Any research project revolves on its data analysis and results, which work as a catalyst to convert raw data into useful knowledge and insights. In the data analysis stage, researchers carefully go through the information they have gathered using logical and statistical methodologies. To find underlying patterns, trends, and linkages, this entails cleaning, organizing, and summarizing data. Finding relationships between variables and presenting complicated data in understandable ways like charts, graphs, and tables are made easier by methods like statistical analysis and visualization. After doing this analysis, researchers examine the data and interpret the findings to make inferences that respond to the hypothesis or research question. To do this, one must recognize newly emerging patterns and trends, draw conclusions from the data, and provide concise justifications for occurrences that are seen. In the end, data analysis and discoveries fill the knowledge gap between gathered data and study goals, providing researchers with important information that improves their profession and may have practical implications.

5.1 Success Rate of Innovation Through Crowd Funding

This research looks at the difficulties entrepreneurs have getting financing and how new goods affect crowdfunding campaigns. To ascertain the elements determining project success or failure, the researchers will review 123 projects on two reward-based crowdfunding sites, Kickstarter.com and wefunder.com. They want to test two hypotheses: the alternative hypothesis (H1), which suggests a connection, and the null hypothesis (H0), which suggests no association between a successful idea and crowdfunding received.

The degree to which financing and project success are related will be evaluated using correlation analysis and hypothesis testing techniques. P-value, which assesses the importance of the data, and scatter plots, which graphically depict the correlations between dependent and independent variables, are two important statistical ideas used in the investigation.

There are now fewer innovators and a reluctance to take risks due to the social tendency that prioritizes job security above entrepreneurial endeavors. It is difficult to get startup money for entrepreneurial ventures, which deters would-be business owners and innovators even more. The research assesses these assumptions using a

mix of P-values and correlation coefficients (r). To help with data interpretation and the identification of possible correlations, scatter plots are used to graphically depict the connections between dependent and independent variables.

The research intends to shed light on variables affecting entrepreneurial activities in the digital era and provide insights into the relationship between innovation success and crowdfunding dynamics.

This study analyzed the data to find the correlations between success and the project's location, number of backers, and category. By analyzing manually collected data from 123 Kickstarter projects, researchers employed correlation and regression to examine factors influencing project success.

