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Providing a Model for Overcoming the Valley of Death for Financial Technology Startups

Amir ebrahimpour azadboni [1*]
hamideh reshadatjoo [2]
alireza askarzadeh [3]

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Abstract

The purpose of this research is to provide a model to overcome the valley of death for financial technology startups. This research is practical in terms of purpose and descriptive-survey in terms of data collection. The community under investigation is the services of five technology-oriented startups in the financial field. After defining the topic and conducting preliminary exploratory and library studies, the factors and components were determined through thematic analysis and by a researcher-made questionnaire that reached the opinion of academic and professional experts familiar with the topic (including 3 university professors and 9 experts) and after obtaining corrective comments. Their qualitative and quantitative analysis (using the Delphi method) has reached the consensus of the elite based on statistical methods related to the ultimate analysis of the model, its components and the combination of factors. In the qualitative part, Maxqda software was used for thematic analysis, and in the quantitative part, Smart pls software was used for factor analysis. This research was formed according to the number of 273 primary codes, of which 30 were open codes and 10 were central codes. The research findings showed that (technology development, institutional pressures, active players in the innovation system, government support, high entrepreneurial intelligence, high liquidity, complex customer base, cooperation, successful demonstration of commercialization) has a significant impact on Death Valley. The results showed that the components of overcoming the valley of death on a better understanding of the use of startups among startups in the financial technology field can cause more optimal use of it among them. Using the introduced model helps startups to identify the components of overcoming the valley of death of startups and to understand their strengths and weaknesses in relevant fields and also to be more efficient in the competitive environment.

Keywords: Valley of Death, startup, Finance-oriented technology

[1] *PhD student of Technology Management, science and research Branch, Islamic Azad University, Tehran, Iran* ***(Corresponding author)****
[2] *Associate Professor, Department of Higher Education, science and research Branch, Islamic Azad University, Tehran, Iran*
[3] *Associate Professor, Bachelor strome college of bisiness, old dominion university, Norfolk, Virginia, USA , collegenovin@gmail.com*

Itroduction

The valley of death is a situation where new businesses cannot reach the end point (Earl et al., 2019; Kogure et al., 2019). It is also described as the inability of a startup to achieve success (Belz et al., 2019). The ability to create, publish and spread knowledge has become an important guarantee for the survival and healthy development of companies (Liu et al., 2020). Many researchers, practitioners or policy makers are not a new phenomenon. Indeed, the existing literature sheds light on a collection of scientific works, reports, recommendations, and government policies that reveal various aspects of the Valley of Death. Many of these studies identified the causes of the Valley of Death, while some even suggested recommendations for overcoming them. All these studies confirmed that the valley of death is a serious challenge that startups, both small businesses and large companies, face during their commercialization projects (Buddy and Aldianto, 2020; Lettner et al., 2020; Maulina et al., 2020). There is a big gap in the process of resource innovation to the transformation of scientific and technological achievements, which is called the valley of death (Zhang, 2020). Startup business is a system for building a business or product in the most effective way possible to reduce the risk of failure. In this approach to start a business through testing, the products from the start-up business should be quickly Validation in the market. This approach is based on scientific testing, unrepeatable product presentation and customer feedback to get the right product (Rise, 2011). The emergence of start-ups, including high-tech startups, is often expected to stimulate innovation (Ebrahimpour et al., 2023). Startups engaging in innovative activities tend to use equity financing rather than debt financing because of their cash flow pattern and risk-return profile. It can be assumed that start-up companies that engage in innovative activities use more financing, especially from private equity investors and angel investors (Hanju, 2021). The startup business philosophy seeks to eliminate useless things and increase value-creating activities during the product or service creation phase; In such a way that start-up businesses can have a perfect product business with a higher chance of success without the need for large external investment (Ebrahimpour and Reshadatjoo, 2021). Financial startups in the world are not only welcomed because they are new or special, but also because they provide banking and financial services with a lower cost, fast and comprehensive, which the traditional banking system is not able to adequately respond to, it has made these technology-oriented startups valuable. This has made the presence and activity of these competitors and new actors very important in the market of services and financial transactions (McKenzie and Company, 2016). Fintech startups are fledgling companies that use the Internet and new technologies to provide financial services with quality, transparency and speed, at a lower cost and with security (Zavlokina, Dolata and Ichavabe, 2016). The source of income for most fintech startups are individual customers and small and medium-sized companies, and surveys show that young and wealthy customers use the services of fintech startups the most, and due to the high penetration rate of using mobile phones and Also, Internet connection in Iran and the country's young population, the expansion of fintech startups as much as possible and the use of their services as much as possible is not far from expected (Moradi et al., 2019). Considering the current conditions in the country,

