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### Comparative analysis of performance determinants in agri-start-ups across continents

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#### Abstract

In the rapid evolving landscape of global entrepreneurship, start-ups across different continents are shaping the future of various industries with innovations. Startups are essential to the search for innovative solutions to the climate emergency. The issue is that startups typically don't last long enough to be successful. Hence we attempted to identify the performance determinants of start-ups in different continents. In this paper we used data from web of science, Scopus, and ProQuest using different search strings. Through advanced search we found 14404 studies out of them 71 studies satisfied our inclusion-exclusion criteria. From these 71 studies from different continents we conducted a systematic literature review to identify the performance determinants of start-ups using Nvivo-14 software, while the answer of frequently faced problem or questions were given based on the generalization of all these studies. Based on our results we found that product market fit was most dominating factor to perform in start-up business, so the co-founder should emphasized on developing the good product-market-fit in the early stage of start-up venture? This study might help the new co-founder of different countries to learn how to start the novel business and it would contribute to develop suitable strategy to perform well.

**Keywords:** Agri-start-ups, content analysis, start-ups, business success, PRISMA, systematic review

#### Introduction

In the rapid evolving landscape of global entrepreneurship, start-ups across different continents are shaping the future of various industries with innovations. Europe is the most represented region in the Emerging Ecosystems ranking, with a 42% share in the Top 100 Emerging Ecosystems, followed by North America with a 27% share. The spirit of innovation is prevalent and driven by startups that are developing world-changing technologies. "By fostering the startup ecosystem the economies overall growth and welfare can be boosted. In essence, fostering a vibrant startup ecosystem is not just advantageous, but essential for any countries sustained competitiveness, economic vitality, and effective response to societal changes.

The market dynamics, production and application of knowledge have been getting the innovative frame. Everyday many innovators are coming in business with innovation and especially after the covid-19 agri-start-ups in Asian and African countries getting very faster growth but the funding and number of unicorn are declining since 2021 because of business expectation. The business expectation is not only affecting the start-ups but also start-ups growth which is also affecting the business expectation and this might be one of reason of poor performance of start-ups but the performance varies with start-up ecosystem

and economic state. Startups are essential to the search for innovative solutions to the climate emergency. The issue is that startups typically don't last long enough to be successful. That's why performance evaluation is a common method used by researchers to determine what makes startups successful. But research on agriculture and related fields is mostly ignored. To promote the agribusiness start-ups globally demands intense study on understanding the reason of poor performance of start-ups and developing general framework for start-ups to get rid out different problems including financial losses and market instability, which will not only promote the start-ups but also create the innovative culture through supporting the innovators coming with high ambition to revolutionize.

#### Review of Literature

The performance of start-ups depends on start-up ecosystem and interaction of start-ups with dynamic economic forces. Hence, Lizarelli *et al.* (2022) [46] conducted a systematic literature review to identify the success factors of lean start-ups using preferred reporting items for systematic review and meta-analysis and found that the most cited performance factor was the support of top management for the implementation of start-ups, followed by customer feedback, minimum viable product to satisfy the customer's

need, and team quality. We can generalize these performance determinants into three basic categories based on the stimulus and response of determinants, which are personal attributes of entrepreneurs, organizational attributes, and the external environment. The personal attribute includes top management and minimum viable product based on the idea of the founder, while organizational and external factors include team quality and customer feedback.