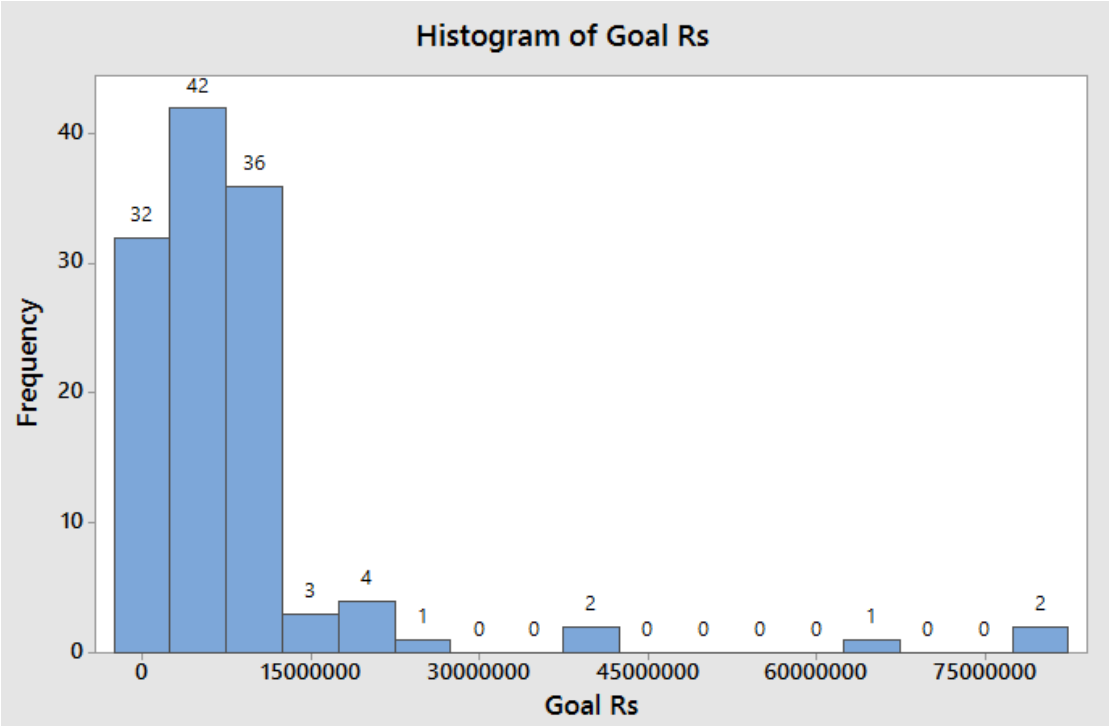

Fig. 5.8 : Goal in Rupees

Figure 5.8 is a histogram, which is a type of bar graph that shows how a continuous variable in this case, the project's goal amount in rupees is spread out. The vertical axis shows the frequency (number of projects) that fall within each range, while the horizontal axis shows the objective amount range (for example, 15 lakhs to 30 lakhs rupees).

The histogram indicates that, among Kickstarter projects in this sample, the most common target amount range was between 25 lakhs and 1.25 crore rupees, or around $33,000 and $166,000 USD. A smaller number of initiatives between 1.75 crore and 8.25 crore rupees, or around $233,000 to $1.1 million USD had substantially greater objective amounts.

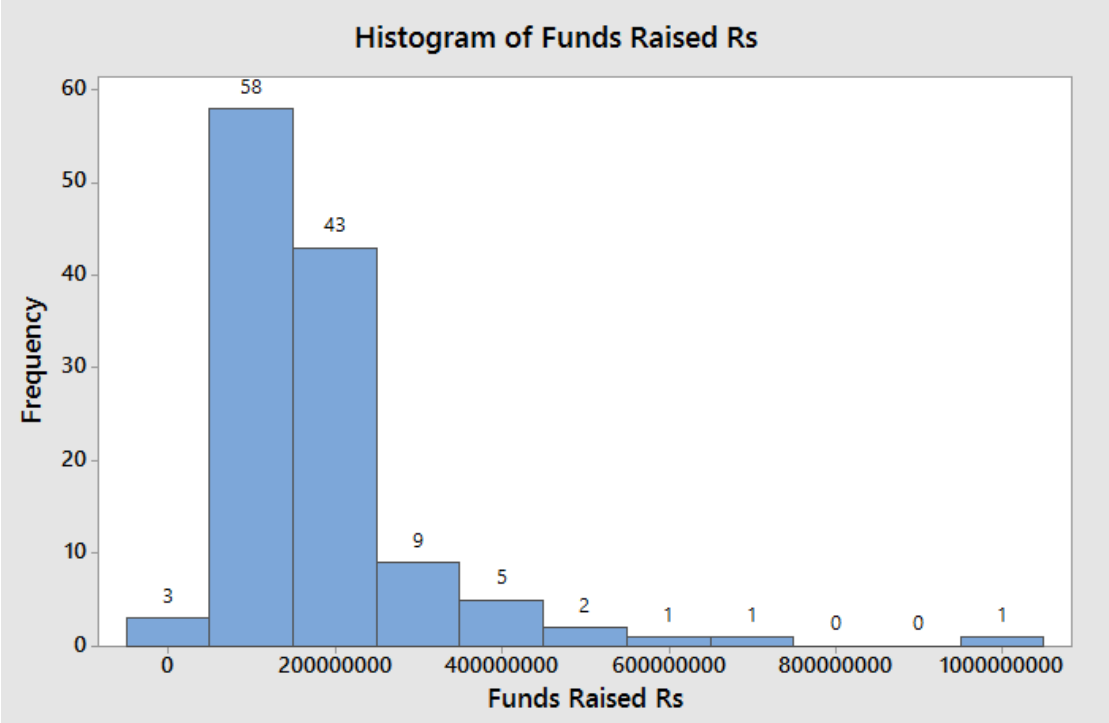

Fig. 5.9 : Funds Raised in Rupees

Figure 5.9 depicts the distribution of a continuous variable (the amount of money collected in rupees) using a histogram, a form of bar graph. The vertical axis shows the frequency, number of projects that fall within each range, while the horizontal axis shows the amount of cash collected in crore rupees (one crore is 10 million). The initiatives with the greatest frequency were those that raised between Rs. 5 crore and Rs. 15 crores, or around $6.6 million and $19.8 million in US dollars.

Additionally, other initiatives Crowdsourcing garnered a lot more money—possibly as much as Rs. 105 crore, or $13.8 million USD. According to the statistics, fewer initiatives collected money in the lower range—possibly even less than Rs. 5 crores.

