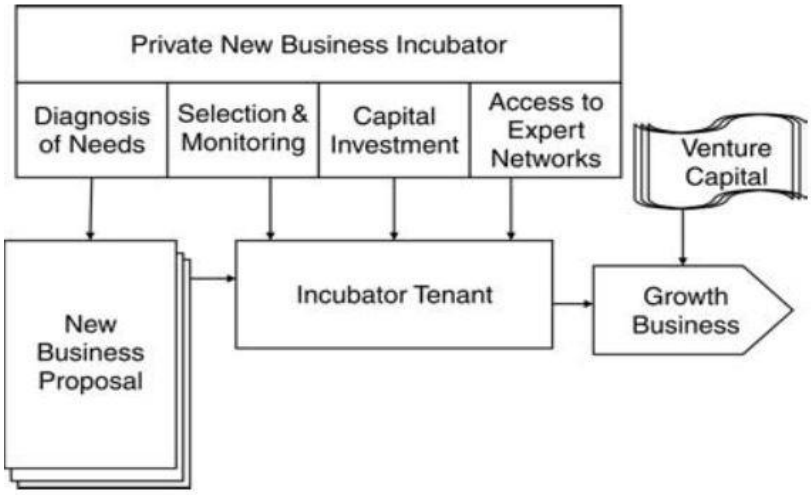

Figure 2.8 Incubation concept framework

Source: (Campbell et al. 1985)

Another important research in this field was conducted by Smilor and Gill (1986). They used a lot of CSFs in a study on business incubation in the USA to examine the effectiveness of the concept of business incubation. As shown in Figure 2.9, they identified the key factors to incubation success as access to financing and capitalization, the perception of success, in-kind financial support, community support, entrepreneurial networks, on-site business expertise, entrepreneurial education, ties with a university and a concise programme with clear policies, procedures and milestones, and selection process for tenants. They found that there is a direct correlation between successful incubation and the extent to which incubators implement each of these factors. That is, if the incubated tenants apply these factors in a good way, they will be successful. The advantage of selecting this model, because it combines all important success factors in any incubation process, starting from resources and services, selection policy, funding, networking, and others. However, in this model do not focus on the management side and its culture, and the mentoring process for incubated tenants.

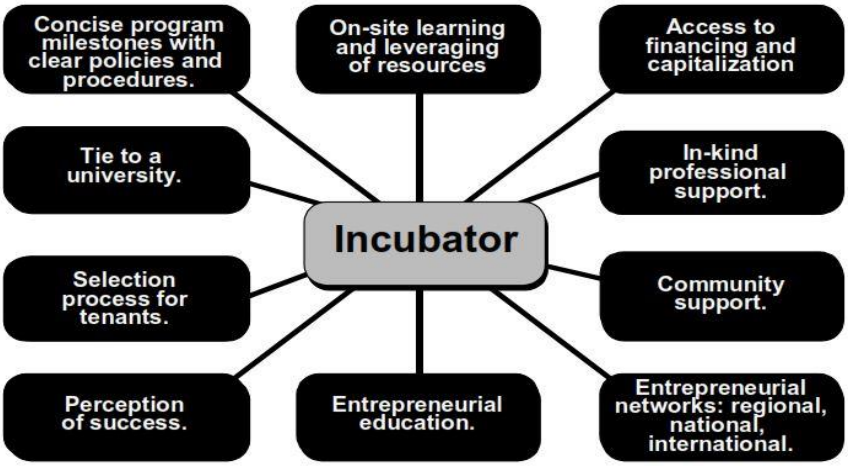

Figure 2.9 Key factors of the incubation success

Source: (Smilor & Gill 1986)

The later research study conducted by Wiggins and Gibson (2003) provides a general overview of business incubation in the USA, by means of a case study conducted on the award-winning Austin Technology Incubator which generated more than USD1.4 billion and more than 3000 jobs, and depending on Smilor (1987) framework. They concluded that BIs must accomplish five tasks well in order to succeed: establish clear metrics for success, provide entrepreneurial leadership, develop and deliver value-added services to member companies, develop a rational new company selection process, and ensure that member companies gain access to the necessary human and financial resources. In order to succeed in the future, the authors suggested balancing the need to diversify holdings while developing sector-specific expertise, making decisions more in the best interest of the start-up client than the incubator and its funding owners, and focusing on providing value-added services, networks, and overall support. Figure 2.10 displays the basic components of TIs in the USA. One of these components is the main services offered by incubators, such as capital, administration, know-how, networking, and facilities. These services are very important for incubator success.

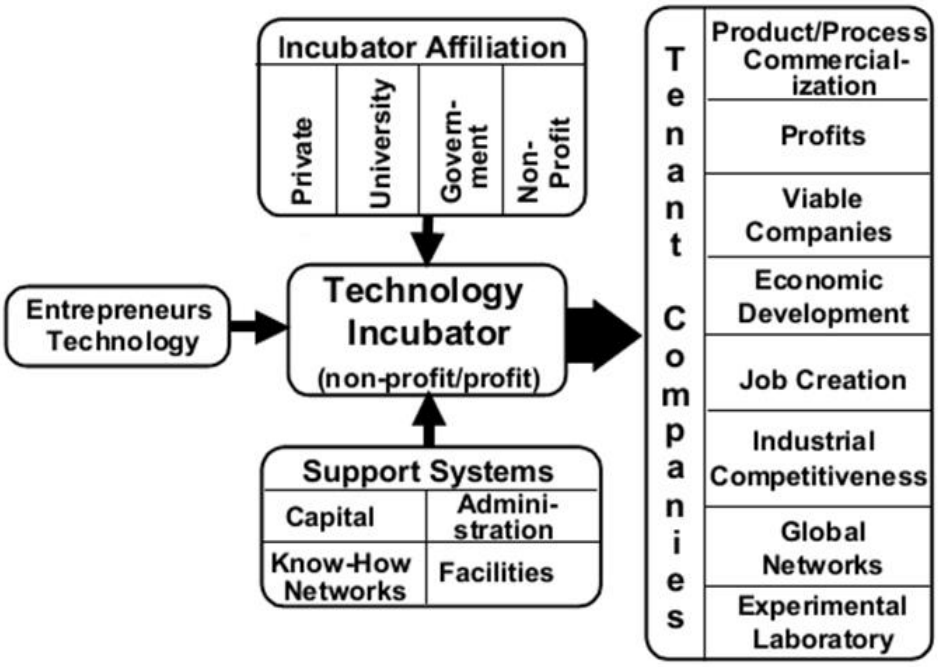

Figure 2.10 Components of technology incubators in the USA
Source: (Wiggins & Gibson 2003)

Verma (2004) conducted an empirical study of 31 Canadian BIs using a prior model using six success factors (shared services, facilities and location, funding and support, incubator governance, mentoring and networking, and entry and exit policies) to test the success of BIs using a combined of two moderators: the age and the size of the facilities, as illustrated in Figure 2.11. The findings showed that the shared services, facilities and location, mentoring and networking, and entry and the exit criteria factors are positively affecting the success of BIs. This model considered an a-prior model of incubator success factors, that represents the theoretical framework for incubator success factors. The primary importance of this model is its dependent variable, which measure the degree of success of incubators, and includes the most viable incubator success factors. This model did not consider entrepreneurial culture for incubator staff or tenants, and also the use of any ICT technology tools.

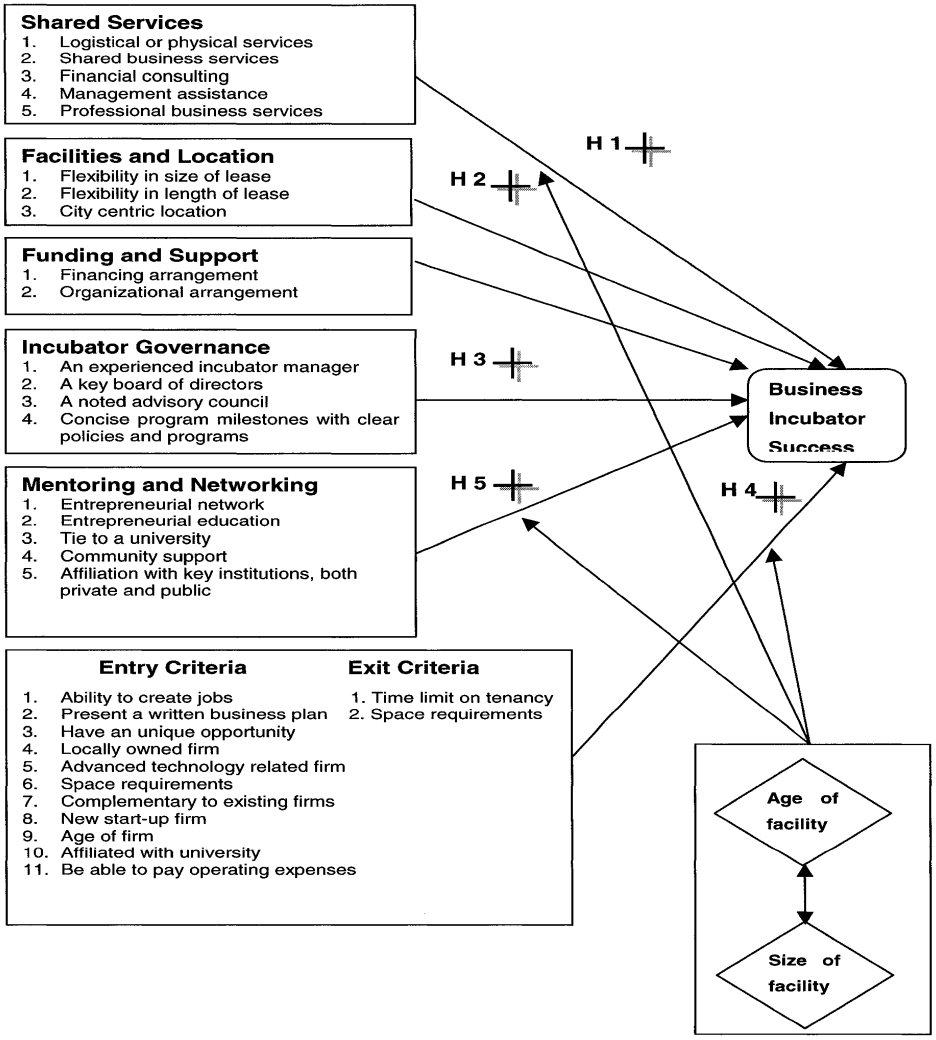

Figure 2.11 The success of business incubators model

Source: (Verma 2004)

Hackett and Dilts (2004) used a real options-theoretic reasoning to develop a base theory of business incubation in order to explain how BIs and the incubation process increase the probability of success for the incubated tenants in the early stages of their business life cycle. In order to achieve that aim, they used a success factor model in an incubation process, which is shown in Figure 2.12 and which depends mainly on three factors: resource munificence, selection performance, and monitoring and business assistance intensity. This model has many implications for managerial practice and policy-making as it can help incubator managers in managing their incubators and show them good practices to use in order avoid entrepreneurial failure. This model represents the incubation process used in incubators. It starts with the selection of the incubatees from a pool of incubation candidates. The chosen

candidates are provided with many services and resources, including monitoring and assistance, especially in the early stage of their development. In the model, the term ‘outcome’ refers to the survival or failure of the incubatee after exiting the incubator. Controls include regional differences in economic dynamism, level of incubator development and incubator size. The arrows in the model indicates the relationships among the constructs. This model is a theoretical study, that needs for future case studies to identify the drivers of incubation performance in different countries and in different incubators types.

