

A SURVIVABILITY MODEL FOR SAUDI ICT START-UPS

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ABSTRACT

Innovation and entrepreneurship are critical elements in the transition to the knowledge-based economy and future competition. Unfortunately, innovation tends to be absent in Arab states for many reasons. To promote innovation in Saudi Arabia, for instance, it is necessary to support inventors' ideas to turn inventions into start-up companies, which are companies in their early stage. At the same time, it seems that there is a need for more academic research to study the success factors of Saudi information and communication technology (ICT) start-up companies. ICT start-ups are important to the economy because they are needed for the progress of all industries. Therefore, this study will identify the factors that lead to successful ICT start-up projects. Then, it will develop a model for the best practices in the interplay among the defined factors that will increase the opportunity to initiate successful start-ups. This research involves a factor analysis study based on a quantitative method to measure the interdependences among the success factors for ICT start-ups. The identified factors are verified using a sample of Saudi start-up companies. The study will contribute to enhancing the technological content to diversify the Saudi economy in order to prepare for the post-oil era.

The study result is a survivability model for Saudi-incubated ICT startups. The resulting model has two phases, as follows: (1) the incubation period, which includes the relationships among three factors leading to constant and successful updates and upgrades of the ICT startup business model; and (2) the post-incubation period, which include relationships among the three factors that help to deal with the changing nature of the market and the emergence of competing products. This solution can be applied within startups with similar conditions.

KEYWORDS

ICT start-up management; small business; entrepreneurship; innovation; success factors, survivability model, Saudi Arabia.

1. INTRODUCTION

A startup is a “young, not yet well-established company (typically 1–3 years)” [1]. It is an early stage company or team searching for a business model in the phase of development and market research. Often with the help of external funding, the founder or entrepreneur intends to

implement an innovative business idea. Technology startups are “*new businesses revolving around technological development and the advancement of technology*” [2].

The truth is that 75% of startups (in all sectors) fail. A study by Shikhar Ghosh on about 2,000 companies that received venture funding between 2004 and 2010 found that three out of four US technology startups failed to return investors’ capital [3]. The information and communication technology (ICT) sector is risky and very volatile; a return on investment may not be certain [4].

This failure is multifaceted. Some startups failed due to premature scaling of one or more of five core dimensions (customer, product, team, business model, and funding). Thus, the growth of these dimensions must be balanced [5]. “Lack of business management skills is the main reason why most ICT start-ups fail to take off” says Martin Carlos Mwizerwa, the kLab acting director and also in charge of National ICT planning and co-ordination [4]. At the same time, innovation requires a team with different disciplines to convert the invention or creative idea into a business or other application and bring the new product to the marketplace [6]. Indeed, the environment provided by incubator that houses small start-up companies from inception to meet the needs of small businesses during their critical stages of development can participate in minimizing the failure percentage in this kind of organizations. Incubators provide low cost office space, coaching and counseling and helpful business services.

Likewise, there is no certain method of ensuring that technology startups will succeed. The primary success factor changes over time due to market demand and changes in the environment. In addition, it is clear that there is a gap in the technological development between Saudi Arabia and developed countries; Saudi Arabia is in the early stage of technology startup development. ICT startups are important to the Saudi economy because ICT is the basis for progress in all industries. Still, the implementation of ICT in Saudi Arabia requires less investment and less time than that in other fields. As described in a report on IT and Telecommunications, “Saudi Arabia’s information and communication technology (ICT) market is one of the largest in the Middle East and represents 68 percent of the total sector in the Arabian Gulf. Saudi Arabia’s public and private sectors rely heavily on the services and products of foreign companies”[7]. This report briefly explained the Saudi market demands and growth. Saudi Arabia has large percentage of young people with high purchasing power and broad knowledge of technology and communications. Since 2000, the industry has sustained a 15% annual growth rate to reach \$20 billion in total spending in 2010. There is a 55% penetration rate for PC users, of which laptops account for 80%. Furthermore, there is a 51.2% internet penetration rate, with approximately 13.85 million internet users and 6.75 million broadband subscribers. Sixty-three percent of the gamers in the Middle East region are located in Saudi Arabia. Moreover, Saudi Arabia has among the world’s highest mobile phone penetration rates [7].

