Journal of Studies in Economics and Management
ISSN : 2602-6570
Volume 06 Number 01 – June 2023

Death Valley curve of Algerian Start-up's Products

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Date of receipt: 14/02/2023 Date of acceptation: 11/05/2023

Abstract :
Despite the growing dangers of the Death Valley Curve on innovative products and services for Algerian startups, Algerian entrepreneurs are seeking to enter the world of innovation with enthusiasm that may not be well thought out. This article will highlight the role of open innovation as a new comprehensive model for an innovative innovative product for startups, especially with low global level. GII Innovation Index Rank Algeria The new open innovation model to face the death valley curve emerged from the in-depth review of several scientific articles and GII data for the period 2011-2021.

The results report includes several statistical tests for the Pearson chi-square statistic, which is equal to 15.753 at a significant level of 0.000. Therefore, we conclude that innovative entrepreneurs are not well aware of the dangers of falling into the death curve.

Keywords : Death Valley Curve, Open innovation, Algeria Venture, Technological Transformations.
Jel Classification Codes : M13,

1. INTRODUCTION

The Algerian state bears the responsibility for the legislative and financial support of startups in Algeria, it may also include other costs associated with launching the operating activity such as the costs of research and development of the product or service, and the cost of launching the product and bringing it to market.

Even after the service or product becomes available to the customer base, the start-up may continue to run into costs while generating no return, which leads to a deepening of the curve. For example, after the product is on the shelf in supermarkets for a financial fee that is paid to the store or is available online in a site that requires a fee for your display of products, these are also other costs that expose the company to other cash flow problems. Accordingly, in this research paper, we discussed the various literature on the issues of the Death Curve Valley, which leads us to raise the problem of the study:

Do entrepreneurs in Algeria realize the dangers of the death valley for startups?

2. Death valley curve concept

According to oxford Dictionary of Finance and Banking Death Valley Curve means a curve on a graph showing how the venture capital invested in new company falls as the company meets its start-up expenses before its income reaches predicted levels. (Law & smullenn, 2008). But according to oxford Dictionary of strategy the Death Valley Curve is a point in development of new business when losses begin to erode the company's equity base, so that it becomes difficult to raise new equity. (Kelly, Booth, & Booth, 2004). Other definition of Longman dictionary of financial terms consederates that term as a venture capital jargon denoting the period after the initial investment in a start-up, when the company is not in a position to raise more capital (Kariithi, 2007).

Within the valley of death, two sub-categories are sometimes distinguished. The technological valley of death refers to early-stage technology development phases such as speculative concept. The commercialization valley of death refers to later-stage technology development phases such as full field or plant scale commercial demonstrations and first and second customer sales and deployments. The valleys of death are a challenge for innovative organizations of all kinds, but

they particularly plague research and technology organizations (RTOs) and start-up companies.

2.1. Technology transfer

On the basis of the SAMPLES technology transfer model, Walsch and Kirchhoff (2002) illustrate the ... Defining Technology-based Start-ups While researchers seem to have agreed on the importance of technology- based start-ups or new (Ulijn, Drillon, & Lasch, 2007) University spin offs transfer technology from their parent organization in the first phase and later, they transfer ... Likewise, government and public authorities have a significant role in startup development through defining the policies (Žarkić & Marinković, june 7-9 2018). Therefore, definitions of technology transfer appear unique and specific to each study (.isher 1976). This underlines the need for establishing a relevant framework for the study of technology transfer (Cohen, 2004). the technology-transfer function of biotechnology start-ups is to transform the basic research findings at :

Research phase : Despite the high risk of startups, however, states offer a number of research and development (R & D) instruments to assist innovative startup firms in designing commercially viable products or processes (Office of Advocacy, 1988), there is no example of successful innovation policies in support of the creation and expansion of knowledge-based start-ups that have been implemented at the expense of support to research in PRIs (OECD, 2013),however, there is a period that is also called "the valley of death." In the initial stage, at the beginning of the curve, large research efforts are needed; however, the need for investment is relatively moderate (Hanefeld & lefferts, 2018). Investors will frame the main risk dimension for a startup trying to enter the growth stage...whether an early stage startup will necessarily need a prototype to receive seed funding. (Tech, 2018), because many entrepreneurs think of a prototype as something that looks and works like the final product. The reality is that many, many prototypes of varying success and resolution are necessary during any hardware product development cycle. (DiResta, Forrest, & Vinyard, 2015). Often referred to as the Death valley curve in the venture capital industry,

this dangerous phase in start-up development requires the funding of negative cash flows from operations (Lehner, 2021).