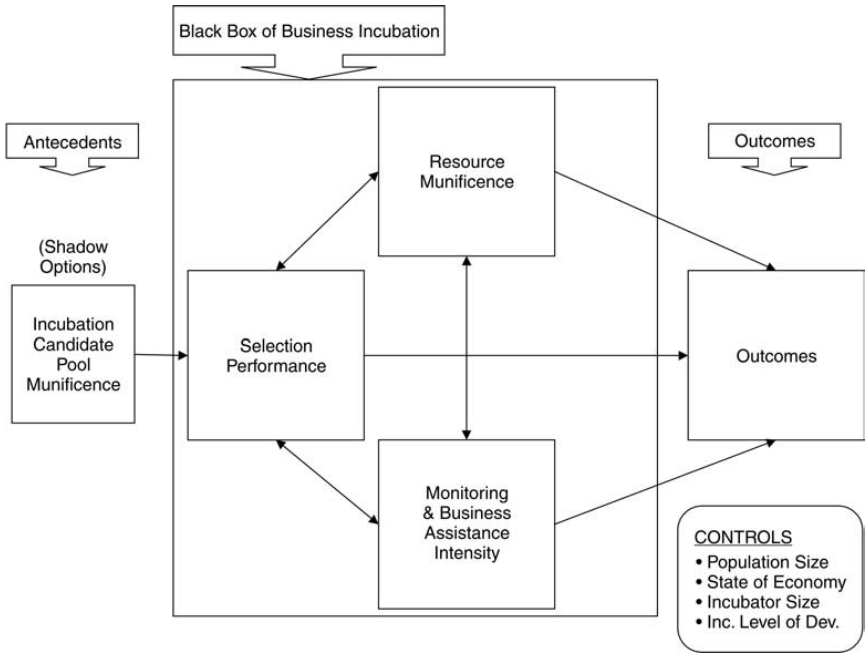

Figure 2.12 Incubation process model

Source: (Hackett & Dilts 2004)

Voisey et al. (2006) examined the impact of a business incubation project (incubation success) on developing and supporting the incubated entrepreneurial projects within Wales. This study was interesting because it helped these business incubations projects to identify valid and achievable generic success measures, based on the graduate teleworking initiative (GTi) experience and a detailed investigation of alternative business incubators. This study used an individual case study methodology which evaluates all aspects of the GTi project. Also, a range of qualitative and quantitative methods was utilized to capture the views of aspiring entrepreneurs. This paper looks at additional ways to measure the success of this type of project, based on

a study of the current academic literature. This study used many success factors found in the literature such as shared office space and resources, selection policy, mentoring, entrepreneurial leadership, incubator governance, and networking. This study still has to conduct more case studies in order to generalize the incubation success model and to study more important success factors such as access to fund and offered ICT tools.

Bergek and Norrman (2008) also suggested another success model. The importance of this paper, that it is developed a basic framework identifying best practices of incubator models and for more rigorous evaluations of incubator performance (the model is not attached to the original paper). This model suggested different dimensions such as selection, marketing, mentoring, training and coaching, networking, funding, and technology. The study conducted using case studies of 16 Swedish incubators, resulting in six model categories. The findings of this study confirmed that all suggested dimensions were positive and can support incubator performance from different perspectives. This model conducted on a small sample of incubators in Swedish, in order to approve their perspectives, different studies and different methods should be conducted in different countries and other different types of incubators to compare the results. Also, other dimensions should increase the performance of incubators especially in this period of times such as the entrepreneurial culture and use ICT tools offered.

In the same context, Khalid et al. (2012) proposed a tested model in order to improve the general understanding of business incubation in Malaysian ICT incubators (the model diagram is not mentioned in the original paper). The model used four dimensions of the business incubation process: selection performance, monitoring and business assistance, resource allocation, and professional management services. The model was tested on a total of 118 incubatees from ICT incubators in Malaysia by using an online survey questionnaire. The findings showed that these four dimensions are significant predictors of business incubation performance, which is considered to be good information for policymakers, managers, and incubatees in order to improve incubation management practices for third-generation incubators. This model improves the general theoretical and practical understanding regarding the ICT incubators performance in Malaysia and provides a validated basis for future research

regarding one of the most important types of incubators at this time period, thus leading to the possibility of creating a successful generation of ICT start-ups that supported by incubators. This model is not supporting networking services as one of the important tools in the ICT infrastructure, and also does not support any resource of the funding resources, which is supposed to increase the chances of incubators success.

Also, Lish (2012) created a conceptual model that examined the influence of various antecedents of the business incubation process, as shown in Figure 2.13. The study was an empirical study conducted among North American BIs. The model used eight factors to test the effectiveness of incubators: fit applications, informational, human, physical, financial, organizational, legal, and relational networks. The research findings indicated that networks of professional services such as legal, marketing, and management information system advice have the most significant impact on incubator effectiveness. Also, the process of selecting clients is very important for finding the most suitable incubatees. Furthermore, resources such as management resources, training, and links can impact incubator success, but only in terms of how they are related to professional service resources. On the other hand, the physical and age characteristics of an incubator, networking activities among incubator clients, virtual incubators, accelerators, and innovation centres lending support were found not to affect incubator success. The study used secondary data from the NBIA, which surveyed more than 1100 incubators in North America and received 218 valid answers. This study is an exploratory Ph.D. study, developed a conceptual model examines the influence of various antecedents of the business incubation process. The strong point of this conceptual model that it is containing the most important success factors that were used in the incubators history. This study did not consider the staff entrepreneurial culture and the use of the professional ICT tools. Furthermore, this study depended on an existing dataset. This dataset did not contain enough observations about some kinds of important data such as jobs created, revenue, and capitalization, which are considered as true indicators of incubator effectiveness.

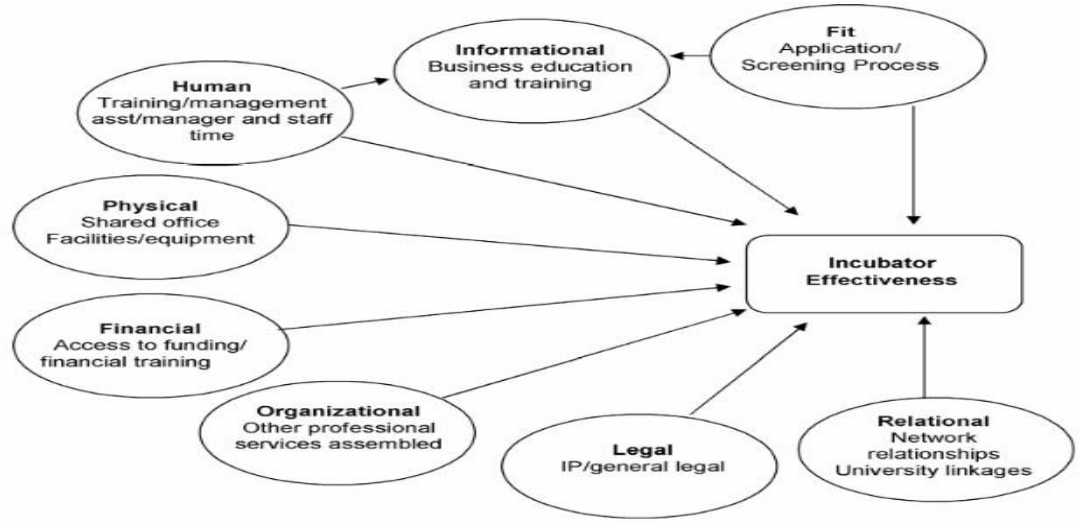

Figure 2.13 Conceptual model of incubator effectiveness

Source: (Lish 2012)

Similarly, Lin et al. (2012) conducted a study to determine the relative importance of various factors in enhancing the service performance of incubators in BIs in China. Their study analysed the relationship between incubators' resources and capabilities by using an incubator resources and capabilities model, as shown in Figure 2.14. In this mixed method study, the authors found that in order to improve incubators' performance, incubators should invest in their infrastructural and external resources, and networking capabilities. Furthermore, the study also found that government policy resources such as funding does not affect incubator performance, while other integrated service capabilities have a small correlation with improved incubator performance.

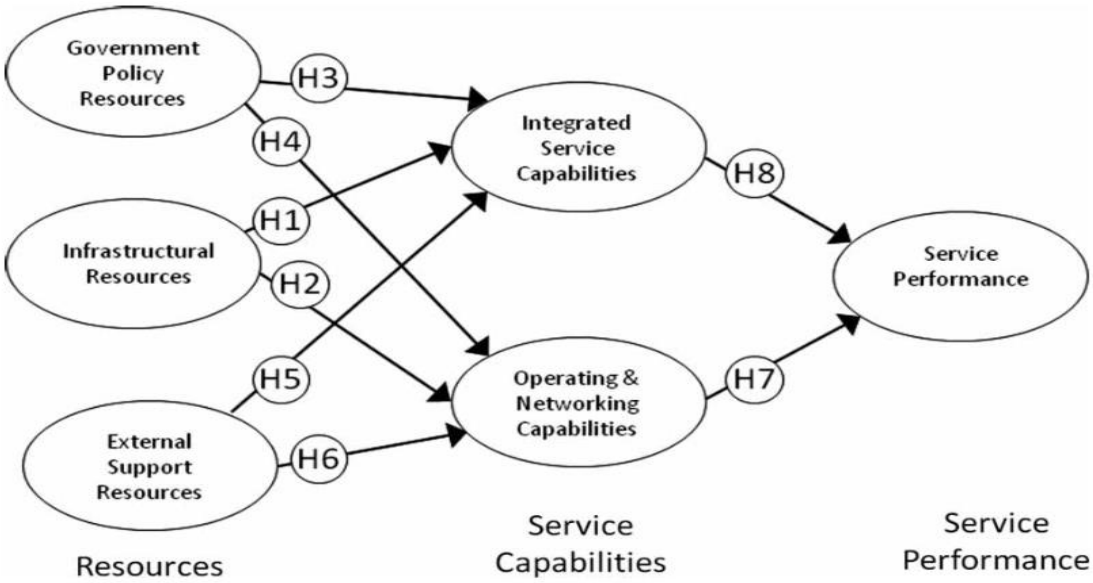

Figure 2.14 Incubator resources and capabilities model

Source: (Lin et al. 2012)

Al-Mubaraki and Busler (2013) conducted 10 case studies on incubators in various countries around the world including the United Kingdom (UK), France, Sweden, Austria, Jordan, Morocco, Bahrain, Saudi Arabia, China, and Indonesia, in order to analyse and discuss the reasons for success and to identify similarities and differences (shown in Figure 2.15) in incubators worldwide. To do this research they used a model that consisted of five dimensions selected from 12 incubation models that were based either on a European model, Middle Eastern model, or Asian model. The five dimensions were the number of graduate firms, incubator goals, incubator services, incubators funded year and incubator types. To compare incubators in terms of the incubator services dimension, they used many services such as facilities, finance, networking, advisory services, and mentoring, among others. Figure 2.15 summarizes the findings of the analysis of the similarities and differences between the 10 case studies based on the five key dimensions stated above. The importance of this study, that it discusses and analyses many successful case studies worldwide, and it is identifying the important similarities and differences of case studies worldwide. This comparing study will give an important clear picture about incubators status worldwide, because it contains some case studies from developed and developing countries (especially the Middle East countries) which can be approved that the incubation process and activities are nearly similar in all incubators worldwide. This

study did not measure the number of incubated firms, the level of funding and grants for each incubator, and also the level of using ICT tools.

