The Success Factors for Growing Health Tech Startups in Thailand

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ABSTRACT

Startups have served as one of the Thai government's mechanisms for promoting economic stability and growth. Health tech startup is a global trend toward new innovative industries. In Thailand, there are many health tech startups born each year. However, the healthcare business characteristic and business model differing from other businesses urge the need to understand the relevant factors of success. This knowledge can help you lower your chances of failing and enhance your chances of succeeding. The success elements that influence success, as well as the ones that are most crucial for health tech firms, were investigated in this study. This research used quantitative methodologies to create a systemic approach. The researchers used data from 240 samples to assess basic statistics and confirmatory second order factor analysis based on the idea of latent variables in Structural Equation Modeling (SEM). It was found that health tech startups in Thailand can be successful because of 6 elements, which are government policy, startup support, human capital, market, finance, and culture. Culture is the most influential factor, followed by startup support, human capital, market, government policy and finance. It's worth noting that tax relief and low-interest financing aren't high on the priority list. Internal elements such as entrepreneurial inspiration or knowledge, experience, and product prominence, on the other hand, take precedence.

Keywords: Startup, Thailand, Entrepreneurship, Business economics, and Factor analysis.

INTRODUCTION:

In Thailand, medical or health technology is becoming increasingly significant, and the Thai government has established a 20 year industrial development strategy plan (2017-2036) that identifies new industries that will drive the country's economy in the future (New S-Curve). The health tech business is linked to three target industries: robotics, digital, and medical hub, and the COVID-19 epidemic has heightened the importance of health tech startups in Thailand.

Currently, there are researchers and companies with potential and capability to develop medical and health innovations. Some of them have been established as start ups and reached the seed round stage. The number of startups in the medical and health industry was rated fifth in a study of startups conducted by the Office of National Higher Education, Science, Research and Innovation Policy Council (NXPO) and the Thailand Tech Startup Association (TTSA) in 2019-2020 and health companies, on the other hand, are distinct from other businesses in that they have a long life cycle, particularly in the seed or development stage. It will take extra time to compare products with those of other businesses and to test products before they are released to the market. As a result, a different business model than other enterprises may be required, and success indicators for business must be identified. The findings of this study will assist various parties in developing a mechanism to support health tech businesses, as well as serve as a guideline for new health tech startups to follow in order to ensure long-term success.

Literature Review and Hypothesis
Startup key success factors

The success of each startup may be valued or defined differently, such as Gelderen *et al.* (2005) indicated that the success was seen by market share or number of customers, profits or sales that increase or exceed the market average. Wong *et al.* (2005) claimed that success came from the founder's achievement of targets, such as owning a business or promoting better quality of life for society. A number of studies are currently underway to look at the factors affecting the success of startups in many fields, which are quite extensive and varied. This research is based on the elements of factors contributing to the success of entrepreneurs according to the concept of Isenberg (2011), who has more than 22 years of entrepreneur development expertise and looked at the success of entrepreneurs who used innovations in conjunction with previous research. It has been discovered that the success of startups is deter-mined by six keye-lements: government policy factor, startup support factor, human capital factor, market factor, finance factor and culture factor. The 6 key elements that drive startup success are the measure of success and the characteristics that drive startup success. The 6 key elements of Isen-berg (2011) was studied by many researchers around the world (Timmons & Spinelli, 2004; Wong *et al.,* 2005; Mueller *et al.,* 2012; Sefiani & Bown, 2013; Ng *et al.,* 2014; Okrah *et al.,* 2018; Prohorovs *et al.,* 2018; Thanapongporn *et al.,* 2021). By reviewing Isenberg's concept (2011) and the relevant literature, variables in the study could be determined. This leads to the 6 hypotheses as following:

H1 The government policy factor influences success of health tech startups in Thailand.

H2 The startup support factor influences success of health tech star-tups in Thailand.

H3 The human capital factor influences success of health tech start-ups in Thailand.

H4 The market factor influences success of health tech startups in Thailand.

H5 The finance factor influences success of health tech startups in Thailand.

H6 The culture factor influences success of health tech startups in Thailand.

From the literature reviews, it was discovered that the success of startups consists of 6 latent variables and 23 observed variables. The composition can be summarized as shown in **Table 1** and **Fig. 1**.

Table 1: Summary of literature review in each factor.

