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## Abstract

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# Comparative Study of Innovation Ecosystems Inducing Success of Startups in The World (Cutting 2000-2017)

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*Global Innovation Ecosystems are the result of creating drive-driven locations driven by their local entrepreneurial and innovative characteristics. This article aims to bring to light important information from three of the largest successful start-up ecosystems in the world. As a goal, this article aims to draw a comparison between the Startup-inducing global innovation ecosystems. The adopted methodology had a descriptive classification and a qualitative method. The study was made through a chronological cut - 2000 to 2017 - disseminating information about Silicon Valley ecosystems - USA; Tel Aviv - Israel and Beijing China. As a result, it was found that even some actions and activities seen in these ecosystems can be performed, but it is necessary to take into consideration the local characteristics and their abilities for the ecosystem to succeed.*

**Keywords:** Culture and Innovation, Ecosystem, Entrepreneurial, Innovation

## 1. INTRODUCTION

### 1.1 Local Development

With the advent of the World Wide Web, business relations have become much more intense and competitive worldwide. Entrepreneurship gained prominence and Startups began to create new mechanisms for innovation. But what are Startups? According to Blank (2014), Startups are not simply smaller versions of large companies and run business models in which customers, their problems and the necessary resources of the product are all "known". In striking contrast, Startups operate in the "search" mode, looking for a recurring and profitable business model. This objective requires dramatically different rules of action, involving scripts, a list of skills and tools that minimize risks and optimize the chances of success **(**BLANK & DORF, 2014).

Therefore, Startups are small businesses that must be scalable and that, necessarily, their entrepreneurs need to work in uncertain environments, covering "calculated" risks. Only in this way, the Startup model can take a scalable leap towards innovation.

The objective of this article was to carry out a comparative study between the world-leading innovation ecosystems that induce Startups. The methodology was descriptive and qualitative. As basic premises, we discuss the ecosystems of Silicon Valley - USA; Tel Aviv - Israel and Beijing - China for understanding that these ecosystems differ from each other, but arrive at a common point, that of local innovation. With the comparative procedures, ideas and paths favorable to the ecosystem were carried out in the processes of innovation and sustainability. It starts from the premise that this study is unprecedented, given the contemporary discussions of the theme.

In order to understand the comparative study, it is necessary that we understand the concept of innovation ecosystems. According to ETZKOWITZ AND LEYDESDORFF, 2000, “Ecosystems have been considered as networks of relationships in which information and talent flow, through systems of co-creation of sustained value” (ETZKOWITZ AND LEYDESDORFF, 2000). Jishnu, Gilhotra and Mishra (2011) and Russell et al. (2011) say that "innovation ecosystem refers to the interorganizational, political, economic, environmental and technological systems of innovation, in which the catalysis, support and support for business growth occurs". WESSNER, 2007 states that “Innovation ecosystems are made up of a set of individuals, communities, organizations, material resources, standards and policies through universities, government, research institutes, laboratories, small and large companies and the financial markets in a given region. These actors work collectively in order to allow knowledge flows, supporting technological development and generating innovation for the market.

The innovation ecosystems have the capacity to dialogue with organizations, whether public or private, class associations, the community in general and its actors, with the aim of prospecting, in loco, an incentive in the entrepreneurial culture than that region may have the best to offer to the world society. It is based on the assumption that ecosystems should be thought from the characteristics of the locality, improving and optimizing the product and / or service coming from the location. With that, the referred ecosystem will tend to become stronger and more structured, capable of taking a leap towards local development and innovation.

**1.2 Silicon Valley Ecosystem**

Silicon Valley is the region with the best structure in terms of innovation ecosystem in the world, which is geographically installed in the United States, in the San Francisco Bay area, where several high-tech companies that work with electrical circuits are installed, concatenating the region called as Silicon Valley. Its history is the star of the success in which it has become an ecosystem based on technology and disruptive innovation.

According to Geology for investors (2014), which is a discussion site on data mining, it is said that: In 1846, California had 700 foreigners and 300,000 indigenous people. In 1849, at the height of the gold rush, 40,000 miners had arrived in the region. At the time, the simple fact of reaching California was already a challenge: the routes that led to the North American west coast were very dangerous and the cause of death from diseases such as cholera was not difficult.

