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An Empirical Study on Technology Entrepreneurship Ecosystem in India

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Abstract: Technology development and entrepreneurial spirit fuels growth of the nation. Indian Government has taken initiatives to create Technology Entrepreneurship (TE) ecosystem. The survey based research was conducted to study evolution of techno-entrepreneurial firms in India. Technology entrepreneurship lies at the heart of many important debates, including those around launching and growing firms, regional economic development, selecting the appropriate stakeholders to take ideas to markets, and educating managers, engineers, and scientists. Unless a generally accepted definition of technology entrepreneurship is established. In this paper, we present about how TE ecosystem evolved recently in India and enabling factors.

Keywords: Technological, entrepreneurship, Eco system, Survey in India.

I. INTRODUCTION

Technology has given individuals the tools to directly shape their environment in many ways. Technology entrepreneurship is a vehicle that facilitates prosperity in individuals, firms, regions, and nations. The definitions from the literature do not explore and identify the ultimate outcome of technology entrepreneurship; the target of the ultimate outcomes; the mechanism used to deliver the ultimate outcomes; or the nature of the interdependence between technology entrepreneurship and scientific and technological advances. Technology and product life cycles are getting progressively shorter, due to acceleration in technological improvements.
Technology entrepreneurship is an investment in a project that assembles and deploys specialized individuals and heterogeneous assets that are intricately related to advances in scientific and technological knowledge for the purpose of creating and capturing value for a firm.The definition of technology entrepreneurship is based on four elements:

A. Ultimate Outcomes

Value creation and capture are identified as two outcomes of technology entrepreneurship because the sources that create value and the sources that capture value may not be the same over the long run.

B. Target Of The Ultimate Outcomes

The firm is identified as the target organization for which value is created and captured.

C. Mechanism Used To Deliver The Ultimate Outcomes

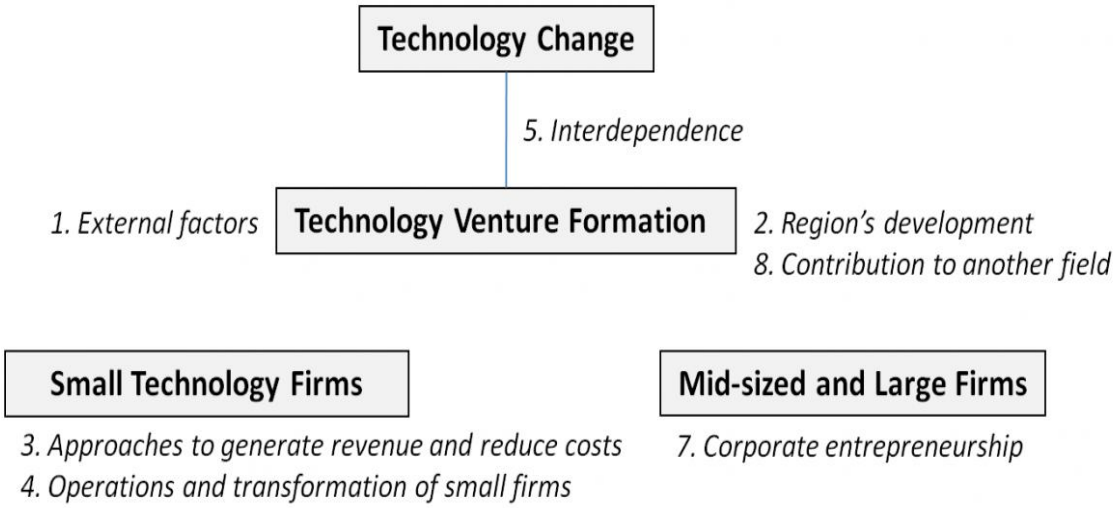
Investment in a project is the mechanism mobilized to create and capture value. A project is a stock of resources committed to deliver the two ultimate outcome types for a period of time.

