START-UP PERFORMANCE: RISING ERA AND THE DEVELOPMENT OF STUDIES

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Abstract— **Research on start-ups and their supporting environments has been widely conducted by researchers with backgrounds in various types of businesses. The aims of this study were conduct systematic literature review about start-up performance and its development in recent years studies to get the brighter perspective for the next research about entrepreneurship, especially for high tech start-up performance. This study reviewed articles from indexed journals related to Start-ups published in 2018 until early 2021, which focus on start-up ecosystems, start-up growth, sustainability and other topics which can related with the 14 pillars of the Global Entrepreneurship Index (GEI). This study discussed the development of terms and previous literature studies related to Start-up Performance with mapping of 65 studies from the last 4 years. The result found that most of the research conducted using quantitative methods, the majority are in the cluster of entrepreneurial attitudes compared to entrepreneurial abilities and entrepreneurial aspirations. In this study, also proposed the development of study that is interesting to examined further related to the existence of start-ups and improved performance.**

Keywords— Start-up; Start-up Performance; Global Entrepreneurship Index; Entrepreneurship

I. INTRODUCTION

The Global Entrepreneurship Index (2018) mention that Entrepreneurs can be high tech or low tech or even no tech. Entrepreneurship is driven not by necessity entrepreneurship but by opportunity. Opportunity entrepreneurship is positively correlated with economic growth. Entrepreneurs envision scalable, high-growth businesses. They also possess the ability to make those visions a reality. They get things done. They go facing obstacles. Entrepreneurs find ways to innovate and bring products to market, their objectives extend to broader social and environmental benefits [2].

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Entrepreneurship on Start-ups focus on their effort to strike a balance between exploration and exploitation to improve business performance even though the growth of ambidexterity is a major challenge [5]. Damodaran (2009) describes start-ups as a high potential for growth in the company's value in the future, in their early stage of development, lack of experience, strong dependence on the sources of capital, and relatively low survival rates. In contrast to Damodaran who describe Start-up as a young organization that is unstable but demanded to develop quickly, in the definition that develops recently, many allude to the linkage of startups with breakthrough innovation, drive innovation spirit, create wealth and growth rapidly in the world economy in recent years. [4]

Global Ecosystem Index (2019) define entrepreneurship as "the dynamic, institutionally embedded interaction between entrepreneurial attitudes, entrepreneurial abilities, and entrepreneurial aspirations by individuals, which drives the allocation of resources through the creation and operation of new ventures." [2]

Reviewing the definition put forward by previous researchers, a startup is required to continue to move dynamically by using their limited resources and abilities to improve its performance in business growth and expand the impact of innovation on the digital market [12, 39, 45]. Thus, studies related to the performance and growth of start-ups became a dominant highlight in entrepreneurship-related research in addition to studies developed to examine the performance businesses.

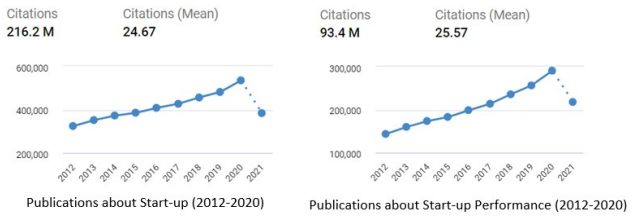

Figure 1: Start-up and Start-up Performance publications and citations (2012-2020)
Source: https://app.dimensions.ai/discover/publication

In figure 1 can be seen a comparison in number and average of citations for studies related to Start-up and Start-up Performance. It appears in the graph that studies conducted on

start-up performance continue to rise from year to year. What is interesting is that the citation rate for start-up related studies is 216.2 M higher than the start-up performance related study which is only 93.4M, but the average citation of start-up performance related studies is higher than the start-up related study.

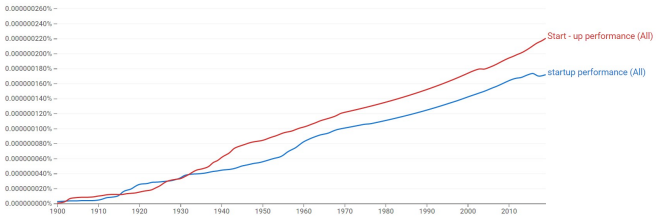

Figure 2: Comparation the usage of words "Start-up Performance" with Google Ngrams(2019)
Source: Processed by researchers (2021)

Fig. 2. Showing the usage of 'Start-up Performance' compared with the word 'Start-up Performance' based on google books records. The y-axis shows the words'relative usage as compared to all other words. Figure produced using Google (2019) Ngram:https://books.google.com/ngrams

Comparison of studies and writing related to start-up performance is also done by observing the graph presented through Google Ngram. As seen in figure 2 below, a comparison of writing the terms start-up and startup shows a wide gap difference. The term Startup Performance was aligned even in a higher position than the writing of the term Start-up. When compared to figure 3 about shifting of industry, since the beginning of the Period Industry 3.0 around the 1930s the term Start-up has become more often used in the development of studies.

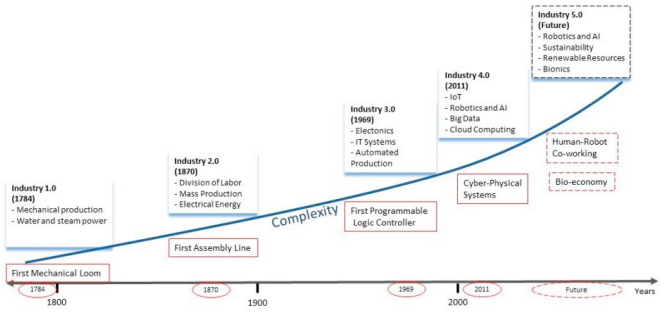

Figure 3: Years by years the shifting of industry
Source: (Demir et al., 2019)

The author believes research related to start-ups and their development will continue to dominate various reputable publication containers along with technological advances and the entry of the digital era to meet industry 5.0.