presenting the development models of pioneer countries in the field of startups and combining them with the existing conditions can expand the field of expansion of startups and the successful implementation of a startup in various fields such as finance and fintech. In this research, the researcher is looking for this basic question: What is the model of overcoming the valley of death in financial technology startups?

Theoretical Foundations

Death Valley

In the literature, one can identify several attempts to describe innovation in the context of a process. The works that indicate a tradition in this line can be identified as the generation of innovation processes (Cui, 2020). For example, (Daldrop et al., 2020) describes the valley of death as the result of a gap that is simultaneously financial, institutional and capabilities. Reference (Baron et al., 2020) assumes the valley of death as a double gap of knowledge and capital. Considering Death Valley from a complex perspective, various factors have been investigated in addition to financial factors. At that point, some authors recognize that mindsets within the framework of organizations usually create barriers to innovation (Leitner et al., 2020).

Startup

Entrepreneurship is on the agenda of many economies to create wealth, boost growth and reduce economic constraints. In this regard, the emergence of technology entrepreneurship, also known as startups, has attracted the attention of policymakers and academics. Startups play a key role in bringing technologies to market, especially as they develop fundamental innovations that stimulate economic growth (Nair et al., 2022). Startups usually have few resources, capabilities and experience to develop and commercialize their products independently (Zheng et al., 2022). In particular, technology startups deal with complex solutions that require interdisciplinary knowledge (Marcon and Ribeiro, 2021). Startups can disrupt existing institutions and may encourage existing companies to respond to their sustainable innovations (Naravanen et al., 2021). Startups may be motivated to choose circular business models to meet the growing expectations of customers, employees and investors who consider environmental, sustainability and governance criteria increasingly important (Alda, 2021; Sciarelli et al., 2021). Other authors use similar arguments to highlight the role of startups in the transition to a circular economy. They state that it is relatively easy for startups to adopt circular economy principles because the company culture is developed from the beginning (Bavens et al., 2020). Therefore, collaboration with external stakeholders may improve startups' ability to develop innovative products and gain competitive advantage (Litao et al., 2022). Existing research shows that networking significantly and positively contributes to new venture performance and competitive advantage. A suitable way for startups is to participate in innovation networks to collaborate with different stakeholders and access complementary assets beyond corporate boundaries (Marcon and Ribeiro, 2021). Although relationships with established organizations and supporting actors are vital for startups, it may be difficult for them to communicate with these organizations (Moritz et al., 2021). Global investment in financial technology increased more than 12 times between 2008 and 2014 and increased from 930 million dollars to more than 12

billion dollars (Asadi Ghanbari et al., 2015), in 2010 more than 100 billion dollars of investment, by new entrants to the fintech industry (Senture, 2018), for example, in the first half of 2018, more than 16 billion dollars were invested in the British fintech industry, which is more than 25% of the 57.9 billion dollars of investment. in the fintech industry, especially after the corona virus epidemic, continues to increase (Alvarez, 2020).