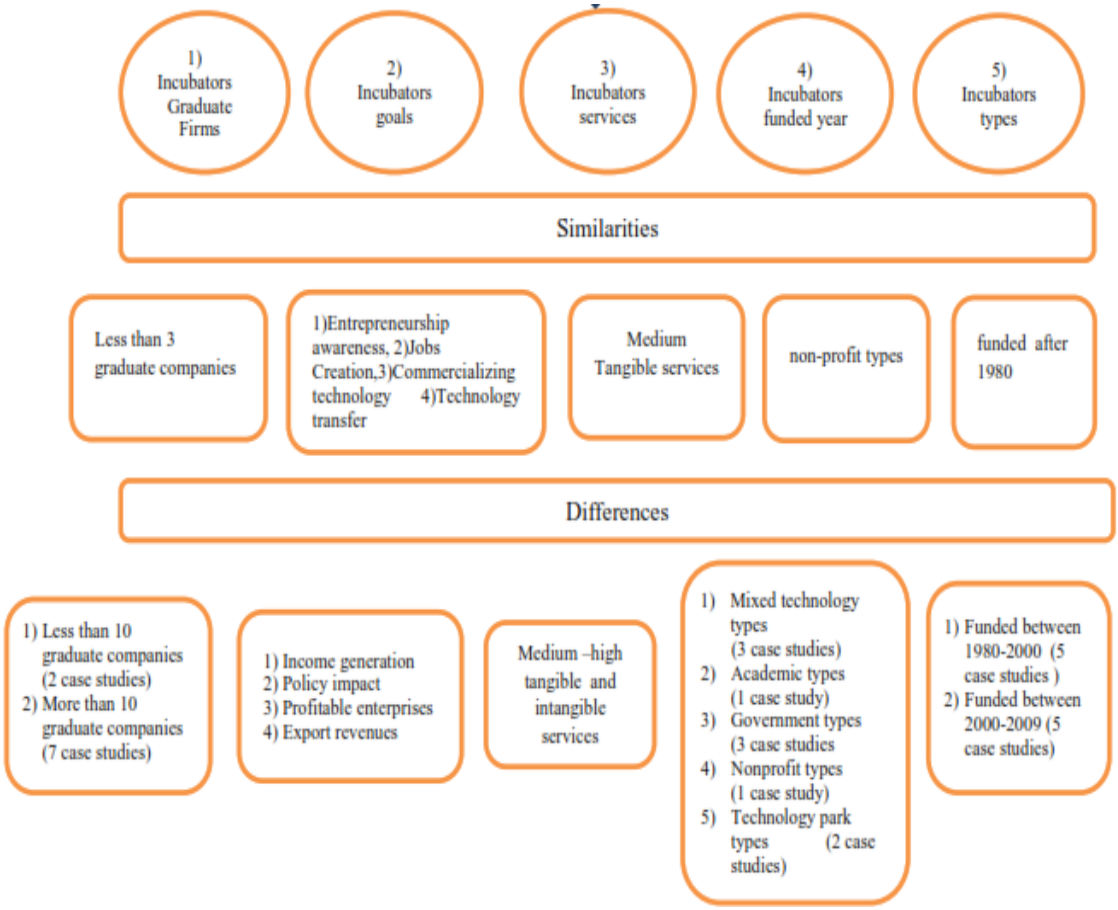

Figure 2.15 Similarities and differences among case studies for five key dimensions
Source: (Al-Mubaraki & Busler 2013)

In a similar vein, Elmansori (2014) conducted a comparative case study of BIs in Jordan and the UAE in order to determine whether the economic conditions and business strategy in Arab countries are suitable for business incubation or not, and to suggest some directions for establishing and implementing more business incubation activities. The research analysis was organized around three sets of variables: the first set of variables described the incubator target groups, financial models and target sector of the BIs; the second set of variables covered the selection process; and the third set of variables focused on services and performance outcomes, selection and graduation and impact. The findings showed that businesses that have been established through an incubator programme are far more likely to succeed in the long term. Also, the incubator programmes in the UAE and Jordan are designed to

accelerate the successful development of entrepreneurs and their businesses through an array of support resources and services. And finally, launching an incubation programme is important for the technology innovation ecosystem and for exporting technology-based products. This paper conducted in order to determine whether the economic conditions and business strategy in the Arab countries are suitable for business incubation. Jordan was one of the tested countries, which the economic situation and the level of the living are very similar to Palestine situation that supposed to give a clearer picture about incubators success and activities in Palestine. This case study is not enough to judge on the incubators in the Arab countries because there are still many dimensions should be taken into the consideration, such as the technology, level of funding, and the survival rate for the incubated businesses.

Theodorakopoulos et al. (2014) presented a literature review paper that gave a critical assessment of the literature on business incubation effectiveness in order to apply a situated theoretical perspective to how business incubation management can provide an environment that supports the development of incubatee entrepreneurs and their businesses. Their study was very useful, that starting from beginning earlier incubators study until recently. This study compared and discussed incubators success models and case studies in different developed and developing countries including Arab countries. Their study summarized more than 65 papers and extracted all the success factors used. The papers were distributed between the years 1985 and 2014. This study was useful, but still, need to develop new models containing these found factors, then to apply these models on the reality ground in deferent developing countries in order to measure the effectiveness of these factors on the success of incubators. The main success factors and the number of papers in which they were used were as follows:

i. Shared office space and resources (13 papers)
ii. Incubatee selection policy (19 papers)
iii. Exit/graduation policy (18 papers)
iv. Incubator governance (managers' competencies) (12 papers)
v. Monitoring performance (11 papers)

vi. Support services management such as know-how, advice on regulations, technology, R&D support, networking internal and external, and access to funding (43 papers).

Inanga and Azih (2014) is one of the most useful and important study. This study proposed a new model that measures the performance effectiveness of Technology Incubation Centre (TIC) on the development of SMEs in Nigeria (see Figure 2.16), by determining the causes of increasing failure rate of graduated SMEs which have been ignored by many other studies. This study used many methods in order to collect the data needed and analysis, these methods are questionnaires, in-dept-interviews, participant observation, descriptive statistics, and the balanced scorecard. The sample for this study consisted of 30 graduated entrepreneurs selected randomly for a period of 15 years. The study aims at identifying how a selection of simple processes and techniques by TIC can support the growth and development of SMEs during and after incubation. The findings of this study showed that the technology transfer program, networking and mentoring, physical space and other facilities, monitoring and reporting, advertisement and promotion, collaboration and benchmarking and fund-raising variables are all not to be effective in the performance effectiveness of TIC, while only information symmetry variable is effective in the performance effectiveness of TIC. In order to increase the success, this study needs to add other variables such as the corporate culture and to test this model on other types of incubators.

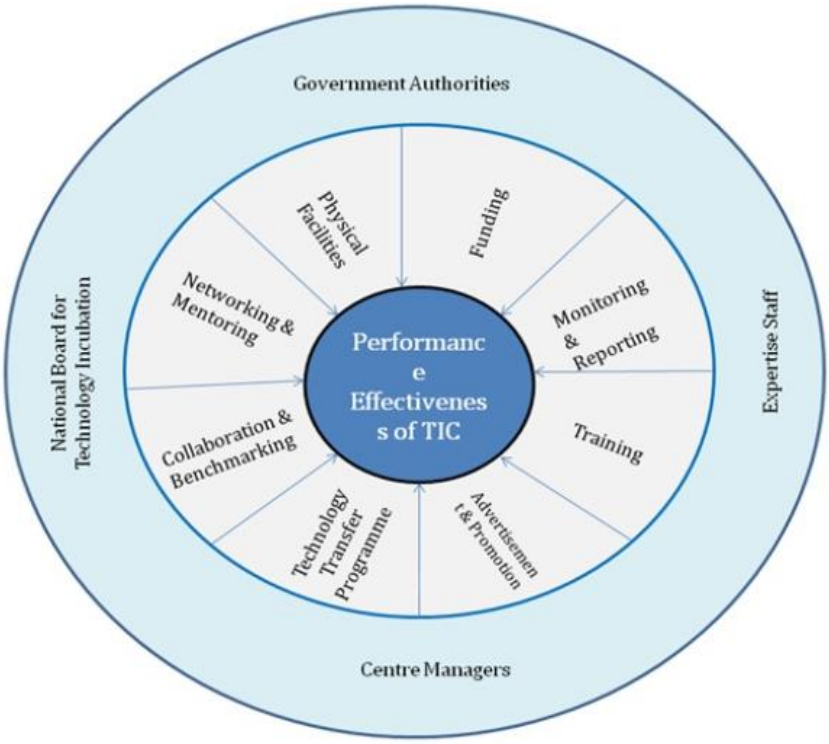

Figure 2.16 The conceptual model of the study

Source: (Inanga & Azih 2014)

Roseira et al. (2014) was useful study, because it is investigating the features of networking within networked incubators (NIs), which posting new ways of measuring incubator performance using many dimensions as business support, legitimacy/credibility, infrastructure, and networking (see Figure 2.17). Networking represents a cornerstone of entrepreneurial action that provides access to necessary resources and can be fostering incubation processes. This study conducted on the start-ups located in the science and technology park of the University of Porto (UPTEC). This study used a combination of qualitative and quantitative methodological tools including content and social network analysis, survey, interviews, and case study. The findings of this study showed that entrepreneurs have high expectations for the dimensions of legitimacy/credibility, infrastructure, and networking, and lower expectations regarding the business support provided by the incubator, and the other incubator support dimensions are impacting the value and effectiveness of the networking process within the networked incubator. This model still needs to add other important dimensions in order to increase the incubator success such as the ICT tools and the incubator staff culture.

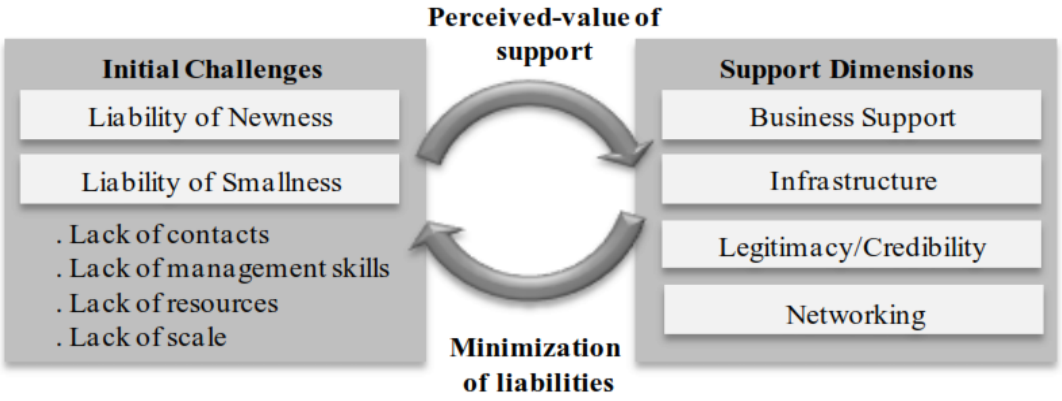

Figure 2.17 Potential of value-adding support by the business incubator

Source: (Roseira et al. 2014)

The importance of Cantu (2015) study, that it is investigating the new business model of incubator established on external networking orientation. This model (not stated in the original paper) approved the importance of networking services in incubators models, which considered one of the important drivers of new incubators' business model in the new generation of business incubators. This model applied a qualitative research and a case study approach using an Italian incubator. In total, 25 interviews were conducted via face-to-face, e-mail, video conference, and phone contexts: 12 with key referents of the ComoNExT Incubator network, ten with key referents of the ComoNExT TH network, and three with key referents of the H-FARM Venture Incubator. The findings of this study showed, that the business model of the service incubator is founded on value-added services among networking within incubatees as well as between start-ups and external actors. External networking and collaboration among incubators, incubatees, and several stakeholders, can undertake new entrepreneurial measures, explore new markets, and innovate constantly. Although this framework was useful, but it covers just one dimension of incubators success, and do not refer to the other important dimensions.

In a similar vein, Sungur (2015) presented a good framework to examine the effects of external networking activities of business incubators on the survival of incubated firms' performance (see Figure 2.18). This study conducted on business development centers (ISGEMs) in Turkey, which considered a kind of business incubator programs focusing on low-tech firms. This study used face-to-face surveys, conducted with totally 414 tenant firms in 12 ISGEMs in 10 provinces in Turkey. The

dimensions of the external networking activities that used in this framework are off incubator firms, university, external service providers, commercial unions, and financial institutions. This study also discussed another incubator success factors, that summarized in Table 2.1. The findings of this study showed, that in all networking categories, the firms which have networking ties with related actors have higher survival probabilities than firms which have not any networking activities. As the previous study, although this framework was useful, but it covers just one dimension of incubators success, and do not refer to the other important dimensions.