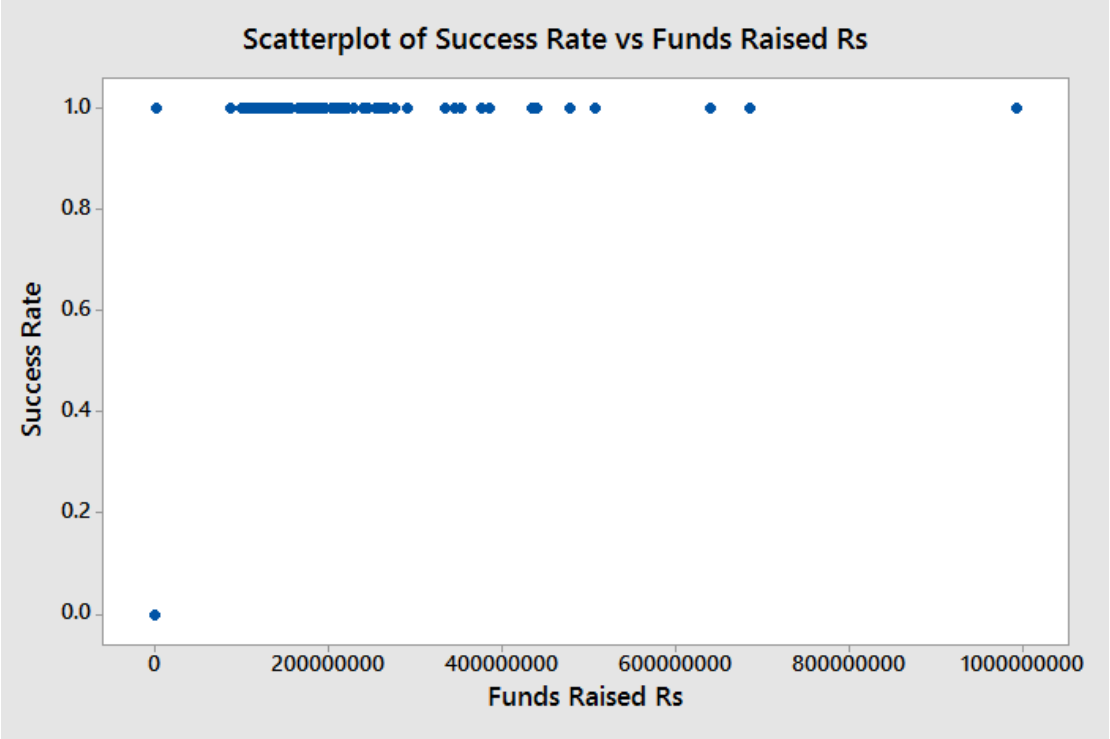

Fig. 5.10 : Success rate Vs funds raised

Figure 5.10 represents a scatterplot, a type of graph that displays the values of two variables for each data point. The vertical axis displays the project's success rate, likely expressed as a percentage between 0 and 1, with 1 signifying success, while the horizontal axis displays the total money collected in rupees.

The scatterplot shows a little rising trend, but the data points are quite dispersed. This demonstrates a positive correlation between the amount of money collected and the success rate. The 0.192 correlation coefficient, supports this.

Correlation Coefficient: There are two possible correlation coefficients: -1 and +1. A positive value indicates a positive correlation, while a negative number indicates a negative correlation. A coefficient closer to zero indicates a weaker correlation between the variables. In this instance, the positive correlation is quite minor, at 0.192.

P-Value: A P-value is 0.033. In hypothesis testing, researcher use a p-value to assess the statistical significance of a result. When the p-value is less than 0.05, often used as a benchmark, it is unlikely that the observed link is the result of chance. In this case, there is some indication that the positive correlation is statistically significant since

the p-value of 0.033 is less than 0.05. Given a p-value <0.05, H0 is erroneous and H1 is accepted.

A p-value of 0.033 indicated that there was a 0.192 correlation coefficient between the success of the crowdfunding campaign and the quantity of money raised. This suggests that projects with higher funding levels have a statistically significant positive connection and a marginally higher chance of success.

Overall, the results of the correlation study point to a marginally strong but statistically significant positive connection between the success rate of Kickstarter projects in this dataset and the amount of money collected. This indicates that the likelihood of projects succeeding was marginally higher for those who collected more money than for those who raised less.

