



Senior Entrepreneurship and Technology

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Abstract

As people live longer, more individuals are out of the labor market at a later stage of life both because they get unemployed, and it is harder for them to find a new job (compared to younger individuals), or because they retire, which is the direct cause of population aging. As a positive way to show the advantages and value of the elderly, senior entrepreneurship is helpful to alleviate the population aging, which will promote a more healthy and sustainable development of economy and society. Senior entrepreneurship is defined as a process in which the older individuals (aged over 50) create a new business in their late professional career or after retirement.

This master thesis examines the link between senior entrepreneurship and technology, adopts the Business Model Canvas framework to analyse the importance given by senior entrepreneurs to technology and compares the difference of senior and younger entrepreneurs, which allows for a more detailed discussion about which technologies can hinder or foster senior entrepreneurs' activity. And the thesis focuses on the technologies that are considered important by a specific group of Chinese entrepreneurs working in the catering industry, operating in Portugal and China. The research addresses the key challenges entrepreneurs are facing with the technologies currently adopted and unveils potential needs for other technologies. The present analysis draws implications both for policy makers, organizations that support businesses, and entrepreneurs in general.

Keywords: population aging, senior entrepreneurship, technology, Business Model Canvas, building blocks, catering industry, Chinese entrepreneurs.

1. Introduction

For a long time, people often thought that the phenomenon of population aging was unique to developed countries, however this phenomenon has become a widespread worldwide problem since the 1970s (United Nations, 2016). Therefore, whether in developed or developing countries, population aging has become a major concern at the

global level.

As the world's most populous country in 2021, China is in a better position to show the problem of aging population (Jiang, Xiang & Gao, 2018). In 2017, in China, the proportion of Chinese citizens above 60 years old was of 17.3 percent, approximately above 241 million individuals and it is expected that China's 65-year-old population will reach 487 million, or nearly 35 percent in 2050 (Chi, 2018). In addition, most of the European countries are struggling to find ways to tackle the demographic consequences of the aging workforce (Stypińska, Franke & Myrczik, 2019). According to Cabral¹, the challenge of socio-demographic ageing in Portugal is greater than in most countries in Europe and indeed in the world, not only life expectancy is improving more than OECD (Organization for Economic Cooperation and Development) average but, above all, the present Portuguese fertility rate is among the lowest in the whole world (Maia & Costa, 2021). Thus, senior entrepreneurship in Portugal and China is a valuable and meaningful phenomenon to be studied due to the population aging dynamics occurring within these two countries.

Under the current international trend of population aging, it is an important measure to reduce the negative impact of population aging to stimulate and enhance the willingness of the elderly to engage in entrepreneurial activities (Wu, 2022). Senior entrepreneurship refers to a process in which the older group of people (aged over fifty years old) creates a new business in their later career – the senior entrepreneurs. In order to reduce the influence of the variable "nationality" on the results of the study, the research objects are specified as Chinese senior entrepreneurs. Chinese business immigrants in Portugal emphasize their high degree of self-employment and concentration in the textile and catering industries (Li, 2018). The catering industry is composed by many small businesses, with relatively low entry barriers and with the potential to offer relevant insights on the use of technology among senior and younger Chinese entrepreneurs in both Portugal and China (Liu, 2005).

¹ Cabral, M. V. (2017). *The Ageing Challenge in Portugal and Europe*.

In the 21st century, technology plays a central role in almost every aspect of peoples' life. Whether they are building a fledgling company or at a critical juncture of rapid growth, today's entrepreneurs must understand that technology is the foundation of all business operations¹. Technology is the knowledge, experience, skills and means accumulated by human beings in the process of long-term utilization and transformation of nature in order to meet their own needs and desires, follow the laws of nature, and is the sum of the methods, skills and means by which human beings use nature to transform nature (GYF, 2021). Thus, this dissertation is devoted to study the types of technologies that Chinese (senior and younger) entrepreneurs – who operate in China and/or Portugal – have used and plan to use in the catering sector.