D. Interdependence of this mechanism with scientific and technological advances

The individuals involved in a project influence and are influenced by advances in relevant scientific and technology knowledge.
In other words, it is not only the scientific breakthroughs, inventions and technological development that are essential for value creation and competitiveness, but it is the discovery of technological opportunities and their commercial exploitation that makes the difference. The process of technology commercialization encompasses all activities from generating an idea, designing, testing the prototype, and manufacturing to marketing the technology-derived products to capitalize market opportunities.

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Technological entrepreneurship (TE) is an important way to commercialize technological innovations and offers unique development opportunities for societies to educate and grow. Much of the interest and early research in technology-based entrepreneurship has its roots in the development in the USA and Europe. However, TE is still a relatively less explored topic in developing countries like India and China. Countries like US, China have created conducive environment to support TE. However, TE in India has been a challenging task. Growth of TE is hampered due to traditional perception of people, inadequate infrastructure, limited venture capitalist, angel investors, and financial institutions which appreciate the specific nature of entrepreneur's needs. Recently, Indian Government has taken initiatives, like incubation centres and various funding mechanisms to create a TE ecosystem. Despite a combination of social structures and cultural values within India that historically constrained entrepreneurship, the efforts in recent years, along with the economic growth and political changes have significantly shifted the national mindset regarding entrepreneurship, particularly among India's youth. Thus, objective of the paper is to identify key success factors driving entrepreneurship in technology based firms in India.

This paper is organized as follows. First, a review of the relevant literature on definitions and importance of TE is presented, followed by review on the factors affecting TE. TE overview in India is then presented in the following subsection. Next, the research methodology adopted in the study along with data collection techniques is presented. In the subsequent section, analysis along with the results is presented. The final section offers conclusions.

II. LITERATURE REVIEW

Bacon et al.(1994)defines high technology industries as those that have short development cycles because products of competitors who are not keeping up with the latest industry developments quickly become obsolete.

Dorf and Byres (2005) define TE as a business leadership style, which includes identifying technological opportunities withhigh growth potential, gathering resources.

Mueller 2007, Storey (1994), In the current study TE is defined as the setting up of new enterprises by individuals or corporations to exploit technological innovation. Research have shown that new expanding and innovative firms are responsible for a significant growth of the country

Lalkaka (2001), A vast body of research exists on the importance and contributions of TE to job creation, economic and social development, and growth.

A. Factors Affecting Technology Entrepreneurship

TE research focuses on understanding the conditions and drivers that lead to the identification

and exploitation of opportunity for value creation. It is a complex and multifaceted phenomenon and occurs at many levels of analyses.

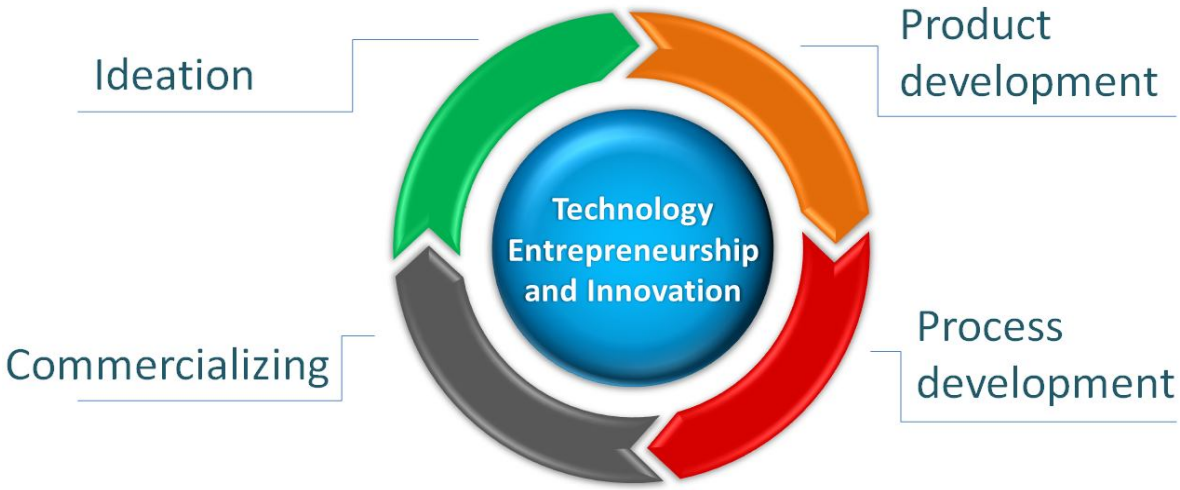
1) At the individual level, the focus is on entrepreneurs, venture capitalists, and other individuals that initiate and drive technological innovation.