The previous paragraph elucidates the important of building new ICT companies in Saudi Arabia to compete against foreign companies. Saudi entrepreneurs will benefit greatly from such a measure. This situation raises questions about the factors that affect the success and survival or failure of Saudi ICT startup businesses. Researchers have attempted to identify the factors affecting the success or failure of these organizations. However, there are limited models focusing on the combination of factors and practices that influence the relative success of Saudi ICT startups. Thus, the purpose of this paper is to increase the percentage of successful Saudi ICT startups based on technological innovation. It aims to provide a model that describes the best practice in relation to the interdependencies among factors for the successful implementation of ICT startup companies. This study will serve to enrich the understanding of the subject of ICT startups and entrepreneurship in an Arab country.

The remainder of paper consists of three main sections. The first section discusses the literature review and presented study hypotheses. The second section describes the methods used in this study and presents the study analysis and results. The final section provides conclusion to the study.

2. LITERATURE REVIEW AND HYPOTHESES

ICT start-ups are importance to the economy because they are needed in the progression of all industries. They require less investment and less time to implement than businesses in other fields. The ICT field include the following: software and communications devices, systems and solutions; communications infrastructure and information technology (IT); products related to the telecommunications sector and IT. Some of the local success stories in the ICT industry include cobone.com, souk.com, maktoob.com and bayt.com.

2.1 Incubation of ICT start-ups

Due to a lack of capital and proper management skills in most small businesses, they fail within their first five years of operation. Thus, the environment provided by incubator facilities houses small start-up companies from their inception to meet their needs during their critical stages of development; public and private resources are combined until the startups become sustainable in their area [8]. According to the National Business Incubator Association (NBIA), an incubator is "a business support process that accelerates the successful development of startup 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 offered both in the business incubator and through its network of contacts." In short, these programs exist to help improve the odds of success for startups.

2.2. ICT incubators in Saudi Arabia

According to the Saudi business incubator network, Saudi Arabia has 20 incubators in all regions—the central region has 12 incubators, the eastern region has 3 incubators, the western region has 4 incubators, and the southern region has 1 incubator. There is only one incubator that specializes in ICT, which is the BADIR ICT incubator.

BADIR ICT was the first technology incubator in the national technology business incubator program established by KACST in 2008. Its scope of work includes the following: computers and communication devices, ICT infrastructure, software and solutions, multimedia, and smartphone applications. It aims to reach a global level by providing excellent services in business development and creating an enabling environment for creativity, development, and promotion of the industry of ICT in the KSA. It has three branches, in Riyadh, Jeddah and Alkhobar.

2.3. Successful ICT start-up

Growth is considered the measure of the success of small businesses. Taylor and Cosenza [9] suggest that growth is a fundamental goal of every company and is necessary for survival. Moreover, growing quickly is critical to the survival of some start-ups [10]. On other hand, Lewis [11] in his research identified eight factors prominent in determining a firm's success or failure, namely (1) financial, (2) personnel, (3) systems, and (4) business resources; (5) the owner's goals for him/herself; (6) operational abilities to important jobs; (7) managerial ability and willingness to delegate; and (8) strategic ability for looking to the future.

This study considers the successful managerial practices as a root for growth of the ICT start-up. Managerial practices support the start-ups workers to learn in order to execute their business idea and to "achieve their project objectives within time and cost, at the desired performance and technology level, while utilizing the assigned resources effectively and efficiently and accepted by the customer"; this was the definition of the successful project management by Kerzner [12]. Moreover, because a profitable entrepreneur is considered a successful entrepreneur, the measure of success at getting into business is operationalized by the question: "Have the entrepreneurs executed their business idea and develop a great company that achieves financial and managerial growth?" This study considers the lack of academic research that studied ICT start-ups success factors for incubation period and post-incubation period.

2.4. Hypotheses

Enhancing the growth of start-ups both managerially and financially (Dependent Variable DV) is the variable of primary interest to this study. According to previous studies ([11],[13], [14], [15], [16], [17], [18], [19] , [20], [21], [22], [23], [24], [25], [26]) the variance in DV depends on three groups of factors (Independent variables IV) as illustrated below:

Table 1. Summary of success factor (IVs)

Group1 (success factors during incubation)	Group 2 (success factors for post-incubation period)	Group3 (success factors for both periods)
This group includes success factors that arise when the Saudi start-up company is incubated in the ICT incubator.	This group includes success factors for the Saudi start-up companies once they have graduated from the incubator and can work without help from the incubator.	This group includes success factors for Saudi start-up companies that are relevant in both the incubation period and post-incubation period.
1- Test the idea, 2- Regional Determinants, 3- Lean method.	4- Stock Option, 5- Mastering Change and flexible management, 6- Marketing.	7- Entrepreneur's personality, 8- Start-up team, 9- Business culture, 10- Social interaction, 11- Venture capital, 12- Innovation, 13- Voice of consumer.