Global Entrepreneurship Index mention the 14 pillars of the entrepreneurial ecosystem for factor driven economies on three continents and compares them to one another. While their overall entrepreneurial performance is similar, the pillar configuration seems to be different. There are some notable similarities; The Risk Acceptance, the Cultural Support, the Technology Absorption, and the Process Innovation scores are very similar in all three country groups. This study highlights articles related to Start-up Performance which is High tech entrepreneurship and its relationship with the 14 pillars developed by GEI to get a more complete perspective and can be compared between field studies developed on three continents and research that has been done. [2]

The three main pillars developed in the GEI report feature components that can drive increased entrepreneurial performance. First, entrepreneurial attitudes are societies' attitudes toward entrepreneurship, it defines as population's general feelings about recognizing opportunities, personality of entrepreneurs, high status perspective about entrepreneurs, accepting the risks associated with business start-ups, and having the skills to launch a business successfully. Entrepreneurial attitudes are important because it express the general feeling of the population toward entrepreneurs and entrepreneurship to recognize valuable business opportunities, and the required skills to exploit these opportunities. If national attitudes toward entrepreneurship are positive, it will generate cultural support, financial support, and networking benefits for those start-up founders and owners.

The second sub-indexes pillars are Entrepreneurial abilities refer to the entrepreneurs' characteristics and their abilities to manage businesses. Businesses created may vary by industry sector, the legal form of organization, and demographics—age, education, etc. Global Entrepreneurship Index define entrepreneurial abilities as start-ups in the medium- or high-technology sectors that are initiated by educated entrepreneurs and launched because of a person being motivated by an opportunity in an environment that is not overly competitive. The level of competition measured the uniqueness of the product or service. Moreover, it is generally maintained that opportunity motivation is a sign of better planning, a more sophisticated strategy, and higher growth expectations than "necessity" motivation in start-ups.

The last sub index is Entrepreneurial aspiration reflects the quality aspects of startups and new businesses. This sub index highlights about entrepreneur motivation to run the early-stage business, taking effort to introduce new products and/or services, develop new production processes, penetrate foreign markets, rapidly increase their company's staff, and finance their business with formal and/or informal venture capital. Product and process innovation, internationalization, and high growth are considered the key characteristics of entrepreneurship, also added a finance variable to capture the informal and formal venture capital potential that is vital for innovative start-ups and high-growth firms.

II. METHOD

The GEI is composed of three building blocks or sub-indices, entrepreneurial attitudes, entrepreneurial abilities, and entrepreneurial aspirations. This study conducted systematic literature mapping of 65 research articles related to start-up performance published throughout 2018 to mid-2021.

Then after obtaining 779 data on start-up articles published in 2018 to mid-2021, the author sorted content related to start-up performance and took 65 articles to be studied further and associated with the existence of 14 pillars of the concept of

entrepreneurship contained in the Global Entrepreneurship Index to obtain a more complete mapping of study topics developed in recent years. As a direction and contribution to future studies, the author also took 180 articles related to entrepreneurship, digital entrepreneurship and its development to studies related to innovation and strategic management and then processed using vos viewer tools as discussion material in the discussion section.

Figure 4. Research Method
Source: Processed by Authors (2021)

The problem highlighted in this study is related to the number of studies on business performance but special studies on start-up performance are still few and rarely done. Topics related to start-up performance are also not too broad and spread across various scientific groups. This study seeks to classify the main topics based on the 14 pillars of the Global Entrepreneurship Index so that it can be seen which groups of topics are still relatively rarely studied by previous researchers.

III. RESULT

Research using quantitative methods which developed in 1800-1850 as a census tool on a large scale of political revolutions and collective movements are still widely chosen by researchers nowadays because it can capture the general condition of the research object and can be done in a relatively short time compared to qualitative studies, systematic literature studies and mix methods [51]. In this study, 65 research articles that have been published in reputable journals are also dominated by research with quantitative methods as seen in table 1.

TABLE 1 TYPE OF RESEARCH

Year	Type of Research								
	Systematic Literature Review		Qualitative		Quantitative`		Mixed Method		Total
2021	4	16%	3	12%	16	64%	2	8%	25
2020	5	24%	3	14%	11	52%	2	10%	21
2019	1	6%	4	25%	9	56%	2	13%	16
2018	0	0%	2	67%	1	33%	0	0%	3
Average	**10**	**15%**	**12**	**18%**	**37**	**57%**	**6**	**9%**	**65**

Source: processed by researchers (2021)

Start-up performance literature review and 14 pillars of Global Entrepreneurship Index

From table 2 we can observe that mapping result related topic with 14 pillars of GEI in 2021 is more evenly distributed. Dominance has not been fully seen because the 25 articles about start-up performance selected are articles published throughout early to mid-2021. In contrast to the mapping done for published articles in 2018-2020, there is a considerable percentage of dominance. But in general, regarding 3 sub-indexes pillars can be observed in table 3 that the distribution of sub-indexes from the four years is higher in Entrepreneurial Attitudes than Entrepreneurial Abilities and Entrepreneurial Aspirations.