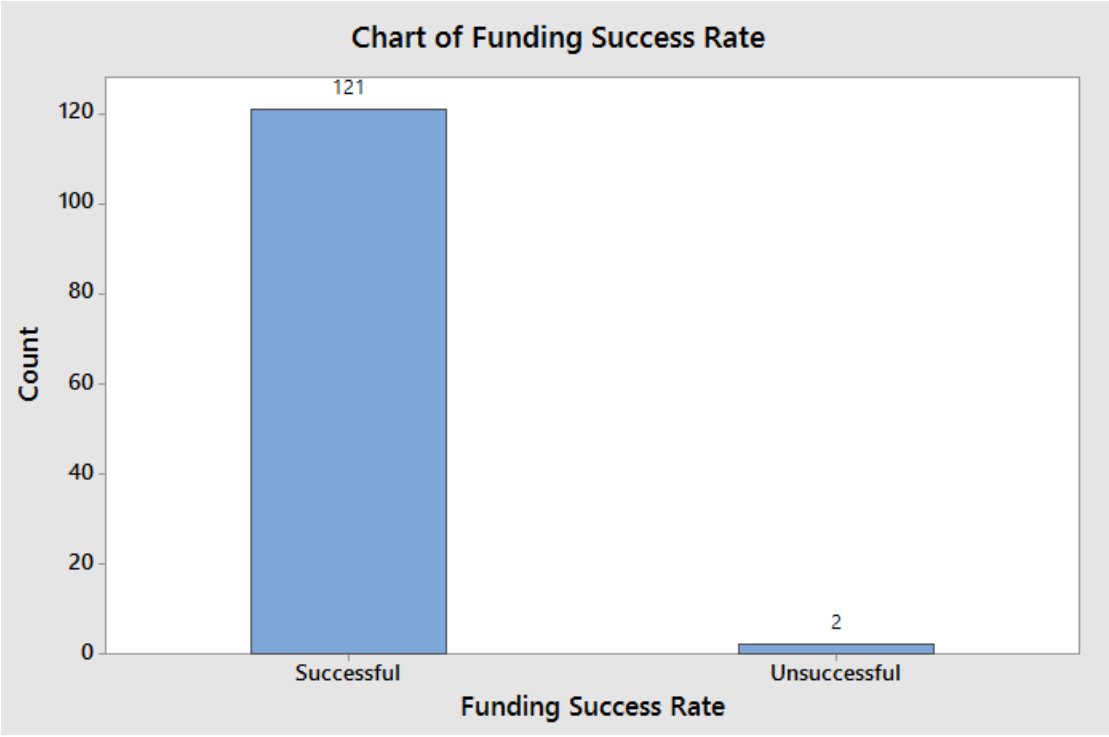

Fig. 5.11 : Successful vs Non-successful

Figure 5.11 is a bar chart that illustrates the classification of project results into two distinct categories: those that were successful and those that were not successful. "Success" was measured as reaching funding goals. A total of 121 initiatives were successful, while just two were unsuccessful, according to the text that accompanies the figure. This dataset contains 121 out of 123 projects, and the bar chart makes it

quite evident that the great majority of those initiatives were successful. It is quite probable that they were successful in reaching their financial targets on Kickstarter. There were just a very limited number of initiatives that did not end up being successful.