Latent variables	Observed variables	References
Government policy (GP)	Taxes (P1)	Cheah *et al.,* 2016; Okrah *et al.,* 2018
	Laws (P2)	National Startup Committee, 2016; Okrah *et al.,* 2018
	Financial support from government (P3)	Vu *et al.,* 2012; Arruda *et al.,* 2013; Pugliese *et al.,* 2016; Geibel & Manickam, 2016
Startup support (SS)	Infrastructure (S1)	Cheah *et al.,* 2016; Worapongdī, 2017; Thanapongporn *et al.,* 2021
	Professional services (S2)	Teeter & Whelan-Berry, 2008; Cheah *et al.,* 2016
	Incubator/Accelerator (S3)	Peña, 2004; Radojevich-Kelley & Hoffman, 2012; Krajcik & Formanek, 2015; Worapongdī, 2017
	Startup activities (S4)	Lee, 2010; Mueller *et al.,* 2012; Geibel & Manickam, 2016
Human capital (HC)	Entrepreneurial Capability (H1)	Vliamos & Tzeremes, 2012; Cheah *et al.,* 2016; Geibel & Manickam, 2016; Khong-khai & Wu, 2018; Prohorovs *et al.,* 2018
	Innovation Capability (H2)	Baum & Silverman, 2004; Worapongdī, 2017; Khong-khai & Wu, 2018
	Startup team (H3)	Geibel & Manickam, 2016; Khong-khai & Wu, 2018
	Experiences of the founding team (H4)	Vu *et al.,* 2012; Yoo *et al.,* 2012; Arruda *et al.,* 2013; Cannone & Ughetto, 2014, Thiranagama & Edirisinghe, 2015; Hyder & Lussier, 2016; Thanapongporn *et al.,* 2021;
Market (MK)	Product (M1)	Nalintippayawong *et al.,* 2018; Prohorovs *et al.,* 2018
	Price (M2)	Tsai *et al.,* 1991; Nalintippayawong *et al.,* 2018
	Scale up (M3)	Geibel & Manickam, 2016; Prohorovs *et al.,* 2018
	Exit strategy (M4)	Tsai *et al.,* 1991; National Startup Committee, 2016