TABLE 2. RELATED TOPIC 14 PILLARS OF GEI

Year	Related Topic 14 Pillar of Global Entrepreneurship Index													
	Entrepreneurial Attitudes					Entrepreneurial Abilities				Entrepreneurial Aspirations				
	1.Opportunity Perception	2.Start-up Skills	3.Risk Acceptance	4.Networking	5.Cultural Support	6.Opportunity Startup	7.Technology Absorption	8.Human Capital	9.Competition	10.Product Innovation	11.Process Innovation	12.High Growth	13.Internationalization	14.Risk Capital
2021	8%	8%	4%	8%	**9%**	**9%**	6%	**9%**	6%	8%	8%	7%	1%	**9%**
2020	8%	**11%**	6%	**11%**	**13%**	5%	4%	**12%**	6%	4%	6%	6%	2%	6%
2019	6%	8%	3%	**14%**	**14%**	**10%**	3%	**12%**	6%	4%	4%	**9%**	3%	5%
2018	**13%**	**13%**	7%	**13%**	**20%**	7%	0%	**13%**	7%	0%	0%	7%	0%	0%

Source: processed by researchers (2021)

TABEL 3. THE SPREAD SUB INDEXES PILLARS OF GEI 2018-2021

Sub-Indexes pillars of GEI	2018	2019	2020	2021
Entrepreneurial Attitudes	**67%**	**45%**	**50%**	**37%**
Entrepreneurial Abilities	27%	31%	27%	30%
Entrepreneurial Aspirations	7%	24%	24%	33%
	100%	100%	100%	100%

Source: processed by researchers (2021)

IV. DISCUSSION

Based on the mapping that has been done, it appears that the distribution of articles related to the 14 pillars of GEI is quite evenly distributed but dominated by the Entrepreneurial Attitude cluster. This fact is relevant with GEI statement, Entrepreneurial Attitude is one of the most important factors to support the creation of an ecosystem, how the organization works and ability to face its business challenges. The existence of qualified entrepreneurial skills, supported by networking that lives in a good ecosystem and the ability to capture opportunities in addition to the ability to take into account risk becomes the main capital that will foster excellent performance in start-ups.

The study, conducted in European countries (German, France, Italia, Poland etc) in the Entrepreneurial Attitude cluster, emphasized the importance of opportunity perception, start-up skills, and networking. While in the Entrepreneurial Abilities cluster is dominated by studies related to human capital, technology adoption and competition. In the Entrepreneurial Aspirations cluster is dominated by studies related to innovation process, high growth and risk capital but in Entrepreneurial Aspirations is not too strong to highlight each pillar in it when compared to cluster entrepreneurial attitude and abilities. In studies conducted in developing and developed countries in Asia (Japan, South Korea, Indonesia, Malaysia etc), it appears that the spread to 14 pillars is strongly dominated by the Entrepreneurial Attitude cluster, especially at the cultural support point index, followed by networking, start-ups skills and opportunity perception. Studies on Risk Acceptance in this cluster are noted to be quite rare. In the Entrepreneurial Abilities cluster, there are predominantly studies conducted discussing Human Capital,

Opportunity Start-up and competition. Studies on Technology Absorption are still quite rare. Studies related to the Entrepreneurial Aspirations cluster in the article studied showed that articles written against the background of countries in Asia have not discussed too much about products and processes of innovation, internationalization and risk capital. But sub index pillar of high growth becomes the concentration in this cluster. The study conducted in middle eastern states (United Arab Emirates, Turkey, Israel etc.) is like countries in Asia that still focus on the Entrepreneurial Attitude and Abilities cluster related to Entrepreneurial Skills and Human Capital.

In table 3 it can be learned that articles written in 2018 to 2020 are dominated by Entrepreneurial Attitudes and in the second rank is the Entrepreneurial Abilities cluster. Entrepreneurial Aspirations ranked last in terms of discussions about sub index points contained in the third cluster is still rarely done. In contrast to mapping data in 2021, Entrepreneurial Aspirations is ranked second only to Entrepreneurial Attitudes as an active topic of discussion put forward by researchers. Studies on Innovation, Start-up High Growth and Risk Capital are more highlighted than the second cluster of Entrepreneurial Abilities although the number of differences is not too much different. This shows that the concentration of research in the field of Entrepreneurship in Start-ups shifts slightly by analyzing and studying more about the Entrepreneurship Aspirations cluster. In future research, it is possible that this Cluster of Entrepreneurship Aspirations will continue to grow to rival the other 2 clusters, Entrepreneurship Abilities and even Entrepreneurial Attitude.

Completing the discussion about studies in Start-up Performance, the authors provide a better picture of future study projections, the author extraction of 180 articles themed on entrepreneurship. The result of extraction studies related entrepreneurship-themed articles using vosviewertools can be mapped sub-topics studied as follows.

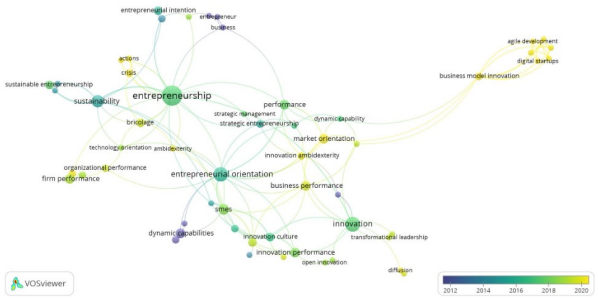

Figure 5. Extraction Result from Vosviewers
Source: Processed by Authors (2021)

In the results of vos viewer extraction can be seen the distribution of study years and trends in the development of the latest studies directed at studying agile development, digital start-ups, business model innovation. The study of Business and firm performance, Innovation ambidexterity and market orientation will continue to grow along with its relationship with key topics that have been widely researched, namely related to Entrepreneurship, Entrepreneurial Orientation, Innovation and Sustainability.