In another passage, in the year 1938, Professor Frederick Termman of Stanford University, encouraged two former students to undertake. These two students revolutionized the world, creating the Hewlett-Packard

Company - HP with just $ 500 in their pockets, at the beginning of their activities. Its two students, William Hewlett and David Packard started the most famous company in California in terms of innovation to date. Another important point in this ecosystem's race for global innovation was the Ames Aeronautical Laboratory - located in Silicon Valley. This was one of the laboratories created by NASA to work with the space industry.

The Hippie movement, extremely important in 1967, is the biggest characteristic of relatively young entrepreneurs, but with an extremely calm head. In Silicon Valley it is easier to find people wearing waistcoats, jeans and traveling on scooters that, necessarily, men and women dressed in formal clothes. It is believed that, because the Hippie movement was born at that time, there are people and entrepreneurs so calm in that ecosystem. Normand, 2014 infers that a few years later, in 1971, the success of the region's semiconductor industry had become known. As a consequence, in a story about her, journalist Don Hoefler named the site Silicon Valley. The logic behind the name was simple: San Francisco Bay is located in what is geographically a valley and silicon is one of the main chemical elements in semiconductor production (NORMAND, 2014).

Therefore, the entire strategy for structuring Silicon Valley was based on the positioning and innovative tactics of an ecosystem designed to be sustainable and disruptive. It is based on the premise that values based on and sustained to give “wings”, which made the nascent or developed companies in the ecosystem to solidify, to the point of having a worldwide impact on the society of the globe with their extremely innovative products and services and bringing benefits never seen until its release to society.

According to discussions about this ecosystem, the contextualization of successful models like the Silicon Valley can even be copied, taking into account the regulatory mechanisms, the necessary qualities of the local market, its plans to encourage financing, as well as the acceleration of business. that will come, later, to the structuring of the ecosystem and an enormous desire to disseminate a culture based on and focused on the dissemination of entrepreneurship.

According to the text “How to create and develop ecosystems: the entrepreneurship acceleration cycle” Rasia (s.d**)** states that there are four component steps to create an ecosystem based on the innovation and feedback of entrepreneurship shown in Table 1:

**The four steps and subcomponents of this cycle**

| 1<br>GREAT DREAM | 2<br>GROWTH | 3<br>COMMITMENT | 4<br>REINVESTMENT |
|---|---|---|---|
| New entrepeneurs seek to build scalable companies in local areas due to: | Entrepreneurs are able to grow their businesses ande reach scales based on: | Successful entrepreneurs remain in the region where they started and engage in new businesses due to: | Successful entrepreneurs reinvest in a new generation through: |
| Quality of social life. | Access to cystiners Access to financing | Quality of local life | Angel and working capital investment |
| Desire of grownt | Access to talent<br>Your entrepreneurial skills | Investment Desire | Orientation<br>Spinoffs Business |

Source: Rasia (s/d) adapted

These four steps in the process of components of a cycle (1- Big dream; 2 - Growth; 3 - Commitment and 4 - Reinvestment) provided the basis for the creation of Silicon Valley and must be followed by other ecosystems, always respecting the individualities provided for in the places. Structuring ecosystems may or may not work. However, it is necessary to take into account the entrepreneurial culture, the inputs - products and services - to which such a location is more apt to develop and make available to society. It is based on the premise that local specificities should be studied and structured so that the model mentioned can be applicable to localities that wish to have a solid ecosystem and that prospect local innovation. According to the following data, in Fig 1, investment information in Silicon Valley has been increasing considerably, which shows that the ecosystem continues to grow over the years.