Ten measurements of (DV)—ICT start-up survivability—were explored to determine how to achieve them by the relationships between IVs. These ten measurements were extracted by studying the causes of Saudi ICT start-up failure. These measurements could arise in the two main period of the start-up’s development. In incubation period, the manager can assess five points: (1) team commitment and employees to support the project owner, (2) fast implementation of the business model, (3) flexibility and adaptation of the team, (4) constant updating and upgrading of the business model, (5) good management skills, and good capital management. Meanwhile, in the post incubation period, the manager can assess four points: (6) good capability of reading the market, (7) minimum level of stubbornness of the owner (my project, my way), (8) distribution of tasks to the whole ICT start-up team, and (9) dealing with the changing nature of the market and the emergence of competing products. Moreover, the measurement for both periods is: (10) continuously innovate.

Thus, this research comes up with ten hypotheses, the first five for incubation period, then four hypotheses for post incubation period and the last one for both periods.

Table 1. Study hypotheses

Incubation period	post-incubation period	Incubation & post-incubation period
<p>H1: Growing and survivability of ICT start-ups by ICT start-up team commitment, which can be positively affected by the interplay among these three factors</p> <ol style="list-style-type: none"> 1. The entrepreneur's personality, with the characteristics of passion, open-mindedness, the desire to be expert, thinking ahead, and the constant flow of ideas; 2. A startup team with prior education, industry experience, and skills; and 3. A business culture with the characteristics of innovation and flexibility, the growth ambition, social capital and networking. <p>H2: Growing and survivability of ICT start-ups by the ICT entrepreneur's flexibility and adaptation, which can be positively affected by the interplay among these three factors:</p> <ol style="list-style-type: none"> 1. The entrepreneur's personality, with the characteristics of passion, open-mindedness, the desire to be expert, thinking ahead, and the constant flow of ideas; 2. A startup team with prior education, industry experience, and skills; and 3. A business culture with the characteristics of innovation and flexibility, the growth ambition, social capital and networking. <p>H3: Growing and survivability of ICT start-ups by the successful fast implementation of the ICT start-up business model, which can be positively affected by the interplay among these two factors:</p> <ol style="list-style-type: none"> 1. Testing the idea before committing to a big 	<p>H6: Growing and survivability of ICT start-ups by improving ICT entrepreneur's capability of reading the market, which can be positively affected by the interplay among these three factors:</p> <ol style="list-style-type: none"> 1. Social skills; 2. Marketing strategies; and 3. The voice of the consumer. <p>H7: Growing and survivability of ICT start-ups by minimizing the stubbornness of the owner, which can be positively affected by the interplay between these three factors:</p> <ol style="list-style-type: none"> 1. The entrepreneur's personality, with the characteristics of passion, open-mindedness, the desire to be expert, thinking ahead, and the constant flow of ideas; 2. A startup team that has prior education, industry experience, and skills; and 3. A business culture with the characteristics of innovation and flexibility, the growth ambition, social capital and networking. <p>H8: Growing and survivability of ICT start-ups by successful distribution of tasks to all ICT start-up team, which can be positively affected by the interplay among these three factors:</p> <ol style="list-style-type: none"> 1. Stock options; 2. A startup team that has prior education, industry experience, and skills; and 3. A business culture with the characteristics of innovation and flexibility, the growth ambition, social capital and networking. <p>H9: Growing and survivability of ICT start-ups depends on successfully dealing with the changing nature of the market</p>	<p>H10: Growing and survivability of ICT start-ups by successful applying disruptive innovation strategy, which can be positively affected by the interplay among these five factors:</p> <ol style="list-style-type: none"> 1- The entrepreneur's personality, with the characteristics of passion, open-mindedness, the desire to be expert, thinking ahead, and the constant flow of ideas; 2- A startup team that has prior education, industry experience, and skills; 3- A business culture with the characteristics of innovation and flexibility, the growth ambition, social capital and networking; 4- Social interaction; and 5- Cash flow.

