



ISM MODEL FOR ENTREPRENEURSHIP BARRIERS IN STARTUP ECOSYSTEM

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Abstract: This study focuses on understanding the complex relationship between various barriers that impede entrepreneurship, such as Lack of viable concept, Lack of Market Familiarity, Lack of Technical Skills, Social Stigma, Human Resource Issues, Protectionism Monopoly, Legal Issues Patent Inhibition, Lack of Seed Capital, Lack of Managing Finance, Lack of Business Knowhow. The study examines how these barriers interrelate with each other and how they can be independent or autonomous in their impact on entrepreneurship. The research aims to identify the factors that contribute to these barriers and establish parameters that can mitigate the risks they pose.

The ISM model serves as the conceptual framework for understanding the interrelationships among individual, startup, and macro environmental factors that influence entrepreneurship. By applying this model, the paper offers insights into how these barriers interact and affect entrepreneurs' ability to establish and sustain their startups. Ultimately, the study aims to optimize the impact of these barriers by identifying the most effective ways to mitigate them, which can help to promote entrepreneurship and drive economic growth.

Keywords: Startup ecosystem, Barriers, Interpretive structural modelling, Cross impact Matrix, Entrepreneurship

1. INTRODUCTION

Creating and managing a new business endeavour with an intention of turning a profit is known as entrepreneurship. (David G., and Andrew J. Oswald Blanchflower 1998). Entrepreneurship is the process, skill, ability to create opportunities, solve problems and contribute to society. It refers to an action process of an entrepreneur towards establishing an enterprise. It is a creative and innovative process and adapting to the environment. Successful entrepreneurs possess a variety of traits, including creativity, risk-taking, self-confidence, and determination. They also tend to have a high degree of autonomy and a strong sense of personal responsibility. (Mitton, Daryl G. 1989). According to Musselman and Jackson, "Entrepreneurship is the investing and risking of time, money, and effort to start a business and make it successful." Entrepreneurs are often known as a source of new ideas or innovators, and bring new ideas to the market by replacing old with a new invention. Benefits to being an entrepreneur include freedom and control, opportunity for growth, pride and satisfaction, and financial rewards. The startup ecosystem is a crucial element of the entrepreneurial landscape because it offers a favourable environment for the development and success of fresh concepts and ventures. This ecosystem is distinguished by its dynamic and ever changing nature which includes a variety of actors, including business owners, investors, incubators, accelerators, and support groups.

A new business venture's likelihood of success or failure depends on a number of variables, including the quality of the concept, the entrepreneur's abilities, the availability of resources, and the status of the market. (David G., and Andrew J. Oswald 1998) Entrepreneurial ecosystems are the interconnected networks, resources, and institutions that support and facilitate entrepreneurship in a particular region or locality. (Malecki, Edward J. 2018). The key components of an entrepreneurial ecosystem include entrepreneurs, support organizations, finance, talent, universities and research institutions, infrastructure, government policies and regulations, culture, and customers. (Malecki, Edward J. 2018). Startups, however, confront a variety of obstacles and difficulties that might make it difficult for them to flourish in the fiercely competitive and constantly evolving business climate. These impediments may be monetary limitations, legislative challenges, or cultural perceptions of business. The challenging task of finding money and investment is one of the main issues faced by entrepreneurs. To develop and promote their goods or services, many companies need large sums of money, and obtaining this finance has been a major challenge. The competition for these resources is severe, and many entrepreneurs struggle to

obtain the investment they require to develop and prosper. Venture capital and angel investment have emerged as key sources of finance for such startups.

Some of the challenges faced by entrepreneurial ecosystems include a lack of access to capital, limited availability of skilled talent, regulatory hurdles, and cultural barriers. (Malecki, Edward J. 2018). Social Networks are important for entrepreneurs, as they can provide access to resources, information, and opportunities and entrepreneurs must be skilled at building and maintaining their networks. (Mitton, Daryl G 1989). There are several different types of entrepreneurs, including solopreneur, lifestyle entrepreneur, social entrepreneur, and scalable entrepreneur. However, there are also some disadvantages to being an entrepreneur, including risk, stress, and lack of job security. Factors that can affect the success of an entrepreneur include business idea, market demand, financing, marketing, and management skills.

Governments play a significant role in creating a supportive environment for entrepreneurs by providing funding and tax incentives, better infrastructure, one window solution, reducing regulations, and fostering innovation. Additionally, policy can also play a role in promoting entrepreneurship education and training, and in supporting the development of startup ecosystems. The environment in which entrepreneurship takes place has an impact on the startup ecosystem. This encompasses elements like economic conditions, institutional frameworks, and social and cultural norms. These elements may both support and hinder entrepreneurship, and they can greatly affect how successful entrepreneurial endeavours are. (Van Gelderen, Marco, Karen Verduyn, and Enno Masarel. 2012)

The significance of context in entrepreneurship research and practice is being recognised more and more. As a result, a variety of fresh theories and methods for comprehending entrepreneurship in its environment have emerged, including institutional theory, social network theory, and resource-based thinking. (Van Gelderen, Marco, Karen Verduyn, and Enno Masarel. 2012)

A multidisciplinary approach is necessary to analyse entrepreneurship in context, relying on knowledge from areas including economics, sociology, psychology, and management. This method can aid in the creation of more effective policies and practices for fostering entrepreneurship and can contribute to a more comprehensive and nuanced knowledge of the elements that influence it. (Van Gelderen, Marco, Karen Verduyn, and Enno Masarel. 2012)

Technological development has made a big influence on how businesses are created and operated, as well as creating new opportunities for business owners. For instance, the internet and social media have made it simpler for business owners to connect with worldwide clients, while cloud computing and automation have reduced the cost of starting and operating a company. Additionally, cutting-edge technologies like blockchain and artificial intelligence have the potential to revolutionise entire industries and open up new business opportunities. Technology, nevertheless, often presents difficulties for business owners. It may be expensive and time-consuming to keep up with the most recent technology developments, and because change happens so quickly, it can be challenging for organisations to adapt quickly. Entrepreneurship is often seen as a key driver of economic growth, as it creates new jobs and businesses, and generates new products and services.

Despite the numerous benefits of entrepreneurship, several barriers can hinder the establishment and success of a startup. With the help of experts and the conducted survey, 11 barriers have been identified which affect the growth of an entrepreneur as shown in figure 1.

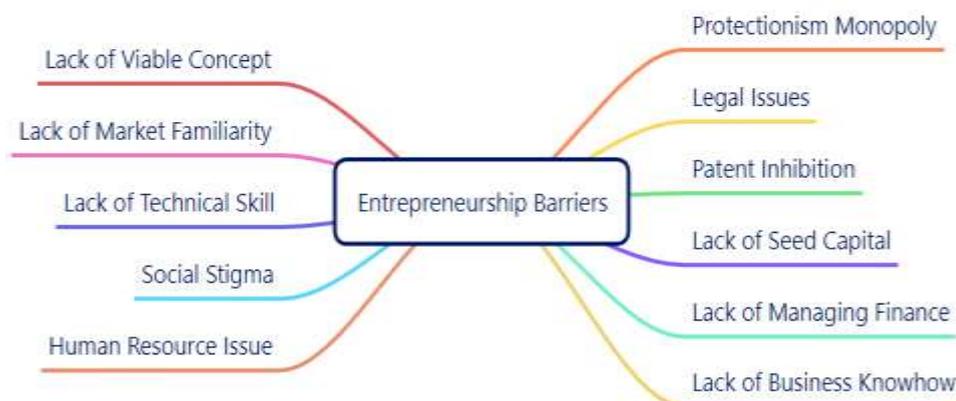


Figure 1. Identified barriers

1.1. Objective

This research paper is focused on the startup ecosystem of professional services, with the aim of identifying and analyzing the various risks associated with it. Specifically, the paper will investigate financial risks, regulatory risks, and market risks that may affect startups in this industry.

To achieve this, the paper will use interpretive structural modeling (ISM) to establish the relationships between the identified risks. ISM is a powerful tool that helps to identify the hierarchical relationships between different variables and provides insights into their interdependencies and impact on the overall system. By using this method, the paper aims to gain a deeper understanding of the complex relationships between the risks in the professional services startup ecosystem.

In addition, the paper will propose a structural model for the barriers in the startup ecosystem. This model will provide a framework for understanding the factors that contribute to these risks and how they relate to one another. The identified barriers will be classified into various categories using MICMAC analysis, which is a technique that helps to determine the level of autonomy and dependence of different variables within a system. By using this approach, the paper aims to identify the key barriers that are most critical to the success of startups in the professional services industry.