FinTech

In the meaning of financial technology, it refers to new technologies for producing products and providing services in the financial industry. Fintechs are able to provide various financial services such as crowdfunding, payments and personal financial management and asset management. Provide more convenience and lower fees to customers (Bhandari, 2020). In fact, fintech is a set of activities and businesses that provide financial services on a wide scale and regardless of geographical boundaries using new software capabilities (mostly based on the web platform). Fintechs can be considered banking and financial technology startups that try to cross the usual boundaries of financial intermediation. Fintech or financial technology is a field of financial services that is based on technology. Fintech is also related to startups, digital companies or even financial companies that have been active for a long time and provide financial services using new technologies (Qaemi et al., 2016; Askarzadeh et al., 2023). Although these technologies were initially focused on issues such as improving the software provided in the payment system, but now, due to the weakness of the banking system, they are trying to provide new banking services in a short time and by reducing the maximum bureaucracy in accordance with the daily needs of customers and Other petitioners have financial services (Dunkley, 2016). The goal of fintech is to attract customers by providing products and services that include a convenient, efficient, transparent and automatic user interface (Gomber et al., 2017).

Methodology

The present research has been used in terms of practical purpose and in terms of mixed approach method. In this way, in order to first present the model and identify the components, dimensions and variables of the model, a qualitative approach was used in the research, and after the presentation of the model and the identification of the model components, a quantitative approach was used for the final test of the model. In this research, after the content analysis method of overcoming the Death Valley of the startup was evaluated, in the next step, using the Delphi method, the relevant dimensions and components are identified from the experts' point of view. The relevant variables and components were monitored and used in the form of a questionnaire. In the quantitative part of the research, the model was designed to test, and the obtained data were used using central indicators, dispersion, distribution shape and related charts. In the inferential part, structural equation technique has been used to measure the impact of variables using Smart PLS software. The statistical population of the research consists of 4 startups in the financial field that use these services. Target population to select a sample from among experts and university professors who had the necessary criteria, 15 people were selected as a statistical sample in the qualitative section. Also, in the quantitative part of the research, the number of 164 people was determined as

the sample size using the Krejcie and Morgan table. Random sampling method is available. The main data collection tools of the research include interviews, questionnaires, case studies, and document review, in order to explain the model, a researcher-made questionnaire was used. The validity of the questionnaire was measured and confirmed by the divergent validity method. For the reliability of the questionnaire, it has been measured by calculating Cronbach's alpha and calculating the combined reliability coefficient (CR). Cronbach's alpha values and composite reliability coefficient calculated for each construct and the number of items used for each construct are given in Table 2. (Technological development, institutional pressures, active players in the innovation system, government support, high entrepreneurial intelligence, high liquidity, complex customer base, cooperation, successful demonstration of commercialization).

Table 2: Normality test of research variables

Variable	Kolmogorov-Smirnov test			Shapiro's test		
	Statistical values	Degrees of freedom	Significance level	Statistical values	Degrees of freedom	Significance level
Technology Development	0.089	164	0.005	0.980	164	0.018
Institutions	0.063	164	0.000	0.943	164	0.000
Active actors of the innovation system	0.138	164	0.000	0.765	164	0.000
Government support	0.112	164	0.000	0.865	164	0.000
High entrepreneurial intelligence	0.138	164	0.000	0.951	164	0.000
Common culture	0.072	164	0.059	0.982	164	0.043
Brand image	0.111	164	0.000	0.977	164	0.001
Customer base	0.135	164	0.000	0.946	164	0.001
Cooperation	0.112	164	0.000	0.973	164	0.002
Successful commercialization	0.087	164	0.005	0.981	164	0.018