According to the CB Insight report (2017) <sup>[17]</sup>, the most influential performance determinants of start-ups were lack of product-market fit or lack of demand for the product (42%) followed by lack of market for their goods and services (14%). To perform better in uncertain market demands, when delivering the product, having the necessary technology to be more innovative or tackling major difficulties and being unable to address these problems counts the most. The members of the ideal cofounder's team should have the necessary abilities, enthusiasm, and work experience to work in startups. The timing of entry is critical because it can significantly affect how quickly startups might grow (Insights, 2017) <sup>[17]</sup>. While, Lussier & Corman (1996) <sup>[48]</sup> considered ten variables capital, record keeping, industry experience, staffing, professional advisor, planning, minority, parent-owned business, industry experience, and economic timing, to identify which factor is more influential on start-ups performance, and identified that Professional advisor was the most important performance determinants followed by planning, and education was important performance determinants. To identify the influencing factors of technology business start-ups conducted a quantitative study. The author surveyed 300 young start-up's CEO and got 205 valuable responses. The data were analyzed using SPSS 22 and PLS 3.2.9 and found that network capability, technology commercialization capability, and exit strategy were the most important determinants of the start-up's performance. While, Klotz *et al.* (2014) <sup>[39]</sup> identified the most important determinants of performance and whether soft skills (passion and vision) or hard skills (previous experience) are important for the performance of start-ups. Authors identified that almost 60% of new start-ups venture fail due to organizational factors despite having experience. According to the author performing well in a diverse entrepreneurial climate, the new firm requires having a clear strategic vision and entrepreneurial passion along with soft hard skills. Through hard skills, entrepreneurs can generate a resource base but for the team to perform collectively well requires strong motive and intent.

Kim *et al.* 2018 <sup>[38]</sup> identified critical success factors in designing business start-ups using the analytic hierarchy process (AHP). The author classified the success of design business start-ups into four classes of determinants (1) entrepreneurship (2) innovation, (3) technology, and (4) economics. The entrepreneurial factors include the entrepreneur's competency, adventure tendency, desire to accomplish, goal orientation, and risk sensitivity, while the innovation category includes entrepreneurial motivation, progressive thinking, self-development, idea commercialization, and market orientation opportunity switch. The technology category includes creative

technology utilization, technology knowledge market-oriented technology, and high technology globalization, while the economics category includes continuous investment, venture capital utilization, raising venture funds, and financial resource retention. Among all these determinants idea commercialization was the most important success factor followed by goal orientation, and entrepreneur competency in all categories. If we compare individual category wise among the five determinants of entrepreneurship, goal creation was the important performance determinant, while among the five determinants of innovation, idea commercialization was the most important performance determinant, and in category 3<sup>rd</sup> (technology), creative team utilization was most important performance determinants, and among five determinants of 4<sup>th</sup> category, continuous investment was most important performance determinants (B. Kim *et al.*, 2018b) <sup>[38]</sup>. De Oliveira Silva *et al.*, (2022) <sup>[22]</sup> identified that start-ups performance depends on dynamic capability which can be measured in four senses that are market competency and opportunity recognition, absorption capacity, integration, and innovation. Recognition of market opportunity requires in-depth market research to take advantage of a niche market and other un-explorable market segments. Absorptive capacity (ability to identify new external information, assimilate, and use it for organization) provides a competitive advantage if external information is used based on the organization's strength. The author stated accelerators are any organization that assists start-ups by providing them input needed to enhance their performance and success, where performance can be measured in financial (based on certain revenue generation) and non-financial (achievement of objectives, and this definition have a broader scope) aspects. Attempted to identify the pattern and extent to which founders play an important role in the performance of start-ups, and found that founders not only play a role in managing the internal business environment but the investment and capital decisions in the firm by external sources depend on the entrepreneurial capacity and growth rate of start-ups. So if the founder replaced by new one than the new investors will attempt to get the advantage of new investment opportunity so firms capital structure will alter and have a positive effect on start-ups performance while if only founders internal position in start-ups altered than it will hurt performance. Similarly, attempted to identify the competitive advantage of product innovation, market intelligence, and pricing capability on a start-up's performance, these parameters are called dynamic capability. Dynamic capability means the firm's ability to integrate, build, and reconfigure internal and external competencies to address a rapidly changing environment. So, to take a competitive advantage by combining different resources it's necessary to offer products either at incentivized prices or innovative or value-added products. The author identified that timing and location also play important roles in performance. The marketing strategy influences the performance have broad implication because it's integrated with the broad external economic situation like affordable price setting policy depending on income distribution pattern and demographic features so market research plays an important role in determining start-ups

performance. Hence performance determinants and how it affects the start-ups varies with start-up ecosystem and economic system, but we didn't find any study which attempted to identify the comparative analysis and answer the frequently faced problems of cofounders or innovators who want to initiate the new start-up venture.