Number footnotes separately in superscripts. Place the actual footnote at the bottom of the column in which it was cited. Do not put footnotes in the reference list. Use letters for table footnotes.

V. Conclusion

The development of studies related to Start-up Performance that varies in each international region shows a good dynamic and a directed movement that focuses on learning adaptation to technological advances to meet industry 5.0. In the study published in the last 4 years Entrepreneurial Attitude is still the main topic that was highlighted by the panel, followed by researching the topic related to the second cluster, namely Entrepreneurial Abilities and the last is Entrepreneurial Aspirations. Mapping results show that even though until this article was written, Entrepreneurial Attitude still dominates, but Entrepreneurial Aspirations which contains studies related to Innovation, High Growth and Risk Capital will likely dominate in the future to meet a new era of Industry 5.0 related to robotics, Artificial Intelligence, Sustainability and renewable resources that will be increasingly researched in the future.

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References

[1] G. Eason, B. Noble, and I.N. Sneddon, “On certain integrals of Lipschitz-Hankel type involving products of Bessel functions,” Phil. Trans. Roy. Soc. London, vol. A247, pp. 529-551, Ap *2019_GEI-2019_final_v2*. (n.d.).

[2] Ács, Z. J., Szerb, L., & Autio, E. (2015). *Global Entrepreneurship Index 2015*. *January*, 1–254.

[3] Adams, S. B. (2021a). From orchards to chips: Silicon Valley’s evolving entrepreneurial ecosystem. *Entrepreneurship and Regional Development*, *33*(1–2), 15–35. https://doi.org/10.1080/08985626.2020.1734259

[4] Akkaya, M. (2019). *Startup Valuation* (pp. 137–156). https://doi.org/10.4018/978-1-7998-1086-5.ch008

[5] Aldianto, L., Anggadwita, G., Permatasari, A., Mirzanti, I. R., & Williamson, I. O. (2021). Toward a business resilience framework for startups. *Sustainability (Switzerland)*, *13*(6). https://doi.org/10.3390/su13063132

[6] Amelia, T. N., Thoyib, A., Irianto, G., & Rofiq, A. (2021). Tech Start-up Incubation Program: Business Model Evaluation on Government Based Incubator in Indonesia. *TEM Journal*, *10*(1), 283–291. https://doi.org/10.18421/TEM101-35

[7] Amry, D. K., Ahmad, A. J., & Lu, D. (2021). The new inclusive role of university technology transfer: Setting an agenda for further research. *International Journal of Innovation Studies*, *5*(1), 9–22. https://doi.org/10.1016/j.ijis.2021.02.001

[8] Anwana, E. (2020a). Enhancing the Entrepreneurship Framework in. In *International Journal of Entrepreneurship Article in International Journal of Entrepreneurship*. https://www.researchgate.net/publication/344458258

[9] Assenova, V. A. (2021). Institutional change and early-stage start-up selection: Evidence from applicants to venture accelerators. *Organization Science*, *32*(2), 407–432. https://doi.org/10.1287/orsc.2020.1390

[10] Caliendo, M., Künn, S., & Weissenberger, M. (2020a). Catching up or lagging behind? The long-term business and innovation potential of subsidized start-ups out of unemployment. *Research Policy*, *49*(10). https://doi.org/10.1016/j.respol.2020.104053

[11] D., Mehta, P., & Avittathur, B. (2021). Supply chain capabilities and competitiveness of high-tech manufacturing start-ups in India. *Benchmarking: An International Journal*, *28*(5), 1783–1808. https://doi.org/10.1108/BIJ-12-2018-0437

[12] Guo, H., Wang, C., Su, Z., & Wang, D. (2020). Technology Push or Market Pull? Strategic Orientation in Business Model Design and Digital Start-up Performance*. *Journal of Product Innovation Management*, *37*(4), 352–372. https://doi.org/10.1111/jpim.12526

[13] Gupta, N. (n.d.-a). Service Quality: Business Incubation and Supportive Policy Intervention. In *A Quarterly Journal*.

[14] Gupta, V. K., & Batra, S. (2016). Entrepreneurial orientation and firm performance in Indian SMEs: Universal and contingency perspectives. *International Small Business Journal: Researching Entrepreneurship*, *34*(5), 660–682. https://doi.org/10.1177/0266242615577708

[15] Halberstadt, J., Niemand, T., Kraus, S., Rexhepi, G., Jones, P., & Kailer, N. (2021a). Social entrepreneurship orientation: Drivers of success for start-ups and established industrial firms. *Industrial Marketing Management*, *94*, 137–149. https://doi.org/https://doi.org/10.1016/j.indmarman.2020.06.012

[16] Honjo, Y., & Nakamura, H. (2020a). The link between entrepreneurship and informal investment: An international comparison. *Japan and the World Economy*, *54*, 101012. https://doi.org/https://doi.org/10.1016/j.japwor.2020.101012

[17] Hudáková, M., Urbancová, H., & Vnou?cková, L. (2019). Key criteria and competences defining the sustainability of start-up teams and projects in the incubation and acceleration phase. *Sustainability (Switzerland)*, *11*(23). https://doi.org/10.3390/su11236720