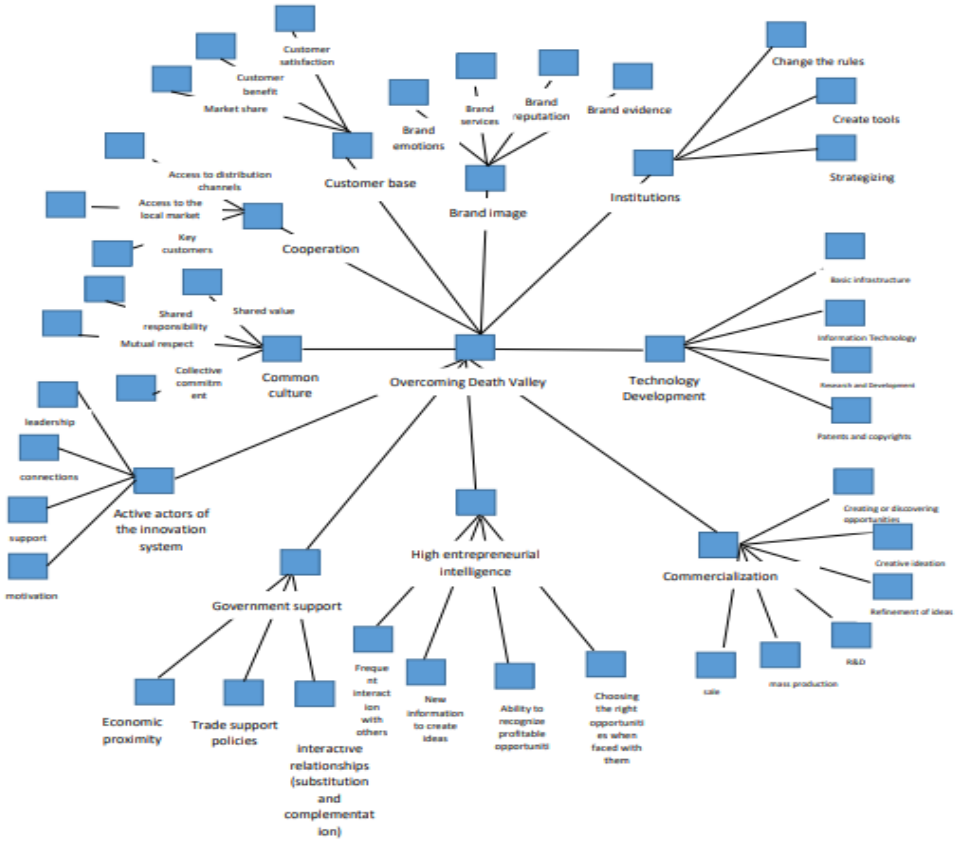
Analysis of data

According to coding in 12 interviews conducted with financial company experts, 273 initial codes were formed. After the initial classification of the resulting data, the concepts of open coding based on orientations, appropriateness and the nature of the burden were placed in 10 categories, which are: Technology Development, Institutions, Active actors of the innovation system, Government support, High entrepreneurial intelligence, Common culture, Brand image, Customer base, Cooperation, Successful commercialization.