Overall, this paper aims to provide a comprehensive analysis of the risks and barriers in the startup ecosystem of professional services. By using advanced analytical tools like ISM and MICMAC analysis, the paper aims to provide valuable insights into the factors that can impact the success of startups in this industry. These insights can be used by entrepreneurs, investors, and policymakers to develop effective strategies for mitigating risks and fostering a more supportive startup ecosystem for professional services.

1.2. An overview of ISM approach

Interpretive Structural Modeling (ISM) is a powerful methodology that helps in understanding complex systems by identifying the relationships among different components of the system. It is a tool for creating a structural model of the system by analyzing the relationships among its different elements. ISM can be used in a wide range of fields, including engineering, management, and social sciences.

ISM involves a series of steps to build a model that captures the interrelationships among the components of a system. The first step is to identify the components of the system and their interrelationships. This is done by eliciting expert opinions through interviews, surveys, or focus groups. The relationships between the components are then represented using a set of symbols.

Common terminology used to represent relationship between elements is discussed as under:

Four symbols used to denote the direction of relationship between the elements are given below (i and j)

A: → element i will reaches element j

B: → element j will reaches element i

C: → elements i and j will help to alleviate each other

D: → elements i and j will not related to each other

This information is represented in the form of a binary matrix and it is called the initial reachability matrix. If an element i reaches element j, then the entry in the cell (i, j) of the reachability matrix is 1 and if element i does not reach element j, then entry in the cell (i, j) of the reachability matrix is 0. If element i reaches to element j and element j reaches to element k, then transitivity implies element i reaches to element k.

Once the relationships between the components are established, the next step is to develop a reachability matrix that indicates which components can influence which other components. The reachability matrix is a binary matrix that indicates whether one component can directly or indirectly reach another component. This matrix is used to develop a hierarchy of the components, which can be used to identify the most influential components in the system.

The next step is to develop an Interpretive Structural Model (ISM) based on the reachability matrix. The ISM is a graphical representation of the hierarchy of components and their interrelationships. It shows which components are dependent on which other components and which components have a higher degree of autonomy. The ISM can be used to analyze the system and identify the key components that need to be focused on for improving the system's performance.

ISM can be used to analyze the risks associated with the startup ecosystem of professional services, such as financial risks, regulatory risks, and market risks. By developing an ISM, it is possible to understand the interdependencies and impact of these risks on the startup ecosystem. The identified barriers can be classified into various categories using the MICMAC analysis, which will help in determining their level of autonomy and dependence and in developing effective strategies for mitigating them.

1.3. Identification of barriers related to the startup ecosystem.

Identifying barriers related to the startup ecosystem requires a systematic approach that involves conducting research, assessing the regulatory environment, evaluating access to funding, analyzing the talent pool, and considering infrastructure.

Conducting research involves gathering data from various sources such as reports, articles, and studies related to the local startup ecosystem. This research can provide insights into the challenges faced by entrepreneurs, investors, and other stakeholders in the ecosystem. Additionally, conducting interviews and surveys with these stakeholders can provide a more nuanced understanding of the barriers faced by startups.

Assessing the regulatory environment is crucial in identifying barriers related to licensing, permits, and other legal requirements that startups must comply with. Regulations can have a significant impact on startups, especially in highly regulated industries like healthcare and finance. Analyzing the regulatory environment can help identify gaps in the regulatory framework that may hinder the growth of startups.

Evaluating access to funding is another critical component of identifying barriers related to the startup ecosystem. Startups require significant financial resources to launch and scale, and limited access to capital can be a significant barrier for entrepreneurs. Analyzing the availability of funding sources, such as venture capitalists, angel investors, and crowdfunding platforms, can help identify gaps in funding and opportunities to bridge those gaps.

Analyzing the talent pool is also essential in identifying barriers related to the startup ecosystem. Startups require skilled workers, and barriers related to talent acquisition and retention can be significant hurdles for entrepreneurs. Analyzing the availability of talent in the local area and understanding the factors that impact retention, such as housing costs, quality of life, and job opportunities, can help develop strategies to overcome these barriers.

Finally, considering infrastructure, including access to reliable internet, transportation, and office space, is a critical component of a successful startup ecosystem. A lack of infrastructure can significantly impact the growth of startups, and identifying any gaps in infrastructure can help develop strategies to address those gaps.

In summary, identifying barriers related to the startup ecosystem requires a comprehensive approach that involves conducting research, assessing the regulatory environment, evaluating access to funding, analyzing the talent pool, and considering infrastructure. By understanding these barriers, stakeholders in the startup ecosystem can develop effective strategies to support the growth of startups and foster a thriving entrepreneurial community.

2. LITERATURE SURVEY

This literature survey is divided into eleven barriers concerning the detection problems faced by entrepreneurs in a startup.

2.1 Lack of viable concept

Entrepreneurs need to understand the importance of the product design curriculum, and the benefits, challenges, and approaches of education of design entrepreneurship. Thoroughly evaluating and refining business concepts to ensure their viability before investing resources into growth initiatives is imperative, as the lack of a viable concept can significantly impact business growth. Such repercussions may include limited market demand, competitive disadvantages, difficulties in securing funding, inefficient resource allocation, and reputational risks. Thus the importance of diligently validating and refining business concepts to mitigate risks and increase the likelihood of successful business growth (Gunes, Serkan. 2012). In addition to that factors, lack of market familiarity, lack of viable concept of business operation, and lack of experience in managing and running a business were also the other factors pointed out by the respondents (Tesfaye, F. ,2011)

2.2 Lack of market familiarity

Entrepreneurs face various challenges and constraints in implementing effective business strategies, such as limited resources, lack of market information, regulatory barriers, and competition. There is a need for entrepreneurs to address these challenges and leverage their strengths to effectively implement business strategies that contribute to the success of a business. There are various business strategies that entrepreneurs can employ to enhance the success of their business. It employs the importance of strategic planning, adaptation, and alignment with the business environment, and highlights the challenges and constraints that entrepreneurs may encounter in implementing effective strategies in a competitive market (Nebhwani, Murlidharan, Hussain Bux Marri, and Riyaz Ahmed Sohag, 2011). Neoteric markets ensure low barriers to entry for new businesses. For Wishberry too, the neoteric nature of the product market ensured negligible hostility for the venture. However, the operating environment was also characterized by a lack of market familiarity and lack of other supporting mechanisms for the business in the form of infrastructure and regulations. (Gupta, G., & Bose, I. ,2017)

2.3 Lack of technical skill

Providing technical training and education to aspiring business owners is very important. Technical expertise is crucial for entrepreneurs to launch and run successful firms, particularly in the areas of product development, manufacturing, marketing, and financial management.

Some of the issues such as limited access to high-quality education and training, poor infrastructure, and a lack of resources for skill development are the reasons which are related to the lack of technical skills among Nigerian entrepreneurs. To overcome these issues and advance entrepreneurship as a viable business model, it is important to take the necessary specialised entrepreneurship training and education programmes that prioritise the acquisition of technical skills.

There are a vast number of advantages of including technical skill development in entrepreneurial education and training programmes, including better business performance, increased competitiveness, more job possibilities, and sustained economic growth. ("Hammed Babatunde Akinlabi, Waidi Adeniyi Akingbade, and Ogundele, O. J. K. 2012).

The constraint analysis of the respondents regarding establishing small scale units with the learnt skills indicated that majority of the respondents in the Bee Keeping and Mushroom Cultivation courses perceived Marketing and Finance as major constraints while that of Terrace gardening course revealed Availability of quality Inputs and Lack of technical skill as major constraints. The study implied to focus on these areas to improve course effectiveness. (Purnima, K. S., Lalitha, A., & Srinivas, T. ,2020).

2.4 Social stigma

Entrepreneurship has long been considered a catalyst for innovation, economic growth and job creation. However, social stigma towards entrepreneurship can often act as a deterrent for aspiring entrepreneur. The societal bias against entrepreneurship stems from various misconceptions. Many view entrepreneurs as greedy individuals solely driven by profit, disregarding their potential contributions to society. Additionally, the fear of failure and financial insecurity often discourages individuals from pursuing their entrepreneurial dreams. Such stigma limits the willingness to take risks and stifles creativity and entrepreneurial spirit. Entrepreneurship, as a career path, is often met with social stigma, which can be frustrating for those who dare to pursue their dreams of starting a business. This bias arises from various factors, including the perception that entrepreneurship is a risky and unstable endeavor, leading to financial insecurity and failure. Bankruptcy has a significant social stigma in Europe. In the USA, bankruptcy laws permit unsuccessful business owners to quickly relaunch their ventures, and failure is regarded as an essential component of the learning process. People who declare bankruptcy are frequently viewed as "losers" in Europe. They have a lot of trouble raising money for a new business. This stigma towards entrepreneurs is quite harmful as it may draw a person back to a great extent and prevent him/her from progressing towards a successful business growth (Landier Augustin. 2005).