2. Literature Review

With the increasing trend of aging in the world, people pay more and more attention to senior entrepreneurship (Maritz, Jones, Foley, Klerk, Eager & Nguyen, 2021). By exploring the existing literature, the characteristic of senior entrepreneurship is clarified and discussed. For example, senior entrepreneurship can reduce social isolation and prevent loneliness, provide social support, build social cohesion, and promote lifelong learning skills (Crossen-White, Hemingway & Ladkin, 2020). Comparing with the young entrepreneurs, senior entrepreneurs have many advantages such as life experience, resources and skills. In recent research, Stypinska, Franke & Myrczik (2019) found that some specific advantages of senior entrepreneurship have been revealed, such as: work and industry experience, more developed social networks, higher technical and managerial skills, as well as a stronger financial position compared to younger persons. On the other hand, several weaknesses of senior entrepreneurs are discovered as well such as lack of information, physical condition and willing to take a risk (Hudson & Goodwin, 2014).

After analyzing the status of senior entrepreneurship, some challenges (such as how to solve the reduced tolerance of senior entrepreneurs for financial risk) were found and the

corresponding solutions are put forwarded as well. Then, the importance of technology to senior entrepreneurship is lead in and several cases of technology adoption are illustrated. With the development of technology, many different technology products have been invented one after another. However, not all age groups are suitable for the same technology, and each group's attitudes and adaptability toward that technology are also diverse (Hauk, Hüffmeier & Krumm, 2018). The technical products we talk about here mainly refer to the technology which are (going to be) essential and important in catering industry.

However, through literature and journal searches, there is not much useful information on the relationship between senior entrepreneurship and technology, or between senior entrepreneurship and catering industry. Thus, how does this older segment of the population manage to adopt and adapt to new technologies is significant. Therefore, we will focus our discussion on newer technologies with which senior entrepreneurs are likely to be interacted in catering industry.

3. Research Design and Methods

In this chapter, the key steps for research design is illustrated at first. And the potential technologies related with dining industry are discovered through theoretical and practical approaches. From the theoretical approach, a technology list is summarized from papers, articles and websites. Gregory², classified 33 kinds of technologies into 5 categories for small businesses. Among them, 9 technologies that have less or no possibility to be adopted by catering industry's entrepreneurs are cut off. Therefore, there are 16 different kinds of technologies that are added to the technology list. On the other hand, following a practical/exploratory approach, a simple interview is implemented to 13 entrepreneurs to obtain the complementary technologies. Two research strategies were used to perform the interviews. The first one consisted in visiting a local restaurant, avoiding dining rush hours, and talking with the owner(s) face-to-face. The second one is implied finding the

² Gregory, A. (2019). 33 Ways to Use Technology In Your Small Business.

available contact of entrepreneurs who have businesses in catering industry and communicate with them online.

Then, the Business Model Canvas method is introduced for assessing the key building business blocks that apply to the catering industry; moreover, these building blocks will be central to understand how senior entrepreneurs use technology within the various key dimensions of their business. And the Delphi method is introduced which support the improving process for gaining the comprehensive suggestion of the entrepreneurs by a second interview. At last, by identifying the type of data from the questions, the Correlation Analysis method and a software named STATA which has strong functions to process the Chi-square Test and Ordinal Logistic Regression Analysis are illustrated.

After obtained the preliminary technology lists through complementary theoretical and practical approaches, the aggregation of those two technology lists provided a specific and comprehensive basis for pursuing with the second-round survey. And the following steps are to:

- Carry out the survey to 100 entrepreneurs of catering sector.
- Collect and organize the data that is obtained from the survey.
- Use data analysis software (STATA) to understand the attitude of entrepreneurs in catering sector towards new technologies and the relationship between the technology and the nine BMC building blocks.
- Compare the difference of technologies that are adopted or going to be adopted taking into account factors such as age.
- Identify the technologies with the potential to improve senior entrepreneurs' businesses.

4. Data Optimization

As the investigation goes on, a substantial portion of entrepreneurs put forward the

suggestions that some of these 31 technologies are ambiguous and redundant. After the re-analysis and combination with the entrepreneurs' suggestions about the type of technologies, the steps for technology list optimization are illustrated and the final technology list is shown.

Due to the fact that age and gender are discontinuous factors, and most questions of the survey relate to choices, it is reasonable to make correlation analysis of categorical variables. Therefore, the steps for transforming the survey results into integer numbers are illustrated.

After the data arrangement, all the survey answers have been transformed into integer figures. In order to obtain robust statistical results, it is necessary to use a data analysis software. Therefore, the integrated data is going to be imported into the statistics software (STATA) and the data analysis is going to be processed.