Figure 2.18 External networks of business incubators

Source: (Sungur 2015)

Carvalho and Galina (2015) was useful, because it presented a comparative case study using three virtuous triad services offered by BI: features, services, and networks, based on a model presented in the literature review, to enhance start-ups development in Portugal and Brazil, and compared these two countries with similar culture but with different levels of development for the first time (see Figure 2.19). This empirical study uses a qualitative research methodology using the interview method with 8 key informants' managers of BI, to study the role of BI in developing start-ups in Portugal and Brazil. These interviews include many dimensions: BI objectives, BI team management profile, selection and exit policy, prestigious perception, internationalization support, and the virtuous triad: infrastructure, business support, and networking. The findings showed that there are no particular differences between BIs in Brazilian and Portuguese, except in international profile of tenants due

to the market size, because most of the firms born global or plan to internationalize in Portugal. These findings depend on the wide services provided, networking platforms and support provided by BI staff individually to their tenants. These results provide some pieces of evidence to develop public policies suitable to entrepreneurial ecosystems. This case study is not enough to judge because there are still many dimensions should be taken into the consideration, such as the technology, the culture of incubator's staff and businesses management culture. And also, to conduct more case studies with a bigger number of the key persons and incubators' managers.

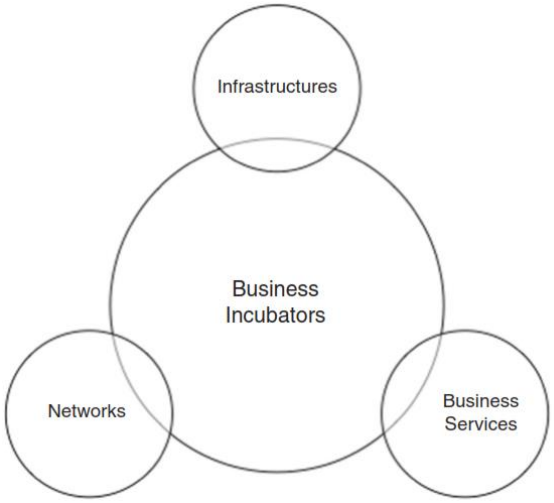

Figure 2.19 Virtuous triad model

Source: (Carvalho & Galina 2015)

Another business incubation performance model was used by Khalid et al. (2017) in a study on ICT incubators in Malaysia (see Figure 2.20). Their study presents a model of detailed contrasting outcomes predicated upon a number of success factors including selection performance, monitoring and business assistance intensity, resource allocation, and professional management services. The study aimed to identify and discuss the underlying components that have an impact on ICT incubation performance in Malaysia. A total of 180 participants were asked to respond to a questionnaire and 118 usable responses were received. The findings highlighted that a ‘one-size-fits-all’ approach is inappropriate. Also, the importance of the four abovementioned factors was confirmed. Moreover, it was found that the resources provided become less significant as incubatees become more profitable, while targeted professional management services increase in significance, and the need for capability

development also increases. This study was useful because it presents a new success model developed depending on the literature, then this model tested on the ICT incubators in Malaysia, in order to measure the performance of these incubators. Also, this model contains some of the important success factors used in the earlier studies. Although this study model was useful, still it needs to add another important success factors in order to make it completed, such as networking services, funding, and ICT tools, because ICT incubators are depending on these important factors to increase their success.

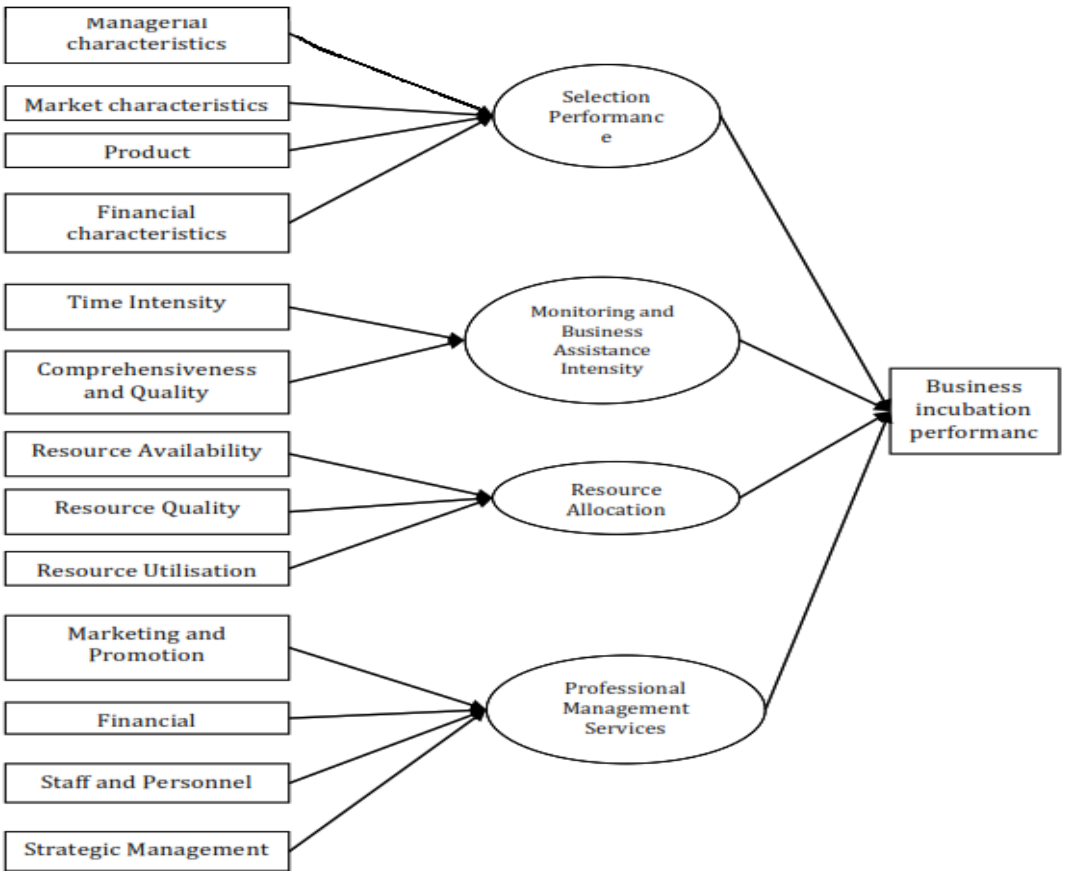

Figure 2.20 Conceptual framework of business incubation process

Source: (Khalid et al. 2017)

Furthermore, Blok et al. (2017) developed a new conceptual model of factors affecting the incubation process of new technology-based firms (NTBFs), as illustrated in Figure 2.21. Their study discussed the process of business incubation in terms of understanding management practices and interactions. The study was useful, because it was depended on a comprehensive literature review and empirical evidence

of management practices in BIs specialized in supporting NTBFs, in order to develop a new conceptual model of success factors that have a good impact on the incubation success of NTBFs. The findings showed that the six factors in Figure 2.21 affect the incubation process of NTBFs in a positive way, and the combination of these six factors helps BI managers to accelerate the learning curve of entrepreneurs and the start-up process for their firm, and to develop practices that really help entrepreneurs in the development of their NTBF. This study is not enough to judge on the new technology-based firms because it did not cover all technology-based firms and still need to study other important factors such as ICT tools and the entrepreneurial culture for the management of these firms and incubators staff.

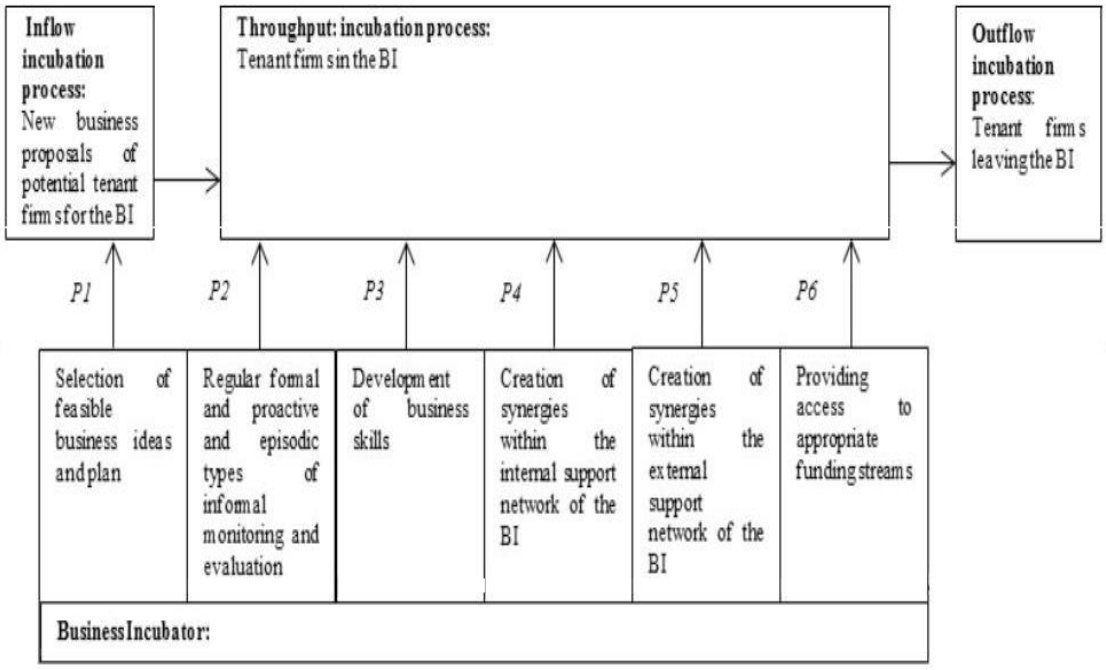

Figure 2.21 Conceptual model of factors affecting the incubation process of NTBFs

Source: (Blok et al. 2017)

Table 2.1 provides a summary of the success models, study region, study method, the reason for selecting these models, and success factors used in every model, that were identified in the reviewed literature.

Table 2.1 Summary of the success models identified in the literature

Success Model	Region	Method	Reason for Selection	Success Factors
(Campbell et al. 1985)	World Wide	Survey and case study	Considered the first linkage of the incubator-incubation concept in the business development process of incubator tenants	Selection policy, mentoring, diagnosis of need, networking, and funding
(Smilor & Gill 1986)	USA	Survey and many case studies	This model is combining all important success factors in any incubation process, starting from resources and services, selection policy, funding, networking, and others.	Selection policy, mentoring, networking, know-how, and funding
(Smilor 1987)	USA	Survey, interviews, case studies, and observations	Considered one of the most comprehensive efforts at identifying and explaining the various components of the incubation system, that enhanced the Campbell 1985 model and solve its weakness.	Shared office space and resources, business expertise, incubator and governance
(Wiggins & Gibson 2003)	USA	Case study	This study provided a general overview of business incubation in the US using a case study on one of the most awarded winning technology incubators in Austin, that has generated revenue more than UDS1.4 billion and created more than 3,000 jobs	Shared office space and resources, selection policy, mentoring, incubator governance, networking, know-how, and funding
(Verma 2004)	Canada	Survey, and phone interviews	This model represents the theoretical framework for incubator success factors	Shared office space and resources, selection policy, exit policy, incubator managers competency, mentoring, networking, and funding
(Hackett & Dilts 2004)	World Wide	Survey and case study	This model used a real options-theoretic reasoning to develop a base theory of business incubation process, that has many implications for managerial practice and policy-making as it can help incubator managers in managing their incubators and show them good practices to use in order avoid entrepreneurial failure	Shared office space and resources, selection policy, and mentoring
(Voisey et al. 2006)	UK	Case study and survey	It helped BIs projects to identify valid and achievable generic success measures, based on the graduate teleworking initiative (GTi) experience and a detailed investigation of alternative business incubators.	Shared office space and resources, selection policy, mentoring, entrepreneurial leadership, incubator governance, and networking

To be continued ….