2.5 Human resource issue

Human resource management is a critical aspect of entrepreneurship that requires careful attention. As entrepreneurs build and grow their businesses, they often encounter various HR challenges that can impact the success and sustainability of their ventures. Businesses constantly struggle to find and keep top talent since they must compete with other organisations for the best prospects. Another significant HR challenge is ensuring effective communication and collaboration within a small team. Entrepreneurs must create a positive and open work culture that encourages honest feedback, fosters teamwork, and promotes a shared vision. Implementing regular team-building activities and investing in professional development opportunities can strengthen employee engagement and motivation. Entrepreneurs also face the task of managing workload and maintaining work-life balance. Startups often operate with limited resources, resulting in heavy workloads and long hours for entrepreneurs and their teams. It is crucial for entrepreneurs to prioritize employee well-being, implement flexible work arrangements where possible, and promote a healthy work-life integration to prevent burnout and maintain a motivated workforce. When there is a skill scarcity on the job market or in highly competitive industries, this can be particularly challenging. (Prasad, S. & Babbar, S. 2000).

2.6 Protectionism monopoly

Barriers to entry in a market can create an uneven playing field for new entrants, providing established players with an advantage (Hayes, 2021a). This advantage can be further enhanced by the creation of government-imposed barriers, requested by industry incumbents seeking to protect their reputations [Hayes, 2021a). Monopolies, where a single entity controls the market for a particular product or service, can also have a negative impact on competition (Hayes, 2021b). In the Latin American context, the free market has become increasingly important, with neoliberal policies focused on reducing trade barriers (Vargas-Hernández, 2018) However, there is a risk that these barriers may be rebuilt, creating challenges for international entrepreneurship (Vargas-Hernández, 2018). Entrepreneurship can be encouraged through the improvement of economic administration and effective economic policies, which can help to counter the benefits enjoyed by large monopolistic players (Khan, 2015). In addition, creating a business-friendly climate can help to support small entrepreneurship and ensure healthy development of entrepreneurship in a changing technological society (Khan, 2015).

2.7 Legal issues

Legal constraints are a major obstacle for entrepreneurship, as highlighted by several studies. (Raeesi, Dastranj, Mohammadi, and Rasouli, 2013) point out that government bureaucracy and complicated taxation systems can deter potential entrepreneurs from entering the market. (Globerman and Clemens, 2018) argue that governmental regulations in different economic contexts often frustrate entrepreneurs and obstruct their entry into the business market. Similarly, (Dutz, Ordober, and Willig, 2000) establish that while severe governmental regulations form a barrier to entrepreneurship, the non-existence of supportive and market-augmenting regulations also hinders new business start-up. (Aidis and Adachi, 2007) criticize the unsupportive business environment in Russia and suggest that better governments regulate entry less to facilitate entrepreneurship. All the studies agree that legal entry barriers should be avoided unless their benefits are very clear and that a good business environment is essential for entrepreneurial success.

2.8 Patent Inhibition

Entrepreneurship involves various challenges, including finance management, legal barriers, and patenting. In order to ensure that customers have access to necessary products and services, governments sometimes allow firms to become regulated monopolies (Carrão & Johnson, 2004). Additionally, many start-ups use legal barriers, such as copyright and patent, to their advantage and gain a competitive edge (Sharma, 2021).

One of the primary reasons for filing patents is to sell products and services at higher prices than competitors or to reduce costs in ways that competitors cannot replicate (Sichelman & Graham, 2010). This is because without incentives beyond those provided by the free market, potential innovators may not be motivated to innovate due to the risk of competitors and third parties free-riding off their inventions (Sichelman & Graham, 2010).

However, the high costs of patent prosecution and enforcement present a significant concern for entrepreneurs as they create barriers to entry (Sichelman & Graham, 2010). (Markman, Balkin, and Baron 2002) also found that patent holder inventors

who kept their jobs showed a lower disposition to risk compared to real entrepreneurs who were willing to take personal sacrifices to bring their inventions to the market.

2.9 Lack of seed capital

The lack of seed capital is the main problem hindering entrepreneurship growth and economic development in Macedonia, which leads to exclusion of young and educated people as well as skilled individuals without initial funding from participating in economic activities (Sichelman and Graham, 2010). Access to finance is critical in the early stages of business, and it presents a major barrier for academic entrepreneurs. The lack of seed capital is attributed to high risks associated with financing in the early stages of business and low profitability rates, leading to investors being disinterested in financing academic spin-outs unless the inventions are patented (Zarezankova-Potevska 2017). Found that founders and managers of innovation hubs in Nairobi identified a lack of seed capital as a significant challenge, hindering the survival and growth of promising technology start-ups (Bramann, 2017). The lack of seed capital is a major obstacle for many aspiring entrepreneurs in Moldova, and highlights that the system of preferential credits was not well-developed during the establishment of businesses in the country. The authors suggest that the underdeveloped system of preferential credits has contributed to the difficulties faced by entrepreneurs in securing the necessary funding to establish their small businesses (Turcan and Colesnicova, 2013).

2.10 Lack of managing finance

Finance is a crucial aspect of entrepreneurship, particularly in the early stages of business, and a lack of understanding in this area can lead to failure due to illiquidity and indebtedness. The study highlights the importance of entrepreneurial education and knowledge, particularly in finance and financial strategy, in mitigating these risks for undergraduate students in Germany (Oehler, Höfer, Schalkowski, 2015). College students' understanding of finance management is often incomplete or flawed, as they possess theoretical knowledge of market economics and currency circulation but lack practical knowledge of financing affairs and investment practices. The author argues that this knowledge gap is caused by a lack of finance management education and guidance, which stems from a combination of factors including family, university, and society. The study calls for a more comprehensive and practical approach to finance management education for undergraduate students (Ouyang, 2015). The main challenges faced in the underutilization of formal sources of finance by MSMEs were inadequate collateral assets and a lack of financial awareness among entrepreneurs. The study highlights that the financing needs of MSMEs vary according to their life-cycle stage and proposes recommendations for entrepreneurs, financial institutions, and policy makers to address these challenges and improve access to finance for MSMEs (Shah and Hingu, 2022). Significant proportion of young people struggle with managing their monthly incomes and do not have enough money to meet their financial needs. The study also revealed that households that have difficulties with debt repayment tend to have no savings at all. The authors observed that aggressive borrowing of quick loans by youth is a common phenomenon, and that two-thirds of the population studied did not track their budgets, if they had any to start with. The study concluded that this lack of financial literacy and budgeting skills among Lithuanian youth is mainly due to the absence of financial management education (Navickas 2014). Many small-scale business traders from Congo, Rwanda, and Burundi struggle to succeed due to a lack of finance management skills. The study highlights that poor finance management is a common challenge among small-scale traders in the region, and it often leads to financial instability and business failure. Kato recommends that efforts be made to provide finance management training and support to small-scale traders in the region to help them improve their financial literacy and skills. (Kato 2013)

2.11 Lack of business knowhow

One of the main challenges faced by household enterprises (HEs) in Ghana is the lack of buyers, as well as the problem of bad debts (Turkson, Codjoe 2020). The lack of business know-how is a contributing factor to various challenges (Bakeine 2009). University students have identified various factors that hinder entrepreneurship as a career, including the changing society, lack of business knowledge (which was perceived to be more important for males than females), social support, and the need to balance time for family responsibilities (Castiglione 2013). The personal barriers to entrepreneurial intention among university students in Ghana include bad experiences of other entrepreneurs, the student's own bad experiences, family background, fear of failure, friends, complacency, and lack of business know-how (Amanamah 2018). The importance of stakeholders in business model innovation, weakness in value proposition design and pricing is a concrete hazard in business operations and illustrates the lack of business know-how, as well as the absence of a marketing person and missing contact with economic persons. (Kauppinen 2018)

3. AN OVERVIEW OF ISM

A comprehensive systemic model is structured through an interactive learning process known as Interpretive Structural Modelling (ISM) where a set of different indirectly and directly related elements are involved. The system structure becomes complicated due to the presence of indirectly or directly related elements which may not be articulated clearly. To address such a situation, a methodology is needed for identifying the structure within a system, and ISM is one such methodology. The ISM methodology is based on two essential concepts, namely, reachability and transitivity. The direction of the relationship between the elements is denoted using four symbols, namely, A, B, C, and D. The information is represented in the form of a binary matrix known as the initial reachability matrix. The steps involved in the ISM approach are shown in Figure 2.