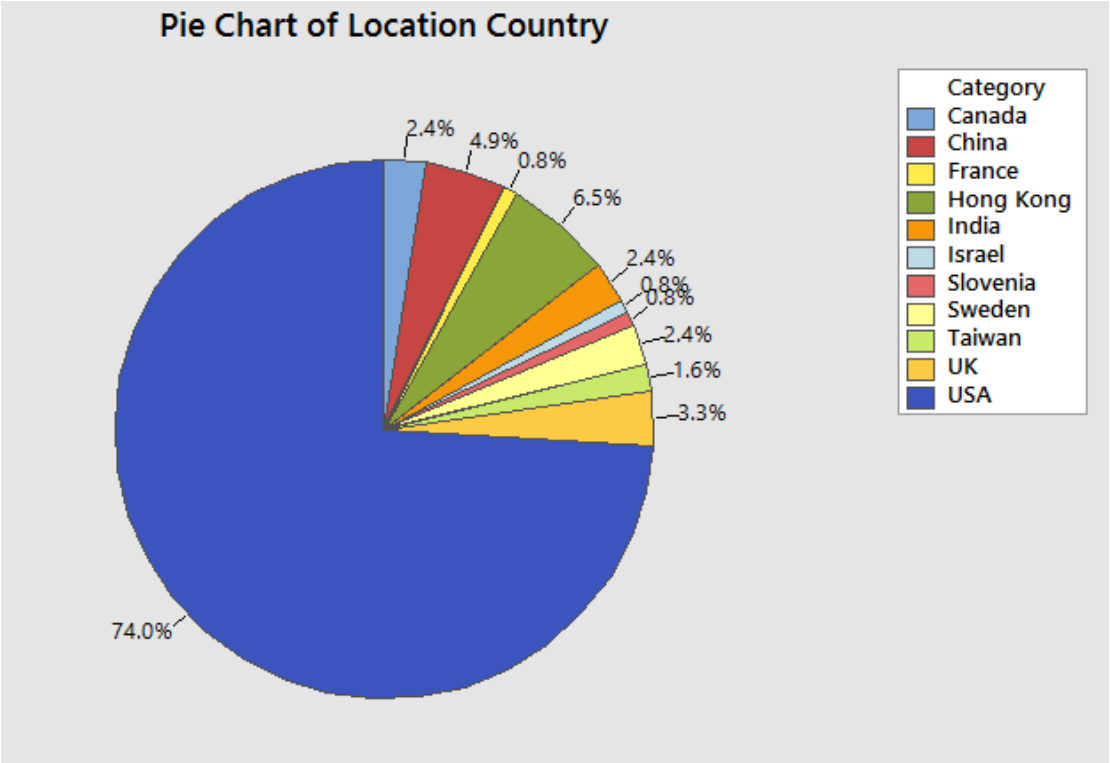

Fig. 5.12 : Location

This research looked at the distribution of successful Kickstarter projects across a variety of countries. A pie chart in **Figure 5.12** which is a circular chart that has been cut into slices to illustrate the percentage of the total that each category accounts for. Here is a pie chart that illustrates the proportion of successful Kickstarter projects that came from different nations. Based on the pie chart, it can be seen that the United States of America accounted for 74% of the successful initiatives that were included in this dataset. There was a much lower percentage of projects that originated from Hong Kong (6.5%), China (4.9%), and the United Kingdom (3.3%). It is estimated that around 2.4% of the successful initiatives were contributed by projects from Canada, Sweden, India, and Taiwan respectively. Slovenia, Israel, and France each had a relatively modest percentage of the successful initiatives in this sample, with each country having a share of less than 0.8%. There is a considerable drop-off in the

number of successful initiatives that originate from other nations, with the United States being the most prominent source of successful ventures. Please keep in mind that the statistics shown here is only representative of 123 of the projects that were funded via Kickstarter. In addition to geography, some elements, such as the kind of project or marketing techniques, may also have a role in determining the level of success achieved.