|	Networks (M5)	Sefiani & Bown, 2013; Nalintippayawong *et al.,* 2018; Prohorovs *et al.,* 2018
Finance (FN)	Private fund (F1)	Boden & Nucci, 2001; Bocken, 2015; Thanapongporn *et al.,* 2021
	Angel fund (family, Friend) (F2)	Boden & Nucci, 2001; Bocken, 2015
	Venture Capital fund (F3)	Bocken, 2015; Lee, 2010; Okrah *et al.,* 2018; Thanapongporn *et al.,* 2021
	Loan (bank) (F4)	Boden & Nucci, 2001; Bocken, 2015; Okrah *et al.,* 2018
	Capital market (F5)	Bocken, 2015; Okrah *et al.,* 2018
Culture (CT)	Success Stories (C1)	Reynolds & Miller, 1992; Castrogiovanni, 1996; Prohorovs *et al.,* 2018
	Social Status of Startup (C2)	Timmons & Spinelli, 2004; Okrah *et al.,* 2018; Thanapongporn *et al.,* 2021
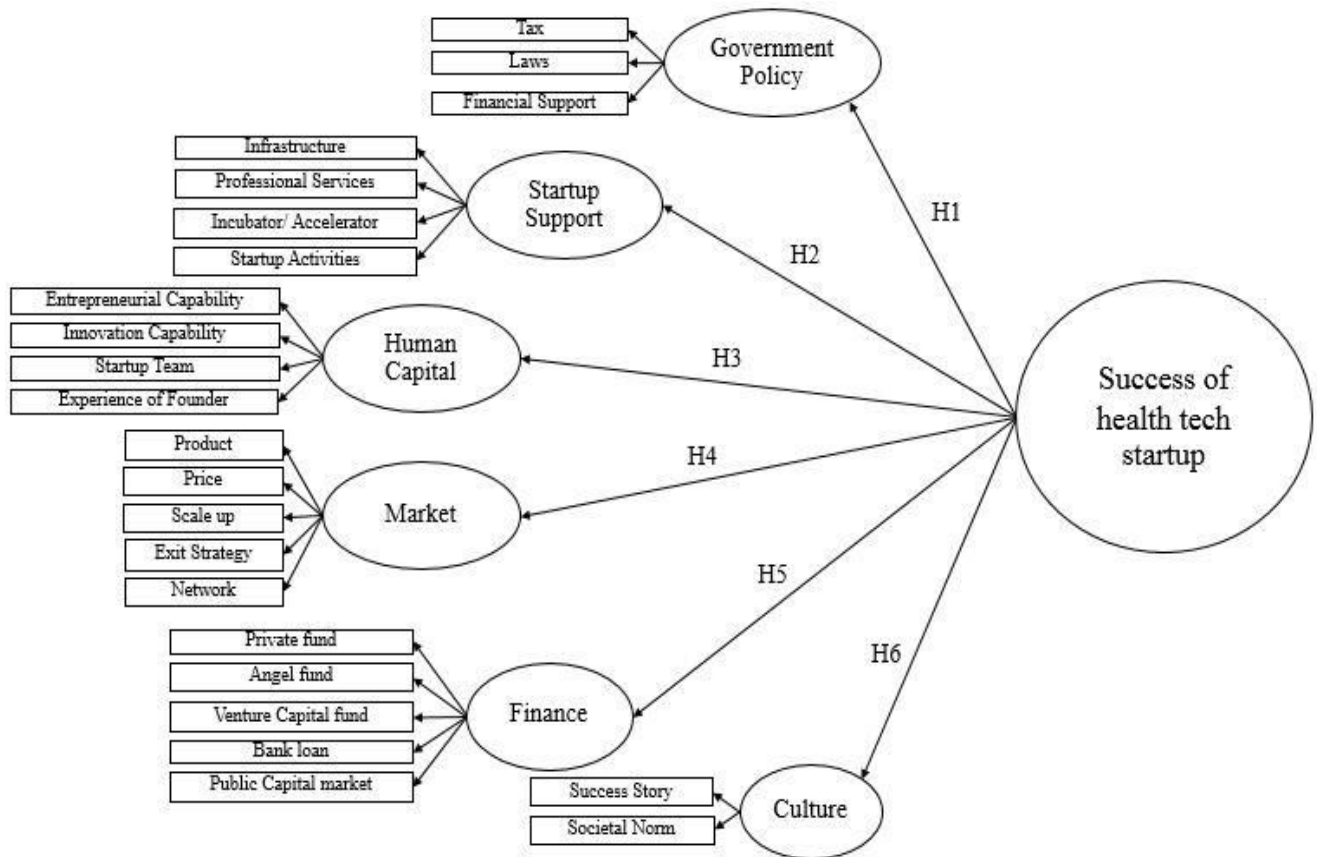
Fig. 1: Conceptual framework and variable component with hypotheses.

METHODOLOGY:

The population in this research is health entrepreneurs registered as a juristic person with the goal of serving as a manufacturer and a wholesaler of products in three groups: pharmaceuticals (drugs), medical devices, and cosmetics and dietary supplement products, with a period of incorporation of a juristic person not exceeding 5 years and with regards to the business still under operations (2020). From retrieval of information from the Department of Business Development, the Ministry of Commerce. It was discovered that at the end of 2020, there were 4,562 entrepreneurs who met the criteria. Structural Equation Modeling was used to calculate the minimum sample size. As a result of the huge sample size, there

is a greater likelihood that the variable will be normalized than the smaller sample. Meanwhile the research by Hair *et al.* (2013) pro-posed that the mean sample size of Structural Equation Modeling should be 10 times the observed variables. Therefore, in this study, the number of observed variables from the relevant literature review was 23, which was then multiplied by 10 as a result; the sample size for this study is 230 people. The sample approach was based on the stratified random sampling concept, which is a type of probability sampling. In other words, the sample group was established based on the company's aims and the population's proportion. The information was gathered through an online survey from December 2021 to February 2022. For the quantitative res-

earch method, the researcher created a survey questionnaire to determine the link between relevant variables, questionnaire items and synthesis based on a review of the literature review. The researcher used the 7-point Likert Scale, and used the data from the sample as a unit for analysis. Basic statistical analysis and confirmatory factor analysis were employed to analyze the questionnaire data based on the principle of latent variables in Structural Equation Modeling (SEM) using AMOS program. Second order confirmatory factor analysis was used for hypothesis testing because the variables studied were complex theoretical variables. The researcher presented the goodness of fit analysis results and correlation of each variable component through statistical values to determine the conditions of the model fit as follows: regression weight (factor loading) representing the significant weight that each latent variable is influenced or extracted from the preceding variable, Chi-square/degree of freedom (CMIN/df) representing the overall goodness of fit of the correlation model which

should be less than 3 (Bentler & Bonett, 1980). The goodness-of-fit index (GFI) must be greater than 0.8 (Seyal *et al.,* 2002), the incremental fit index of improved NFI (CFI) must be greater than 0.9 (Bentler & Bonett, 1980), and the root-mean-square error of approximation (RMSEA) must be less than 0.08 (Hair *et al.,* 2013).