5. Data Analysis and Discussion

The integrated data is going to be analyzed in three parts: Satisfaction, Technology Questions and Building Blocks of BMC.

From the summarized satisfaction result, it is found that the entrepreneurs' customers are generally satisfied with their services. And it is noticeable that the COVID-19 has been (negatively) influencing the affluence of customers. In other words, those customers would not like to take the risk to have a meal in the restaurant which means the take-out or food delivery solutions are safer and more popular. Due to the fact that "age" is a discrete variable, it is convenient and necessary to transform it into a categorical variable to analysis its correlation with other dependent variables. In order to compare the results of senior entrepreneurs with the young ones, it is logical to make a cut at 45 (the median value is 43) and make sure the two groups have a similar number of observations to reduce the sample difference and increase reliability. Therefore, the Mean values and Standard Deviations of the two groups are obtained. Also, the P-values of "age" to Satisfaction are acquired through the Pearson Chi-square method. From the results, the

young entrepreneurs show higher satisfaction in Effort Level.

After processing the Ordinal Logistic Regression, the Odds Ratios of “age” to each Technology Question is obtained, and their correlations classification and ranking are integrated into tables. Several conclusions are found from the summarized results and the Ordinal Logistic Regression results. For example, all the analyzed technologies have strong negative correlation on age except the Shopping Cart Software which means, as the age increases, the entrepreneurs have less knowledge, less aspiration to spend money and time, more negative assessment of importance about most of the technologies.

The BMC connected with Catering Industry

Key Partners	Key Activities	Value Propositions	Customer Relationships	Customer Segments
Shareholders	Ordering	Dishes	Returned Customers	Students
Suppliers	Cooking	Quality	Occasional Customers	Office Workers
Third-party Platform	Cashiering	Environment		Event Organization (Birthday, Wedding)
	Delivering	Etiquette	Channels	
	Key Resources		Physical Restaurants	
	Capital		Online Delivering	
	Ingredient		(Third-party Platform)	
	Staff		Advertising	
Cost Structure		Revenue Streams		
1. Fixed Cost: Housing Decoration Liquidity Advertising	2. Variable Cost: Ingredient Human Resources Daily Consumption	1. Third-party Platform: Cooperation Profit Sharing		2. Cashiering: Cash Virtual Currency

With the help of BMC, a clear understanding of the entrepreneur's catering structure was developed. As a result, it is easy to estimate in which building blocks the technology is necessary and useful, and what help it can provide. Then, the values of technology importance to each building blocks of BMC are collected from the summarized result. And those values are integrated into a table by technology importance ranking. For comparing the influence degree of the independent variables “age” to the BMC, it is necessary to use the Ordinal Logistic Regression to obtain the influence degree of these technologies that

are correlated with age. From the technology correlation ranking results, it is found that, as the age grows, the entrepreneurs think that most of those technologies are less important to the different building blocks of BMC in the catering industry (such as the Time Tracking Management technology to the Key Resources building block). The other aspects' discussions and conclusions from the results are illustrated as well.

Last but not the least, the general conclusions from all the three parts are described by technology importance ranking from strong to weak. For example, the technology which the entrepreneurs don't want to spend time to learn is Email Addresses Collection. The technology which the senior entrepreneurs would like to spend more time than the young ones is Shopping Cart Software.

6. Conclusions and Limitations

The present dissertation addresses the following research question: "What technologies are important and helpful for senior entrepreneurship?". With the data provided by the entrepreneurs, the answers to the research question are clear and reasonable. However, this study presents some limitations. For example, the survey was accomplished within a special historical period (COVID-19) which means the data obtained from the entrepreneurs may not apply in different periods under different (and not so restrictive) circumstances. In addition, this dissertation focuses on the catering industry and should not be extrapolated to other industries.

As a concluding remark, the senior entrepreneurship is becoming popular and stimulated to against the aging of population and other social issues. However, people (not only the senior entrepreneurs) have to accept and learn new technologies to adapt to the ever-improving social life. As science and technology develop, software and applications which are essential and convenient for small and medium business will expand. Only the continuous learning of the senior entrepreneurs can catch the footsteps of the young entrepreneurs and give full play to their advantages.

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