5.2 Success rate of Entrepreneur through Crowd Funding

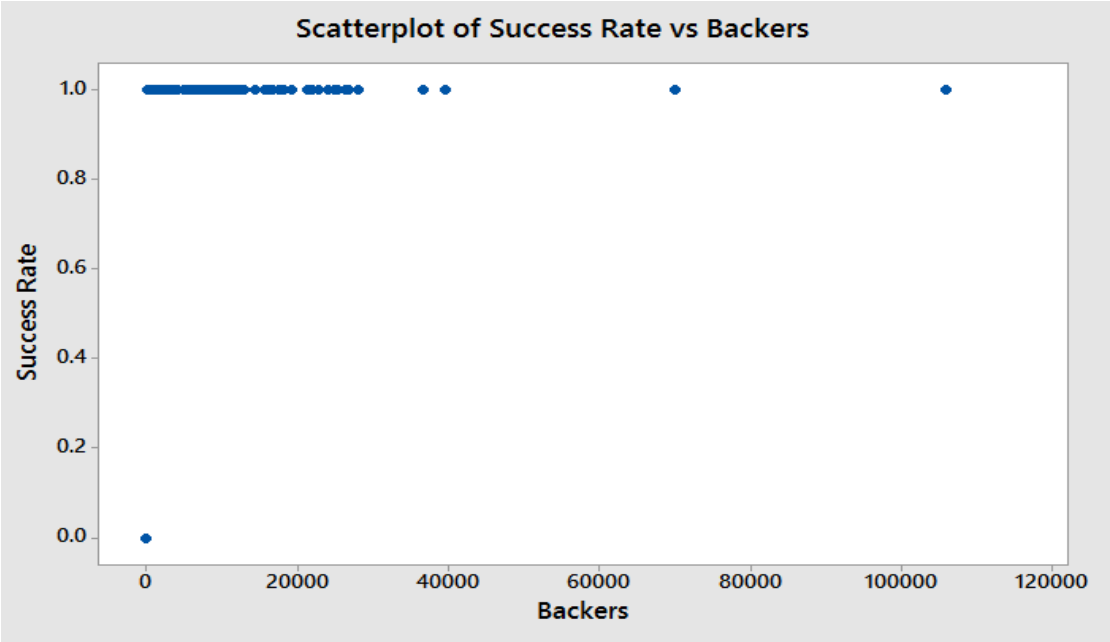

Fig. 5.13 : Success rate vs backers

Figure 5.13 The scatter plot of supporters demonstrates a positive, strong linear relationship between crowd financing success and backers. Research looked at the connection between Kickstarter project success rates and supporter counts. The number of supporters and success rate were compared by the researchers using correlation analysis. One statistical method for determining the direction and degree of a link between two variables is correlation analysis. A scatterplot, which displays the values of two variables for every data point, is shown in Figure 13. The vertical axis shows the project's success rate, which is often expressed as a percentage between 0 and 1, with 1 denoting success, while the horizontal axis shows the number of supporters for the project. The scatterplot's data points indicate an overall rising trend, with projects that have more supporters often seeing greater success rates. This implies that the number of supporters and project success are positively correlated.

The range of a correlation coefficient is -1 to +1. A positive correlation is shown by a positive value, while a negative correlation is indicated by a negative number. A weaker correlation between the variables is indicated by a coefficient that is closer to zero. In this instance, the positive correlation is quite minor, at 0.189. A p-value is used in hypothesis testing to evaluate a result's statistical significance. The observed link is unlikely to be the result of chance when the p-value is less than 0.05, which is often employed as a benchmark. In this case, there is some indication that the positive correlation is statistically significant since the p-value of 0.031 is less than 0.05. Overall, the results of the correlation study point to a marginally significant but statistically significant positive connection between the success rate of Kickstarter projects in this dataset and the number of supporters. This indicates that the likelihood of success for initiatives with more supporters was somewhat higher than that of those with fewer backers. It's critical to keep in mind that causality differs from correlation. It is not a given that having more supporters makes a project successful, even when there is a positive link between the two variables. Success may also be influenced by other elements, such as the caliber of the project concept, the project presentation, or the use of marketing and promotion techniques. Furthermore, given that there were only 123 projects in the sample, the correlation coefficient's strength may be low.