<p>launch; and</p> <p>2. Using the lean method.</p> <p>H4: Growing and survivability of ICT start-ups by achieving a successful constant update and upgrade of the ICT start-up business model, which can be positively affected by the interplay between these three factors:</p> <ol style="list-style-type: none"> 1. The entrepreneur's personality, with the characteristics of passion, open-mindedness, the desire to be expert, thinking ahead, and the constant flow of ideas; 2. Testing the idea before committing to a big launch; and 3. Using the lean method at the beginning stage. <p>H5: Growing and survivability of ICT start-ups by improving management skills and capital management, which can be positively affected by the interplay among these three factors:</p> <ol style="list-style-type: none"> 1. The entrepreneur's personality, with the characteristics of passion, open-mindedness, the desire to be expert, thinking ahead, and the constant flow of ideas; 2. Sufficient venture capital; 3. Testing the idea; and 4. Using the lean method. 	<p>and the emergence of competing products, which can be positively affected by the interplay between these three factors:</p> <ol style="list-style-type: none"> 1- Mastering change skill; 2- Innovation; and 3- The voice of the consumer. 	
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3. METHODOLOGY

3.1 Research goal

The objective of this research was to improve ICT start-ups' performance. It focused on Saudi ICT start-up companies and it explored reasons for start-ups to fail in detail through the results of an initial case study that targeted the most unique and most popular incubator in the region, namely the BADIR ICT incubator. The case study explored an area that could later be hypothesis tested through a questionnaire targeting the entrepreneurs who had start-ups in the BADIR ICT incubator.

This research attempted to provide a survivability model for Saudi ICT start-ups by addressing the three following research questions: What are the critical success factors that influence the survival and growth of Saudi ICT startups? Why do some Saudi ICT start-ups fail? What are the

management practices needed to build strong, successful business start-ups? The first question was addressed by analyzing the literature and identifying the 13 factors which were considered a basis for the proposed model. The second question was addressed by carrying out a simple case study to elucidate the reasons for the failure of some Saudi ICT start-ups. The researchers summarized these into 10 points, which were considered as a measurement for the survivability of Saudi ICT start-ups. Finally, the third question was addressed by analyzing the proposed model based on the information provided by answering the two previous questions.

3.2 Sample and data collection

The survey of this study is conducted on 138 entrepreneurs and managers of 46 incubated start-ups operating in ICT sector in Saudi Arabia, between the years of 2013-2014. Start-up firm fulfilling the criteria that (1) still incubated or graduated from the BADIR ICT incubator, and (2) not being undergone a loss, are indexed as success performing start-up firms. All 46 start-up firms meet those two requirements were contacted via email and informed about the research. However 34 respondents accepted to participate in and fill out the research questionnaire. Data obtained from those 34 questionnaires were analyzed through the SPSS statistical packet program and ten proposed relations were tested through multiple regression analyses. A limitation of this study is its small sample size. Using the Raosoft tool to calculate the recommended study sample size (with a 5% margin of error, 95% confidence level, total population size of 138, and 50% response distribution), the result was 102.

3.3 Analyses and results

This study includes 10 hypotheses for the growth and survivability of ICT start-ups. Each hypothesis is a result of the interplay among the group of IVs. Thus, the researcher applied regression for each group to study their relationships. 43 items using 5 likert-type scale are used, the overall reliability coefficient (Cronbach's Alpha) of this instrument 0.975, indicates the reliability of scales used in that survey. Table 3 presents the results of the testing processes of the study hypotheses in statistical language. The results show that some hypotheses were accepted, and some rejected.

The results were obtained from testing the suggested model for respondents who were workers or founders of ICT startup incubated in the BADIR ICT incubator. Their age was mostly 20–35 years, while a small group was 36–50 years old. They all had a high education level, with a college degree or higher. Most of the respondents were male. Moreover, they had a good amount of experience in ICT; most had previously worked in an ICT field, for instance, in an ICT SME, large ICT company, or ICT department in a governmental sector.