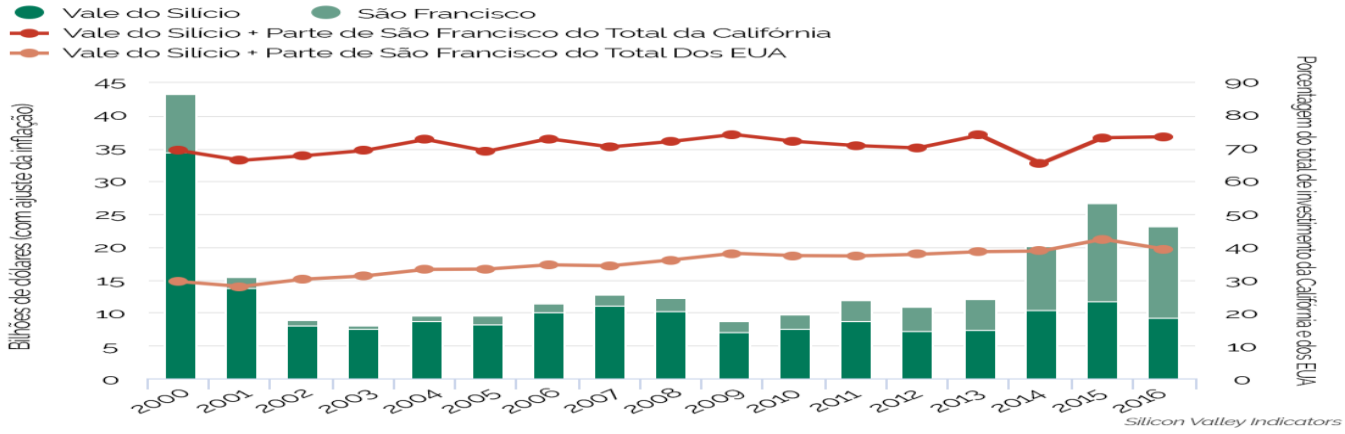


Figure 1 – Investment in Silicon Valley

Source: Silicon Valley Indicators, (s/d)

The figure shows the exact cut of the increase in investments from innovation in Silicon Valley. That is, from the beginning of its activities to the present day, Silicon Valley has been receiving considerable figures in terms of investment in Startup and innovative ideas. It is up to the rest of the world, interested in building their innovation ecosystems, to study their localities, their habitats and cultural processes, in order to identify which products / services are geographically excellent and to try to execute, in the best possible way, the business identified.

According to GSER (2017), “In the years 2016 to 2017, more than 47 thousand new jobs were created, 29% of which correspond to jobs in the technology area. Also, the region has produced 80 unicorns (Startup whose revenue has reached millions) since 2003”. Undoubtedly, a successful ecosystem, based on entrepreneurial culture and the positioning of universities thinking about producing theory linked to business, should serve as an example to prospect activities capable of being promoted worldwide.

### 1.3 Israel's ecosystem - Tel Aviv

Located in a country that is constantly in a geopolitical war, the city of Tel Aviv, Israel boasts strategic and disruptive innovations, despite being one of the smallest cities in the world that have the most successful Startups, which makes the town bear the name of "Middle East Silicon Valley". Tel Aviv's history mixes with that of its country. Israel is a relatively small country and is going through a war that has lasted for many decades. “Its population has, on average, 8.5 million inhabitants, containing more Startup per capita than any other country: About 1 for every 2000 Israelis” **(**COGO, 2018, p. 77). In addition, the country has

the 3rd largest number of companies registered on the Nasdaq - which is an index of the market for common shares and similar securities listed on the stock market. Together with the Dow Jones Average and the S & P 500 it is one of the three most followed indices in the US stock markets (COGO, 2018), just behind the United States and China. Israel's nickname is Startup nation because it has several companies with this characteristic and because it has in its society the characteristic for changes and the culture of starting to innovate from the beginning. What should be taken into account in this article is the peculiar characteristic of that country. Perhaps the ability to start from scratch and the culture based on the eternal start had a direct impact on what has become Israeli Silicon Valley. The History of Israel gives rise to a situation of struggle, with a population that suffers from the constant geopolitical war, but that practically doubled in size in the first two years of its existence, growing by more than 1 \ 3 during the next seven years (COGO, 2018).

One of the important characteristics of this country is that Israel has always had a lot of hostility towards neighboring countries, being forced to export to distant markets, consequently, forced to have experiences with large markets and with high costs. This characteristic of Israel made the country realize that, necessarily, it would need to work directly with innovation. Another feature that we think is important for Israel to become a country geared towards innovation was its military arsenal. According to COGO (2018), maturity was reached briefly because society has experienced an incredible mix of incisive experiences since the end of high school, that is, men and women are forced to enlist in military life and undergo experiences within the process. This is also believed to be a distinctive feature of the Israeli population. And yet, according to COGO, 2018, The third main factor that profoundly influences Israel's success is given by immigration. “Immigrants are not averse to starting over. They are, by definition, risk takers”.