Table 4. Extracted codes

Open coding	Categories	Interview No									
		1	2	3	4	5	6	7	8	9	10
Basic infrastructure	Technology Development	1	1	0	0	0	0	0	0	1	1
Information Technology		1	0	0	0	0	0	1	1	1	1
Research and Development		1	1	1	0	0	0	1	1	1	0
Patents and copyrights		1	1	0	0	0	0	0	1	1	1
Change the rules	Institutions	1	0	0	0	0	0	1	1	1	1
Create tools		1	1	1	0	0	0	1	1	1	0
Strategizing		1	1	0	0	0	1	0	0	1	1
leadership	Active actors of the innovation system	1	0	0	0	0	0	1	0	1	0
connections		1	1	1	0	0	0	1	1	1	0
support		1	1	0	0	0	0	0	0	1	1
motivation		1	0	0	0	1	0	1	1	1	1
Economic proximity	Government support	1	1	1	0	0	0	1	1	1	0
Trade support policies		1	1	0	0	0	0	0	0	1	1
interactive relationships (substitution and complementation)		1	0	0	0	0	1	1	1	1	1
Frequent interaction with others	High entrepreneurial intelligence	1	1	1	0	0	0	1	0	1	0
New information to create ideas		1	1	0	0	0	0	0	0	1	1
Ability to recognize profitable opportunities		1	0	0	1	1	0	1	1	1	1
Choosing the right opportunities when faced with them		1	1	1	0	0	0	1	1	1	0
Shared value	Common culture	1	1	0	1	0	0	0	0	1	1
Shared responsibility		1	0	0	0	0	0	1	1	1	0
Mutual respect		1	1	1	0	1	0	1	1	1	0
Collective commitment		1	1	0	0	0	0	0	0	1	1
Brand evidence	Brand image	1	0	0	0	1	0	1	1	1	1
Brand reputation		1	1	1	0	0	0	1	1	1	0
Brand services		1	1	1	0	1	0	0	0	1	1
Brand emotions		1	0	0	0	0	0	1	1	1	1
Customer satisfaction	Customer base	1	1	1	1	1	0	1	1	1	0
Customer benefit		1	1	0	0	0	0	0	0	1	1
Market share		1	0	0	0	0	0	1	1	1	1
Access to distribution channels	Cooperation	1	1	1	0	1	0	1	0	1	0
Access to the local market		1	1	0	0	0	0	0	0	1	1
Key customers		1	0	0	0	1	1	1	1	1	1
Creating or discovering opportunities	Successful commercialization	1	1	1	0	0	0	1	1	1	0
Creative ideation		1	1	0	0	0	0	0	0	1	1
Refinement of ideas		1	0	0	0	0	0	1	1	1	1
Production and development in the R&D department		1	1	1	0	0	0	1	1	1	0
mass production		1	1	1	0	1	0	1	0	1	0
sale		1	0	1	0	0	1	0	1	1	0

Figure No. 1: Maxqda output



Discriminant validity

An important criterion that determines Discriminant validity's the degree of relationship between the structure and its indicators in comparison of the relationship of that structure with other structures; In such a way that the acceptable divergent validity of a model indicates that a construct in the model interacts more with its indicators than with other constructs (Reshadjoo and Ebrahimpour, 2021). The results of the Discriminant review are shown in Table No. 5.

Table 5 Discriminant validity assessment by Fornell and Larcker method

	Technology Development	Institutions	Active actors of the innovation system	Government support	High entrepreneurial intelligence	Common culture	Brand image	Customer base	Cooperation	Successful commercialization
Technology Development	1									
Institutions	0/38512	1								
Active actors of the innovation system	0/13655	0/45292	1							
Government support	0/42911	0/34013	0/19522	1						
High entrepreneurial intelligence	0/39417	0/36547	0/23155	0/16431	1					
Common culture	0/28753	0/28361	0/32155	0/45142	0/0876	1				
Brand image	0/32019	0/39803	0/28932	0/55390	0/09832	0/83180	1			
Customer base	0/35261	0/29451	0/26352	0/70152	0/19232	0/63251	0/8203	1		
Cooperation	0/29415	0/64821	0/13625	0/15521	0/18251	0/19821	0/22152	0/44521	1	
Successful commercialization	0/14870	0/56449	0/25872	0/49076	0/19802	0/23018	0/38902	0/13902	0/26091	1

Fit of the structural model: In order to check the fit of the structural model, the R2 and q2 criteria have been used, the values of each of which are shown in Table No. 6 and indicate the proper fit of the structural model.

Table 6. R2 and q2 criteria

Structures	Q2	R2
Technology Development	0/0000000	0/648515
Institutions	0/2451620	0/852612
Active actors of the innovation system	0/2652201	0/695361
Government support	0/2736915	0/732541
High entrepreneurial intelligence	0/2315842	0/936512
Common culture	0/2515201	0/775514
Brand image	0/2801541	0/925164
Customer base	0/3250162	0/592516
Cooperation	0/4252036	0/961542
Commercialization	0/3882901	0/877390

Fit of the research model

In order to achieve the objectives of the research, first, by using the confirmatory factor analysis test, the amount of factor loadings of each of the research items was examined, and after confirming the appropriate level of the factor loadings of each of the items, the fit indices of the research model were checked. And finally, after evaluating the mediator's role with the help of Sobel's test, we will examine the presented hypotheses using the structural equation modeling test.