From then on, fundamental research becomes much less important while innovation thrives. ... Through research partnerships, companies keep in touch with leading-edge researchers who are important sources of new ideas, (Miller & l Côté, 2012). Silicon Valley has developed through waves of innovation, with a handful of innovative startups initiating each wave. ... the coming out of small business companies set up by academics who have transformed **basic research** in innovation. (kaufmann & Ruediger, 2014). For example, the US President's Council of Advisors on Science and Technology predicts that U.S. companies will spend upward of $100 billion on AI R&D per year by 2025 (Graça, 2021).

Startup Evolution Curve is a masterpiece of practical, actionable, and easy-to-follow steps to turn an idea into a profitable and scalable business. (Sembler, 2021). For example, Scholten (2006) noted a positive impact, while other studies did not support these findings and could not ... regarding their educational background and functional and industry experience than those of other startups. (Tietz, 2013). Also the Lean Startup Approach represents a promising concept to combine many of the latest findings in research and practice that support the entrepreneur in the process of effectively dealing with uncertainty and limited resources (Kählig, 2011). Now let's see what does development really mean.

Developments phase : According to tha Cambridge dictionary development means, ***'' the process in which someone or something grows or changes and becomes more advanced.''*** (De, 2021) . Startups are emerging in many industries, and many startups have to compete with an existing firm in the market (Cui, Fang, & Zhao, 2020), short-term emphasis is especially prevalent in startups, for at least two reasons. Before the initial seed capital is exhausted, the development of a product (or service) must be completed, in order to attract secondary financing (Bower, 2021). Another important asset for startups is the relationship between incubators and research centers…data shows that 23% of the companies have no formal agreements

with research centers ; 40% have up to three agreements ; the other 37% have more than three and up to 10 agreements (Jr., Cahen, & Borini, 2019).

2.2. Commercialization

Product launch : It means the stage where product teams set goals, research their audience and competition, align expectations, and establish the marketing strategy. The launch team also works closely with product developers to establish a timeline for a launch date and identify key marketable components of the product. (Gangaraju, 2022). A launch can be divided into three stages:

a-Planning. This is the stage where product teams set goals, research their audience and competition, align expectations, and establish the marketing strategy. (Gangaraju, 2022), a timeline detailing when key launch activitis need to be accomplished should be developed to ensure a successful launch (Jacobsen, 2010). The launch team also works closely with product developers to establish a timeline for a launch date and identify key marketable components of the product. (Gangaraju, 2022), a project *plan* for the product launch will already be in the development stages. This will include the planning of milestones, (Laubner, Brunner, & Lemser, 2018), the key to these eventual turnarounds was following the plan by monitoring the product through launch, recognizing the possibility of the problem, evaluating the alternatives, and executing on a chosen plan with as much commitment (Garcia, 2014).

b- Execution. This is the window of time during which the product is formally released (Gangaraju, 2022) , implying that lean launch execution has positive effects on new product performance (Authors, 2018). This includes the actual day of release and the subsequent marketing efforts to maintain buzz throughout the following weeks. During this time, product and marketing data is collected that will eventually help determine the success of the launch. (Gangaraju, 2022), Once approved, innovations at these firms are *executed*, and the entire corporation systematically supports the launch (Kiesner, 2010).

c- Analysis. Eventually, marketing efforts will wind down as the product transitions from the "launch" stage into the "growth " stage of the product life cycle (Gangaraju, 2022), the launch protocol is used to support monitor

and control activities during the launch cycle. The launch control protocol identifies key "deliverables" or success measures during product launch. (Kahn, 2014) Such measures can correspond to data collected during the release window and determine whether KPIs and other goals were met as a result of the launch. (Gangaraju, 2022).