[18] Jonek-Kowalska, I., & Wolniak, R. (2021a). The influence of local economic conditions on start-ups and local open innovation system. *Journal of Open Innovation: Technology, Market, and Complexity*, *7*(2). https://doi.org/10.3390/joitmc7020110

[19] Kagan, E., Leider, S., & Lovejoy, W. S. (2020). Equity contracts and incentive design in start-up teams. *Management Science*, *66*(10), 4879–4898. https://doi.org/10.1287/mnsc.2019.3439

[20] Kaufmann, D., & Reuveni, B. (2020a). Influence of economic crisis on the performance of incubated companies: the Israeli case. *European Planning Studies*, *28*(11), 2153–2173. https://doi.org/10.1080/09654313.2020.1711875

[21] Kollmann, T., Stöckmann, C., Hensellek, S., Kensbock, J., & Universität Duisburg-Essen Lehrstuhl für E-Business und E-Entrepreneurship. (n.d.). *European Startup Monitor 2016*.

[22] Leendertse, J., van Rijnsoever, F. J., & Eveleens, C. P. (2021a). The sustainable start-up paradox: Predicting the business and climate performance of start-ups. *Business Strategy and the Environment*, *30*(2), 1019–1036. https://doi.org/10.1002/bse.2667

[23] Minola, T., Hahn, D., & Cassia, L. (2021). The relationship between origin and performance of innovative start-ups: the role of technological knowledge at founding. *Small Business Economics*, *56*(2), 553–569. https://doi.org/10.1007/s11187-019-00189-y

[24] Mishra, O. N., & Gupta, S. (2020). Antecedents and Impact of E-commerce Adoption among New Venture Firms: Evidence from Tourism and Hospitality Industry. *Vision*, *24*(4), 431–440. https://doi.org/10.1177/0972262920927940

[25] Mota, R. de O., Godinho Filho, M., Osiro, L., Ganga, G. M. D., & Mendes, G. H. de S. (2021a). Unveiling the relationship between drivers and capabilities for reduced time-to-market in start-ups: A multi-method approach. *International Journal of Production Economics*, *233*, 108018. https://doi.org/https://doi.org/10.1016/j.ijpe.2020.108018

[26] Mungila Hillemane, B. S. (2020a). Entrepreneurial ecosystem for tech start-ups in Bangalore: an exploration of structure and gap. *Journal of Small Business and Enterprise Development*, *27*(7), 1167–1185. https://doi.org/10.1108/JSBED-07-2019-0233

[27] Oppong, G. Y. S., Singh, S., & Kujur, F. (2020a). Potential of digital technologies in academic entrepreneurship – a study. *International Journal of Entrepreneurial Behavior & Research*, *26*(7), 1449–1476. https://doi.org/10.1108/IJEBR-06-2019-0401

[28] Pacheco Pardo, R., & Klingler-Vidra, R. (2019). The Entrepreneurial Developmental State: What is the Perceived Impact of South Korea's Creative Economy Action Plan on Entrepreneurial Activity? *Asian Studies Review*, *43*(2), 313–331. https://doi.org/10.1080/10357823.2019.1589418

[29] Peng, H., Zhou, C., & Liu, Y. (2020). Entrepreneurial experience and performance: From the aspect of sustainable growth of enterprises. *Sustainability (Switzerland)*, *12*(18). https://doi.org/10.3390/SU12187351

[30] Peng, J., Wang, Z., & Chen, X. (2019). Does Self-Serving Leadership Hinder Team Creativity? A Moderated Dual-Path Model. *Journal of Business Ethics*, *159*(2), 419–433. https://doi.org/10.1007/s10551-018-3799-0

[31] Pinkow, F., & Emmerich, P. (2021a). RE-EXAMINING CROWDFUNDING SUCCESS: HOW THE CROWDFUNDING GOAL MODERATES THE RELATIONSHIP OF SUCCESS FACTORS AND CROWDFUNDING PERFORMANCE. *Central European Business Review*, *10*(20), 1–24. https://doi.org/10.18267/j.cebr.263

[32] Polo García-Ochoa, C., De-Pablos-Heredero, C., & Blanco Jiménez, F. J. (2020). How business accelerators impact startup's performance: Empirical insights from the dynamic capabilities approach. *Intangible Capital*, *16*(3), 107–125. https://doi.org/10.3926/IC.1669

[33] Power, B., & Reid, G. C. (2021). The impact of intellectual property types on the performance of business start-ups in the United States. *International Small Business Journal: Researching Entrepreneurship*, *39*(4), 372–400. https://doi.org/10.1177/0266242620967009

[34] Regner, T., & Crosetto, P. (2021). The long-term effects of self pledging in reward crowdfunding. *Technological Forecasting and Social Change*, *165*, 120514. https://doi.org/https://doi.org/10.1016/j.techfore.2020.120514

[35] Rok, B., & Kulik, M. (2021). Circular start-up development: the case of positive impact entrepreneurship in Poland. *Corporate Governance: The International Journal of Business in Society*, *21*(2), 339–358. https://doi.org/10.1108/CG-01-2020-0043

[36] Sahi, G. K., Gupta, M. C., & Cheng, T. C. E. (2020). The effects of strategic orientation on operational ambidexterity: A study of indian SMEs in the industry 4.0 era. *International Journal of Production Economics*, *220*(August 2018), 107395. https://doi.org/10.1016/j.ijpe.2019.05.014

[37] Sinčić Ćorić, D., Lučić, A., Brečić, R., Šević, A., & Šević, Ž. (2020). An Exploration of Start-ups' Sustainable Marketing Orientation (SMO). *Industrial Marketing Management*, *91*, 176–186. https://doi.org/10.1016/j.indmarman.2020.09.002