Hence to answer these problems we formulated these two objectives, 1<sup>st</sup> to identify the performance determinants of agri-start-ups of different continents, and 2<sup>nd</sup> to answer the frequently asked problems in the start-ups industry.

### Data and Methodology

The SCOPUS, Web of Science core collection (Thompson Reuters), and ProQuest database were referred for searching research publications on given relevant search string. Only the English language and start-ups as restrictive gates were used to identify more relevant studies in advanced search in different databases. While the frequently asked questions were answered using the generalization of results of content analysis.

**Table 1:** Number of papers search string wise

Search String	Scopus Records	ProQuest Records	Web of Science Records	
Startup* + Performance	6400	231	3087	
Startup* Success OR failure	2941	417	1167	
Agricultur* + Startup* + Performance	13	4	11	
Agri* + Startup* + Performance	48	3	14	
Agri* + Startup* + Success OR failure	32	1	8	
Agribusiness + Startup* + Success + Failure	3	1	2	
Agribusiness +Startup* + Performance	4	4	7	
Agriculture + Startup* + Success OR Failure	1	0	5	
Total	9442	661	4301	Sum Total 14404

### Inclusion and exclusion criteria

To select relevant studies for synthesizing detailed

knowledge about agribusiness start-ups' performance we included the following inclusion-exclusion criteria.

**Table 2:** Inclusion Criteria

Inclusion Criteria	
Inclusion criteria	Reason for inclusion
Research focus	Studies that identify performance parameters, desirable those who classified these parameters, and selected studies that give a detailed analysis of how particular determinants affect a start-up's performance.
Quantitative empirical studies	Only those quantitative studies are included that explain how particular determinants affect a start-up's performance based on quantitative testing.
Language	Only English language studies included