3.1. Theoretical foundations:

The ISM approach is based on the theory of systems thinking. It assumes that a system can be understood as a set of interrelated components that interact with each other. These interactions can be either positive or negative and can have both direct and indirect effects. Systems thinking also assumes that the behavior of a system is not determined by the behavior of its individual components but by the interrelationships among them.

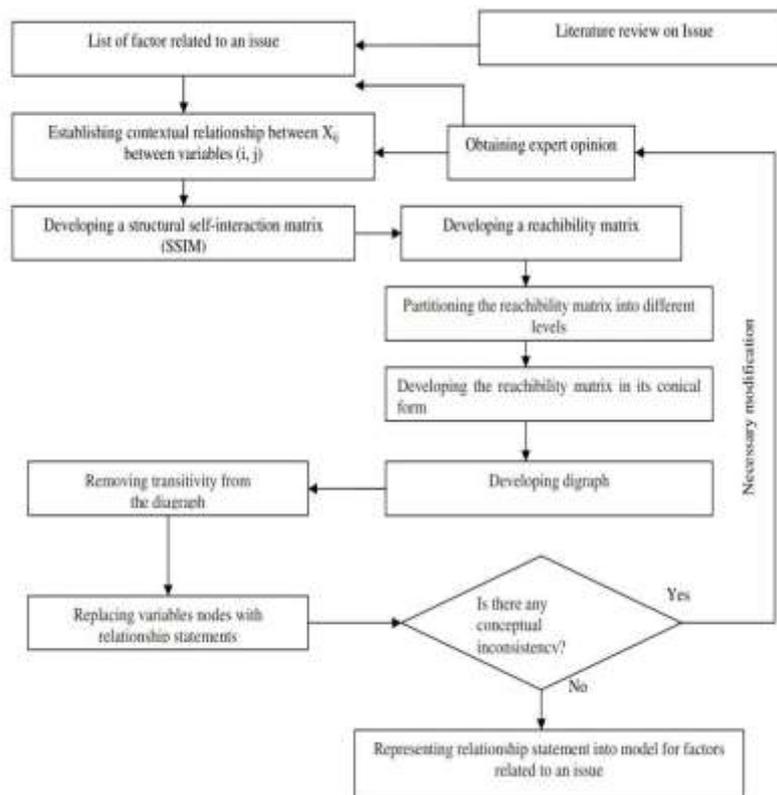


Figure 2. Steps involved in ISM approach

3.2 Steps involved in the ISM approach:

The ISM approach involves several steps. These steps are as follows:

1. **Problem identification:** The first step in the ISM approach is to identify the problem or issue that needs to be addressed. This can be done through various methods such as surveys, interviews, or focus groups.
2. **Identification of factors:** The next step is to identify the factors that impact the problem or issue. These factors can be both internal and external to the system.
3. **Constructing an initial list of factors:** The third step is to construct an initial list of factors that can be used as a basis for further analysis. This list should be comprehensive and include all the relevant factors that impact the problem.
4. **Pairwise comparisons:** The fourth step is to conduct pairwise comparisons of the factors on the list. This involves comparing each factor to every other factor on the list.
5. **Developing a reachability matrix:** The fifth step is to develop a reachability matrix based on the results of the pairwise comparisons. This matrix shows the direct and indirect relationships among the factors.
6. **Building the ISM:** The sixth step is to build the ISM based on the reachability matrix. The ISM shows the hierarchical relationships among the factors and can be used to identify the most important factors that impact the problem.
7. **Developing the final model:** The seventh step is to develop the final model based on the ISM. This model can be used to identify the root cause of the problem and develop appropriate solutions.
8. **Validation:** The eighth step is to validate the final model using various methods such as expert reviews or simulations.
9. **Implementation:** The ninth step is to implement the solutions identified in the final model.

10. Monitoring and evaluation: The final step is to monitor and evaluate the effectiveness of the solutions implemented.

3.3 Applications of the ISM approach:

The ISM approach has been widely used in various fields such as management, engineering, and social sciences. In management, it has been used to analyze supply chain management, quality management, and human resource management. In engineering, it has been used to analyze product design and manufacturing processes. In social sciences, it has been used to analyze community development and public policy.

3.4 Advantages of the ISM approach:

The ISM approach has several advantages. It provides a systematic and structured approach to modeling complex systems. It also allows for the identification of the most important factors that impact the problem. Additionally, it provides a framework for developing appropriate solutions based on the root cause of the problem.

3.5 Conclusion:

The ISM approach is a powerful methodology for modeling complex systems and relationships. It provides a systematic and structured approach to problem-solving and can be applied to various fields such as management, engineering, and social sciences. The approach has several advantages and can be used to identify the most important factors that impact the problem and develop appropriate solutions.

4. ISM approach to modelling

The various steps involved in ISM technique used to model the structural relationship among identified risks are discussed in the following paragraphs

4.1 Interpretive Structural Modeling

Interpretive Structural Modeling (ISM), provides an ordered and directional framework for complex problems and gives decision makers a realistic and clear picture of the system and its involved variables (Wang et al., 2008; Chandramowli et al., 2011). This method is interpretive in the sense that it relies on the group's judgement to determine whether and how items are related; structural in the sense that it extracts an overall structure from the complex set of items based on the identified relationships; and modelling in the sense that it provides a diagram model of the specific relationships as well as the general framework (Mandal & Deshmukh, 1994). The Technique was introduced by Warfield in the year 1974, with the aim to establish a suitable modeling technique to analyse how one item has an impact on the other one and to get a better understanding of the arising problem.

In Table 1, Identified barriers with their definition and views based on them are stated.

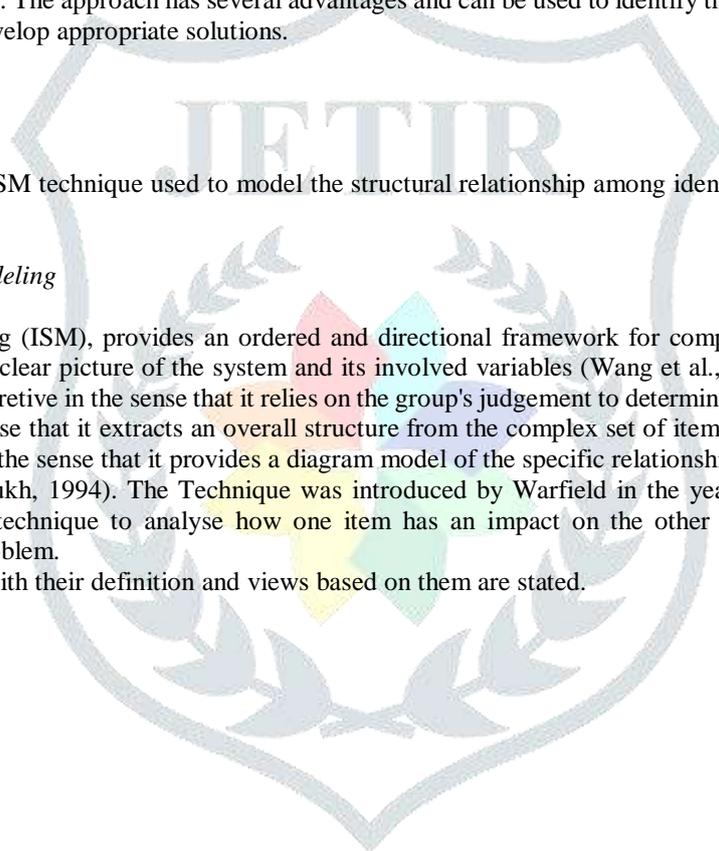


Table 1. Summary of selected views on the identified barriers with their definitions.