Success as a new product : Only by successful launches of new products that companies are able to turnover and profits. This is were the main problem is based (Anonym, 2006). Bringing a successful product to market is a team effort. While designers are responsible for usability, utility and the rest of the user experience there are many factors which contribute to the success or failure of new product development and many of these are outside of the designer's direct control. (International., 2021). According to Francisco Javier Miranda Gonzalez and Tomas Manuel Banegil *Palacios,* through thier study in 2002 « *The effect of new product development techniques on new product success in Spanish firms*» (Development & Association, 2003), they found that The product life cycle and the degree of importance that innovation has over the competitiveness in the industry may influence new product success (Abdel-Kader & Lin, 2009). Eric Ries too developed the lean startup concept based on lessons learned from failed attempts of his own to start a business or launch new products (Cobb, 2015), Eric Ries said that startups could be a success if they follow a certain process. This means that the process can always be learned and those who have experience can also teach them, every entrepreneur will always wonder whether a startup will fail. (Small, 2021). The important factors responsible for failure of new products is that the new products do not satisfy the needs of many potential customers, the failure results from an inadequate coordination between R&D and marketing functions (Havaldar, 2005). Customer dissatisfaction often moves business owners to do some serious self-examination to see in which areas they can improve (Caldwell, 2019).

The Lean Startup offers a set of tools and methodologies for entrepreneurs both in startups and established corporations to better achieve success. Since the vast majority of startups fail, understanding how to build a better company (Ries, 2016), in software startups, the lean startup has jumped the fence to some of the world's largest companies, including Facebook, Google, and General Electric. Lean startup techniques are how these companies now regularly serve billions of people. (Gelobter, 2015). That method first identifies a problem that needs to be solved. It then

develops a minimum viable product or the smallest form of the product that allows entrepreneurs to introduce it to potential customers for feedback. This method is faster and less expensive than developing the final product for testing and reduces the risk that startups face by decreasing their typical high failure rate. Lean startup redefines a startup as an organization that is searching for a scalable business model, not one that has an existing business plan that it is determined to execute. (KENTON & BEER, 2021).

Success as a business : Many studies have been connducted to determine the success or failure rate of new products. We define success or failure of a new product based on whether the product achieves the management's performance objectieves (Havaldar, 2005), about 90% of startups fail. 10% of startups fail within the first year. Across all industries, startup failure rates seem to be close to the same. Failure is most common for startups during years two through five, with 70% falling into this category (Embroker, 2022), studies have found that 30 to 55 per cent of new industrial products fail, while the failure rate for consumer products is about 75 per cent (Havaldar, 2005).

The number one reason why startups fail is due to misreading market demand this is found in 42% of cases (Insights, 2021). Failure because of competition most likely happens when a startup has been active for three to five years (Kotashev, 2022). And the second largest reason why startups fail (29% of cases) is due to running out of funding and personal money (Insights, 2021). In 2018, 82% of businesses that went under did so because of cash flow problems (Schmid, 2021), other major reason for startups failure (at least 10% or above) are from pricing or cost issues, user-unfriendly products, poor marketing and product mistiming (Insights, 2021). The important success factors for new products were studies by cooper and kleinschmist were conducted to evaluate the importance of the early stages of innovation on late stage and thier influence on the final product success (Uecke, 2012) as follows :

a- Product superiority and uniqueness : which is the most important success factor. It means superior quality and new product features that give the product substantial competitive advantage over competitors in the

market place. (Havaldar, 2005). For example, when Crompton Greaves Ltd. (CGL) introduced a new electrical equipment, called Moulded case Circuit Breaker (MCCB) in Indian market in technical collaboration with Hitashi company from Japan, i twas a greatsuccess in the indian market because it had a superior product feature than its competitor's MCCB. (HAVALDAR, 2014).

b- Market knowledge : or (marketing effectiveness) is considered important because the company understands the needs and wants of target markets, defines the same at the product concept stage of new product development process, and translates this knowledge into marketing strategies and action plans. (Havaldar, 2005).

c- The startup ecosystem : it consists of a group of people, startups, and related organizations that work as a system to create and scale new starups, startup ecosystems are formed often in a relatively limited area with a center of gravity like a university or concentration of technology companies. This ecosystem draws together key actors and stakeholders that gravitate towards growth ventures, including new enterpreneurs, mentors, incubators, sources of talent such as universities and corporations, investors and supporting services like startup-savvy law and acounting agencies. (health, 2021). According to the Kauffman Foundation, "Entrepreneurial ecosystems drive local economic vibrancy and national economic growth by building fertile environments for new and growing companies to thrive." Think of it as an interconnected network of support players (Williams, 2020).