…. Continuation

(Sahay 2008)	World Wide	Survey and case study	The useful of this study	Access to market, incubator governance, networking, and funding
(Bergek & Norrman 2008)	Swedish	Case study	This study developed a basic framework identifying best practices of incubator models and for more rigorous evaluations of incubator performance	Selection policy, advertisement, access to market, training and coaching, networking, funding, advice on regulations, and technology
(InfoDev 2009)	Developing Countries	Survey and interviews	These success factors tested in many different developing countries.	Shared office space and resources, selection policy, mentoring, training and coaching, networking, and funding
(Khalid et al. 2012)	Malaysia	Survey	This model improves the general theoretical and practical understanding regarding the ICT incubators performance in Malaysia and provides a validated basis for future research regarding one of the most important types of incubators at this time period, thus leading to the possibility of creating a successful generation of ICT start-ups that supported by incubators.	Shared office space and resources, selection policy, and mentoring
(Lish 2012)	North America	Case study depended on the NBIA surveyed data	This study is an exploratory Ph.D. study, developed a conceptual model examines the influence of various antecedents of the business incubation process. The strong point of this conceptual model that it is containing the most important success factors that were used in the incubators history.	Shared office space and resources, selection policy, incubator manager competency, networking, know-how, and funding
(Al-Mubaraki & Busler 2013)	World Wide	Multi-case studies and literature review	It discusses and analyses many successful case studies worldwide, and it is identifying the important similarities and differences of case studies worldwide. This comparing study will give an important clear picture about incubators status worldwide, because it contains some case studies from developed and developing countries which can be approved that the incubation process and activities are nearly similar in all incubators worldwide	Networking, funding, advice on regulations, and R&D

To be continued ….

…. Continuation

(Elmansori 2014)	Jordan and UAE	Survey and Interviews	This paper conducted in order to determine whether the economic conditions and business strategy in the Arab countries are suitable for business incubation. Jordan was one of the tested countries, which the economic situation and the level of the living are very similar to Palestine situation that supposed to give a clearer picture about incubators success and activities in Palestine.	Selection Policy, exit policy, and funding
(Theodorakopoulos et al. 2014)	World Wide	Critical assessment of the literature	This study was very useful, that provided a critical assessment of the literature on business incubation effectiveness, starting from beginning earlier incubators study until recently. This study compared and discussed incubators success models and case studies in different developed and developing countries including Arab countries.	Shared office space and resources, selection policy, exit policy, incubator manager competences, mentoring, networking, know-how, funding, and advice on regulations
(Inanga & Azih 2014)	Nigeria	Questionnaires, interviews, and participant observation	Proposed a new model that measures the performance effectiveness of Technology Incubation Centre (TIC) on the development of SMEs in Nigeria, by determining the causes of increasing failure rate of graduated SMEs	Shared office space and resources, mentoring, advertisement, collaboration and benchmarking, training and coaching, networking, funding, and technology
(Roseira et al. 2014)	Portugal	Case study, interviews, and survey	It is investigating the features of networking within networked incubators, which posting new ways of measuring incubator performance using many dimensions	Shared office space and resources, legitimacy and credibility, incubator governance, networking, funding, and technology
(Cantu 2015)	Italy	Case study and interviews	The importance of this study, that it is investigating the new business model of incubator established on external networking orientation. This model approved the importance of networking services in incubators models, which considered one of the important drivers of new incubators' business model in the new generation of business incubators.	Shared office space and resources, mentoring, collaboration and benchmarking, training and coaching, incubator governance, and networking

To be continued ….

…. Continuation

(Sungur 2015)	Turkey	Face-to-face survey	It is a good framework to examine the effects of external networking activities of business incubators on the survival of incubated firms' performance on business development centers in Turkey	Shared office space and resources, collaboration and benchmarking, networking, and funding
(Carvalho & Galina 2015)	Brazil and Portugal	Interviews and literature review	It presented a comparative case study using three virtuous triad services offered by BI: features, services, and networks, based on a model presented in the literature review, to enhance start-ups development in Portugal and Brazil.	Shared office space and resources, mentoring, training and coaching, incubator governance, networking, and funding
(NBIA 2015)	World Wide	Survey and interview	This success factor was presented and tested by NBIA in many case studies in different countries.	Incubator manager competences
(Khalid et al. 2017)	Malaysia	Survey and literature review	This study was useful because it presents a new success model developed depending on the literature, then this model tested on the ICT incubators in Malaysia, in order to measure the performance of these incubators. Also, this model contains some of the important success factors used in the earlier studies.	Shared office space and resources, selection policy, and mentoring
(Blok et al. 2017)	Europe	Comprehensive literature review and empirical evidence, survey, and interviews	This study was useful, because it depends on a comprehensive literature review and empirical evidence of management practices in business incubators, in order to develop a new conceptual model of success factors that have a good impact on the incubation success. Also, this study was directed to the new technology-based firms.	Selection policy, mentoring, business expertise, networking, and funding

Table 2.2 provides a summary of the success factors that were identified in the reviewed literature.

Table 2.2 Summary of the success factors identified in the literature

Success Factors	Authors
Selection Policy	(Campbell et al. 1985; Smilor & Gill 1986; Wiggins & Gibson 2003; Hackett & Dilts 2004; Verma 2004; Voisey et al. 2006; Bergek & Norrman 2008; InfoDev 2009; Khalid et al. 2012; Lish 2012; Elmansori 2014; Theodorakopoulos et al. 2014; Blok et al. 2017; Khalid et al. 2017)
Networking Services	(Campbell et al. 1985; Smilor & Gill 1986; Wiggins & Gibson 2003; Verma 2004; Voisey et al. 2006; Bergek & Norrman 2008; Sahay 2008; InfoDev 2009; Lish 2012; Al-Mubaraki & Busler 2013; Inanga & Azih 2014; Roseira et al. 2014; Theodorakopoulos et al. 2014; Cantu 2015; Carvalho & Galina 2015; Sungur 2015; Blok et al. 2017)
Shared Office Space and Resources	(Smilor 1987; Wiggins & Gibson 2003; Hackett & Dilts 2004; Verma 2004; Voisey et al. 2006; InfoDev 2009; Khalid et al. 2012; Lish 2012; Inanga & Azih 2014; Roseira et al. 2014; Theodorakopoulos et al. 2014; Cantu 2015; Carvalho & Galina 2015; Sungur 2015; Khalid et al. 2017)
Funding and Financial Support	(Campbell et al. 1985; Smilor & Gill 1986; Wiggins & Gibson 2003; Verma 2004; Bergek & Norrman 2008; Sahay 2008; InfoDev 2009; Lish 2012; Al-Mubaraki & Busler 2013; Elmansori 2014; Inanga & Azih 2014; Roseira et al. 2014; Theodorakopoulos et al. 2014; Carvalho & Galina 2015; Sungur 2015; Blok et al. 2017)
Mentoring Services	(Campbell et al. 1985; Smilor & Gill 1986; Wiggins & Gibson 2003; Hackett & Dilts 2004; Verma 2004; Voisey et al. 2006; InfoDev 2009; Khalid et al. 2012; Inanga & Azih 2014; Theodorakopoulos et al. 2014; Cantu 2015; Carvalho & Galina 2015; Blok et al. 2017; Khalid et al. 2017)
Incubator Governance	(Smilor 1987; Wiggins & Gibson 2003; Verma 2004; Voisey et al. 2006; Sahay 2008; Roseira et al. 2014; Carvalho & Galina 2015; Obaji et al. 2016)

As regards the theories that are used in BI models, various studies have stated that there are very few theories that have been developed for measuring the success and effectiveness of incubators. For instance, Weick (1995) in his article stated that there are not many implicit and explicit studies conducted with regards to theorizing about incubators and incubation in the literature. Also, Bergek and Norrman (2008) stated that, still, there is a lack of a theoretical base studies evaluating incubator performance and identification the best practices. This view is also supported by Hackett and Dilts (2004) and Theodorakopoulos et al. (2014), whom concluded that the newness of the field means that almost all the studies in the literature are exploratory and descriptive with little attention devoted to theory-building.

2.4.3 Summary of the Literature and Selection of Factors

Following the call for conducting more practical research on business incubation processes and incubators success, this study investigates the factors that are affecting the success of incubators, in order to develop a new success model that can enhance incubators success, especially in the developing countries. There is a large faith and huge amounts of money are investing in incubators, for that, the identification of best practice incubator models is very important.

To formulate the research questions for this study, many important points were taken into consideration, regarding selecting the suitable success factors. These points are:

Firstly, all discussed models in this section contains some reasons of not recommending these models to be adopted in some the Middle East countries as discussed before each model, such as some models not included some important factors that supposed to enhance the incubators success in the Middle East countries such as ICT tools and the corporate culture which are strongly connected with incubators' success as stated in many studies found in the literature, and recommended by Palestinian incubators' experts. Also, some of these studies were conducted on some types and some case studies of incubators, not on all types, which need to conduct more studies in order to improve the validity of these models. others developed theoretical models, which is not tested on the real ground. Furthermore, some of the models were conducted in specific countries which can vary from country to country depending on the situation on the ground. Also, some of the studies were too old and cannot be valid in this time period, but it was selected in order to approve that some base success factors were valid in different time periods and still until now.

Secondly, during searching the literature, different studies in different time frames, different regions (such as developing countries, Arabs countries, and the Middle East countries), different incubators' types, and different studies' methods were taken into account in selecting the success models.

Thirdly, as many factors have been used in the literature over the years due to the growth in the existence of BIs all around the world, only the most relevant success factors were selected by taking into consideration the special context and situation of Palestine and some of the Middle Eastern countries. For example, the success factor, funding and financial support, can be used a lot in developing countries such as Palestine and some of the Middles Eastern countries because of the bad economic situation and the wars that are underway there, but it may not be used as a success factor as much in developed countries that have a good economic environment.

Fourthly, as mentioned in the literature, the main success factors for first-generation incubators were related to the physical facilities and infrastructure of the incubators (Roseira et al. 2014; Cantu 2015; Carvalho & Galina 2015), but nowadays as we mentioned above, the focus has shifted from tangible aspects (which can be easily offered) to intangible aspects (which are not so easy to provide), such as business development process support, networking, management experiences, and so on.

Fifthly, Gozali et al. (2015) pointed out that the Department of Cooperative and Small Enterprises and the Ministry of Cooperative and Small and Medium Enterprises of Indonesia stated that a basic incubator must offer the following: space, shared office facilities, services such as management counselling (marketing, finance, production, technology), support in terms of business R&D and access to technology usage, skill development (training, business plan formulation, management training), seed capital and assistance in gaining access to capital from financial institutions, and the synergy which leads to the creation of an adequate business network, both local and international. As regards this definition and the definition of the incubation process derived from the literature, the factors selected by this research covered almost all of these phases of the incubation process and the incubator’s functions.

Finally, to the knowledge of the researcher based on a screening of the literature, corporate culture has not been used before as a success factor for incubator success. After a deep discussion with some incubator experts in Palestine, there are two main reasons why the researcher was encouraged to include corporate culture in

the model proposed in this research. First, as mentioned above, to date corporate culture seems not to have been used as one of the key success factors of incubator success, but it was recommended as a success factor by key individuals in Palestinian incubators during the email interview phase of this study. Second, most of the activities of an incubator are very similar to those of a corporation or organization (Verma 2004; Cantu 2015; Mian et al. 2016). Moreover, as found in the literature, innovation and entrepreneurship are one of the important outcomes of the incubator, and there is a very strong relationship between innovation and culture in any corporate body or organization because culture is very important in encouraging people to use corporate resources in an innovative way, and any corporate innovation needs a culture that supports it in order to force employees to let go of old values and beliefs and instead adopt new ones, which is not an easy task (Blank 2015).