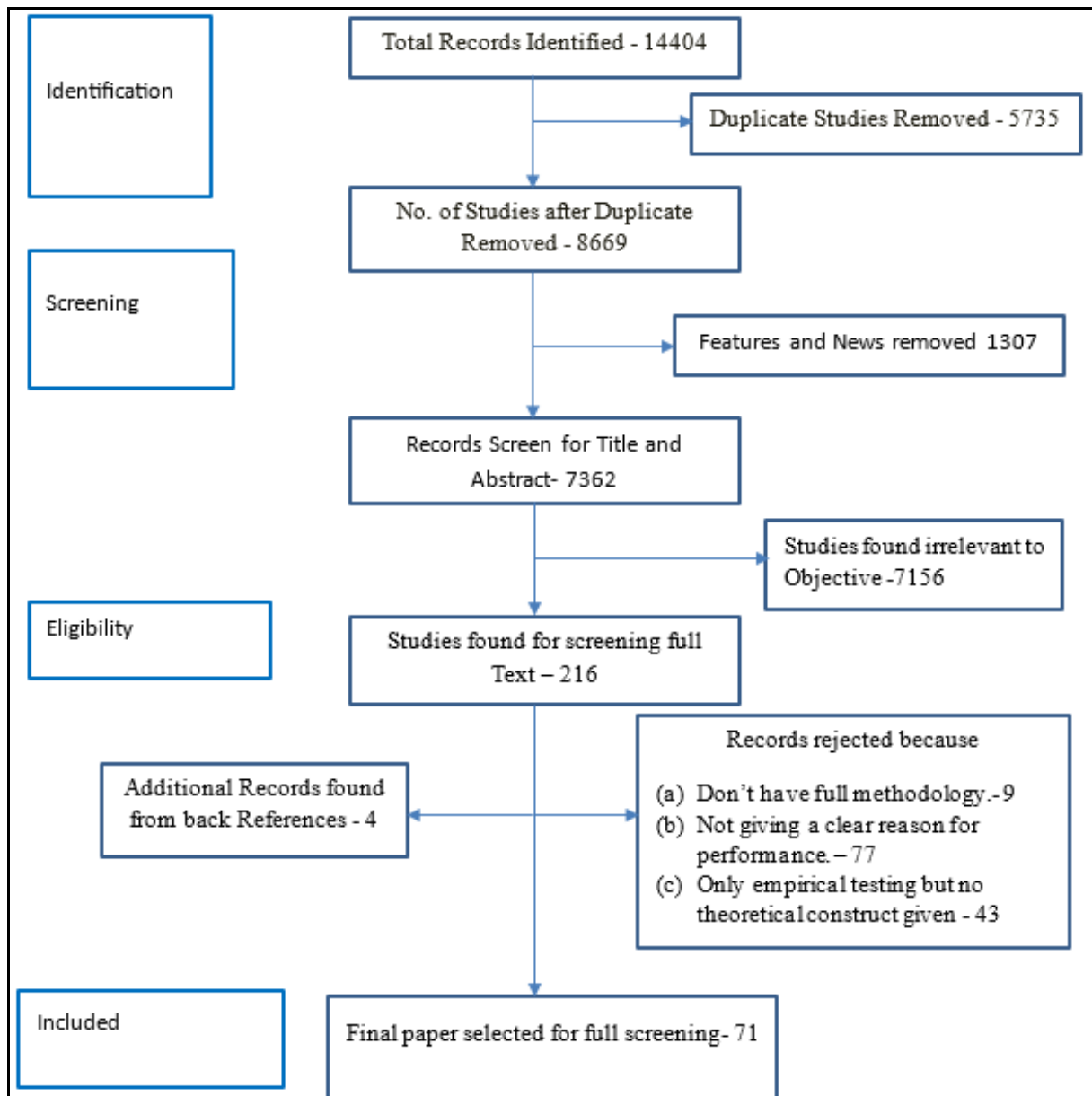
**Table 3:** Exclusion Criteria

Exclusion Criteria	
Publication Type	Excludes book chapters or books, conferences, news, proceedings, dissertations, and feature
Unity Analysis	Excluded studies that are not related to start-ups performance measures
Research Focus	Studies that do not show research methodology, analysis, and discussion are not included in this study

### Review schema

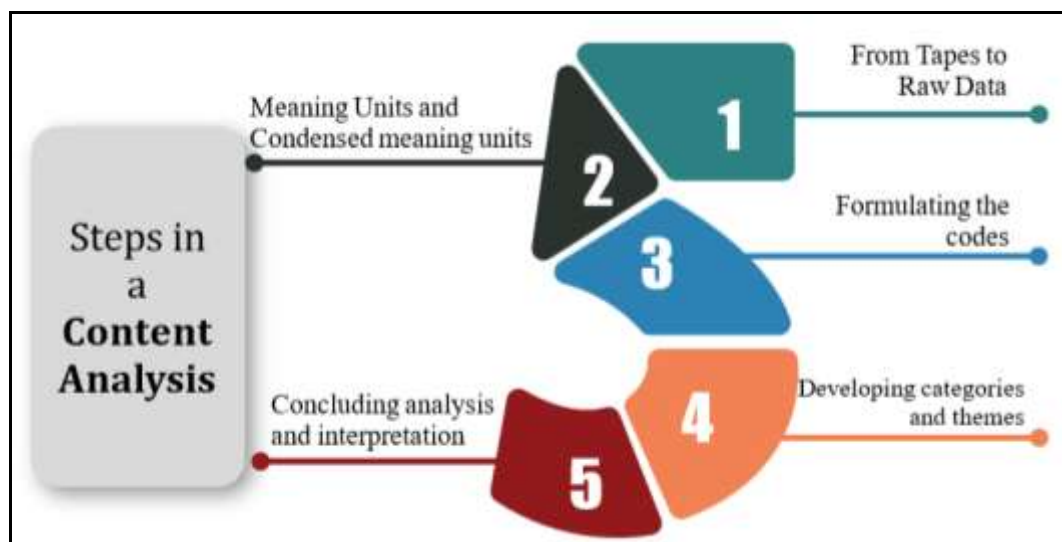
To review systematically and access the results qualitatively, we followed the PRISMA-2020 methodology of systematic review. We found a total of 14404 records from different databases out of which only 71 studies satisfied the inclusion-exclusion criteria.