3. Case study : the impact of death valley curve in algerian startups

3.1. The innovation climate in Algeria between 2011-2021: For that indicator, the data for Algeria from 2011 to 2021. The average value for Algeria during that period was 22.91 points with a minimum of 19.5 points in 2020 and a maximum of 24.5 points in 2016. The latest value from 2021 is 19.9 points. For comparison, the world average in 2021 based on 132 countries is 34.30 points (economy, 2011-2021).

Algeria is currently implementing a new innovation strategy in a move towards a knowledge-based society. The aim is to put firms at the center of innovation, to foster the innovation of small- and medium-sized enterprises (GII, 2011-2021), according to Vincent Le Geno, CEO of

Emerging Capital Partners How can increase the low insurance penetration rate in Algeria in the medium term... Raising capital enables these small businesses to accelerate innovation development plans (Report, 2011). algeria scored 56.25 points out of 100 on the 2019 Global Competitiveness Report published by the World Economic Forum (forum, 2012-2020).

3.2. Statistical analysis of research samples : To find out if there is a statistically significant relationship between the risk of falling into the death curve and the failure of innovative projects through a questionnaire that included 57 emerging or innovative enterprises. The Pearson correlation coefficient was used to clarify the significance of the relationship between failure during the technological transformation stage or the market stage. The results are shown in the following table:

Table 1. The results of the relationship between failure in the technology transfer stage or the market stage

var	correlation coefficient	significance level	relationship direction
Failure because of technology transfer	0.308	0.0001	Positive
Failure because of commercialization	0.351	0.0001	Positive

Source: author's spss results.

Through the results shown in the above table, it is clear to us that there is a statistically significant direct relationship at a significant level of less than 0.01 between failure during the technological transformation stage or the market stage indicates that the greater the risk of death in the stage of technological transformation or marketing, the greater the failure rate of innovative projects. This result is consistent with previous studies in foreign countries, which showed that the group of vital environmental factors represented by the startups ecosystem, business angels and entrepreurhip culture….etc.

To shed the light and illustrate the last data the researcher delved deeper by asking questions to a sample of unsuccessful entrepreneurs about the extent of their expectations about the dangers of falling into the death curve and what has been achieved in reality.

Table 2. did start-up teams about death valley curve risks

		Technology transfer	commercialization	total
1 N	Count Expected count	7 16.7	70 60.3	77.0
2 Y	Count Expected count	44 32.3	98 109.7	142.0
3 total	Count Expected count	51 51.0	168 170.0	219.0 220.0

Source: research's spss data

Chi-Square tests

	value	df	Asymp.Sig 2 sides	Exact Sig 2 sides	Exact Sig 1 side
Pearson Chi-Square	15.753	1	.000		
Continuity Correction	14.426	1	.000		
Likehood Ratio	17.951	1	.000		
Fisher's Exact Test				.000	.000
N of valid cases	219				

Spss data results.

4.Results:

This results report includes several statistical tests that can be used to evaluate this data. However, we will focus on the Pearson chi-square statistic, which is equal to 15.753 at a significant level of 0.000. Therefore, we will reject the basic hypothesis and conclude that the owners of innovative projects are not well aware of the dangers of falling into the death curve.

5.Conclusion

to avoid the danger of the Death Valley Curve via Open Innovation approach, such as practical advices for not getting involved in capital-intensive business which will need more funds to be prepared and launched untill be commercialized, and requesting financial support from the venture capital fund ASF (Algerian Startup Fund), Angel investors and others, and connecting them with large state-owned and private corporations, and national and international investors to overcome the obstacles related to the innovative products of startups in algeria, as well as intensive work during the early periods from prototyping to final product and provide events as like Algeria Disrupt and communications for sharing experiences, and probably resorting to crowd- funding such as requesting donations via the legal process, Open Innovation also will benefiting algerian entrepreneurs from the service of business incubators and government trade grants during the stage of technological transformation of the products and services.

6. Recommendations

- Accumulate some resources before you start;
- Keep your day job until revenue starts to flow;
- Solicit funds from friends and family;
- Use crowd funding;
- Apply for contests and business grants;
- Get a loan or line-of-credit;
- Join a startup incubator;
- Barter your services for their services;
- Joint venture with distributor or beneficiary;
- Commit to a major customer.

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