It is believed that, due to these three basic characteristics of the Israeli people, the country has taken a turn towards the area of innovation, capable of standing out before the great world nations. It starts from the premise that the country has taken a significant leap, with peculiar characteristics and a driving force (public policies) based on Research and Development; a profound synergy between academia and industry; incentive to corporate internationalization programs, in addition to a wide participation of the state in a risk spreadsheet. All of this led to solidification, capable of boosting this country as an Asian precursor in terms of innovation. It has one of the highest densities of nascent companies in the world (COGO, 2018), that is, the city of Tel Aviv remains literally within an innovation bubble, prospecting various areas of IT and making disruptions in the world. It starts from the premise that a city so small and with so many negative impacts on the economy, due to the constant geopolitical war, as well as the lack of natural resources, managed to overcome all these negative points and became one of the largest cities with a high concentration of nascent companies in the world. The best answer for Tel Aviv to become the Asian Innovation Valley is, precisely, its militaristic culture, collectivism, the proximity of businessmen to Israeli universities and the ability to keep connected a robust ecosystem of suppliers, consumers, mentors, talents engineering and also venture capital with the immense capacity to connect in an efficient and optimized way, to the point that a country so small and so in need of different public policies had the capacity to excel in terms of innovation and considerable concentration of entrepreneurs and their Startups.

We’ll see the cultural paradigm break with respect to filings for Israeli patent applications in the chart below.

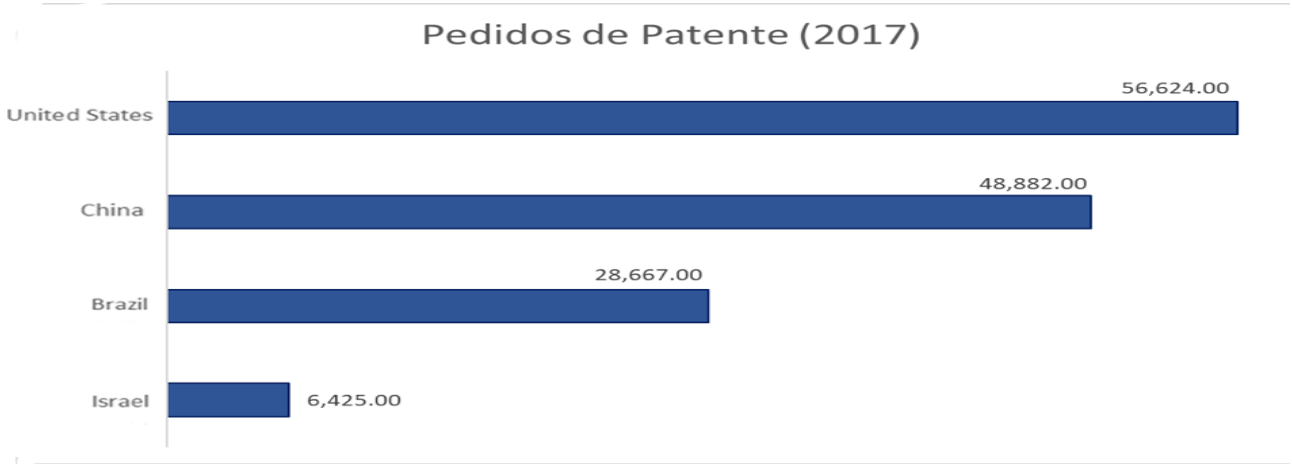


Figure 2 – Filing of Israeli Patent Applications

Source: Israel Patent Office, INPI, WIPO

As small as Israel's patent applications may still be, it is clear that the culture is geared towards entrepreneurship and impact innovation.

**1.4 Beijing-China ecosystem**

China has gone through several world difficulties and only in this century has it been arousing interest in the innovation race. The People's Republic of China is a socialist country and the most populous in the world. About almost 1/5 of the world population resides in China. The country has the 2nd largest economy in the world, second only to the United States. The People's Republic of China is divided into 23 provinces and has the largest land border in the world, with almost 22 thousand km2. Its economy is based on the import of manufactured goods and the export of technological products, with a favorable trade balance.

Regarding the Chinese evolution, there is a very big paradigm break when the country ceases to be an exporter of pirated products and turns, primarily, to a country capable of developing products / processes and programs supported by world innovation. In this context of changes in how to deal with industrialization and technology, China has established two policies for the development of science and technology: The Five-Year Plan (2011-2015) and the National Plan (2006-2020). The Five Year Plan brought a total of US $ 1.7 trillion to several technological sectors that are very strategic for the economy (including: renewable energy, biotechnology, efficient and ecological technologies, electric cars and a new generation of Information Technology). The National Plan, in the medium and long term, aims to face what is perhaps the greatest challenge of Chinese technological advances, which is to improve the sector's innovation capacity (QUEIROZ, s \ d).