RESULTS AND DISCUSSION:

The researcher was able to collect 240 completed questionnaires, which was more than the target number cosmetics and dietary supplement goods accounted for 65 percent of the respondents, followed by pharmaceuticals (22.5 percent), medical dev-ices and services (12.5 percent), and medical devices and services (12.5 percent). When considering the length of time in business, it was discovered that 24.17 percent had been in operation for three years, followed by 4 years (22.5%), 5 years (20.83%), 2 years (16.67%) and 1 year (15.83%) respectively as detailed in **Table 2**.

Table 2: General information of sample.

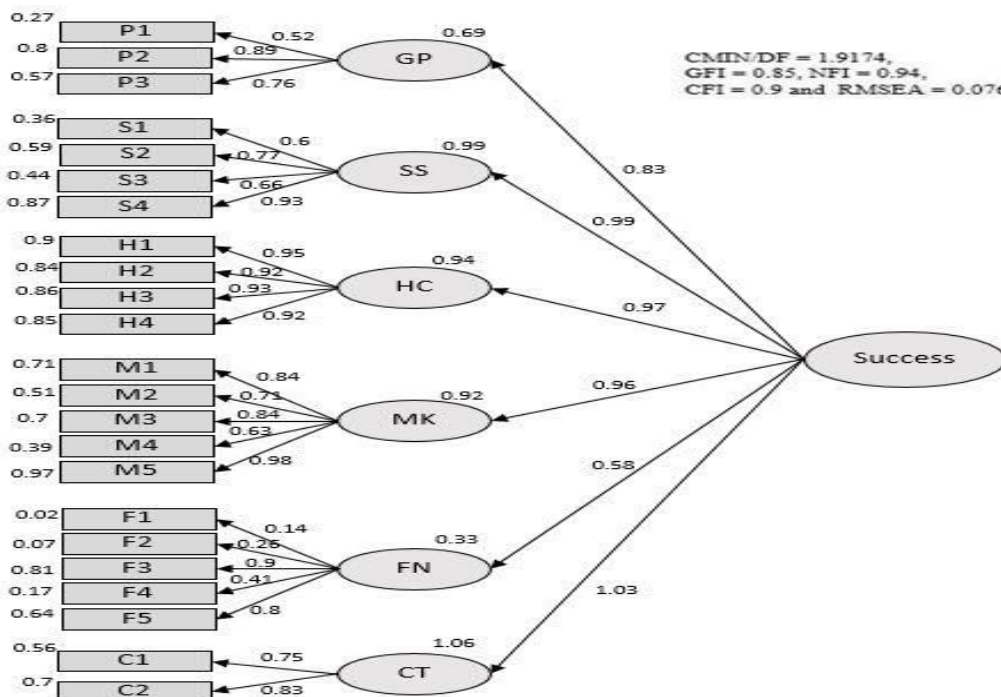| Description		Frequency	%
Group of product	Pharmaceuticals	54	12.50%
	Medical devices	30	65%
	Cosmetics and dietary supplement	156	22.50%
Year of operation	1 year	38	15.83%
	2 years	40	16.67%
	3 years	58	24.17%
	4 years	54	22.5%
	5 years	50	20.83%

Fig. 2: Result of final 2nd order CFA model with standardized coefficient.

As shown in **Fig. 2** and **Table 3**, the findings of the AMOS program with second order factor analysis revealed that all six factors influence the success of health tech startups. The model in **Fig. 2** presents such statistics and Indices as CMIN/df =1.917< 2.0 with df=182 and P=.00<.05; RMSEA=.076<.08; GFI=.851>.80; CFI=.91>.9, presenting the close fit of the model to the data.

In **Table 3**, the square root of AVEs shows higher values in comparing with the inter-construct correlations values. Therefore, the constructs' discriminant validity is proven. When P-values are less than 0.001, however, all hypotheses are supported (significant level = 1%).

Table 3: Model discriminant validity.