S. No.	Name of Barrier	Views
1.	<p><i>Lack of viable concept:</i></p> <p>Lack of viable concept: It means lack of proper concept. Sometimes when a person starts the business it can't run properly because of a lack of viable/proper concept.</p>	<ol style="list-style-type: none"> 1. On many occasions there is a difficulty faced by an entrepreneur in securing funding since the Investors are typically looking for a clear and compelling concept when deciding to invest in a startup. Without a viable concept, it can be difficult to convince investors to provide funding, which can limit the resources available to the startup. 2. With A viable concept for a startup,a clear direction will allow the team to focus on specific goals and objectives. Without this direction, startups can struggle to prioritize their efforts and may end up pursuing a variety of unrelated projects or ideas. 3. Without a viable concept, startups may struggle to identify their target audience or create products or services that resonate with potential customers. 4. Startups which lack a viable concept are at a higher risk of failure. Without a clear path to success, it can be difficult to build momentum and gain traction in the marketplace.
2.	<p><i>Lack of market Familiarity:</i></p> <p>The term "lack of market familiarity" refers to a situation where an individual or business is not familiar with the specific market or industry in which they are operating.</p>	<ol style="list-style-type: none"> 1. Startups need to identify their target market in order to build a product or service that meets their needs. 2. Without proper knowledge about the market there is a great chance of a startup failing. 3. There will always be an increased risk of failure of startups which lack market familiarity. 4. It can also result in a poor marketing strategy as Startups may struggle to identify the best channels to reach their target market or to create messaging that resonates with potential customers.
3.	<p><i>Lack of Technical Skill:</i></p> <p>Technical skills refer to the specialized knowledge and expertise needed to accomplish complex actions, tasks, and processes relating to computational and physical technology as well as a diverse group of other enterprises.</p>	<ol style="list-style-type: none"> 1. With lack of technical skill it can make it difficult to build a high-quality product or service. 2. It will be difficult to identify new opportunities for innovation or to execute on those opportunities. This can lead to a company being left behind by its competitors. 3. It will increase the cost and maintenance of a company thus it will rely on external developers to build and maintain its product or service which will be expensive and can also result in delays or miscommunication if the external developers do not understand the startup's goals and vision. 4. The future goal to scale a product or service will also be affected which can limit a startup's ability to grow and expand.
4.	<p><i>Social stigma:</i></p> <p>Social stigma is the disapproval of, or discrimination against, an individual or group based on perceived characteristics that serve to distinguish them from other members of a society</p>	<ol style="list-style-type: none"> 1. A large number of budding entrepreneurs are dragged down due to lack of support from society due to a stigma to entrepreneurship. 2. Family support is also a major factor which affects the growth of a business. 3. It is a basic factor which needs to be eliminated in order to set a strong foundation for a successful business. 4. It can be done by showing promising results and facts to the family.

5.	<p><i>Human Resource Issue:</i></p> <p>Employees with the required knowledge, expertise, and experience are needed for the efficiency of the business processes and high levels of productivity.</p>	<ol style="list-style-type: none"> Hiring talented employees is a major issue faced by budding business owners. Relevant skills are a must in employees as it is the firm foundation of a business. Apart from hiring, managing employees is also a difficult task which requires a lot of skill. This issue can be eliminated by hiring skill specific employees and hiring a skilled manager to manage the team.
6.	<p><i>Protectionism Monopoly:</i></p> <p>Protectionism monopoly in the startup ecosystem refers to the use of government policies or regulations to limit competition and create barriers to entry for new startups</p>	<ol style="list-style-type: none"> Protectionism and monopoly practices can create significant barriers for startups, limiting their ability to compete and innovate in the market. Dominant players in the industry may use their market power to restrict competition, creating a disadvantage for new entrants. Monopoly practices, such as predatory pricing and exclusive contracts, can make it difficult for startups to gain market share and access resources. Protectionist policies, such as tariffs and trade barriers, can limit startups' ability to expand their market reach and compete globally.
7.	<p><i>Legal Issues:</i></p> <p>In legal use, an "issue" means a point disputed by parties to a lawsuit. Legal issues may also refer to either a person's lineal descendants or a group of securities offered for sale. An issue of law is a question of how a law is applied rather than a question of fact.</p>	<ol style="list-style-type: none"> Legal constraints can act as a barrier for startups, creating uncertainty and compliance challenges. Failure to comply with legal requirements can result in costly penalties, fines, and legal disputes. Legal constraints can create barriers to entry for startups, particularly in highly regulated industries. Startups may face legal challenges related to intellectual property disputes, patent infringement, and other legal issues.
8.	<p><i>Patent Inhibition:</i></p> <p>A Patent owner is given an exclusive right to prevent others from making, using, selling, offering for sale, or importing a process or product(s) in respect of which the patent has been granted.</p>	<ol style="list-style-type: none"> Patent inhibition can act as a significant barrier for startups, limiting their ability to protect their innovative ideas and products. The high costs of obtaining and defending patents can be prohibitive for startups with limited resources. Patent disputes and litigation can be lengthy and costly, draining resources and diverting attention from core business activities. Lack of patent protection can also make it difficult for startups to attract investors, who may be reluctant to invest in companies without intellectual property protection.
9.	<p><i>Lack of Seed Capital:</i></p> <p>Seed capital is the initial amount of money an entrepreneur uses to start a business.</p>	<ol style="list-style-type: none"> Lack of seed capital can be a significant barrier for startups, limiting their ability to finance their operations and scale their businesses. Startups may struggle to secure funding from traditional sources, such as banks and venture capitalists, due to their limited track record and perceived risk. The lack of seed capital can also hinder startups' ability to attract and retain top talent and invest in marketing and business development activities. Without sufficient seed capital, startups may face difficulty in developing and launching their products, as well as expanding their market reach.

10.	<p><i>Lack of managing finance:</i></p> <p>Financial management is the business function that deals with investing the available financial resources in a way that greater business success and return-on-investment (ROI) is achieved.</p>	<ol style="list-style-type: none"> Lack of financial management skills can be a significant barrier for startups, limiting their ability to effectively manage their finances and make informed business decisions. Poor financial management can lead to cash flow problems, debt accumulation, and overall financial instability. Startups may struggle to accurately forecast their financial performance and make effective budgeting and investment decisions. Without strong financial management skills, startups may struggle to secure funding from investors and lenders, who may be hesitant to invest in companies with a weak financial track record.
11.	<p><i>Lack of business knowhow:</i></p> <p>Refers to the absence or insufficient knowledge, experience, and understanding of the fundamental principles and practices involved in running a successful business.</p>	<ol style="list-style-type: none"> Lack of business know-how can be a significant barrier for startups, limiting their ability to effectively plan, execute, and grow their businesses. Startups may struggle to develop a clear understanding of their target market, competition, and industry dynamics, making it difficult to identify growth opportunities and create a compelling value proposition. Without strong business knowledge, startups may struggle to develop effective marketing and sales strategies, manage operations and resources, and navigate legal and regulatory requirements. Lack of business know-how can also hinder startups' ability to attract investors and secure funding, who may be looking for companies with a strong business plan and growth strategy.

4.2 Development of a structural self interaction matrix (SSIM)

In order to establish a contextual relationship between the 11 identified barriers, a group of experts with considerable academic background and expertise on entrepreneurship were contacted, and a survey was conducted to establish the contextual relation of “affects to /influence” between any two barriers.

Table 2. Represents the established inter relationship among the barriers. Where each symbol represents the contextual relation among any two barriers.

- A is used for the relation from risk i to risk j (i.e. if risk i affects risk j).
- B is used for the relation from risk j to risk i (i.e. if risk j affects risk i).
- C is used for both direction relations (i.e. if risks i and j influence each other).
- D is used for no relation between two risks (i.e. if risks i and j are unrelated).

S. No.	Barriers	2	3	4	5	6	7	8	9	10	11
1	Lack of Viable concept	B	B	D	A	A	D	A	D	D	D
2	Lack of Market familiarity		D	A	A	A	A	D	D	C	C
3	Lack of Technical skill			D	D	D	D	D	D	D	D
4	Social stigma				C	B	B	B	B	B	B
5	Human resource issue					D	D	D	B	B	B
6	Protectionism monopoly						C	C	D	D	B
7	Legal issues							C	D	D	B
8	Patent Inhibition								D	D	B
9	Lack of seed capital									C	D
10	Lack of managing finance										B
11	Lack of business knowhow										

Table 2. SSIM Matrix

4.3 Development of the initial reachability matrix (IRM)

The Binary Matrix of Initial Reachability Matrix is formed by replacing the symbols A,B,C,D in SSIM with 1 and 0. The following conditions are followed for the transformation from SSIM to IRM.

When the SSIM value is A, the corresponding (i,j) entry in the IRM is set to 1, and the (j,i) entry is set to 0. Similarly, when the SSIM value is B, the (i,j) entry is set to 0, and the (j,i) entry is set to 1. If the SSIM value is C, both the (i,j) and (j,i) entries in the IRM are set to 1, and when the SSIM value is D, both entries are set to 0. It's important to note that entries along the diagonal where i = j are always set to 1.

The IRM for the identified barriers is shown in **Table 3**.