- Among the selected studies 19 studies were conducted in Asia, 16 studies in Europe, 13 studies in Northern America, 10 studies in Southern America, 7 studies in Oceania, and 6 studies were conducted in South Africa.
- The selected studies (71 studies) were analyzed using the Nvivo-14 software through content analysis methodology which involves the following five steps:



(Source: <http://www.prisma-statement.org/Extensions/ScopingReviews>)

**Fig 1: PRISMA-2020**



**Fig 2: Steps in content analysis (Erlingsson and Brysiewicz, 2017)**

1. **Meaning unit and condensed meaning unit:** this step involves converting the direct verbal responses into a meaningful unit in uniform language and descriptive. At the time of data collection, it's very essential to collect the relevant needed data and the sample should be big enough to represent to representation of the population. Selecting and putting relevant information demands reading the entire content (transcript) or listening to recordings many times to develop the concept and meaning intact. The condensed involves shortening the sentences to meaningful units.
2. **From tape to raw data:** If tape data at this still were not meaning were converted into meaningful units based on the semi-structure questions and study purpose designed for content analysis using Nvivo-14.
3. **Formulating the codes:** After converting the raw data into a meaningful unit to prepare the codes, the codes were bullet points that gave a clear connection between interviewed condensed information and the study's desired questions. To capture the in-depth interpretation of the collected information the child-codes should be made based on which were the sub-category or in-depth information about the coded information.
4. **Developing categories and themes:** After developing codes and sentiments the next step is to develop the themes in which we generalize the statements and makes the statements uniform, here the overarching impression is seen in the results and method, so we go through the content analysis where the content analysis done by the Nvivo-14.
5. **Concluding analysis and interpretation:** To conclude the results of performance determinants results were discussed with the previous studies results.

## Results

### Factor responsible for start-ups performance (According systematic review)

**Personal Factors:** Factors which can be controlled or depends on co-founders capability. These factors includes CEO decision making capability, entrepreneurial capability, knowledge and skill and experience of co-founders

**Organizational factors:** These factors depend on organizations team quality. This factor includes product market fit, business model, team strength and comparative advantage then other firms, networking power.

**External Factors:** These factors include government support, business environment, and external support.

Based on our selected studies we found the clear dominance of PMF or idea over the other determinants followed by team strength and competitive advantage, knowledge and skill of co-founder and networking strategy used, while among the external factors external business environment was most performance determinants which was affecting the founder's intent, managerial strength and also help in developing the business model based the collaboration and taking advantage of alliances.

The overall dominance of any determinant for particular doesn't mean it will be dominant for all continents so we explored importance of each determinants continent wise.

### Key performance determinants of start-ups in Asia and Europe

The performance determinants for start-ups, particularly in the field of agri-start-ups, exhibit variations based on location and other demographic factors related to the ultimate customer. To gain a more profound understanding, we conducted an analysis of these determinants on a continent-specific basis. Through a systematic review, we identified that in Asia, the primary performance determinants were product-market fit, followed by the business model and marketing. Notably, in this review, the authors classified the business model and marketing as distinct factors to emphasize their specific roles within the overall business framework. In terms of external factors, funding emerged as the most crucial performance determinant, followed by government support and the business environment. Among personal factors, the founder's decision-making held the utmost significance as a performance determinant, with time realization during the start-up's initial stages following closely. In Europe the major performance determinants were business model and PMF equally important followed by founders' decision regarding founding and team management and external alliance and advantages, while the third most important determinant of performance was strength and competitive advantage of team over competitors.