Table 3. Summary of significant findings

Hypotheses	DV & IVs	F-test	Adjusted R-square	P-Value	Accepted /Rejected
H4	DV: Successful constant updating and upgrading of the ICT start-up business model IVs: 1- Entrepreneurial personality 2- Testing ideas	69.857	0.862	.027 .019	Accepted

	3- Using the lean method			.001	
H9	DV: Dealing successfully with the changing nature of the market and the emergence of competing products IVs: 1- Mastering change skills 2- Innovation 3- Voice of the consumer	51.465	0.821	.000 .039 .026	Accepted
H5	DV: Improving management skills and capital management IVs: 1- Entrepreneurial personality 2- Sufficient venture capital 3- Testing the idea 4- Using the lean method	20.415	0.702	.026 .208 .258 .317	Rejected
H10	DV: Successful applying disruptive innovation strategy IVs: 1- Entrepreneurial personality 2- Start-up team 3- Business culture 4- Social interaction 5- Cash flow	15.965	0.694	.070 .480 .009 .246 .418	Rejected
H6	DV: Improving ICT entrepreneurs' capability of reading the market IVs: 1- Social skills 2- Marketing strategies 3- Voice of the consumer	25.467	0.69	.180 .006 .080	Rejected
H3	DV: Successful rapid implementation of the ICT start-up business model IVs: 1- Testing the idea 2- Using the lean method	22.617	0.567	.014 .293	Rejected
H2	DV: ICT entrepreneurs' flexibility and adaptation IVs: 1- Entrepreneur personality 2- Start-up team 3- Business culture	14.205	0.546	.077 .048 .373	Rejected
H8	DV: Successful distribution of tasks to the whole ICT start-up team IVs: 1- Stock options 2- Start-up team	12.418	0.509	.353 .541	Rejected

	3- Business culture			.000	
H1	DV: ICT start-up team commitment IVs: 1- Entrepreneurial personality 2- Start-up team 3- Business culture	11.012	0.476	.054 .711 .117	Rejected
H7	DV: Minimising the owner's stubbornness IVs: 1- Entrepreneurial personality 2- Start-up team 3- Business culture	2.834	0.143	.276 .583 .705	Rejected

3.4 The proposed survivability model

Hypothesis 4 of this study stated that the growth and survivability of ICT startups is related to achieving successful constant updating and upgrading of the ICT startup business model, which can be positively affected by the interplay between three factors. The three factors are entrepreneurial personality, testing the idea before committing to a big launch, and using the lean method at the beginning stage.

Start-ups must have a destination in mind: Creating a thriving and world-changing business is a startup's vision. To achieve this, start-ups employ a strategy that includes a business model, a product roadmap, a point of view about partners and competitors, and ideas about who the customer will be. The product is the end result of this strategy, and this change constantly through the process of optimization. Less frequently, the strategy may have to change (this is called a pivot). However, the overarching vision rarely changes. Entrepreneurs are committed to seeing the startup through to that destination. Every setback is an opportunity for learning how to get where they want to go.

The lean start-up method builds capital-efficient companies because it allows startups to recognize that it is time to pivot sooner, creating less waste of time and money. The method is designed to teach the entrepreneur how to drive a start-up. Instead of making complex plans based on a lot of assumptions, the entrepreneur can make constant adjustments through the build-measure-learn feedback loop. Through this loop, the entrepreneur can learn when and if it is time to pivot or whether he or she should persevere along the current path. The lean start-up offers methods to scale and grow the business with maximum acceleration.

Thus, using these three factors throughout the process of start-up driving, the entrepreneur always has a clear idea of where he or she is going and remain thoroughly focused on getting to the destination. The lean start-up methodology reconceives a start-up's efforts as experiments that test its strategy to see which parts are brilliant and which should be revised. A true experiment follows the scientific method. It begins with a clear hypothesis that makes predictions about what is supposed to happen. It then tests those predictions empirically. Just as scientific experimentation is informed by theory, start-up experimentation is guided by the start-up's vision. The goal of every start-up experiment is to discover how to build a sustainable business around that vision.

The findings in the literature corroborate the importance of the study's fourth hypothesis. For example, Ries [26] showed that the passion, energy, and vision that the entrepreneur brings to new ventures are precious resources in the success of a start-up. Moreover, he included the concept of testing the idea with the lean method. He considered the products created by the start-up to be experiments, and the outcome of those experiments would be learning about how to build a sustainable business. The resulting information is more valuable for start-ups than dollars or awards because it can influence and reshape the next set of ideas.

Hypothesis 9 stated that the growth and survivability of ICT startups relates to successfully dealing with the changing nature of the market and the emergence of competing products. This can be positively affected by the interplay between three factors, namely mastering change skill, innovation, and the voice of the consumer.