It was observed that, with the result of the policies of the *Quinquennia*l and National plans, there was an increase in the incentive of expenses with Research and Development, a jump of the order of 41 billion dollars in 2000 to 344 billion in 2014, totaling eight times more investments in R&D in the fourteen-year period. China practically tied with the USA in terms of investments in R & D & I in 2019, as shown in the fig below:

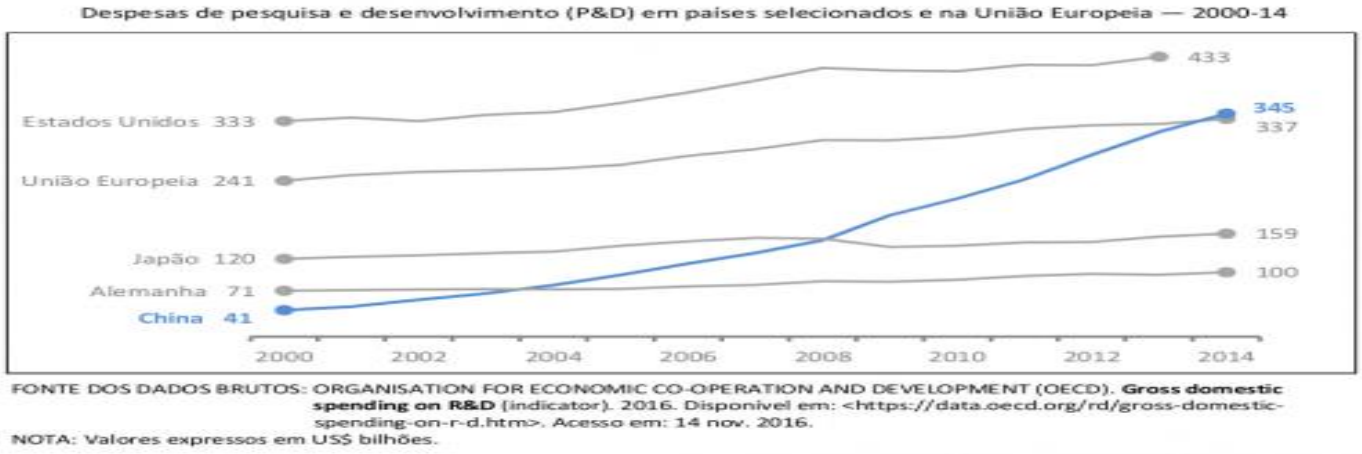


Figure 3 – Research and Development Expenditure in selected countries and in the European Union from 2000 to 2014

Source: Organization For Economic Co-peration and Development (OCDE),2016

Fig 4 shows that China exceeded, in 2019, the number of Startups that are able to multiply their earnings, the so-called Unicorns produced in that country.