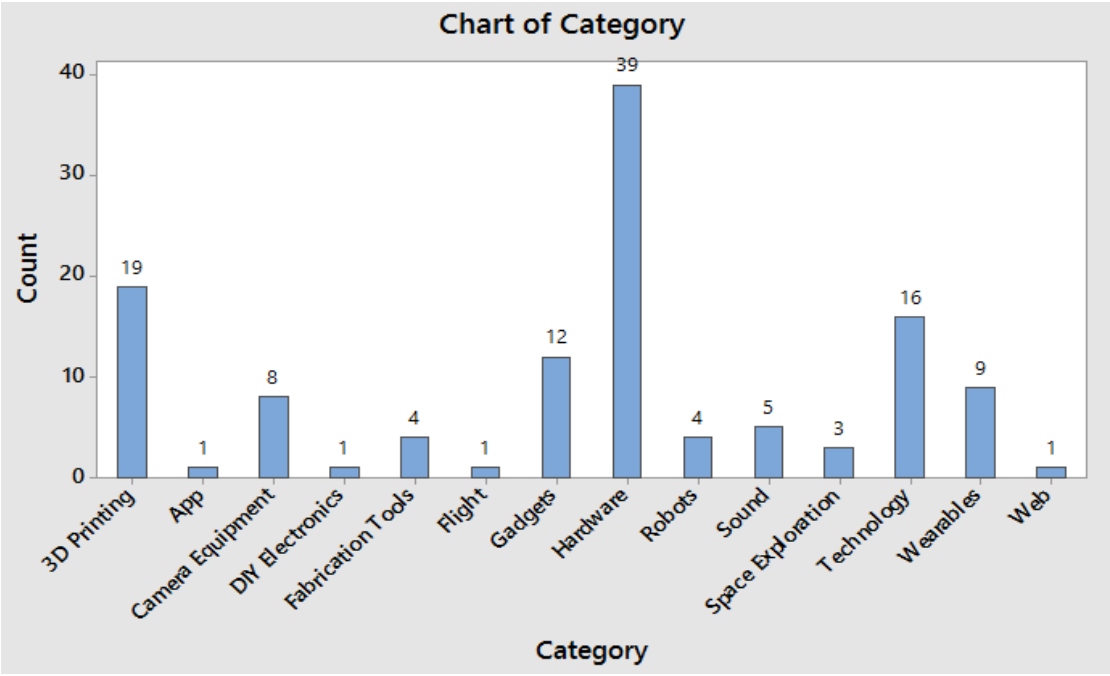

Fig. 5.14 : Category

The **Figure 5.14** A bar chart, is a graph where the frequency or percentage of categorical data is represented by rectangular bars. Here, the categories are the many Kickstarter project kinds, and the number of successful projects in each category is shown by the height of the bar. With 39 completed projects, the Hardware project category in this dataset was the most successful, as seen by the bar chart. 3D printers (19 successful projects) and technology (16 successful projects) came next, respectively, to hardware. There was only one successful project in each of the following project categories: DIY Electronics, Apps, Flight, and Web. Additionally, there were a few successful ventures in the fields of robotics (4), music (5), and space exploration (3). The number of successful initiatives in categories including gadgets (12), cameras (9), and wearables (8) was modest. The most successful initiatives were in the hardware category; just a few successful projects were found in various other areas.

5.3 Success rate of Entrepreneur through Consumer Purchasing Trends

Through an analysis of consumer buying behaviors, the goal of this study seeks to determine the market share (consumer purchasing trends) of new items or brands that have found success. This study will investigate the null hypothesis (H0), which states that there is no relationship between a successful entrepreneur's product and what customers have previously purchased. On the other hand, the alternate hypothesis (H1) proposes that there is a relationship between successful business owners and current customer buying patterns for their novel items. Put more simply, this research wants to know whether customers are really choosing to purchase the goods that successful entrepreneurs have made. This research uses data from over 3,000 purchases to examine how popular consumer electronics are among Mumbai, India's citizens. According to the report, TVs are the second most popular product after mobile phones. According to subcategory research, the most popular mobile accessories are smartphone covers and headphones/earphones. The Maximum Likelihood technique and the Bayes theorem were used by the researchers to examine historical purchasing trends and forecast new ones.

The survey also showed that customers like products like smartphone covers and headphones/earphones. To comprehend patterns in customer behavior, the researchers used statistical techniques including the Maximum Likelihood algorithm and the

Bayes theorem. While the Maximum Likelihood method makes predictions about customer purchasing patterns using both primary and secondary data, the Bayes theorem modifies forecast probabilities depending on fresh information.

In order to identify purchasing patterns, the process comprises data gathering from nearby retailers, subcategory analysis, data filtering, frequency calculation, and pie chart analysis. Predicting market trends such as brand choice, pricing range, and product features is further aided by frequency calculation and pie chart analysis.

Through the integration of different statistical methodologies, the research adds to a complete knowledge of consumer behavior in the digital era by offering insightful information on consumer preferences and future market trajectories in the consumer electronics sector. This research explores the most popular consumer electronics among 3,000 suburban Mumbai residents, focusing on their everyday uses and preferences. Our analysis leverages the Bayes theorem and Maximum Likelihood algorithm.

The Bayes Theorem is a statistical technique that may be used to determine the conditional probability of an event happening in the presence of another event that has already occurred. Put more simply, it lets you adjust the likelihood of something happening after learning new information. It is less often employed in descriptive statistics, as this research seems to be, but it might be used in this case for more complex analysis (not covered in the paragraph), including forecasting the purchase of gadgets based on a person's demographics.

The Maximum Likelihood Algorithm is a statistical technique that determines which statistical model parameters are most likely to have created the observed data. Put another way, it assists in determining the most likely reason for the information you have gathered. Although it's not discussed in the text, it might be employed here to determine the aspects impacting consumers' purchasing patterns for electronics, even if it's more often used in complicated models.

The substantial positive association (correlation coefficient $r = 0.959$) between the performance of businesses and their conformity to current consumer purchasing trends is evident. This implies that an entrepreneur's degree of success tends to correlate strongly with the latest trends in customer purchasing. The p-value of 1.20e-

05, which is much less than the usually accepted significance level of 0.05, indicates that the observed association is statistically significant.

The remarkably low p-value and the extremely high correlation coefficient (r) lead to the acceptance of the alternative hypothesis (H1) and the rejection of the null hypothesis (H0). The alternative hypothesis that successful entrepreneurs are more in line with current consumer purchasing trends is supported by a statistically significant positive correlation between the success of entrepreneurs and their alignment with these trends.