To check the significance of the relationship between the variables, the t-test statistic or t-value is used. Because the significance of each error level is checked at 0.05, therefore, if the amount of factor loadings observed with the t-value test is calculated to be smaller than 1.96, the relationship is not significant.

The development of technology has a significant effect on the model of overcoming the valley of death in startups (0.459, 5.899). Institutions have a significant effect on the model of overcoming the Death Valley of startups (0.699, 5.098). The active actors of the innovation system have a significant impact on the model of overcoming the Death Valley of startups (0.712, 6.377). Government support has a significant effect on the model of overcoming the Death Valley of startups (5.675, 0.448). High entrepreneurial intelligence has a significant effect on the model of overcoming the Death Valley of startups (0.638, 5.489). Common culture has a significant effect on the model of overcoming the Death Valley of startups (0.559, 5.877). Brand image has a significant effect on the model of overcoming the Death Valley of startups (0.590, 6.764). Customer base has a significant effect on the model of overcoming the Death Valley of startups (0.389, 6.009). Cooperation has a significant effect on the model of overcoming the Death Valley of startups (0.663, 5.389). Commercialization has a significant effect on the model of overcoming the Death Valley of startups (0.702, 4.944).

figure 2. The structural model of research in standard mode

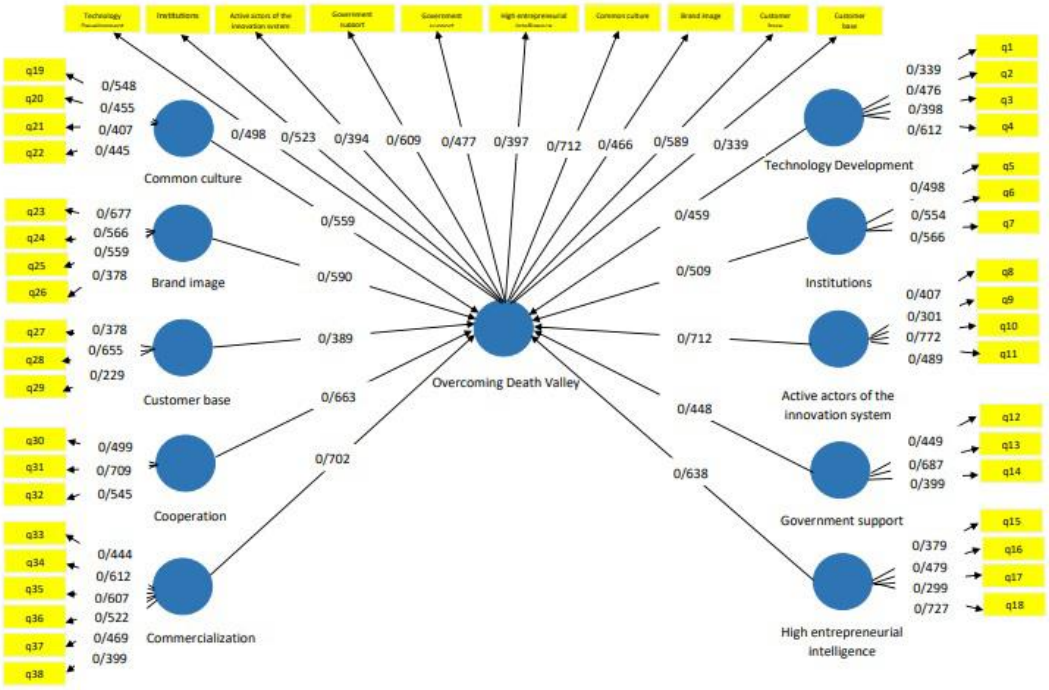
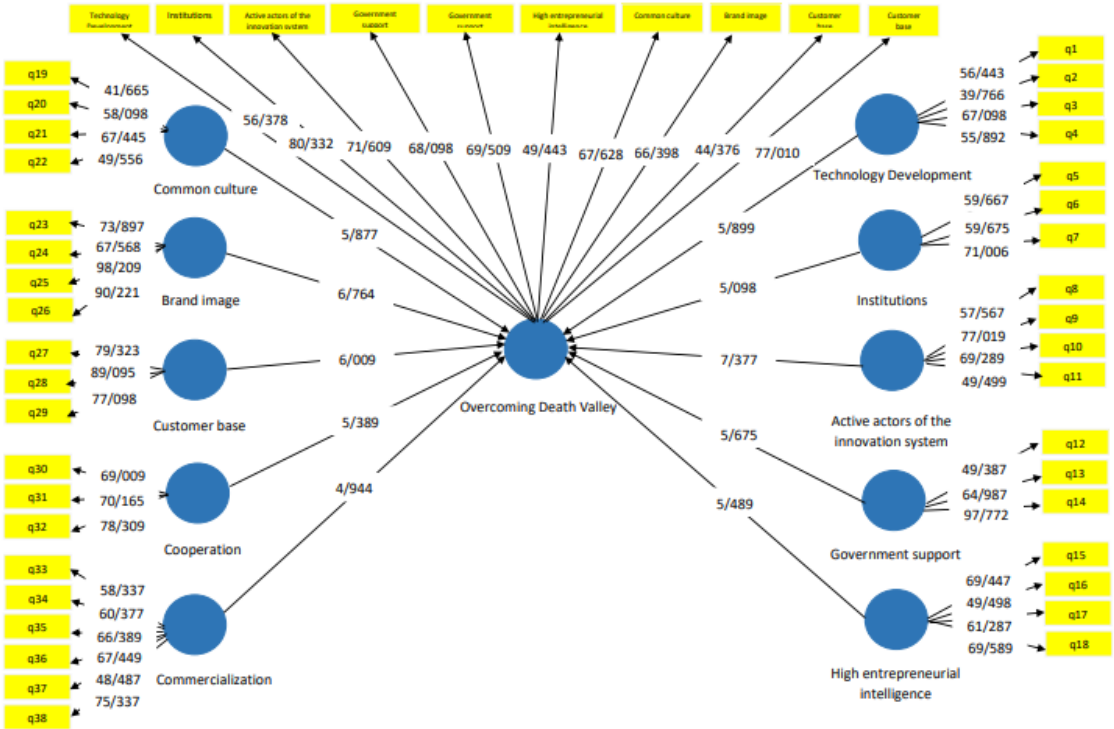