[38] Snehal, S., Ranjany, S., & Krishnashree, A. (2020). Assessing and comparing top accelerators in Brazil, India, and the USA: Through the lens of new ventures' performance. *Entrepreneurial Business and Economics Review*, *8*(2), 153–177. https://doi.org/10.15678/EBER.2020.080209

[39] Teixeira, E. G., Moura, G. L. de, Lopes, L. F. D., Marconatto, D. A. B., & Fischmann, A. A. (2021). The influence of dynamic capabilities on startup growth. *RAUSP Management Journal*, *ahead-of-print*(ahead-of-print). https://doi.org/10.1108/rausp-08-2019-0176

[40] Tekin, E., Ramadani, V., & Dana, L.-P. (2021). Entrepreneurship in Turkey and other Balkan countries: are there opportunities for mutual co-operation through internationalisation? *Review of International Business and Strategy*, *31*(2), 297–314. https://doi.org/10.1108/RIBS-10-2020-0133

[41] Tolmachev, D. E., & Chukavina, K. v. (2020). Technology entrepreneurship in the Russian regions: Educational and geographical paths of start-up founders. *Economy of Region*, *16*(2), 420–434. https://doi.org/10.17059/2020-2-7

[42] van Rijnsoever, F. J., & Eveleens, C. P. (2021a). Money Don't matter? How incubation experience affects start-up entrepreneurs' resource valuation. *Technovation*, *106*. https://doi.org/10.1016/j.technovation.2021.102294

[43] van Weele, M., van Rijnsoever, F. J., Eveleens, C. P., Steinz, H., van Stijn, N., & Groen, M. (2018). Start-EU-up! Lessons from international incubation practices to address the challenges faced by Western European start-ups. *The Journal of Technology Transfer*, *43*(5), 1161–1189. https://doi.org/10.1007/s10961-016-9538-8

[44] Vasconcelos Gomes, L. A. de, Salerno, M. S., Phaal, R., & Probert, D. R. (2018). How entrepreneurs manage collective uncertainties in innovation ecosystems. *Technological Forecasting and Social Change*, *128*, 164–185. https://doi.org/10.1016/j.techfore.2017.11.016

[45] Wiesböck, F., & Hess, T. (2020). Digital innovations: Embedding in organizations. *Electronic Markets*, *30*(1), 75–86. https://doi.org/10.1007/s12525-019-00364-9

[46] Yasin, N., Khansari, Z., & Tirmizi, K. (2021). Exploring the challenges for entrepreneurship business incubator hubs in the United Arab Emirates. *International Journal of Globalisation and Small Business*, *12*(2), 190–212. https://doi.org/10.1504/IJGSB.2021.114575

[47] Young Chung, W., Jo, Y., & Lee, D. (2021). Where should ICT startup companies be established? Efficiency comparison between cluster types. *Telematics and Informatics*, *56*, 101482. https://doi.org/https://doi.org/10.1016/j.tele.2020.101482

[48] Zhao, F., Prentice, C., Wallis, J., Patel, A., & Waxin, M. F. (2020a). An integrative study of the implications of the rise of coworking spaces in smart cities. *Entrepreneurship and Sustainability Issues*, *8*(2), 467–486. https://doi.org/10.9770/jesi.2020.8.2(28)

[49] Zhou, Z., & Verburg, R. (2020). Open for business: The impact of creative team environment and innovative behaviour in technology-based start-ups. *International Small Business Journal: Researching Entrepreneurship*, *38*(4), 318–336. https://doi.org/10.1177/0266242619892793

[50] Zielske, M., & Held, T. (2020). The Use of Agile Methods in Logistics Start-ups: An Explorative Multiple Case Study. *International Journal of Innovation and Technology Management*, *17*(06), 2050042. https://doi.org/10.1142/S021987702050042X

[51] Zyphur, M. J., & Pierides, D. C. (2020). Statistics and Probability Have Always Been Value-Laden: An Historical Ontology of Quantitative Research Methods. *Journal of Business Ethics*, *167*(1). https://doi.org/10.1007/s10551-019-04187-8

Appendix

No	Year	Author	Country	Focus of Study	Type of Research				The fourteen pillars of the Global Entrepreneurial Index													
									Entrepreneurial Attitudes					Entrepreneurial Abilities				Entrepreneurial Aspirations				
					Systematic Literature Review	Qualitative	Quantitative	Mixed Method	1.Opportunity Perception.	2.Startup Skills	3.Risk Acceptance	4.Networking	5.Cultural Support	6.Opportunity Startup	7.Technology Absorption	8.Human Capital	9.Competition	10.Product Innovation	11.Process Innovation	12.High Growth	13.Internationalization	14.Risk Capital
1	2021	Rijnsoever	North America and Western Europe	the effects of incubation experience on start-up entrepreneurs' valuation of different tangible and intangible resources offered by incubators			v		v			v		v						v		
2	2021	Choi S.-K	South Korea	the effect of innovation capabilities and government support policies on start-up performance is examined			v			v		v	v	v					v			
3	2021	Dorcas K.D	Ghana	better understand the relationship between entrepreneur traits and innovation performance.			v									v	v	v	v			
4	2021	Jonek-Kowalska	Poland	determine the actual strength of the conditions developed by city authorities on the creation and development of start-ups.			v						v			v						v
5	2021	Power B	USA	intellectual property (IP) types enhance multidimensional performance			v								v		v	v	v			
6	2021	Ferreira R.M.	-	develop a dynamic model to study the entry and the exit decision for a VC facing the opportunity to invest and expand a start-up firm	v				v		v									v		v
7	2021	Regner T	Germany	explore one form of such opportunistic behavior: self pledging and its potential effect on the post-campaign development of crowdfunded projects			v		v		v					v						v
8	2021	Eesley C.E.	Stanford, USA	Impact of program participation and entrepreneurship rates			v			v			v			v				v		
9	2021	Halberstadt	Austria and Northern Macedonia	Investigation into social entrepreneurship orientation (SEO)				v		v		v	v			v						v
10	2021	Amry D.K	-	university technologytransfer (UTT) mechanisms that lead to the commercialisation of intellectual property	v				v				v		v			v				
11	2021	Mota R.D.O.	-	investigate how drivers and capabilities are related to reducing time-to-market.	v					v						v	v		v	v		
12	2021	O'Connor J.T	-	examined the correlation between CSU success factor achievement and CSU performance in capital projects			v		v					v			v			v		v
13	2021	Gupta	India	examines the latent constructs, such as social media technology use (SMTU), innovation capability (IC), entrepreneurial orientation (EO) and innovation performance (IP)			v			v				v	v	v	v	v				