Moreover, there are two ways to assess the development of an organization's culture. The first one is through measurement and the second one is by determining the relationship between the organizational culture and corporate performance (Cui & Hu 2012). In addition, this study stated that many types of research study in many countries have examined the positive relationship between organizational culture and corporate performance, and this relationship is very important to increase the performance of the organization. Another relation between innovation and culture was examined. This relationship is very strong in any company or organization, because it influences how people use company resources in an innovative way. In addition, the same study adds that innovation in any company is not just about the company's resources, technology, acquisitions, or people; there also needs to be a culture to support it and which can force employees to let go of old values and beliefs and instead adopt new ones, which is not an easy process (Blank 2015). Another study supported the importance of the organization culture is stated by Umrani et al. (2017), this study found that organizational culture plays an important role in developing some competitive advantage to ensure enhanced organizational performance.

2.5 SUCCESS FACTORS ASSOCIATED WITH INCUBATOR SUCCESS IN THIS RESEARCH

In the previous section, several factors were identified that can be used to predict incubator success. This section discusses and defines the most relevant factors discovered in the literature review, which are used for the development of the research model proposed in this study.

2.5.1 Selection Policy

One of the most important processes in the success of a business incubator is how the incubator selects the firms it wishes to help, and this may vary with the mission and objectives of the incubator. In Campbell et al. (1985), the proposed business incubator model suggested that the selection and monitored application of business services are one of the four areas where incubators/incubation creates value.

Any incubator that seeks to be successful and to build sustainable companies must have good selection policies and rules in order to evaluate, recommend, and select tenant firms. The criteria for tenants selecting which include: the ability to create jobs, pay operating expenses, present a written business plan, have a unique opportunity, be a start-up company, be locally owned, have fast-growth potential, and be high technology related. Admission into an incubator is approved by the board of the incubator, the incubator manager, and the selection committee (Smilor 1987).

In the same year, Merrifield (1987) introduced three questions for selecting candidates for incubation. The first two questions are the basis for the constructs relating to business attractiveness and fit. The two questions directed to the incubation applicant are: “Is this a good business in which anyone should be involved?” and “Is this a business in which [the applicant] organization has the competence to compete?” The third and final question is: “What is the best method for entry and/or growth?” This question addresses the issue of whether the business is considered as an attractive and good fit.

According to Hackett and Dilts (2004), a selection policy is concerned with how an incubator identifies new ventures that are weak but promising from those that cannot be incubated. As regards the selection criteria for incubatees, Hackett and Dilts (2004) states that they vary and differ between business incubators and that there is no agreed set of general effective criteria. It has also been claimed that one of the basic findings of incubator/incubation research is that variability in the incubatee screening and selection process can lead to the incubator and/or incubatee failure (Kuratko & LaFollette 1987). Furthermore, Bearse (1998) compared the selection of incubatees and the selection of students for admission to Harvard University. He asked whether Harvard students succeed because of what Harvard does to them, or because Harvard selects only students who will succeed regardless of what Harvard does to them? Furthermore, Autio and Klofsten (1998) stated that scholars stress the importance of having a good fit between incubatee needs and the incubator business assistance services provided.

As regards the responsibility for and the method of assessing new tenants, Elmansori (2014) found that, in the case of Jordanian business incubators, the selection process is often organized based on the project and the clients, using several criteria that depend on the role of each incubator, and the selection team usually includes the incubator manager, staff, and committee. Some of the selection criteria used by Jordanian incubators are personal attributes, idea feasibility, personal characteristics, project applied-idea, profitable business and qualification of tenants. Whereas, in the UAE, the selection criteria are new business, ideas level, market size, competitive advantage and new idea. Moreover, the selection team is usually comprised of the managers or the partners of the incubator.

Francesco Schiavone et al. (2014) divided the selection process into two types of approach. The first one focuses on the idea and mainly relies on a deep understanding of the drivers of the new venture’s business profitability, such as the product, market, and competition. The second approach focuses on the entrepreneur and relies on the evaluation of the motivations, skills, competencies and personality of the entrepreneur candidates themselves.

In the same context, Carvalho and Galina (2015) states that the incubator selection is mostly done through the incubator website, or by using the Canvas model to transform an idea into a business model, and in some cases is complemented by some financial statements.

2.5.2 Networking Services

Currently, due to the development and spread of ICT, networking is considered to be one of the most important factors in the success of incubators, firms, tenants, and businesses. In Campbell et al. (1985), the proposed business incubator model includes the provision of access to the incubator network as one of the four areas where incubators/incubation creates value.

Incubators support tenants and entrepreneurs to achieve their business objectives. Entrepreneurship is a dynamic process that requires links or relationships not only among individuals, but also among a variety of institutions. Through networking, the entrepreneur has access to more opportunities and will have a greater chance of solving his/her problems expeditiously, which will give him/her the chance to succeed in his/her new venture (Smilor 1987). In support of this viewpoint, Hansen et al. (2000) states that networking is less dependent on specific individuals or entrepreneurs' personal connections; rather, it can be expanded to include numerous companies or other entities such as regulators, policy-makers and research institutions in many different sectors.

In Johannisson (2000), networking is defined as interconnected dyadic relationships, where these relationships are considered as a group of nodes that may take the form of roles, individuals or organizations. Hence, different network types can be defined by expressing different nodes (actors) and different relationships. Thus, according to this definition, business networking can be referred to as a set of two or more connected business relationships or firms (Kajikawa et al. 2010).

As regards the importance of networking, it has been argued that the entrepreneurial network can provide links and relationships that can promote and

sustain a new venture in an incubator (Smilor 1987). Networks are crucial for the survival and growth of new ventures and SMEs as they provide information, knowledge and expertise as well as reduce the uncertainty that firms face (Collinson & Gregson 2003). In the incubator literature, network provision. both internal and external, is identified as one of the most important components and thus has received particular attention (Bergek & Norrman 2008). Moreover, networking is considered as a cornerstone and mechanism for entrepreneurial businesses, and for nurturing relationships that provide access to necessary resources that can be fostered as part of incubation processes and promote business relationship building before the start-ups need these (Roseira et al. 2014).

In the same context, networking enables entrepreneurs to evaluate with other entrepreneurs, get inspiration, develop common ideas and assess the performance of their business, and it can also strongly promote performance through innovation for commercialization and internationalization, inspiration, idea development, business development and assessment, knowledge sharing, skill acquisition, identification of core competencies and Blue Ocean, structured business process, increased market share, and scientific research (Inanga & Azih 2014). Furthermore, Sungur (2015) considers networking services to be one of the most important elements of the incubation process.

Depending on the previously mentioned networking importance, especially external networking with other companies and businesses, Smilor (1987) classified networking into the following categories: the entrepreneurial network, tied to a university, community support, and affiliation with key institutions both public and private. On the other hand, Sungur (2015) classified external networking activities into five categories: off-incubator firms, university (laboratories, academia, conferences, libraries, etc.), external service providers, commercial unions, and financial institutions.

2.5.3 Incubator Resources and Services

Considered one of the most important factors for the success of any incubated company, this factor relates to matters such as office space at favorable rents and access to a pool of shared resources such as receptionists and secretaries, meeting rooms, conference rooms, and car parking. These resources and services are offered by incubators at an inexpensive cost to reduce overhead costs and have received special attention in the literature. Also, these resources are essential to create shared leisure spaces to encourage tenants to integrate and maximize the potential collaboration and the free exchange of ideas. (Adkins & Association 2002; Lalkaka 2003; Bergek & Norrman 2008; Commission 2014; Carvalho & Galina 2015)

Physical resources such as physical space and furniture are considered one of the important services offered by an incubator especially in the beginning of incubators' establishing, and are continuing currently with other supporting services. According to Carayannis and Von Zedtwitz (2005), access to physical resources such as the office space, furniture, and computer networking are one of the central services to incubation process. Also, Theodorakopoulos et al. (2014) stated that business incubators have to provide tenants with affordable office space and a group of support services both through internal and external affiliates to increase the probability of business survival. Verma (2004) divided resources and services offered by incubators into five main dimensions which were adopted in this study model: business support, physical, financial consulting, management assistance, and professional business services.

In Elmansori (2014), it is stated that incubators for small businesses provide physical facilities such as office, warehousing, and manufacturing space, common loading docks, a shared board or meeting space, kitchen facilities, and a common reception area, including a shared copier, fax, audio-visual equipment, and often times computers. Moreover, Gozali et al. (2015) reports that the Department of Cooperative and Small Enterprises, and the Ministry of Cooperative and Small and Medium Enterprises of Indonesia state that space and shared office facilities are basics that all incubators should provide.

2.5.4 Funding and Financial Support

Accessing and securing funds is the main target of incubators, and this was especially in the past when incubators first appeared. Funding supports business tenants that have a good idea but do not have enough money and know-how to achieve their aim. Incubators offer access to funding through their network of contacts and also offer financial training support in addition to offering actual funding, and some incubators can offer access to a range of governmental funding sources (Campbell et al. 1985; Kuratko & LaFollette 1987; Grimaldi & Grandi 2005).

In their BI model, Campbell et al. (1985) stated that the provision of financing is one of the four areas where incubators-incubation creates value. Thus, access to financial resources is one of the key factors in the survival of most start-ups, and consequently for business incubation it is also one of the incubator effectiveness factors (Campbell et al. 1985; Grimaldi & Grandi 2005; Lish 2012). In the same context, O'Neal (2005) added that incubators are designed to provide resources, expertise, and access to financial resources in order to increase the odds that a new business will succeed, it means that it will be subsequent economic benefits gained by the sponsoring entity. Furthermore, admission to an incubator may offer the tenants a degree of credibility that enhances the possibility of getting future investment, besides giving them access to a network of financial resources.

Incubators financing depends on private or public sponsors, but the primary forms of income for incubators may come from rent and service fees. Private sector sponsors include corporate funding and direct donations. Public sector sponsors include federal, state, and local governments (Allen 1985; Allen & Rahman 1985; Verma 2004).

Incubators can be classified into four organizational types: (1) for-profit private or corporate, which are concerned with full incubation rather than job creation potential and have less focus on the entry criteria for tenant firms and are less likely to limit tenants' residency due to the financial risk associated with tenants' turnover; (2) not-for-profit public or government, which focus on job creation and economic

development and limit the duration of tenant residency; (3) academic or educational institutions; and (4) hybrid public/private partnerships (Allen 1985; Brooks 1986; Allen 1988; Peters et al. 2004; Verma 2004).

In the conceptual model of incubator effectiveness proposed in Lish (2012), many indicators are used to measure the factor of access to finance, such as the ability to access angel investors or an angel network, the ability to access venture capital investors, the ability to access in-house investment funding, help in accessing commercial loans, help with accounting or financial management, help in accessing specialized funds, and economic literacy training.

As reported in Gozali et al. (2015), according to the Bank Indonesia, lack of seed capital support means that incubators cannot do their job well, and it is considered one of the factors that is increasing the development of incubators in Indonesia. It was also found that a significant number of in wall tenants cannot obtain seed capital even though their business is feasible. With respect to the above, the Department of Cooperative and Small Enterprises, and the Ministry of Cooperative and Small and Medium Enterprises in Indonesia stated that seed capital and facilitating capital access to a financial institution are basic concepts that the incubator should provide.