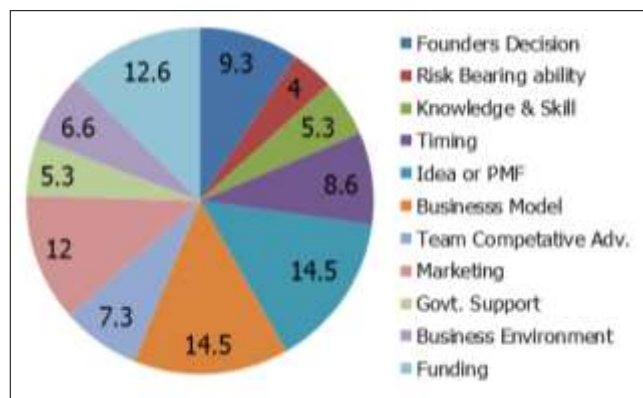


Fig 3: Percentage contribution of each determinant in start-ups performance (Asia)

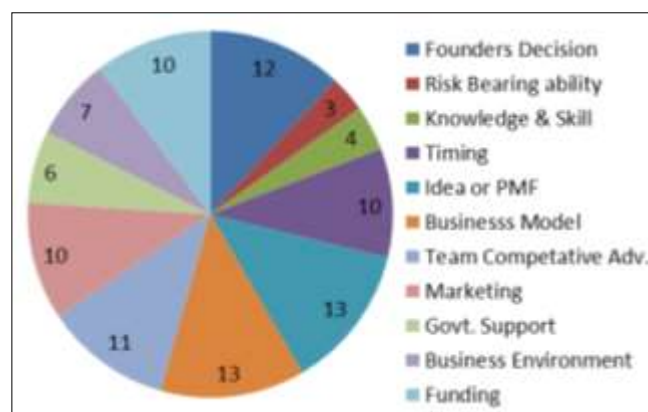


Fig 4: Percentage contribution of each determinant in start-ups performance (Europe)

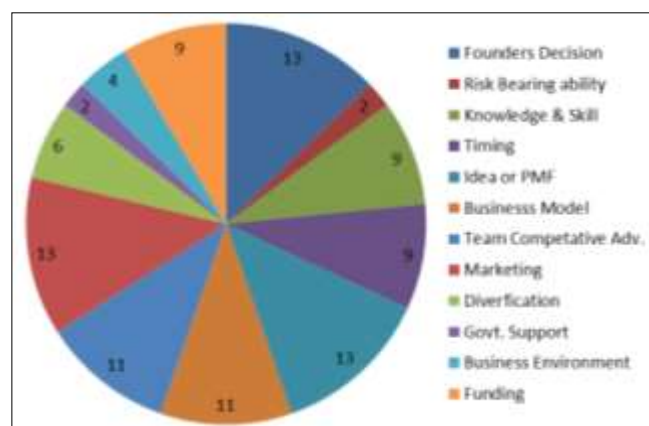
### Key performance determinants in South America and Northern America

The most performance determinant of start-ups performance

in South America was idea or product market fit followed by founders' decision making regarding different activities, marketing decision, business model and time realization. Among the interpersonal factors the founder's decision making and time realization was most important factor followed by knowledge and skill of founders. The most important determinants in Northern America were idea or product market fit followed by competitive advantage of team, marketing and business model. The founder's decision marketing and business model was equally important followed by time realization knowledge and skill. Among the external factors the funding and business environment was most important performance determinant, while among the three major classes the organizational factor was most important class followed by interpersonal factor and external factors. The one of main trend noticed the product market fit or idea was most important determinants in all countries, while the major class affecting the performance was organizational factors followed by inter-personal factors and external factors.



**Fig 5:** Percentage contribution of each determinant in start-ups performance (Southern America)

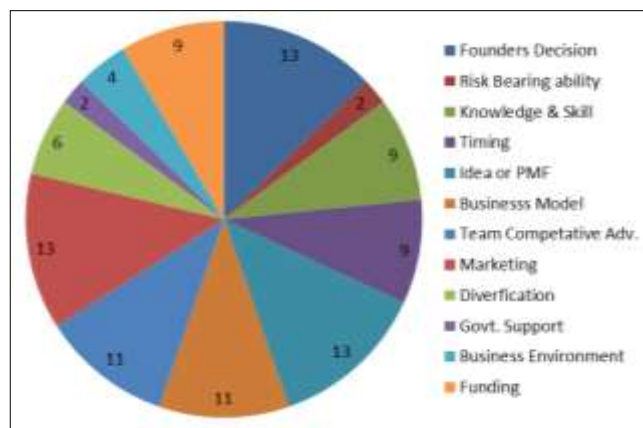


**Fig 6:** Percentage contribution of each determinant in start-ups performance (Northern America)

### Key performance determinants in Oceania and South Africa

We found two studies from Oceania continent (one from New Zealand and another from Australia), from the only two studies we couldn't predict the performance determinants for entire continent but the trend noticed regarding performance determinants of start-ups showed the similar trend as the other continent regarding major class.