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2) At the organizational level, the research is on the technological teams, structures, processes, and inters- organizational linkages that impact value creation.

3) At the systems level, it is about the resources exchanged among different players in the ecology of value creation, which includes the governing factors such as government, technology and competition policy, industry standards, and the economics of geographical locations.

The success of entrepreneurs is influenced by support (formal and informal)from others. Formal support comes in the form of financial, technology, and strategic partnerships (Carrier et. al. 2004.Thereby the factors influencing entrepreneurial success can be divided into two categories –individual factors and environmental factors.



B. Environmental factors

Environmental factors can be defined as those factors that lie beyond the control of theentrepreneur and strongly influence the success of the firm. Lack of financial resources has been found as the principlefailure cause of high-tech firm.

Access to capital via venture capital has played a major role in the United States in supporting new business creation and growth. Accumulation and diversity of human capital in top management was found to positively influence innovation and business venturing among high-technology entrepreneurship

C. Individual factors

Individual factors are those which represent the personality attributes or traits of an individual.networking with customers provokes commercialization ideas and make financial resources accessible to firms especially in their initialphases of establishment, when there is on-going research and development activities. It is found that entrepreneurs in technology based firms were motivated by the challenging task, freedom to explore new ideas and autonomy.

D. Overview of TE in India

TE in India has developed through several pathways, shaped by Government policy, the education system, and through interaction with multinationals.

In India,to promote TE, many Government and non-Government agencies areputting efforts to enhance the TE activity. Particularly Department of Science and Technology(DST), Government of India has played a key role. Technology Innovation Management and Entrepreneurship Information Service (TIME IS), a joint project of National Science and Entrepreneurship Development Board (NSTEDB), DST and Federation of Indian Chambers and Commerce and Industry (FICCI) is now one of the credible ladder towards the enhancement of India's entrepreneurial economy.

The project has taken initiatives to provide guidance and assistance to the entrepreneurs especially the technopreneur to find technologies, projects, funding options and information about policy environment, incentive schemes and industrial infrastructure available in the country covering both the central and state government and have become proficient at tapping the local talent pool. Fourteen Science and Technology Entrepreneurship Park (STEP) and around 24 Technology Business Incubators (TBI) have been

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established which are acting as a real booster to convert Technology Innovations in to Techno – Entrepreneurship in colleges and universities in India have established education and training programmes to foster entrepreneurship, Centre's for entrepreneurial studies and business incubators, like Society for Innovation & Entrepreneurship (SINE) at the Indian Institute of Technology Bombay, in Mumbai.Ministry of Science & Technology, Government of India launched a novel programme known as TechnopreneurPromotion Programme (TePP).

III. RESEARCH METHODOLOGY

This is an applied study, exploratory in nature. Sequential design has been adopted to conduct
this study. Qualitative part was conducted via interviews of some of the entrepreneurs at SINE, IIT Bombay to gain insights about the factors to be included in the questionnaire. The questionnaire was designed based on a thorough literature review and experts suggestions. In the quantitative stage, questionnaires was used to identify the factors.

Part 1 includes all questions pertaining to general information about the organization (date of establishment, employee size, type of business).