2.5.5 Mentoring Services

Mentors or advisors are senior men and woman who have different perspectives and important career experiences that can influence people in the early phases of their professional life, and they play a different role than peers or consultants (Lichtenstein 1992). Mentoring is very important because knowing one’s tools is not enough, entrepreneurs need to be trained and taught how to “play the game” and how to utilize their tools effectively. In two incubators investigated by Lichtenstein (1992), entrepreneurs expressed a need for mentoring from mentors and incubators’ managers, so they could obtain new ideas and feedback-peers, which considered the most effective way for entrepreneurs to develop their needs and ideas.

In De Beer (2012), mentoring is defined as a process of informal communication, usually face-to-face and over a sustained period of time, between a mentor (a person who is perceived to have greater relevant knowledge, wisdom, or experience) and a tenant who is perceived to have less to transfer in terms of knowledge, social capital, and psychosocial support. He also added that mentoring processes offered as service support in the incubators environments, which includes the provision of both career support and psychosocial support.

In the same context, Matlay et al. (2012) summarized the differences between mentoring and coaching. On the one hand, the method of learning is essentially the same, but mentoring differs from coaching because mentoring helps entrepreneurs to grow as people (rather than providing them with specific skills to address specific needs) so that they widen their personal horizons and also teaches them how to be entrepreneurs in a much more general sense by improving decision-making, change management, identification of new opportunities, networking skills, etc. Also, mentoring is not a business relationship; it is voluntary for the most part, and more effective for both parties than cognitive.

In the same year, based on an in-depth analysis of the literature Ahmad (2012) connected mentoring with the definition of incubation. He stated that incubation can be described as a process of mentoring designed to help young entrepreneurial firms to grow rapidly in a controlled environment and to acquire skills to reduce the prospect of failure once they cease to be incubatees. Finally, he summarized what mentoring is in the following key points: ongoing relationship that can last for a long period of time; can be more informal and meetings can take place as and when the mentee needs some advice or support; more long term and takes a broader view of the person; mentor is usually more experienced and qualified than the mentee; often a senior person in the organization who can pass on knowledge, experience and open doors to otherwise out-of-reach opportunities; focus is on career and personal development; agenda is set by the mentee, with the mentor providing support and guidance to prepare the mentee for future roles; and revolves more around developing the mentee’s professional abilities.

Many studies mention that mentoring is one of the important newer services that incubators offer to tenants. Lalkaka (1996) found that in incubator services in the USA, tenant networking and mentoring are the components most in demand among university faculty members and business executives, and that these components are seen as facilitating strategic partnerships and securing temporary staff. Furthermore, Verma (2004) used mentoring and networking as a success factor in his theoretical framework.

Office sharing, financial support, business mentoring, coaching, and training are all important facilities and factors that are offered by incubators to support the life of new start-ups (Soetanto 2005). Also, Chan and Lau (2005) in one of their case studies stated that for the mentoring system to be effective and supportive, it requires, among other things, constant contact between the technology firm and the mentor, sharing experiences of the business development process, building a good relationship, and providing advice on solving problems the firm faces during the incubation process.

Davies (2009) stated that in any incubator the incubation programme should connect incubatees with local entrepreneurs via a mentoring programme where they meet each other every month or more or less frequently in line with the needs of the business. The mentors can be the local investors and must be selected carefully by the programme manager. Mentors can provide many services to tenants such as advice, guidance on planning, helping to determine goals and a timescale, ensuring that such objectives are being met, providing leads to business opportunities, and helping in writing progress reports and constraints that were faced. Dahleez (2009) concluded that mentorship is one of the popular services provided by TIs, and that mentoring programmes are used to link entrepreneurs with highly successful and experienced mentors who can provide advice and assistance to new ‘technepreneurs’ on a regular basis.

Also, Commission (2014) considered that the rental of physical space, mentoring, training, consulting in various areas, networking, and access to financing are just a few of the wide range of services that can be offered to entrepreneurs. Some

researchers also considered coaching, mentoring, and training as an important factor in the second stage of the incubation process (Giordano et al. 2010; Al-Mubaraki & Busler 2012; Commission 2014). Furthermore, Carroll (2014) who put an entrepreneurial and innovation ecosystem initiatives, stated that the effect of mentoring must be improved as a tool to support entrepreneurship, and he made some key points about how to do this.

For many years, the tangible elements of incubator resources were used as indicators for success, but recently the focus has shifted to intangible factors, such as entrepreneurial networking, mentoring, and coaching, which enhance access to various forms of capital, such as social, human, and financial (Theodorakopoulos et al. 2014; Tola & Contini 2015). Furthermore, Carvalho and Galina (2015) considers that mentoring is one of the important services that incubators can offer to entrepreneurs.

Mentoring is one of the services that are offered by many incubators around the world; many case studies and research studies in many countries have mentioned the mentoring as one of the important factors and/or indicators that can be used in assessing incubator success and performance (Mian 1996; Wilson 2008; Alsheikh 2009; Dahleez 2009; Hallam & DeVora 2009; Somsuk et al. 2010; Al Mubaraki & Busler 2011; Ahmad 2012; Al-Mubaraki & Busler 2012; Somsuk et al. 2012; Al-Mubaraki et al. 2013; Gertner 2013; Kemp 2013; M. Shepard 2013).

2.5.6 Incubator Governance

The management team and staff, are one of the most important parts of any organization in terms of success and competitiveness. For that incubator, governance is one of the most important factors in incubators success and efficiency. Many studies and studies considered incubator governance as one of the key success factors in the incubator's success and performance. Having an incubator governance structure is very important. This structure usually consists of an experienced incubator manager, a key board of directors, a noted advisory council, and concise program milestones with clear policies and procedures. This type of governance plays an important role in recommending, reviewing, evaluating, and selecting tenants (Allen 1985; Smilor

1987; Kumar & Kumar 1997; Verma 2004; Grimaldi & Grandi 2005; Hannon 2005; Dee et al. 2011; Lish 2012; Obaji et al. 2013; Obaji et al. 2014; Cantu 2015; Shannxi 2016). Furthermore, in the same context, Obaji et al. (2014) added that incubator governance measures the importance of an experienced incubator manager, a key board of directors, a willing advisory board, clear incubation policies and programs and a proactive management team.

The executive board or board of directors usually consists of investors, financial contributors, business individuals, as well as experts and technical individuals who can help in setting policies. Also, for the advisory boards or the advisory council usually, consists of some individuals who have big interests in incubators' facilities more than incubators' policies (Allen 1985; Verma 2004).

The incubator manager is the key to the success of the incubator as he/she can assess when an incubatee needs critical help as opposed to life support (Dee et al. 2011). In Theodorakopoulos et al. (2014), states that in a university-based incubator, the incubator manager considers a high survival rate as the key criterion for success. On the other hand, the management team of a private incubator is concerned with the incubator's own investment in new companies and the team participates in all the aspects of the daily management of operational activities, whereas the management of public incubators acts as an intermediary (Grimaldi & Grandi 2005; Shannxi 2016).

Incubator owners or major sponsors are usually involved in many active and passive ways, such as in the form of financial support, advising tenants, taking an equity position with tenant companies, serving on the board of directors, and working as consultants to tenant companies. These types of involvement are the most common among privately and university-sponsored incubators (Verma 2004).

Incubator governance is very important in the incubation process because incubated companies always need to know what will be expected of them, how they should perform, how they will be evaluated, what the daily procedures, activities, and policies are, and what the incubator will provide. Moreover, any emerging company will experience problems and uncertainties. Whether and how rapidly incubated

companies develop depends on the relationship between the types of governance and the types of entrepreneur in the incubated companies (Smilor 1987; Verma 2004). Furthermore, incubator governance usually helps in fostering entrepreneurial learning in the incubated community and developing entrepreneurial competencies (Theodorakopoulos et al. 2014).

Incubator management must work, communicate and follow the incubator policies and procedures for dealing with entrepreneurs and incubated companies' development to help them minimize their difficulties, understand their program deadlines, know how their companies' performance will be evaluated, and find the right patterns for the business (Smilor 1987; Verma 2004; Cantu 2015). Thus, concentrating on intangible business services and employing qualified managers and support staff will increase the possibility of incubator success and help start-ups in creating, growing, and developing their business (Theodorakopoulos et al. 2014).

2.6 INFORMATION AND COMMUNICATIONS TECHNOLOGY (ICT)

This section discusses the information in the literature about the moderator of this study, namely ICT, and is divided into the following subsections on the definition of ICT, importance of ICT, relationship between ICT and start-ups, relationship between ICT and incubators, the background to and types of ICT tools, and opinions of Palestinian specialists about ICT incubators.

2.6.1 Definition of ICT

The term ICT is a combination of two terms: information technology (IT) and communications. Information technology refers to any computing technology, such as networks, hardware, software, communication devices, communication infrastructure, systems and solutions, and the internet. Nowadays, most companies have an IT department to manage every process involving computers, programming, web development, networks, and other technical areas of their business. Therefore, IT has become a part of our everyday lives (Almakenzi et al. 2015; TechTerms 2015).

Information and communication technologies allow access to information through telecommunications, so the term is similar to IT but is also concerned with communication technologies such as the internet, wireless networks, cell phones, voice over internet protocol (VoIP), video conferencing, social networking sites such as Facebook, and other communication mediums.

Modern ICT has created a global village, meaning that people can communicate with others in wherever they live. Therefore, ICT is studied in the context of how modern communication technologies affect society (TechTerms 2015). According to the European Commission, the importance of ICT lies less in the technology itself than in its ability to create greater access to information and communication in underserved populations (TechTarget 2015).

2.6.2 Importance of ICT

The creation and development of new businesses has been encouraged by ICT, which offers a value proposition based on its application in areas such as selling online, outsourcing, and competitiveness. Information and communication technologies are considered to be tools that can increase productivity and transparency across all sectors including agribusiness and tourism.

Therefore, using ICT in an effective way has become a core requirement for international competitiveness because it is critical in supporting and enhancing information sharing using new channels of communications instead of traditional ones. So business incubators play a critical role in providing access to these services in an effective way through the use of ICT tools and in teaching entrepreneurs and incubator staff how to use these tools and services effectively (InfoDev 2009).

Taylor (2015) stated that ICT can contribute significantly to economic growth, and SMEs are adopting ICT tools in order to support their competitiveness, profitability, and productivity. Also, Lee and Lio (2017) , in their empirical study, examined the impact of ICT development on venture creation through collecting and analysing cross-country data from the World Bank for the period from 2002 to 2014.

They found that the impact of ICT development on venture creation was positive, especially in middle/high-income countries, because of the richer complementary inputs to ICT and the fairer environments for business competition in these countries.

All the experts interviewed for this study agreed that ICT tools are very important nowadays in all parts of our life. Incubators depend on ICT tools to provide their services and to ensure the success of their incubated projects. Moreover, innovation depends on technology as it allows innovators to be more creative. In addition, ICT tools are very important and useful in all stages of the incubation process especially where there is a lack of human resources. These tools can help in reducing the incubation period of projects, which is important for incubation efficiency. Furthermore, ICT tools have become very important in today's digital world, and there are many ICT tools that are being utilized in the incubation process that affect the success of the incubated projects and the success of all types of incubators in general. Finally, most incubated projects that are currently being supported in Palestinian incubators are ICT based, so providing an appropriate space including a good range of good-quality ICT tools is very important for enhancing the success of these incubated projects.

2.6.3 ICT and Start-ups

Davies (2009) stated that ICT start-ups try to attract professionals with technology expertise more than personnel with business experience. The start-up environment can be more unfriendly in a developing economy, not least because the services required are often inadequate, inaccessible and expensive.

According to Almakenzi et al. (2015), which proposes a survivability model for Saudi ICT start-ups, there is a need to conduct more research on Saudi ICT start-ups to study their success factors. In addition, "ICT start-ups are important to the economy because they are needed in the progression of all industries. They required less investment and less time to implement than businesses in other fields."