Variables	1	2	3	4	5	6	7	8	9	10	11	Driving Power
Lack of Viable Concept	1	0	0	0	1	1	0	1	0	0	0	4
Lack of Market Familiarity	1	1	0	1	1	1	1	0	0	1	1	8
Lack of Technical Skills	1	0	1	0	0	0	0	0	0	0	0	2
Social Stigma	0	0	0	1	1	0	0	0	0	0	0	2
Human Resource Issues	0	0	0	1	1	0	0	0	0	0	0	2
Protectionism Monopoly	0	0	0	1	0	1	1	1	0	0	0	4
Legal Issues	0	0	0	1	0	1	1	1	0	0	0	4
Patent Inhibition	0	0	0	1	0	1	1	1	0	0	0	4
Lack of Seed Capital	0	0	0	1	1	0	0	0	1	1	0	4
Lack of Managing Finance	0	1	0	1	1	0	0	0	1	1	0	5
Lack of Business Knowhow	0	1	0	1	1	1	1	1	0	1	1	8
Dependence Power	3	3	1	9	7	6	5	5	2	4	2	

Table 3. IRM (Initial reachability matrix)

4.4 Development of the final reachability matrix (FRM)

For the development of the Final Reachability Matrix the concept of Transitivity should be considered in the IRM constructed. Transitivity states that If A is related to B, and B is related to C, then A is related to C.

Table 4 represents the Reachability Matrix whereas in **Table 5** Final Reachability Matrix is represented with the transitivity taken into consideration.

Driving power of one barrier is equal to the sum of total barriers(including itself) it leads to whereas the dependence of a barrier is the sum of total barriers that leads to it.

Variables	1	2	3	4	5	6	7	8	9	10	11	Driving Power
1	1	0	0	0	1	1	0	1	0	0	0	4
2	1	1	0	1	1	1	1	0	0	1	1	8
3	1	0	1	0	0	0	0	0	0	0	0	2
4	0	0	0	1	1	0	0	0	0	0	0	2
5	0	0	0	1	1	0	0	0	0	0	0	2
6	0	0	0	1	0	1	1	1	0	0	0	4
7	0	0	0	1	0	1	1	1	0	0	0	4
8	0	0	0	1	0	1	1	1	0	0	0	4
9	0	0	0	1	1	0	0	0	1	1	0	4
10	0	1	0	1	1	0	0	0	1	1	0	5
11	0	1	0	1	1	1	1	1	0	1	1	8
Dependence Power	3	3	1	9	7	6	5	5	2	4	2	

Table 4. Reachability Matrix

Variables	1	2	3	4	5	6	7	8	9	10	11	Driving Power
Lack of Viable Concept	1	0	0	1*	1	1	1*	1	0	0	0	6
Lack of Market Familiarity	1	1	0	1	1	1	1	1*	1*	1	1	10
Lack of Technical Skills	1	0	1	1*	1*	1*	1*	1*	0	0	0	7
Social Stigma	0	0	0	1	1	0	0	0	0	0	0	2
Human Resource Issues	0	0	0	1	1	0	0	0	0	0	0	2
Protectionism Monopoly	0	0	0	1	1*	1	1	1	0	0	0	5
Legal Issues	0	0	0	1	1*	1	1	1	0	0	0	5
Patent Inhibition	0	0	0	1	1*	1	1	1	0	0	0	5
Lack of Seed Capital	1*	1*	0	1	1	1*	1*	1*	1	1	1*	10
Lack of Managing Finance	1*	1	0	1	1	1*	1*	1*	1	1	1*	10
Lack of Business Knowhow	1*	1	0	1	1	1	1	1	1*	1	1	10
Dependence Power	6	4	1	11	11	9	9	9	4	4	4	

Table 5. FRM (Final reachability matrix with driving Power and dependence)

4.5 Partitioning the final reachability

In the process of constructing an Interpretive Structural Model (ISM) diagram, the next step after identifying the barriers is to determine the reachability and antecedent sets for each barrier. This is accomplished using the (FRM), which calculates the set of elements that each barrier can reach and the set of elements that can reach each barrier. These sets are crucial for identifying the relationships and dependencies among the barriers. To create the ISM diagram, a new column is added to record the intersection of the reachability and antecedent sets for each barrier. This information is then used to identify the top-level elements in the digraph, which are barriers that share a common reachability set and intersection. These top-level barriers do not lead to any other barriers in the system. After identifying the top-level barriers, they are removed from the list and their corresponding numbers are eliminated from all reachability, antecedent, and intersection sets. This procedure is repeated to determine the next level of barriers and is continued until all the barriers have been assigned a level. To illustrate this level partitioning procedure for barriers to entrepreneurship, **Tables 6,7,8 and 9** are presented. These tables depict the barriers, their reachability and antecedent sets, intersection, and corresponding levels, which help to identify the interrelationships and hierarchy of the barriers. In **Table 10**, Each respective barrier is represented next to its Corresponding level.

Elements(Mi)	Reachability Set R(Mi)	Antecedent Set A(Ni)	Intersection Set R(Mi)∩A(Ni)	Level
1	1, 4, 5, 6, 7, 8,	1, 2, 3, 9, 10, 11,	1,	
2	1, 2, 4, 5, 6, 7, 8, 9, 10, 11,	2, 9, 10, 11,	2, 9, 10, 11,	
3	1, 3, 4, 5, 6, 7, 8,	3,	3,	
4	4, 5,	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11,	4, 5,	1
5	4, 5,	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11,	4, 5,	1
6	4, 5, 6, 7, 8,	1, 2, 3, 6, 7, 8, 9, 10, 11,	6, 7, 8,	
7	4, 5, 6, 7, 8,	1, 2, 3, 6, 7, 8, 9, 10, 11,	6, 7, 8,	
8	4, 5, 6, 7, 8,	1, 2, 3, 6, 7, 8, 9, 10, 11,	6, 7, 8,	
9	1, 2, 4, 5, 6, 7, 8, 9, 10, 11,	2, 9, 10, 11,	2, 9, 10, 11,	
10	1, 2, 4, 5, 6, 7, 8, 9, 10, 11,	2, 9, 10, 11,	2, 9, 10, 11,	
11	1, 2, 4, 5, 6, 7, 8, 9, 10, 11,	2, 9, 10, 11,	2, 9, 10, 11,	

Table 6. First Iteration

Elements(Mi)	Reachability Set R(Mi)	Antecedent Set A(Ni)	Intersection Set R(Mi)∩A(Ni)	Level
1	1, 6, 7, 8,	1, 2, 3, 9, 10, 11,	1,	
2	1, 2, 6, 7, 8, 9, 10, 11,	2, 9, 10, 11,	2, 9, 10, 11,	
3	1, 3, 6, 7, 8,	3,	3,	
4		1, 2, 3, 6, 7, 8, 9, 10, 11,		1
5		1, 2, 3, 6, 7, 8, 9, 10, 11,		1
6	6, 7, 8,	1, 2, 3, 6, 7, 8, 9, 10, 11,	6, 7, 8,	2
7	6, 7, 8,	1, 2, 3, 6, 7, 8, 9, 10, 11,	6, 7, 8,	2
8	6, 7, 8,	1, 2, 3, 6, 7, 8, 9, 10, 11,	6, 7, 8,	2
9	1, 2, 6, 7, 8, 9, 10, 11,	2, 9, 10, 11,	2, 9, 10, 11,	
10	1, 2, 6, 7, 8, 9, 10, 11,	2, 9, 10, 11,	2, 9, 10, 11,	
11	1, 2, 6, 7, 8, 9, 10, 11,	2, 9, 10, 11,	2, 9, 10, 11,	

Table 7. Second Iteration

Elements(Mi)	Reachability Set R(Mi)	Antecedent Set A(Ni)	Intersection Set R(Mi)∩A(Ni)	Level
1	1,	1, 2, 3, 9, 10, 11,	1,	3
2	1, 2, 9, 10, 11,	2, 9, 10, 11,	2, 9, 10, 11,	
3	1, 3,	3,	3,	
4		1, 2, 3, 9, 10, 11,		1
5		1, 2, 3, 9, 10, 11,		1
6		1, 2, 3, 9, 10, 11,		2
7		1, 2, 3, 9, 10, 11,		2
8		1, 2, 3, 9, 10, 11,		2
9	1, 2, 9, 10, 11,	2, 9, 10, 11,	2, 9, 10, 11,	
10	1, 2, 9, 10, 11,	2, 9, 10, 11,	2, 9, 10, 11,	
11	1, 2, 9, 10, 11,	2, 9, 10, 11,	2, 9, 10, 11,	