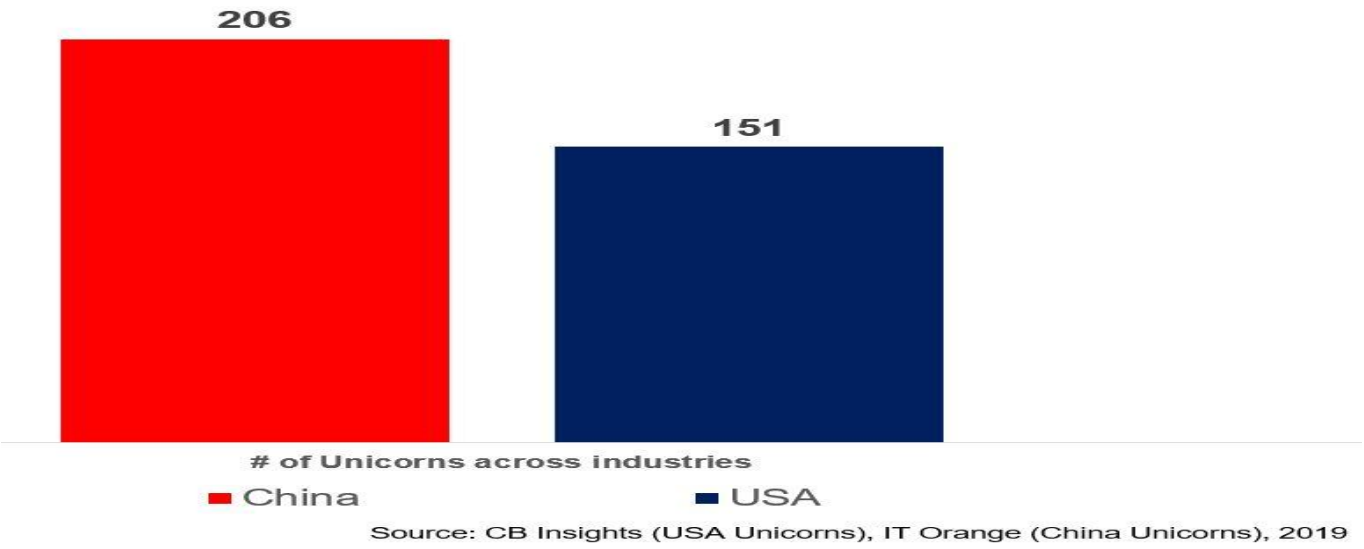


Figure 3 – Number of Unicorns in Chine and The United States

Source: China Unicorns, 2019

The identification of the graph shows us that, in 2019, China already surpassed the United States in number of Unicorns. For this reason, this country began to emerge in the area of technological innovation, seeking the development of several products and services directly linked to technological disruptions. In addition to the entire technological arsenal and the paradigm shift in working towards global innovation, research data from the International Accounting firm KPMG found that China and the United States together have the greatest technological innovation potentials in the world. This study originated from a survey based on data from a total of 800 world leaders who work directly with technology, including Startups and Fortune 500 executives, which is a ranking of the 500 largest corporations worldwide compiled and published by the magazine Fortune. Another important characteristic of the country is its major leader, President Xi

Jinping, who categorically stated the following explanation: “For a strong China, for a Chinese people with quality of life, great vigor is needed in the field of science and technology (…) With new times come new circumstances and new tasks, forcing us to have, in the field of innovation in science and technology, new concepts, new plans and new strategies, so that we can achieve our two goals for the centenary and accomplish the revival of the Chinese dream: accelerating innovation in all sectors and seizing the decisive opportunity for global competitiveness. This is our starting point for building a country strong in science and technology.” (STARTUPSE, 2018).

According to the information from the country's leader, there is a great cultural and structural revolution that culminates in Chinese S & T & I, capable of providing unimaginable subsidies and, consequently, proposing new mechanisms for restarting the People's Republic of China with regard to the disruptive technology and innovation. It is up to the Chinese government to implement all public policies, capable of subsidizing all paths that favor the creation of business Startups based on increments and disruptive innovation. There are already some projects underway in the People's Republic of China in the field of Startup with the ability to change the way we use the Wi-Fi connection. The Asian dragon is developing Li-Fi, a new type of internet connection that is much better than Wi-Fi - It is a light connection, which uses visible LED light to transfer data with greater speed than Wi-Fi, which is based on radio waves. The connection will be based on emissive carbon dots in all colors (F-CDs, in the acronym in English) that allow to develop a faster wireless communication channel. A test carried out in 2015 by the Chinese government ministry showed that Li-Fi can reach a speed of 50 gigabytes per second (with it, a movie download, for example, can be done in just 0.3 seconds). However, it is stipulated that Li-Fi will only be available six years from now (STARTUPSE, 2018). In addition to this new way of accessing the World Wide Web, we will also have the insertion of the Internet of Things in the traditional Chinese cutlery / sticks, let's see: The traditional “sticks” for Chinese food have become sensors to detect if everything is right with the food - After suffering a problem with contaminated soils, the Chinese decided to use the Internet of Things in the service of health. It is also possible to detect the calories, acidity and even the temperature of the food (STARTUPSE, 2018).

The city of Beijing, capital of China, has been making significant leaps in terms of innovation and intellectual property. According to the World Intellectual Property Organization - WIPO — founded in March 1998, in response to the demand for knowledge and skills in training, teaching and research in Intellectual Property (PI), it states that China has generated “About 3.17 million of global patent applications, being executed in 2017, which corresponds to an increase of almost 6% per year ”In other words, according to statements by the general director of WIPO, Francis Gurry, the demand derived from innovation linked to Intellectual Property has significantly increased the global economic growth rate, bringing an increasingly competitive component of commercial activities. Also according to WIPO (2017), in just a few decades, China built an intellectual property system, encouraged national innovation, joined the world's intellectual property leaders - and is now driving global growth in registrations. For this, it is known that China, more specifically, the city of Beijing has been pioneering and bringing an innovative arsenal to the world, capable of competing equally with the world power in terms of innovation, the United States. It is assumed that this competition will bring good results to the world in terms of science,

technology, innovation, research and development and intellectual property, the latter already emerging as a differential in the world confluence between the two world powers.