There are many famous entrepreneurs who made millions because they seemed to be in the right place at the right time. However, for every successful entrepreneur in this position, many others were there, too. Facebook, for example, faced early competition from other college-based social networks. Two facets of Facebook's early growth impressed investors. The first was the customers found a product valuable; the owner knows what the consumer really needs. The second impressive thing about Facebook's early traction was its innovative idea; Facebook is scaling and evolving all the time. When it stops innovating, it will lose its reputation and its start-up mentality. Facebook has, so far, managed to stave off competition and remain as frontrunner by some distance in the social networking sphere.

Many entrepreneurs are attempting to build the next Facebook, but when they try to apply the lessons of Facebook and other famous start-up success stories, they quickly get confused. As mentioned in terms of the first point of this model H4, start-ups need to conduct experiments that help to determine what techniques will work in their unique circumstances. Indeed, what differentiates the success stories from the failures is that the successful entrepreneurs had the foresight, ability, and tools to discover which parts of their plans were working brilliantly and which were misguided, and adapted their strategies accordingly. Thus, successful entrepreneurs have a mastery of change skill (knowing when to switch to the alternative plan).

It is also important that for the word *innovation* to be understood broadly. Start-ups use many kinds of innovation—novel scientific discoveries, repurposing of existing technology for a new use, devising a new business model that unlocks value that was previously hidden, or simply bringing a product or service to a new location or a previously underserved set of customers. In all of these cases, innovation is at the heart of the company's success. Entrepreneur must learn what customers really want, not what they say they want. Entrepreneur must discover whether they are on a path that will lead to the growth of a sustainable business. Otherwise, it is helpful for the entrepreneur to have a changing plan to exit before breaking down, for example, by combining the start-up with large company in order to avoid losing it.

The importance of this point (H9) is also corroborated by the findings in the literature. Ries [27] described a start-up in real life as a portfolio of activities that occur simultaneously. These include running the engine, serving existing customers while acquiring new ones, operations, marketing, improving existing products, steering, and deciding when to pivot if needed. The ability to balance all of these activities is the challenge for entrepreneurs. For example, a start-up can face the challenge of supporting existing customers while trying to innovate. What changes when the company grows is the mix of these activities in its portfolio of work.

4. CONCLUSION

This study, which is conducted on ICT start-up firms of Saudi survived in series of crises, highlighted two significantly accepted relationships which can be draw a model for this research. The first one comprises the interdependences between three factors of IVs, as follows: entrepreneurial personality with five characteristics (passion, open-mindedness, the desire to be an expert, thinking ahead, the constant flow of ideas); testing the idea before committing to a big launch; and using the lean method at the beginning stage of the start-up. These factors can positively affect the growth and survivability of ICT start-ups by achieving successful constant updating and upgrading of the ICT start-up business model. The second relationship comprises the interdependences between three factors of IVs, which are as follows: mastering change skill, innovation, and voice of the consumer. These can positively affect the growth and survivability of ICT start-ups by successful dealing with the changing nature of the market and the emergence of competing products. These two relations are very important and can solve the main problems or difficulties facing the entrepreneurs at the incubation and post incubation period. These findings are consistent with the literature like Ries [27]. The effect of incubation process with the studied IVs in predomination of some difficulties faces Saudi ICT start-up toward firm sustainable performance is examined and revealed for the first time through that survey, which differentiates this study from others.

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REFERENCES

- [1] Erni, P.(2012). Evaluation methodology for high-tech and innovative R&D projects proposed by SME, start-up or spin-off (Unpublished MBA dissertation). University of St. Gallen, Switzerland.
- [2] American Society of Mechanical Engineers. (2012). High-tech start-ups. Retrieved from <https://www.asme.org/engineering-topics/high-tech-startups>
- [3] Gage, D.(2012). Small business: The venture capital secret: 3 out of 4 start-ups fail. Wall Street Journal. Retrieved from <http://online.wsj.com/europe>
- [4] Mwai , C.(2013). Lack of business skills bog down ICT startups. In the New Times. Retrieved from <http://www.newtimes.co.rw/section/article/2013-09-09/108497/>
- [5] Jimenez, C.(2012). Why 11 out of every 12 startups fail. Retrieved from <http://agbeat.com/entrepreneur/why-11-out-of-every-12-startups-fails>
- [6] Gaynor, G.H. (2012). The innovation dilemma. *Engineering Management Review, IEEE*, 40(3), 5–6. doi:10.1109/EMR.2012.2206958
- [7] U.S. Saudi Arabian Business Council. (2012). IT and telecommunications in Saudi Arabia. Retrieved from http://www.us-sabc.org/files/public/IT_and_Telecommunications_in_Saudi_Arabia.pdf
- [8] Shalaby, N.M. (2003, June). The role of incubators and technology parks as a home for entrepreneurs in Saudi Arabia. In XX IASP world conference on science and technology parks, Lisboa, Portugal.
- [9] Taylor, S.L., & Cosenza, R.M. (1997). Limitless vs. sustained growth strategies: What's the answer to the corporate growth dilemma? *Business Forum*, 22(2/3), 29–33. Retrieved from <http://www.startupticker.ch/uploads/File/Attachments/Tamino%20Fuchs%20BachelorThesis.pdf>
- [10] Storey, D.J., & Greene, F.J. (2010). *Small business and entrepreneurship*. Harlow, Financial Times Prentice Hall.
- [11] Lewis, V.L., & Churchill, N.C. (1983). The five stages of small business growth. *Harvard Business Review*, 61(3), 30–50. Retrieved from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1504517