Table 8. Third Iteration

Elements(Mi)	Reachability Set R(Mi)	Antecedent Set A(Ni)	Intersection Set R(Mi)∩A(Ni)	Level
1		2, 3, 9, 10, 11,		3
2	2, 9, 10, 11,	2, 9, 10, 11,	2, 9, 10, 11,	4
3	3,	3,	3,	4
4		2, 3, 9, 10, 11,		1
5		2, 3, 9, 10, 11,		1
6		2, 3, 9, 10, 11,		2
7		2, 3, 9, 10, 11,		2
8		2, 3, 9, 10, 11,		2
9	2, 9, 10, 11,	2, 9, 10, 11,	2, 9, 10, 11,	4
10	2, 9, 10, 11,	2, 9, 10, 11,	2, 9, 10, 11,	4
11	2, 9, 10, 11,	2, 9, 10, 11,	2, 9, 10, 11,	4

Table 9. Fourth Iteration

S. No.	Barriers	Levels
1	Lack of Viable concept	3
2	Lack of Market familiarity	4
3	Lack of Technical skill	4
4	Social stigma	1
5	Human resource issue	1
6	Protectionism monopoly	2
7	Legal issues	2
8	Patent Inhibition	2
9	Lack of seed capital	4
10	Lack of managing finance	4
11	Lack of business knowhow	4

Table 10. ISM based levels of variables

4.6 Development of conical matrix

Table 11 shows the formation of the Conical Matrix which is achieved by combining barriers of the same level across both rows and columns of the Final Reachability Matrix. Driving Power of a barrier is determined by the total number of ones in its corresponding row while for the dependency it is determined by the total number of ones in its corresponding column.

Variables	4	5	6	7	8	1	2	3	9	10	11	Driving Power	Level
4	1	1	0	0	0	0	0	0	0	0	0	2	1
5	1	1	0	0	0	0	0	0	0	0	0	2	1
6	1	1*	1	1	1	0	0	0	0	0	0	5	2
7	1	1*	1	1	1	0	0	0	0	0	0	5	2
8	1	1*	1	1	1	0	0	0	0	0	0	5	2
1	1*	1	1	1*	1	1	0	0	0	0	0	6	3
2	1	1	1	1	1*	1	1	0	1*	1	1	10	4
3	1*	1*	1*	1*	1*	1	0	1	0	0	0	7	4
9	1	1	1*	1*	1*	1*	1*	0	1	1	1*	10	4
10	1	1	1*	1*	1*	1*	1	0	1	1	1*	10	4
11	1	1	1	1	1	1*	1	0	1*	1	1	10	4
Dependence Power	11	11	9	9	9	6	4	1	4	4	4		
Level	1	1	2	2	2	3	4	4	4	4	4		

Table 11 Conical Matrix

4.7 Development of digraph

After determining the conical matrix and assigning levels to the respective barriers, with the help of IRM a digraph is established ,as shown in **figure 3** Each barrier is placed as per its determined level and the arrows direction is determined with the use of IRM which helps in understanding if the arrow goes from i^{th} element to the j^{th} element or not.

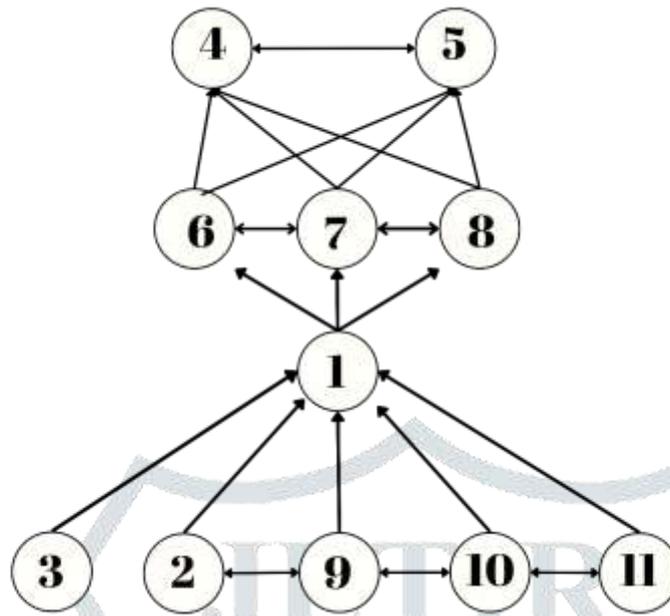


Figure 3. Digraph showing the level of entrepreneur ecosystem barriers.

4.8 Development of ISM model

The digraph is transformed into an ISM model by replacing the nodes with the respective name of their identified variable. As shown in **figure 4**.

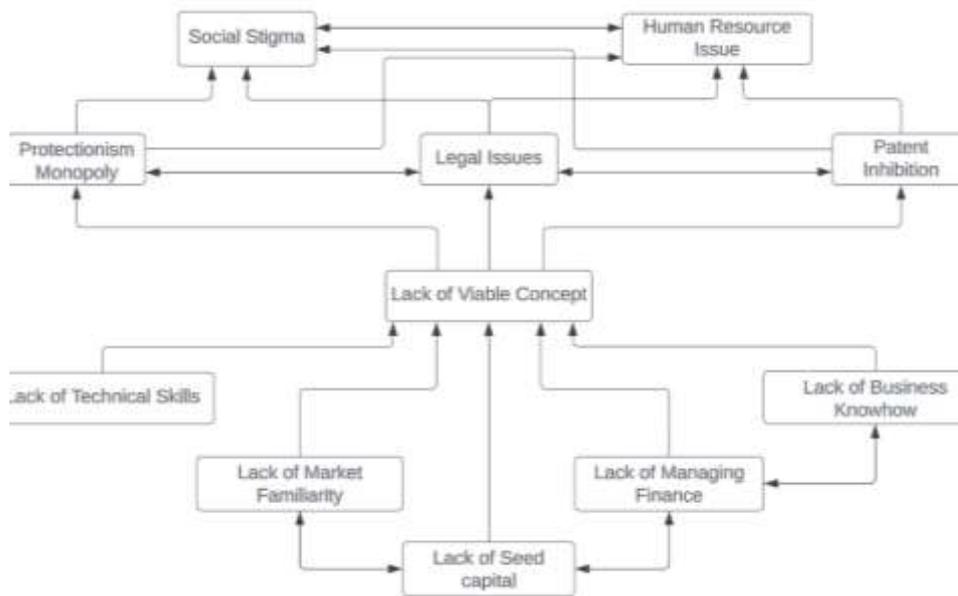


Figure 4: ISM model showing the level of Entrepreneur ecosystem barriers.

4.9 MICMAC analysis

Barriers can be categorized into four distinct clusters based on their driving powers and dependence. The first cluster, Cluster I, consists of autonomous barriers that have weak driving power and dependence, and are relatively disconnected from the overall system. However, as these barriers move away from the corner, they become more interactive with the system. The second cluster, Cluster II, comprises dependent barriers that possess weak driving power but strong dependence. These barriers are more affected by other barriers and have a lesser impact on them. The third cluster, Cluster III, includes linkage barriers that exhibit strong driving power and strong dependence. They are central to the system and any actions taken by these barriers will have an effect on others and will also affect themselves. Finally, the fourth cluster, Cluster IV, encompasses independent barriers that have strong driving power but weak dependence. They serve as the basis on which many other barriers are reinforced and require special attention in terms of their management. Overall, the classification of barriers into these clusters provides a more nuanced understanding of their impact on the system and can inform strategic decision-making processes. (Raeesi et al., 2013).

(1) **Autonomous risks:** These risks have weak driver power and weak dependence. They are relatively disconnected from the system, with which they have few strong links.

(2) **Linkage risks:** These have strong driver power as well as strong dependence. They are also unstable. Any action on them has an effect on others and also a feedback effect on themselves.

(3) **Dependent risks:** This category includes those risks which have strong dependence power but weak driver power.

(4) **Independent risks:** These have strong driver power but weak dependence power. It is generally observed that a risk with a very strong driver power, called a 'key risk' falls into the category of independent or linkage risks.