Figure 3. Structural model of the research in meaningful mode



Research findings

In the qualitative part of this research, after interviewing the experts, nine factors were extracted, which include (technology development, institutions, innovation system actors, government support, high entrepreneurial intelligence, common culture, brand image, customer base, cooperation, commercialization). to be These ten factors are actually factors influencing the model of overcoming the Death Valley of startups. which is described in the small part of working with Smart PLS software. Technology development has a significant effect on the model of overcoming the Death Valley of startups (0.459, 5.899). This component in the research literature of Earley et al. (2019), Amonariz et al. (2017), Zhou et al. (2016), Wong (2015), Maia and Claro (2014), Rencher (2012), Reis et al. (2008) and Other researchers have been interested. They believed that the development of technology is effective in overcoming the valley of death and will eliminate the Chasm. Institutions have a significant effect on the model of overcoming the Death Valley of startups (0.699, 5.098). Researches such as Thomson (2018), Hartley and Medlock (2017), Nalivanchek and Kirlichak (2017), Byrd et al. (2017) and other researchers were considered. They found that institutions have a positive relationship with overcoming the valley of death, so that in the study of Gicherova and Link (2017) on the valley of death in Brazil, these dimensions had an impact on the valley of death. Actors of the innovation system have a significant effect on the model of overcoming the Death Valley of startups (0.712, 7.377). Many studies such as Mossberg et al. (2018), Opris and Lonescu (2016), Hong et al. (2013), Cooper (2013), Bovender et al. (2010) addressed this issue. They found that innovation can be a way to cross the valley of death. Companies overcome this by innovating the product and the production process. Government support has a significant effect on the model of overcoming the Death Valley of startups (0.448, 5.675). According to the articles that have been worked in this field, such as Emmret -Buck (2011), Pope et al. (2017), Jaksic et al. (2015), Wang (2014), Niosi (2009), the necessity of government support was emphasized. They found that government support could improve much of this valley of death. High entrepreneurial intelligence has a significant effect on the model of overcoming the Death Valley of startups (0.638, 5.489). Studies such as Kogure et al (2019), Rowlinson et al. (2019), Girdauskiene et al. (2015) the payment. They stated that not having entrepreneurial intelligence or having a low level of entrepreneurial intelligence can deepen the valley of death for companies. Common culture has a significant effect on the model of overcoming the Death Valley of startups (0.559, 5.877). This component in the research of Wilson et al. (2018) Nalivaychenk & Kirilchuk (2017) found that in order to get out of the valley of death, startups need a common culture through which they can prepare both the company and the human resources for this challenge. The image of the brand has a significant effect on the model of dominating the Death Valley of startups (0.590, 6.764). Research such as Maulina et al. (2020), Nemet et al. (2018), Jung et al. (2015), addressed the brand name component. They stated that having a weak brand can lead to the gap of Death Valley. This research has been done in financial startups. The customer base has a significant effect on the model of overcoming the Death Valley of startups (0.389, 6.009). This component in the research of Wilson et al. (2018), Magruk (2016) who mentioned the customer base

in overcoming the valley of death. They stated that a complex customer base and relationships with customers in order to maintain their loyalty can reduce the gap of the valley of death. In fact, new products are met with more enthusiasm from customers. Cooperation has a significant effect on the model of overcoming the Death Valley of startups (0.663, 5.389). This component in the research of Chi-Han & Hung-Che (2016), Abereijo (2015), Pusateri et al. (2015) shows that cooperation among different departments of a startup can help overcome the valley of death. Commercialization has a significant effect on the model of overcoming the Death Valley of startups (0.702, 4.944). This component in the research of Budi & Aldianto (2020), Maulina et al. (2020), Lettner et al. (2020), discussed the importance of this component in Death Valley.

The sensitivity of the valley of death is such that sometimes with the entry of an agent that can create inconsistency in the startup, it can destroy the entire startup. All the factors that are to deal with the valley of death must be compatible and interact in order to overcome the valley of death, otherwise it is not possible to prevent this challenge for startups.

Based on the purpose and problem of the research, suggestions are presented in relation to the research to conduct future research:

Focusing on increasing technology development in order to grow and promote startups and the development of technology maintenance, both in terms of the production process and the product, as well as better business performance.

Creating strong rules for better visibility of financial startups and the use of financial technologies by organizations.

Supporting and strengthening credit guarantee funds and investment development among qualified people in order to create startups in the field of fintech.

Investigating the dimensions of active innovation players with the aim of developing startups with the aim of overcoming the valley of death in the field of financial technology-oriented businesses.

Creating a common culture among employees and understanding innovation in the product and production process with the aim of reducing risk and in order to overcome the valley of death in financial technology startups.

Dimensions of commercialization and paying attention to patents and creating an organizational atmosphere towards patenting employees and creating double innovation in order to get away from the valley of death for financial startups.

Creating a customer base and maintaining relationships with customers, as well as knowing actual and potential customers in order to grow and develop startups in the financial field.

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