Part 2 includes the questions related to entrepreneurial profile, ideation and start-up (age of the entrepreneur, qualifications, motivation, experience, funding mechanisms).

Part 3 contains questions related to technological and innovation.

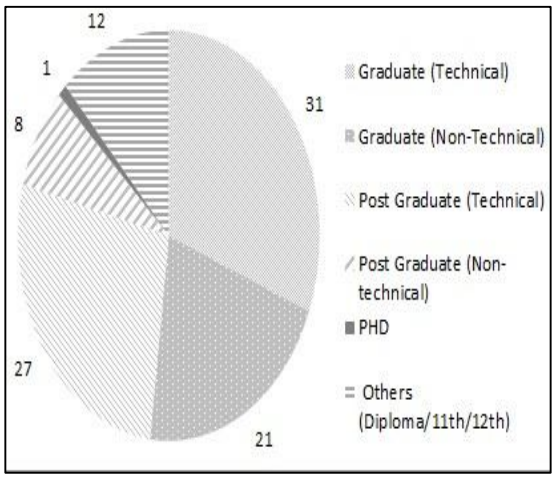
Part 4 contains questions related to entrepreneurial performance. In the current study entrepreneurial performance (success) is measured by using actual rate of growth and market share of the firm. Three states and one union territory in India were selected for data collection. Pune and Mumbai cities from Maharashtra state, Ahmadabad from state of Gujarat; Hyderabad from Andhra Pradesh and Delhi region (union territory) were considered for selecting the technology based firms. Owner/entrepreneur of each technology based firms were selected as the respondents. 250 sets of questionnaires were distributed and 130 were returned by the respondents. 100 sets were found usable for the data analysis. Descriptive statistics is used to conduct preliminary analysis to identify the factors enabling TE in India. Figure presents the regional distribution of firms.

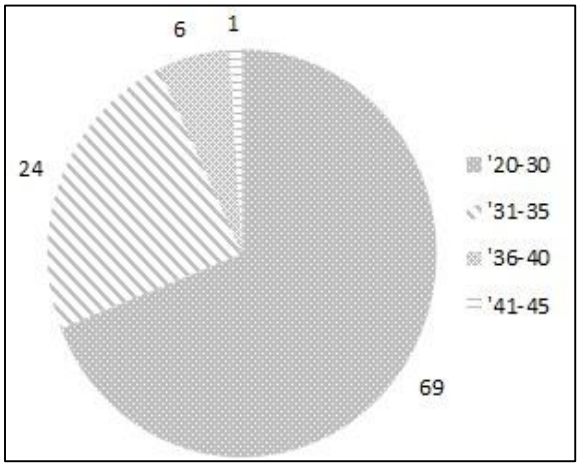
IV. ANALYSIS AND RESULTS

Descriptive analysis was used to identify the importance of factors related to Entrepreneurial profile, motivation, qualities, business start-up, and seed capital.

A. Entrepreneurial profile

Out of 100 firms 95 % of the firms were first generation entrepreneurs. Maximum numbers of entrepreneurs in all the regions fall in the age group of 20-30 except in Mumbai where maximum entrepreneurs were in the age group of 31-35 as shown in Figure.2. Average age of the entrepreneur at the time of starting the venture was 28. As far as the respondent's level of education is concerned bachelor's degree was the most common degree (52%). Thirty-one percent of the entrepreneurs were technical graduates whereas 27% were technical post graduates as shown in Figure. 3. Sixty eight percent of the respondents had technical experience before starting the venture.