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14	2021	Leendertse J	(1) the Netherlands (2) the DACH (Germany, Austria, and Switzerland) (3) the Nordics (Denmark, Norway, Sweden, and Finland)	This study focuses on *sustainable start-ups* , which are hybrid organizations that besides developing a business also contribute to solving social and environmental problems			v		v					v	v			v				
15	2021	Minola T	Italia	test the origin of innovative start-ups affects their initial technological knowledge and, in turn, performance at founding.			v			v			v		v			v	v			
16	2021	Yasin N	United Arab Emirates	explore the challenges and experiences among business incubators (BIs), as providers, for their effective performance and operations.		v					v		v	v			v					v
17	2021	Pinkow F	German	the impact of the funding goal on other factors that impact crowdfunding success.			v		v	v	v			v		v						v
18	2021	Canovas-Saiz L	United States	the performance of accelerators, and provide important managerial implications for their managers, investors, and entrepreneurs.			v					v	v		v						v	v
19	2021	Rok B., Kulik M.,	Poland	Circular start-up development		v						v	v			v	v		v			
20	2021	Assenova V.A.	170 countries	Institutional change and early-stage start-up selection			v			v		v		v								
21	2021	Amelia T.N., Thoyib A., Irianto G., Rofiq A.	Indonesia	Tech Start-up Incubation Program: Business Model Evaluation on Government Based Incubator		v						v	v	v		v		v	v	v		v
22	2021	Valles V.M.R., Cuesta P.Y.C., Reina L.B.M	Canton Ibarra-Ekuador	the entrepreneurial activity in times of the COVID-19 pandemic			v		v	v	v			v								v
23	2021	Tekin E., Ramadani V., Dana L.-P	Turkey	evaluate the entrepreneurship activity in Turkey and the Balkan countries and to show in which fields they can cooperate in the future	v				v	v					v	v		v				v
24	2021	Young Chung W., Jo Y., Lee D	-	the triple helix model, the government, private companies, and universities play an important role in the development of the regional economy and the growth of clusters.				v				v		v				v	v	v		
25	2021	Adams S.B	San Fransisco	identifies the entrepreneurial ecosystem that supported key tech start-ups on the San Francisco Peninsula prior to the 1960s, shows how the ecosystem developed and how it evolved			v					v	v					v	v	v		
26	2020	Stefanelli	Italy	impact on spin-off performance			v		v	v						v			v			
27	2020	Caliendo M	German	*active labor market policy perspective*			v		v	v		v		v			v		v			v

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28	2020	Mishra O.N.	(KSA, UAE, Qatar, Kuwait, Oman, Bahrain)	investigate the antecedents of e-commerce adoption and to gather empirical evidences about the impact of e-commerce adoption on such firms.			v							v	v	v	v					
29	2020	Sinčić Ćorić D	(Croatia, Slovenia, Serbia, Albania	explore the implementation of sustainable marketing orientation (SMO) within the start-up context.			v						v			v	v			v		
30	2020	Kaufmann D	Israel	comparing the performance of incubator companies, incubated during financial crises, to the performance of graduates, incubated during the non-crises time.			v		v	v	v	v	v		v	v						
31	2020	Mungila Hillemane	Bangalore	value for regional policy makers in strategizing to promote Bangalore ecosystem, and for researchers in undertaking “ecosystem gap analysis”				v			v	v	v	v		v	v					
32	2020	Polo Garcia	Spain	investigate whether business accelerators do assist their startups in the generation of their dynamic capabilities and			v			v		v	v			v			v			v
33	2020	Oppong G.Y.S	India	identify opportunities and challenges faced by academic entrepreneurs' startups				v	v	v	v	v	v				v					
34	2020	Gupta N	India	assess the service quality of business incubators, identifies the service quality dimensions and suggests to match the tenant/start-up firm's perception with incubator's service design, delivery and differentiation gave a supportive policy funding by the government.	v				v	v	v	v	v									v
35	2020	Zielske M.	German	increases entrepreneurial success of logistic start-up by means of the ability to better deal with the rapidly changing customer expectations, business model insecurities, and complex technological decisions.		v				v	v				v	v		v	v			
36	2020	Costa J., Matias J.C.O	-	present how open innovation can enhance sustainable innovation ecosystems and boost the digital transition	v																	
37	2020	Kagan E	-	examines the effectiveness of different contractual arrangements, focusing in particular on the effects of contract form and contracting timing on founder effort and on the value of the venture			v					v	v			v						
38	2020	Fichter K.,	Berlin	clarify whether the integration of sustainability goals and considerations into generic BPCs has an impact on the business activities of participating entrepreneurs and start-up teams			v						v				v	v	v	v		
39	2020	Peng H., Zhou C., Liu Y	-	(meta analysis) consensus in academic circles on the relationship between entrepreneurial experience and entrepreneurial performance.	v					v	v		v			v				v		
40	2020	Anwana E.,	South Africa	elements within the national entrepreneurship framework of South Africa need to be improved to develop a robust ecosystem of innovative, high-growth start-ups and entrepreneurship		v						v	v	v				v	v			v