Construct	Success	CT	FN	MK	HC	SS	GP
Success of Health tech startup : Success	0.118						
Culture : CT	0.098	0.145					
Finance : FN	0.054	0.054	0.114				
Market : MK	0.088	0.088	0.040	0.115			
Human capital : HC	0.112	0.112	0.050	0.052	0.540		
Startup support : SS	0.052	0.056	0.024	0.039	0.016	0.060	
Government policy : GP	0.075	0.125	0.102	0.069	0.485	0.234	0.745

Table 4: Standardized regression weights.

Hypothesis	path			Standardized coefficient	S.E.	C.R.	P value	Decision
H1	GP	<--	Success	0.832	0.06	10.561	***	Supported
H2	SS	<--	Success	0.993	0.045	21.163	***	Supported
H3	HC	<--	Success	0.971	0.057	22.627	***	Supported
H4	MK	<--	Success	0.961	0.036	22.166	***	Supported
H5	FN	<--	Success	0.576	0.054	8.52	***	Supported
H6	CT	<--	Success	1.03	0.034	29.134	***	Supported

Note: *** $\rho < 0.001$, ** $\rho < 0.01$ and * $\rho < 0.05$

The standard coefficients show that, the most influential factor was culture; this is supported by a number of studies. (Castrogiovanni, 1996; Prohorovs *et al.,* 2018), which discovered business inspiration and the founder's awareness of success stories play an important role in success. The startup support element is the next most essential aspect, which is consistent with the research by Cheah *et al.* (2016) and Thanapongporn *et al.* (2021), which discovered having a place and infrastructure enabling startups to run their business is a key factor for the success of start-up entrepreneurs. This is also in accordance with the research by Teeter and Whelan-Berry (2008) it was discovered professional services will contribute to the success of startups.

Furthermore, Radojevich-Kelley & Hoffman, (2012) discovered that an incubator's or accelerator's actions contribute to a start-up's success while the research by Lee, (2010) found that startup activities, such as seminars to share experiences, business matching, business collaboration and business network, etc., play a key role in a startup's success. The third impor-

tant factor was the human capital factor, which is consistent with the study by Lin *et al.* (2006) which found that entrepreneurial capability of entrepreneurs and founders have a beneficial impact on company success rates. This is because competence, skills and knowledge are factors that help startups gain business advantage (Lee, 2010). According to research by Khongkhai and Wu, (2018), a significant component supporting the success of startups is the ability of entrepreneurs and founders to apply innovation to corporate products. Additionally, the research by Geibeland Manickam, (2016) disco-vered that the startup team has a vital impact in the success of a company. Many studies found that the experience of the founder team in conducting research, organizational management, and business operations is important for success (Yoo *et al.,* 2012; Arruda *et al.,* 2013; Hyder & Lussier, 2016; Thanapongporn *et al.,* 2021). The market element is the fourth and most essential factor, which is consistent with the research by Prohorovs *et al.* (2018), which found that out-standing products or services that can solve customer

pain point problems and create satisfaction play a crucial part in the success of startups. In the other words, startups with innovative products or services are more likely to succeed than those with less innovative products. This is in consistent with the findings of the research by Geibeland Manickam (2016), the capacity to scale up manufacturing for both domestic and foreign customers while preserving quality standards correlates to startup entrepreneurs' success, according to the study. Further-more, having a net-work to extend one's business or a business partner is a crucial component. Lee, (2010) found that participation in the startup cluster or business grouping is positively correlated with the success of startups. The same is true for the study of Sefiani and Bown (2013), which found that the increased number of business partners enhances the level of startup success. The fifth factor was the government policy factor, which is consistent with the research by Geibeland Manickam, (2016), which discovered that government financial support in the form of funds or gifts, especially in the early stages, had a significant impact on the startup's performance. Meanwhile, the research by Okrah *et al.* (2018) found that incentives play a critical part in the development of startup companies. The last factor is finance, which is consistent with the research by Bocken (2015) which found that sufficient private funds of the owner, especially in the early stage, directly affect the success of startup entrepreneurs.

CONCLUSION:

According to the findings of the study, it was found that health tech startups in Thailand can be successful because of the 6 elements, which are government policy, startup support, human capital, market, finance, and culture. Culture is the most influential factor, followed by startup support, human capital, market, government policy and finance. It is worth noting that tax support or access to low-interest funding sources is of the last priority. However, internal factors such as business inspiration or know-ledge, experience & product prominence are the top priority.

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CONFLICTS OF INTEREST:

The author certifies that there are no conflicts of interests in the study, data collection and analysis.

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