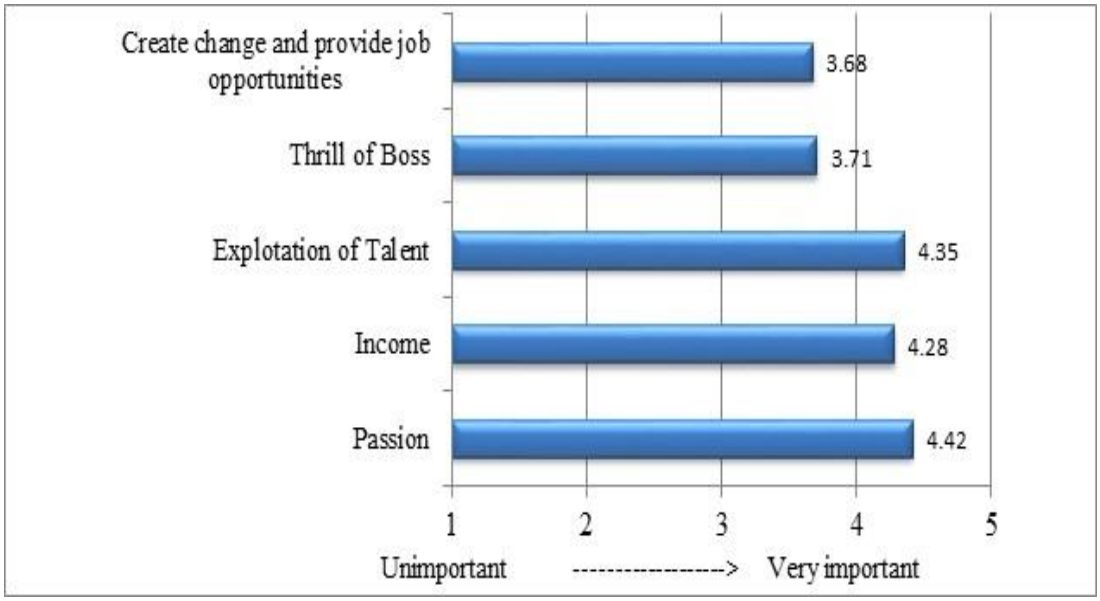




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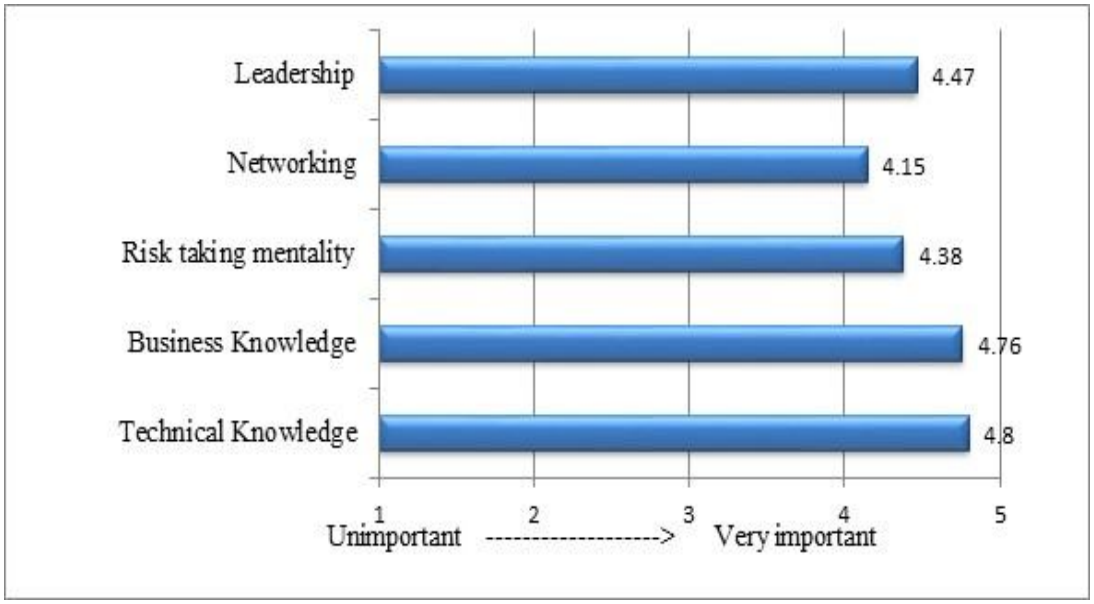
B. Motivational Factors

There are many reasons why entrepreneurs are excited towards venture creation. Passion for doing the business and exploitation of their talent and expertise were found to be the most important factor for starting the new venture. Entrepreneurs in Pune and Bangalore were motivated to start the venture for earning additional income. Thrill of being the boss was found to be less motivating factor in almost all the regions as shown in Figure.