## 2. METHODOLOGICAL PROCEDURES

The method used is descriptive, carried out in a qualitative way, seeking updated information and stories, in some journalistic texts, articles and e-books on the innovation ecosystems studied here in 2019: Silicon Valley, in the United States, Tel Aviv in Israel and Beijing in China. It is known that, in the qualitative research, mechanisms of an empathic nature are constructed, the reasons are traced and the actors that propose to optimize the object of the study are identified. Its approach can only be used to understand specific and delimit able phenomena, more for its degree of internal complexity than for its quantitative expression.

As for the classification of the research, the descriptive one was chosen, which (...) aims at the characteristics of a certain population or phenomenon or, at the same time, the establishment of relationships between variables. There will be countless studies that can be classified under this title and one of its most significant characteristics is the use of standardized data collection techniques, such as the questionnaire and systemic observation **(**GIL, 2002).

It is based on the premise that the survey of ecosystem information proposed here drew a world map of a good part of innovative and entrepreneurial initiatives worldwide, capable of helping other ecosystems to shape themselves, always aiming at models of economic sustainability and innovation.

## 3. RESULTS AND DISCUSSION

With the onset of the global crisis, local innovation ecosystems were increasingly on the rise. The cities that proposed development supported by their ecosystems are the ones that have the most competitive advantages in terms of innovation, prospecting an increasingly competitive and innovative world, bringing resolutions to the various global problems thought, planned and executed within the innovation ecosystems.

As a general objective, the article made a comparative study between the main innovation ecosystems in the world (United States, China and Israel) inducing Startups and the result is surprising when discussing the global ecosystem.

With regard to Silicon Valley, the ecosystem is already a success, bringing to its surroundings a significant increase in jobs - in the years 2016 to 2017, only due to its culture based on innovation and the development of entrepreneurial culture. The region has held the largest production of unicorns in the world since 2003, in addition to harnessing the theory of American universities to business.

With regard to the city of Tel Aviv - which has Israel as its country, it is therefore peculiar. With a very small population, the city managed to make significant leaps in terms of innovation with three basic characteristics: a) Country with several natural and war problems, having to adapt to exports to distant countries on account of the authority with neighboring countries; b) All Israeli citizens, regardless of gender, enlist in the army and c) Permanent immigration in that country, that is, those who arrive are not afraid to start everything from scratch, bringing a striking characteristic of the entrepreneurial subject, which is having the ability to make mistakes and start all over again. Israel and Tel Aviv mix in everything,

with their very peculiar characteristics and solidification capable of bringing to such a small country an arsenal with so many innovations and technological products and processes. Regarding the Republic of China and the city of Beijing, what can be seen as results is an ecosystem based on the disruptive processes of Artificial Intelligence, Internet of Things and a new way to access the world wide web. It is now up to the Republic of China to continue seeking results through the information already reiterated by its chief, President *Xi Jimping*, who says that China should be strong based on the propagated culture of Science and Technology. It is worth mentioning that China has been making extremely significant leaps in terms of Research, Development and Innovation. What can be concluded from this previous study is that, in most cases, the ecosystem has its own characteristics of the locality and only the entrepreneurial subjects are able to perceive all the peculiarities that are guided and marked by the locality, the local culture and the actions imposed by the countries treated here. In accordance with the objective presented here, a comparative chart follows regarding the entrepreneurial characteristics of the studied World Innovation Ecosystems:

| Ecosystem But Innovations Worldwide | Ecosystem Characteristics | Pro-activity of Eco systems | Tratatives for innovative solutions |
|---|---|---|---|
| USA | • Culture of starting innovative projects containing few resources;<br>• Calmness and tranquility with the theme of entrepreneurship: Hippie Movement;<br>• Success of the semiconductor industry, originating the Silicon Valley; | • Creation of the Ames;<br>• Aeronautical Laboratory;<br>• Elaboration of the 4 steps of the ecosystem cycle. | • Increased investment in Silicon Valley;<br>• 151 Unicorns accounted until 2019. |
| ISRAEL | • Entrepreneurship culture based on IP;<br>• Enlistment in the army of all Israeli citizens;<br>• Citizens start everything from scratch. | • 1 startup for every 2000 Israelis. | • Adaptation with distant countries due to austerity with neighboring |
| CHINA | • Paradigm break: From pirated products to products/processes and programs based on global innovation. | • The Largest number of Unicorns in the world;<br>• Tie with USA in P&D&I | • Li-fi/ sticks for Chinese food. |