- [12] Kerzner, H. R. (2009). *Project management: A systems approach to planning, scheduling, and controlling*. Hoboken, New Jersey. John Wiley & Sons.
- [13] Key, S.(2013a). 4 tests to fail-proof your business idea. *Entrepreneur*. Retrieved from <http://www.entrepreneur.com/article/228153>
- [14] Key, S.(2013b). 5 qualities of successful entrepreneurs. *Entrepreneur*. Retrieved from <http://www.entrepreneur.com/article/227776#ixzz2kWSpIgN2>
- [15] Fuchs, T.(2013). Investigation of factors, which influence the likelihood of fast growth in Swiss technology start-ups (Unpublished bachelor's dissertation). Horw, Lucerne University of Applied Sciences and Arts. Retrieved from: <http://www.startupticker.ch/uploads/File/Attachments/Tamino%20Fuchs%20Bachelor%20Thesis.pdf>
- [16] Lasch, F., Robert, F., & Le Roy, F. (2013, April). Regional determinants of ICT new firm formation. *Small Business Economics*, 40(3), 671–686.
- [17] Blank, S. (2013, May). Why the lean start-up changes everything. *Harvard Business Review*. Retrieved from <https://archive.harvardbusiness.org/cla/web/pl/product.seam?c=29512&i=29514&cs=72931baa3b05f76aca8090b33db139b0>
- [18] Takahashi, H. (2013). Do stock options accelerate the growth of startups? Retrieved from <http://www.b.kobe-u.ac.jp/~keieizaimu/uploads/files/zenkokutai/37/11.pdf>
- [19] Lasch, F., Le Roy, F., & Yami, S. (2007). Critical growth factors of ICT start-ups. *Management Decision*, 45(1), 62–75. doi:10.1108/00251740710718962
- [20] Kaye, D. (2013). Mastering change: What you can learn from KFC and Instagram. *Business transformation*. *Entrepreneur*. Retrieved from <http://www.entrepreneur.com/article/229874>
- [21] Tobak, S. (2013). 7 marketing truths every business leader should know. *Entrepreneur*. Retrieved from <http://www.entrepreneur.com/article/229822>
- [22] Galagan, P., & Herring, S. (2011). Why innovation? Why now? *T+D*, September, 26-28.
- [23] Macnab, G. (2012). Abu Dhabi media summit: Gawdat explains the nine rules key to Google's success. *Screen International*. Retrieved from <http://search.proquest.com/docview/1095738288?accountid=142908>
- [24] Rigby, D.K., Christensen, C.M., & Johnson, M. (2002). Foundations for growth: How to identify and build disruptive new businesses. *MIT Sloan Management Review*, 43(3), 22–32. Retrieved from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1513137
- [25] Reuver, J. (2012). Voice of the consumer, contextual factors and the impact of business planning on high tech startup firm survival. Retrieved from http://essay.utwente.nl/61907/1/Master_thesis_JeroenReuver_1029886.pdf
- [26] Freiling, J., & Laudien, S. M. (2013). Explaining new venture failure: A competence-based approach. *AIMS 2013 Conference*. Retrieved from http://cdiaims2013.sciencesconf.org/conference/cdiaims2013/pages/cdiaims2013_Freiling_Laudien.pdf
- [27] Ries, E. (2011). *The lean startup: How today's entrepreneurs use continuous innovation to create radically successful business*. New York: Crown Business.

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