C. Entrepreneurial Qualities

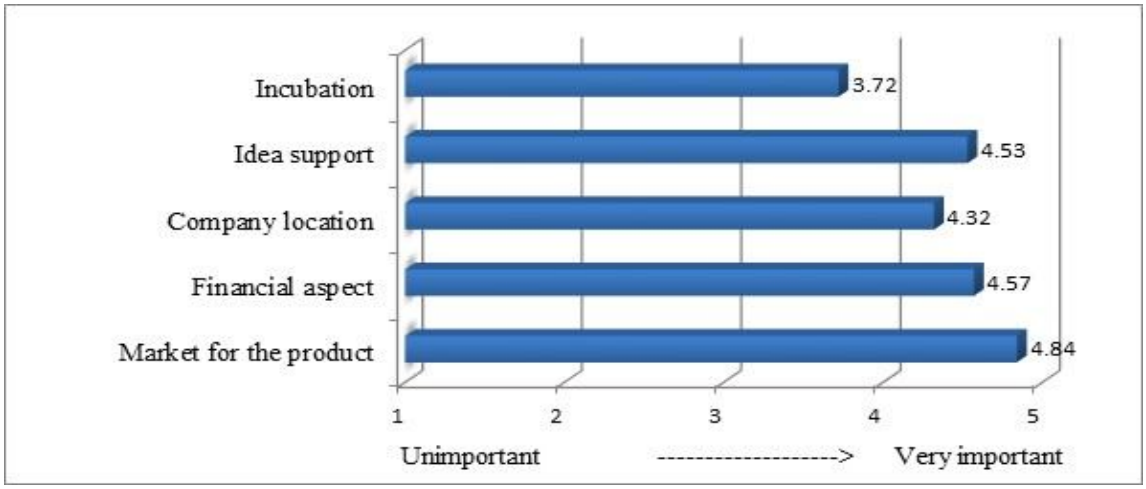
Technical knowledge followed by business knowledge was considered as the most important quality of an entrepreneur as shown in Figure. Seventy eight percent of the respondents were found to have technical expertise in the domain. In addition to technical expertise majority of people were innovative and has organizing ability.



D. Business Start-up Factors

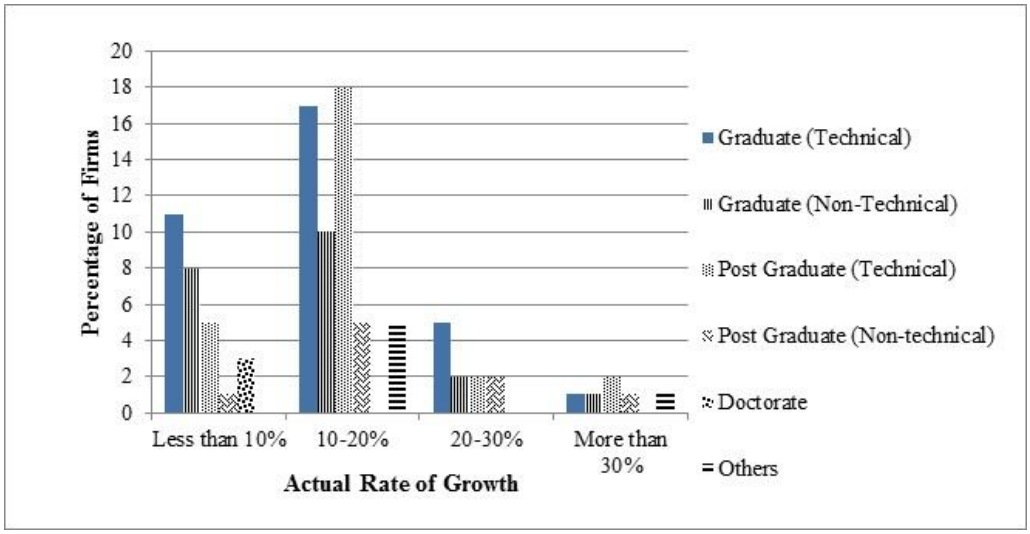
Entrepreneurs placed market for the product and financial resource to be the relatively more important as compared to others while starting a business as shown in Figure. Thirty percent of the entrepreneurs got idea from peers and their family.