The most important class affecting the start-ups performance was organizational factor, but the second major class affecting performance was external factors followed by interpersonal factors in both Oceania and South Africa. The most important performance determinants in Oceania were PMF followed by team competitive advantage, marketing, business model and funding which are external factor having similar extent, while the most important performance determinants in South Africa was business model followed by PMF or idea and funding was equally important as founders' decision making.



**Fig 7:** Percentage contribution of each determinant in start-ups performance (Oceania)



**Fig 8:** Percentage contribution of each determinant in start-ups performance (South Africa)

### Answer of frequently asked questions on start-up I have idea but how to start and when to start?

1. Before starting new business Collect comprehensive information and analyses idea
2. Conduct market research to identify customers (Demand nature and volume)
3. Shape idea into product or service based on customers need
4. Conduct multiple test of product and service at unit level to access performance
5. Entre into market with final tested product

### How to grow and establish in dynamic market?

#### To stabilize in market requires generate customers confidence and value in product so

1. Identify and analyze the reason of not generating customer base

2. Refine the product based on customer value
3. Develop marketing strategy and customer networking

### What should a co-founder do when start-up has get product market fit?

1. Identify the potential of market
2. Expand the business with high investment
3. Go for diversification if core-business has been established with significant growth rate

### What to under financial constraints?

1. At initial stage it's better to come in market with basic product and generate customers belief
2. If market is dispersed and intense then better to go for high investment & search for funding
3. If market have gestation period based on customers habit then it's better not to go for searching funding till early traction stage
4. Investors generally prefer to invest when they found that start-up will generate high growth rate and revenue in upcoming years

### Conclusion and Discussion

Start-ups are companies that, when they introduce novel products or services to the market, have the potential to expand rapidly in an environment of uncertainty. Success as a performance indicator is contingent upon several factors, such as the personalities of the founders, the caliber of their ideas, the timing of their start-ups, their capacity to obtain capital and outside support, their capacity to reap the benefits of strategic alliances, their business models, the decisions made by their CEOs, the caliber of their teams, their marketing strategies, and their tactics. Startups are essential to the search for creative answers to the climate emergency. The issue is that startups typically don't last long enough to be successful. That's why performance evaluation is a common method used by researchers to determine what makes startups successful (Asgari *et al.*, 2022) <sup>[8]</sup>. Even though performance depends on a variety of factors and varies depending on the technological field and startup stage, not all factors equally affect performance. Depending on the stage of operation and the health of the economy, risks and challenges might occur at any stage of a start-up. The struggling start-ups are unable to scale, thus they remain in the early stages until failing and disappearing in the end. Businesses' success and survival, according to Al Issa, (2020) <sup>[4]</sup>; Liu & Bell, (2019b) <sup>[45]</sup> mostly depend on the strategic choices made by the founders or entrepreneurs, which are a product of their own values and beliefs. The founder's personality traits, the calibre of the team in startups, and external factors like the economy and the regulatory environment all have an impact on strategic decisions. Therefore, it is crucial to understand the cognitive thought process and characteristics of how entrepreneurs deal with their thoughts and emotions when making decisions (Caputo *et al.*, 2015) <sup>[15]</sup>. A person's entrepreneurial spirit can be seen in their capacity to combine input and input services to gain advantages like strategic partnerships, innovate, and organize a business for improved profitability, especially in a highly risky business environment (Drejeris *et al.*, 2021) <sup>[24]</sup>. So the co-founder

should first analyse the performance determinants of business ecosystem according to their product or service including start-ups ecosystem to perform well. This study might help the new co-founder of different countries to learn how to start the novel business and it would contribute to develop suitable strategy to perform well.

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