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41	2020	Zhao F., Prentice C	Australia	investigate the economic and socio-cultural implications of coworking trend for smart cities, their ecosystems and the use of urban public spaces		v						v	v							v		v
42	2020	Honjo Y	Japan	explores the link between entrepreneurship and informal investment.			v		v	v	v	v		v		v						
43	2020	Tolmachev D.E	Russia	collected and analysed data on technological start-ups founded in the past decade focused on identifying global start-ups, in which at least one of the founders was educated in Russia.			v		v				v		v	v				v	v	
44	2020	Chillakuri B	India	underscores the need for linking sustainability to the start-up ecosystem and proposes a framework with the help of triple bottom line approach to sustainable development.	v					v		v	v			v	v			v	v	
45	2020	Slavik S., Hanak R	-	deepen and broaden the knowledge of the strategies regarding the launch of micro enterprises and thus improve their competitiveness and viability.	v				v	v								v	v			
46	2020	Snehal S., Ranjany S.,	Brazil, India, and the USA	assess and compare the factors influencing the performance of new ventures within top business accelerators across three countries using the Resource Based View (RBV) theory			v			v		v	v			v				v		v
47	2019	Seo Y.W., Lee Y.H.	South Korea	explored the effects of the innovation system of start-ups and community support and resources on business performance of start-up companies			v					v	v			v		v	v	v		
48	2019	Garidis K	-	build a multi-item scale for start-ups cooperation behavior. provides a causal analysis on the impact of cooperation behavior on start-up performance.				v		v		v	v			v				v		
49	2019	Hudáková M	-	investigates and identifies crucial and efficient competencies of start-up founders and new business leaders, together with the identification of crucial support provided by accelerator programs.				v	v	v		v	v			v					v	v
50	2019	Ma Z., Zhu J., Meng Y.,	China	examine the impact of returnee entrepreneurs' overseas capital (human and social) and domestic capital (human and social) on their venture performance			v						v			v	v					
51	2019	Maia M.M	Brazil	the performances and discursive strategies mobilized by high-tech start-up entrepreneurs looking for financial support.			v		v	v	v					v						

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52	2019	Jaafar N.J., Alwazni J.S.M	Malaysia	explores the effect of future orientation, social networks on women small businesses' performance and examine the mediating effect of innovation activities between future orientation, social networks and small businesses' performance			v		v	v		v		v		v			v			
53	2019	Ariza Eka Yusendra M	Developing country	create and explore the start-up business performance improvement model through effective incubation model			v			v		v	v						v	v		
54	2019	Pacheco Pardo R	South Korea	conceptualise and assess the South Korean government's turn towards supporting entrepreneurship as a manifestation of what we label the entrepreneurial developmental state.		v							v	v		v	v			v		v
55	2019	Corrente S	-	the entrepreneurial ecosystem as a set of interdependent and coordinated factors in a territory enabling entrepreneurship.			v					v	v				v				v		
56	2019	Szalavetz A	Hungarian	the activities of start-ups specialising in artificial intelligence (AI)-powered solutions could contribute to upgrading in dependent market economies.	v						v	v		v	v		v						v
57	2019	Ghosh D	India	analyzes the main features and challenges of the high-tech manufacturing sector, and the way in which enabling environment including policy making, supply chain capability and related technologies through Industry 4.0 could be leveraged to foster growth.		v						v	v	v	v			v		v		
58	2019	van Weele M	Israel and Australia	underlying institutions that cause challenges in the entrepreneurial ecosystem, incubators provide symptomatic solutions by creating an environment that protects start-ups from unfavorable institutions.		v			v			v	v	v			v						v
59	2019	Di Fatta D.	Madrid Spain	to study the relationships among the start-up firms inside an incubator.		v						v	v	v				vv				
60	2019	Chatterji A.	India	founders received in-person advice from other entrepreneurs who varied in their managerial style.			v						v			v						
61	2019	Ferri S., Fiorentino R., Parmentola	Italia`	explored the relations between patenting processes and spin-off performance			v		v					v				v		v		
62	2019	Padrão L.C., Andreassi T	-	analyse the influence of incubator marketing support on the product performance of incubated (New Technology Based Firms) NTBFs			v			v		v		v		v				v		
63	2018	Vasconcelos Gomes	-	entrepreneurs that face the challenge of coordinating a complex network of actors in the presence of individual and collective uncertainties		v			v	v	v	v	v			v						
64	2018	Famiola M.,	Indonesia	to explore the system of entrepreneurial learning in Indonesian business Incubator and identify their success factors to support the entrepreneurs		v						v	v	v						v		
65	2018	Bastié F., Cieply S	French	compare two ways of transferring businesses: transfers to outsiders and transfers to employees			v		v	v			v			v	v					