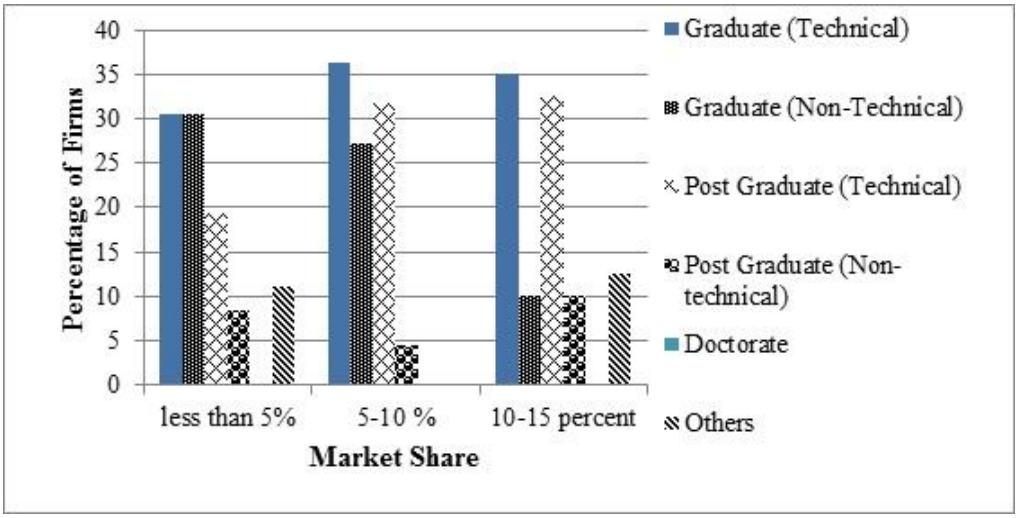
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E. Relationship Between Firm Performance, And Level of Education And Work Experience

Maximum number of firms in the sample holds 10-15% of market share with 10-20% of rate of growth. It was found that the firms with large market share and 10-20% growth rate have entrepreneurs with graduate /postgraduate technical background as shown in Figures.





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V. CONCLUSION

The study was conducted to study the evolution of entrepreneurial firms in terms of origin of business ideas, profiles of entrepreneur's and to identify the significance of entrepreneurial characteristics in defining a company's success. The study revealed that passion for doing business is critical for an entrepreneur to succeed. However some regional variation was observed in pune and Bangalore. Earning additional income was the motive in the two cities.

The study revealed that founders put emphasis on the technical and business knowledge to be essential for techno-entrepreneur. Technology related skills and knowledge were strongly present in the profile of entrepreneurs. From a policy perspective, advancements in formal technical education, both graduation and post-graduation created a base for technical skill set in India and found to encourage TE. Market for the product and financial aspect had major impact in the start-up phase of entrepreneurial process. Initial amount of seed capital is a critical factor for firm's success in future. This study provides input to those who are starting their entrepreneurial journey. The findings can be used by policy makers to develop schemes for TE development for the country. The future research can be conducted to find more associations between firm performance, and technology related factors in the early phase of start-up, and to find the impact of the factors on the success of the firm and to study.