2.6.4 ICT and Incubators

Khalid et al. (2012) stated that BIs are very important for the growth of ICT SMEs, and it is for that reason that the Malaysian government, like other countries, has established its own incubation programmes to catalyse the growth of ICT SMEs in order to become a developed nation by the year 2020. Furthermore, the authors mentioned that many researchers in the economic and entrepreneurship field have stated that business incubation is a very useful and effective strategy to employ in order to accelerate the growth and development of technology-based SMEs.

Furthermore, Obaji et al. (2012) argued that the use of a technology business incubation programme is a very good way to ensure the survival and promotion of businesses as well as an effective economic development strategy, especially for developing countries.

2.6.5 ICT Tools

It is very important to utilize and adapt ICT tools for organizational processes to increase the competitiveness of organizations, especially internationally. Since ICT applications are used by many people, their use can save a huge amount of time and money for organizations and improve the effectiveness of decision-making. These competitive advantages have long been known but have received renewed attention recently. According to Hoffman (1985), argues that adopting ICT tools can dramatically improve international competitiveness. Also, using ICT tools can help to extend an organization’s businesses and enable an organization to provide more comprehensive customer services and functions (Skibniewski & Nitithamyong 2004). Moreover, Bafoutsou and Mentzas (2002) adds that using ICT tools in organizational processes can save a huge amount of time and money by decreasing the need to travel, as well as improve the efficiency and effectiveness of decision-making.

Also, ICT tools are considered to contribute to increasing productivity and transparency across all sectors, such as agribusiness and tourism. Since the advent of the internet, the development of ICT has led to major changes in society because the

cheapness and affordability of the IT products facilitate access to information beyond national borders (Veronice 2015; Veronice et al. 2015).

Currently, information is a crucial part of any organizational process, for example, information about customers, market, competitors, procedures, products, etc., and the adoption of ICT tools can help organizations or companies to collect, process, store, and share that information (Lopez-Nicolas & Meroño-Cerdán 2009). For example, the use of search engines, databases, and networks in organizations can reduce the cost and effort associated with information searches and thereby improve organizational efficiency.

Furthermore, using ICT tools for virtual meetings, audio, video, images, presentations, etc. can help management and teams share information and documents in different places and countries, and enhance collaboration and teamwork (Abudayyeh et al. 2001).

Information and communications technology tools can be used in education in general and in an organization's educational endeavours. For example, many ICT tools and applications are used for preparing curriculums and presenting them, or for downloading courses from e-learning systems such as IT learning, Wattle, and Web CT, among others (Li 2012).

Earlier, ICT tools were classified into three categories: computer technology, the internet, and telecommunication. Currently, ICT is classified into hardware, communication software, and office equipment (S. Sohal et al. 2001), which are vast domains. Based on the literature, Li (2012) classified ICT tools into five categories (see Figure 2.22). He also stated that tools can be classified in various ways from different ICT perspectives. One perspective is that mentioned by Jiménez-Zarco et al. (2006), who stated that ICT tools are more than just computer software or internet; their effect on economic and business fields should be recognized. They divided ICT tools into two points: one from economic and management such as a social construction, an information provider, an infrastructure (both hardware and software) and a business process and system. The other point from a marketing point such as a

variety of applications, a promotional channel, a communication media and a tool for relationship marketing.

Drigas et al. (2011) divided ICT tools into two categories: synchronous and asynchronous. Synchronous tools enable real-time communication at the same time from different places and include, for example, chatting tools such as Skype, MSN, and video conferencing. Asynchronous tools are not for real-time (different times, different places) communication and include email, Wiki, podcasts, and others (Ashley 2003).

Other types of ICT tools include computing tools such as spreadsheet, presentation and data maintenance tools, and so on. Another new application of ICT tools stated in the literature can be added to the computing tools, called data analytics system. This system can be implementing in order to provide a data analytics platform or programming interface. The importance of this platform is allowing users to create and execute software applications that can help in building data models-based analytics functionality such as classification and prediction. Currently, we are living a digital world, many organizations are producing large amounts of data, such as organization data, transaction records, and others. These big data analytics are facing many challenges to organizations to collect, store, and analyze especially with the limited computing resources and/or storage resources available to the organization. Big data analytics involves the analysis of large and complex data sets in limited time and resources, that may replace traditional data analysis techniques. Incubators still need more time to use these intelligent systems, because of those most incubators systems still in the earlier stages of development and need more time to be tested and adopted especially with the availability of the few resources in this field (Wasson et al. 2017).

Furthermore, some ICT tools such as learning management systems and content management systems are used in course management. There are also social networking tools such as Facebook, Myspace, and Twitter. Finally, there are collaboration tools such as project management systems and workflow systems.

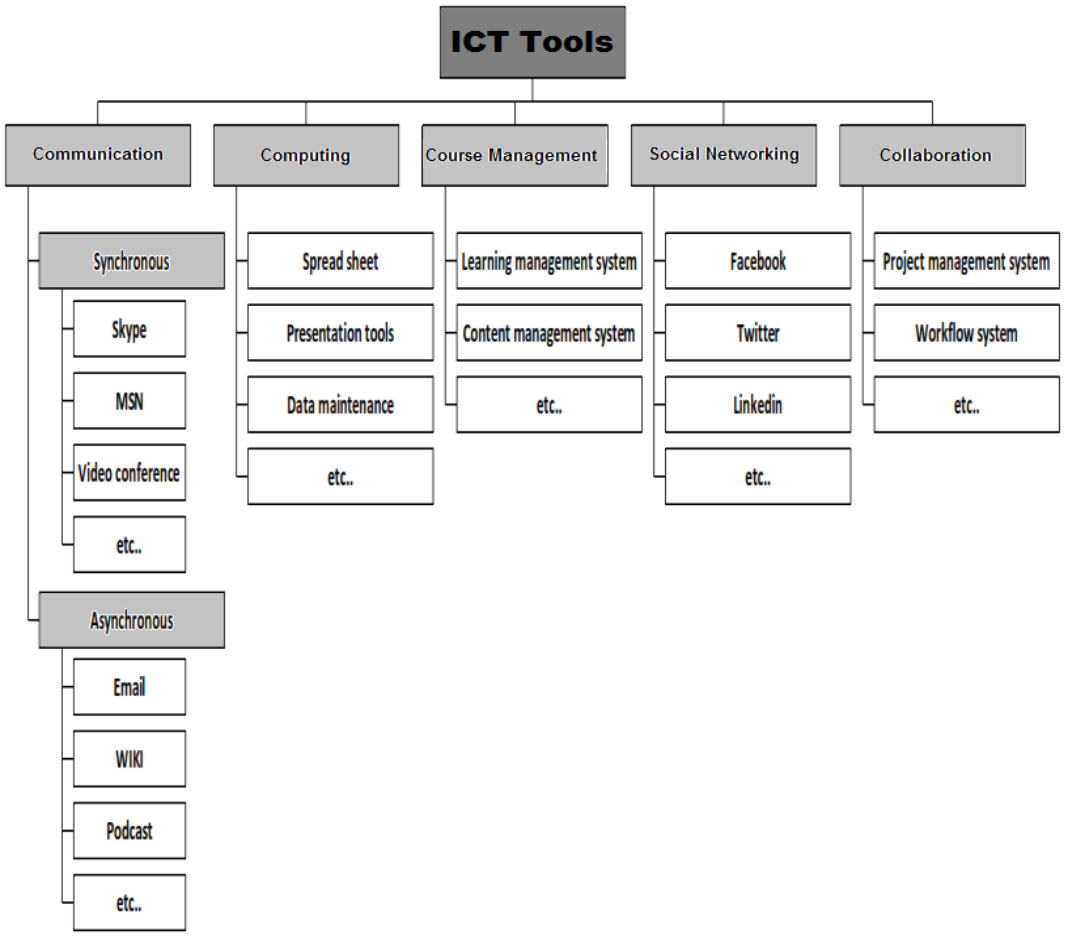

Figure 2.22 Classification of ICT tools

Source: (Li 2012)

2.6.6 Opinions of Palestinians Specialists

This subsection presents some ideas and comments from some Palestinian specialists about the importance of ICT incubators in Palestine in general. These opinions were collected during the email interviews that were conducted in the early stage of this study to identify the potential incubator success factors.

Firstly, the incubator manager of PPU stated that to produce successful and financially viable firms that can survive on their own, the early incubators focused on the ICT field. Furthermore, the ANU Business Innovation and Partnership Centre (NaBIC) manager in An-Najah National University (ANU) in Palestine stated that incubators are important in Palestine as they provide a positive climate for Palestinian entrepreneurs (specifically in the ICT sector) by providing them with the necessary

tools that enable them to develop their innovative ideas and to proceed successfully to the next step (acceleration).

2.7 SUMMARY

After reviewing the literature on incubator' success, it became clear that incubators in developing countries, especially in the Levant, still have a low level of success compared to that seen in developed countries. Although previous studies have discussed a range of incubator success factors and models, success stories are still hard to find and previous studies are trying to develop professional models that can help incubators to succeed.

This study analyses previous success models in different countries in order not only to identify the success factors that are commonly used in different models around the world, but also to discover new success factors and consequently develop a new success model that can help incubators in developing countries to succeed.

In light of the above aims, the first research question that this study seeks to address is: What are the main success factors that determine incubator success? This research question is answered in this chapter in sections 2.4 and 2.5.

The second research question that arises after identifying the success factors is: How can we develop a success model for the relationship between success factors and incubator success? The relationship between the various factors and incubator success are built based on prior studies and previously proposed success models related to incubator success. This question is answered in Chapter IV.

A third research question arises following the building of the incubator success model, which is: Do ICT tools moderate the relationship between success factors and incubator success? The answer to this research question is presented in Chapter V.

Finally, this study tries to answer a fourth research question, which is related to the potential applicability of the research model to BIs. The results of a statistical analysis address this question and are also presented in Chapter V.

The model proposed in this study is also discussed with and presented to some experts in this field for the purpose of identifying any methods and processes that could be adapted in order to make good use of the study results and thereby increase the success of incubators.

This chapter presented a review of the relevant literature on the definitions of the known types of incubator in general, summarized the importance of incubators around the world and also presented some views of Palestinian incubator stakeholders and managers, who summarized the factors and indicators that affect the success of incubators in Palestine and the importance of incubators, especially ICT incubators, to the Palestinian people and to the economic situation in Palestine.

Next, the chapter provided some evidence from the literature regarding the importance of conducting similar research studies in this field and also presented the main factors identified in the literature that are used in models and case studies to identify the reasons for incubator success around the world from 1985 to the present day. Some of these factors have been used in the past and the present, whereas some factors have been used just in the past and other factors just in the present. Furthermore, it was discovered that some factors can be used as success factors in some countries but they cannot be used in other countries due to different social, political and economic contexts.

Then, this chapter provided information about the key success factors used in this study that were derived from the literature. Then, it discussed the importance of SMEs in business development and some key challenges in this field, including how BIs can help SMEs to succeed. Finally, this chapter discussed the importance of ICT in general and in the incubator field in particular, and the reason behind using this factor as a moderator in the proposed model.

CHAPTER III

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter discusses the methodology in this study. There are many different research methodologies available to a researcher in order to achieve the objectives set out for this study, an appropriate research methodology has to be adopted.

In this chapter the operational framework of the research and the phases followed were described to provide an understanding of the flow of the research. Then the research design is described and the rationale and justification for using a mixed methods approach in the current research is presented. After that, the research methods are described which involve the use of quantitative and qualitative data collection techniques. Then, the techniques used for the analysis of the quantitative and qualitative data are discussed in detail. Finally, the chapter ends with a brief conclusion.

3.2 OPERATIONAL FRAMEWORK FOR THE RESEARCH

The operational framework for a study can consist of many methods and procedures and is designed to help researchers to conduct their research effectively. Research methods must address the research questions and subsequently lead to the achievement of the research objectives. Figure 3.1 displays the operational framework recommended by Creswell (2013). This study's operational framework consists of five main phases, each of which is described in the following subsections.