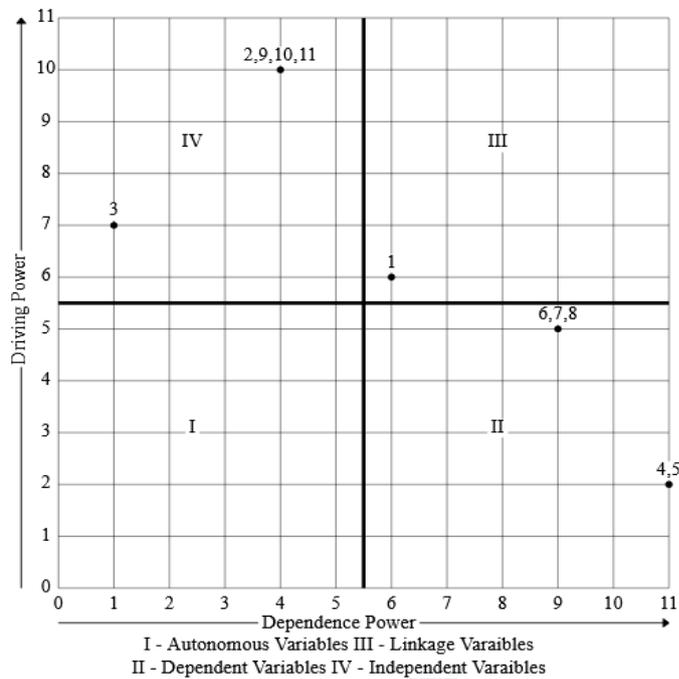


Figure 5. Driving power and dependence diagram

5. Findings and discussion

According to the driving and dependence diagram, various barriers exist in the startup ecosystem, and these barriers have complex relationships. These barriers can be categorized as independent, linkage, and dependent variables. The linkage variable, Lack of Viable Concept, is a crucial link between the independent and dependent variables. The analysis suggests that four independent variables, Lack of Market Familiarity, Lack of Technical Skills, Human Resource Issues, and Lack of Business Knowhow, have the most significant impact on the dependent variables, Lack of Seed Capital and Lack of Managing Finance. Thus, it is crucial for startups to focus on acquiring necessary skills, expertise, and building a strong team to overcome these challenges. In addition, Lack of Seed Capital and Lack of Managing Finance are primarily affected by Human Resource Issues and Lack of Business Knowhow. This highlights the importance of startups having a strong business plan, financial management skills, and a competent team to secure funding. Addressing human resource issues, such as attracting and retaining skilled employees, can also positively impact the financial sustainability of a startup. External factors such as social stigma, legal issues, and patent inhibition also impact the startup ecosystem. Social stigma creates a negative perception of entrepreneurship, which can discourage investors and the general public from supporting startups. Legal issues and patent inhibition can increase the cost of doing business and create barriers to entry. Therefore, policymakers must address these external factors to create a supportive environment for startups to thrive.

In conclusion, the driving and dependence diagram suggests that startups must focus on building a strong team with necessary skills and expertise to overcome the challenges in the ecosystem. Addressing human resource issues and lack of business knowhow can positively impact securing seed capital and managing finance, which are crucial for startup sustainability. Policymakers must also address external factors such as social stigma, legal issues, and patent inhibition to create a conducive environment for startups to grow and succeed.

6. Conclusion

The driving power and dependence diagram in **figure 5** provides a comprehensive overview of the barriers faced by startups in the ecosystem. Variables 2 (Lack of market familiarity), 3 (Lack of technical skill), 9 (Lack of seed capital), 10 (Lack of managing finance), and 11 (Lack of business knowhow) are independent variables according to the driving power and dependence diagram. The barriers are impacted by these variables but not the other way around. A linking variable that has an impact on all additional factors is variable 1 (Lack of viable concept), Variables 6 (Protectionism monopoly), 7 (Legal issues), 8 (Patent inhibitions), 4 (Social stigma), and 5 (Human resource issue) are dependent variables. In contrast these variables which are influenced by other variables in the diagram (**figure 5**), stand in for the obstacles that startups must overcome in the ecosystem. The obstacles that prevent startups from growing in the ecosystem include lack of a viable concept, lack of market familiarity, lack of technical skills, social stigma, human resource issue, protectionism monopoly, legal issues, patent inhibition, lack of seed capital, lack of managing finances, and lack of business knowhow. Each of these obstacles is substantial and needs consideration to be removed. Some of these obstacles are interconnected, making it challenging to handle them separately. Conducting market research prior to launching a startup is one way to overcome the problem of having an unviable concept and being unfamiliar with the market. The market gaps and the level of demand for the product or service can both be determined with the use of this study. Startups can also employ experts who have the technical know-how necessary to put their concepts into practice. Governments can also provide incentives to entice qualified people to the startup environment.

Overcoming these barriers requires a collaborative effort between startups, government, and society. By addressing these barriers, startups can thrive, create jobs, and contribute to the overall economic growth of the country. Awareness initiatives and mentorship programmes can also help alleviate social stigma and a lack of business expertise. These programmes can help companies and educate the public about the value of entrepreneurship. By providing improved working circumstances, fostering creativity and innovation, and enabling opportunities for professional growth, human resource problems can be resolved. Government involvement can be used to overcome patent inhibition, legal issues, and protectionism monopolies. Governments have the power to enact laws that encourage wholesome competition and dismantle monopolies. They can also establish legislative guidelines that guarantee fair competition and safeguard startups' intellectual property rights. Angel investors, venture capitalists, and crowdsourcing can help businesses overcome their financial management and lack of seed capital problem. The government may potentially establish a fund that offers startup companies seed money. Startups can also gain from financial literacy programmes that show them how to successfully handle their finances.

Spend time and money undertaking thorough market research to obtain a thorough grasp of the target market in order to address the issue of "**Lack of market familiarity**." Making educated selections will enable us to spot opportunities and competitors, as well as analyse market dynamics and industry trends. Making connections with business leaders, mentors, and advisers with knowledge of the target market can assist to navigate new ground by offering insightful advice and support. Look for established businesses or organisations in the target market with whom to form strategic alliances. Engage the customers directly to learn about their requirements, preferences, and trouble areas. To acquire insightful data, surveys, interviews, and focus groups can be formed. Utilize this data to improve the product or service offerings and customize the marketing tactics to satisfy the target audience.

Determine the precise technical talents a startup needs and the gaps in the current team to address the "**Lack of Technical Skills**" issue. Prioritising the efforts to acquire the required abilities will be made easier by identifying the crucial areas where further expertise is required. Actively seek out people with the technical abilities a startup needs. Look for applicants who have solid track records in the particular industry and suitable experience. Invest in projects and training programmes to help the current team members' technical skills. This could include seminars, classes, online training, or mentorship initiatives. To keep the staff abreast of the newest technology and trends, promote continuous learning and offer opportunities for professional development.

Start by using personal savings, credit cards, or loans from friends and family to finance the startup's early phases in order to address the "**Lack of seed capital**" issue. Being resourceful and frugal will allow to stretch the budget and concentrate on bringing in early income to support the company's operations. Find angel investors who are prepared to contribute seed money in exchange for equity in the firm. High-net-worth people or groups that spend their own money in promising enterprises are known as angel investors. Create a convincing pitch, locate possible angel investors through networking occasions, startup communities, or online resources, and then approach them with a carefully designed company plan. Look into government incentives, subsidies, and initiatives that assist new businesses. Numerous nations and areas provide funding options intended expressly to support startups. Find out which local organisations that help businesses with funding and resources, innovation funds, incubators, and accelerators exist.

Create a thorough financial plan to address the "**Lack of managing finance**" issue. Make a thorough financial strategy that details the startup's anticipated income, costs, and cash flow. Take into account elements like production costs, marketing costs, personnel pay, and administrative costs. This strategy will act as a road map for handling the money

well. Keep thorough records of every financial transaction, and keep tabs on your spending. To simplify the procedure and obtain visibility into the company's financial health, use accounting software or other tools. Make a budget that is in line with the financial strategy and the company's objectives. Allocate money to various parts of the startup, and establish expenditure caps for each sector. Regularly review and analyze the budget to identify areas where costs can be reduced or reallocate resources to optimize the financial management.

Spend money on entrepreneurial education by enrolling in business courses, workshops, seminars, or online programmes to address the problem of "**Lack of business knowhow**". Look for initiatives designed especially for new businesses and entrepreneurs. These educational possibilities can provide a solid foundation in subjects like marketing, operations, finance, and strategy. Make connections with seasoned business owners, subject matter experts, and mentors who can offer advice and impart their business expertise. Join startup communities, attend networking events, and actively look for opportunities to interact with seasoned people who may provide guidance and insights. Join an accelerator or incubator programme that offers mentorship as one of its offerings. Conduct in-depth analysis of the market, competition, industry, and customer preferences. Keep abreast on market dynamics, emerging technology, and industry trends. Study both failure and success stories of startups. Analyze the reasons behind the failures or successes and learn from their experiences.

In conclusion, these barriers can be eliminated or their effect on a startup can be minimized by understanding the relation between them. This relation helps us to understand which barrier needs the immediate attention and needs to be resolved first hand. The future scope of this research can include conducting a detailed analysis of each barrier and developing an action plan to address them effectively. Additionally, future research can explore the impact of technology on the startup ecosystem and identify emerging trends that can shape the future of entrepreneurship.

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