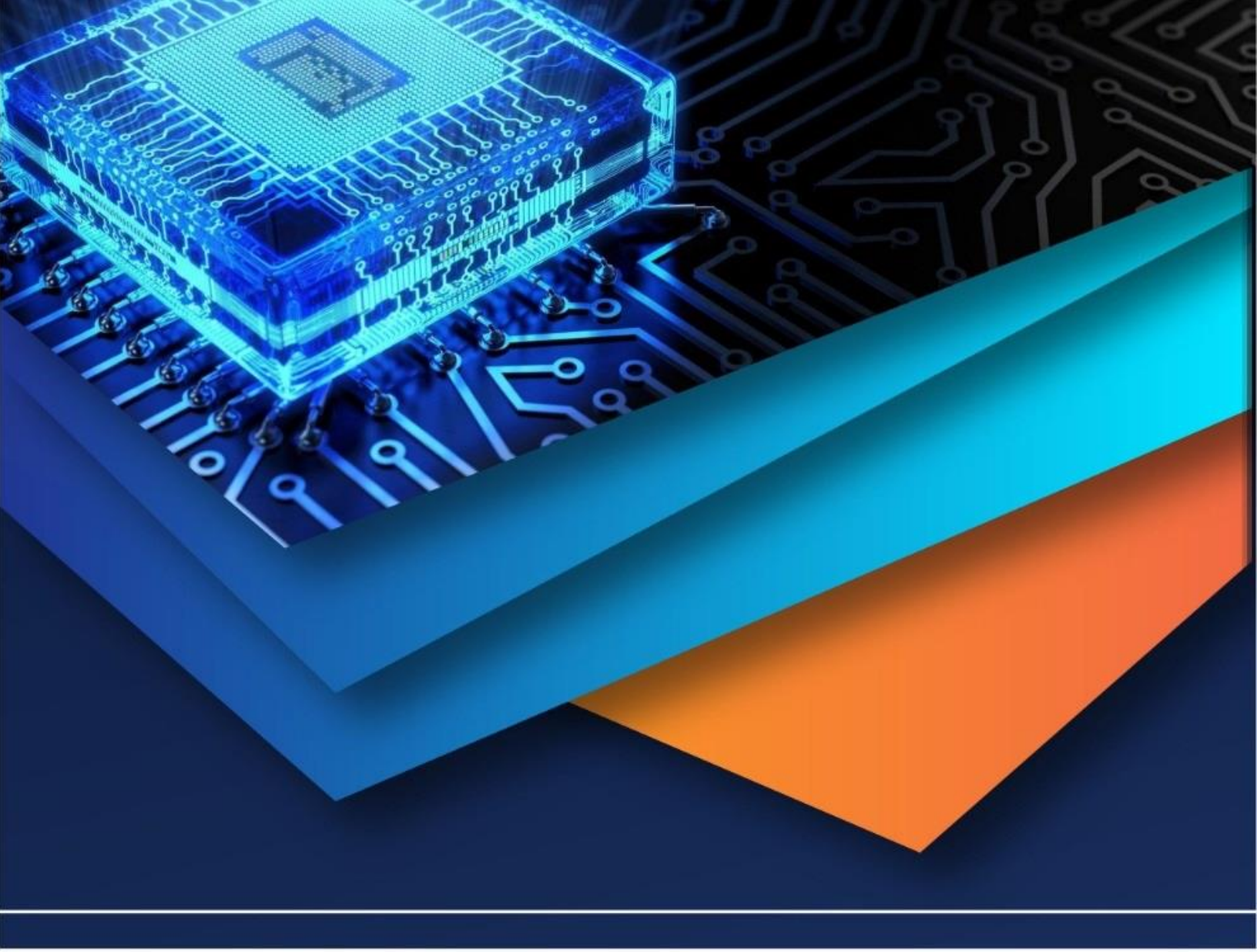
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