**Table 4:** Comparison of Ecosystems

Source: own authorship

## 4 CONCLUSIONS

This comparative study of the world's leading startup success inducing ecosystems brought up information, which is important for future studies, such as inducing local culture, willingness on the part of local society to undertake, strategically think about the local ecosystem and make it happen, within geographic and global parameters, in addition to bringing solutions based on culture, proactivity and characteristics of these ecosystems. It is assumed that future analyzes can be made by these and other ecosystems, in order to bring up important information that minimizes the unsustainability of organizing an innovation ecosystem.

## 5 REFERENCE

[1] BLANK, S; DORF. B. Entrepreneur's Manual the step-by-step guide to building a great company. Rio de Janeiro: Alta book, 2014.

[2] COGO, B. The impact of high-tech startup ecosystems on Economic System Development: The case of Israel. Master's Program in Economics and Gestione Delle Aziende Curriculum: International Management, University of Venicy, 2018.

[2] ETZKOWITZ, H.; LEYDESDORFF, L. The dynamics of innovation: from national systems and 'Mode 2' to a triple-helix of university-industry-government relations. Research Policy, Amsterdam, v. 29, n. 22, p.100-123, 2000.

[3] GEOLOGY FOR INVESTORS. The California Gold Rush: 1840-1857. 2014. Available at: <https://www.geologyforinvestors.com/california-gold-rush/> Accessed on September 5, 2019.

[4] GSER - Global Entrepreneurship Monitor (2017) Global Report 2016/17, Retrieved 02 Jul 2017 from http://www.gemconsortium.org/report/49812

[5] GIL, A. C. How to prepare research projects? 4. ed. São Paulo: Atlas, 2002.
JISHNU, V.; GILHOTRA, R. M.; MISHRA, D. N. Pharmacy education in India: Strategies for a better future. Journal of Young Pharmacists, vol. 3, n. 4, p. 334-342, 2011.
[6] LDSOFT: Innovation made in China leads intellectual property orders in the world https://www.ldsoft.com.br/blogs/inovacao-made-in-china-pequim-lidera-pedidos-de-propriedade-intelectual-no-mundo/ Accessed on September 11, 2019.
[7] NORMAND, R. Silicon Valley: understand how the most innovative region on the planet works. [S.l: s. n.], 2014. Available at: http://www.valedosilicio.com/. Accessed on: 11/23/2019.
[8] QUEIROZ, R. Chinese technological advances Transform the country into the power of Innovation, s / d. Available at: <https://chinavistos.com.br/avancos-tecnologicos-chineses/> Accessed on 09/30/2019.

[9] RASIA, L. How to create and develop ecosystems: the entrepreneurship acceleration cycle. Available at: <http://sensecoaching.com.br/ec ecosystem-how-create-and-development-one/> Accessed on September 5, 2019.

[10] RUSSELL, M. G.; STILL, K.; HUHTMÄKI, J.; YU, C. RUBENS, N. Transforming innovation ecosystems through shared vision and network orchestration. In: Triple Helix IX International Conference. Stanford, CA, USA. 2011.

[11] STARTUPSE: Ecosystem – Silicio Valley. https://www.startse.com/noticia/ececosystem/SiliconValley/44448/vale-do-silicio Accessed on September 5, 2019.

[12] STARTUPSE. How China has become a powerhouse of technology and innovation. 2018. Available at:<https://www.startse.com/noticia/nova-economia/tecnologia-inovacao/45020/como-china-se-transformou-em-uma-potencia-de-tecnologia-e-inovacao> Accessed on September 15, 2019.

[13] STARUPSE: How to create and development a new Silicon Valley? http://startupsorocaba.com/ececosystems-how-to-create-and-develop-a-new-silicon-valley / Accessed on September 5, 2019.

[14] STARTUPESE:https://www.startse.com/noticia/ececosystems/65824/5-graficos-that-prove-the-digital-growth-of-china Accessed on October 25th.

[15] WESSNER, C. W. (Ed.). Innovation policies for the 21st century: report of a symposium. Washington: National Academies Press, 2007.