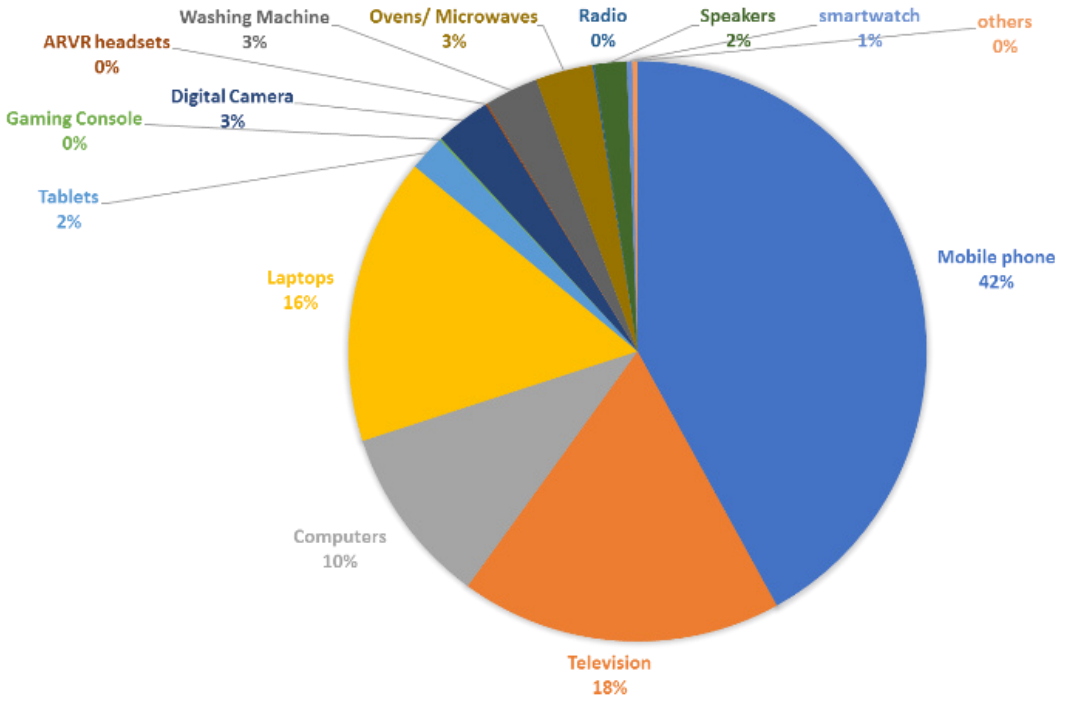

Fig. 5.15 : Consumer Electronic Products purchase trend

The pie chart in **Figure 5.15** depicts the percentages of Mumbai suburbs' electronic product purchases are shown in the research. Most people choose mobile phones and TVs. The population was 3000. A pie chart, or circular chart broken into slices to show the percentage of a total that each category takes up, is seen in **Figure 5.15** With 42% of respondents indicating a purchase, the pie chart shows that mobile phones were the most popular consumer electronic device bought by suburban Mumbai residents. Televisions ranked second in popularity, having been purchased by 18% of respondents. Consumers preferred laptops (16%) and computers (10%). Gaming consoles, and tablets were all far less common, with fewer than 10% of respondents

selecting any of them. Fewer than 3% of the respondents bought other devices, such as speakers, washing machines, microwaves, radios, digital cameras, and smartwatches. Preferences for consumer electronics may evolve over time. Other devices were much less popular than mobile phones and TVs, which were the undisputed leaders.

Table 5.1 : Consumer Electronic Products table

Consumer Electronic Products	Actual device sold
Mobile phone	1260
Television	540
Computers	300
Laptops	480
Tablets	60
Gaming Console	3
Digital Camera	93
ARVR headsets	3
Washing Machine	90
Ovens/ Microwaves	96
Radio	3
Speakers	54
smartwatch	9
others	9

Table 5.1 shows the actual consumer electronic products sold. For the variable of interest (consumer electronics purchases), **Table 5.1** offers a descriptive statistical analysis that summarizes the data to provide insights into core trends (averages) and dispersion (how spread out the data is). The proportion of inhabitants who bought each kind of consumer electronics is shown in the table.

Mobile phones were the most popular consumer electronics purchase among 3,000 suburban Mumbai residents surveyed; an astounding 42.0% of respondents said they had purchased one. At 18.0%, televisions came in a distant second, ahead of laptops (16.0%) and PCs (10.0%). With washing machines, microwaves, ovens, and digital cameras each hovering around 3% of responses, appliances and cameras showed a

sharp decline in popularity. Ownership of speakers and tablets was significantly lower, at less than 2% apiece. Smartwatches, the least popular category with just 1% of the total, rounded out the list. The undisputed leaders were mobile phones and TVs, followed by laptops and PCs. Other devices and appliances were much less common.

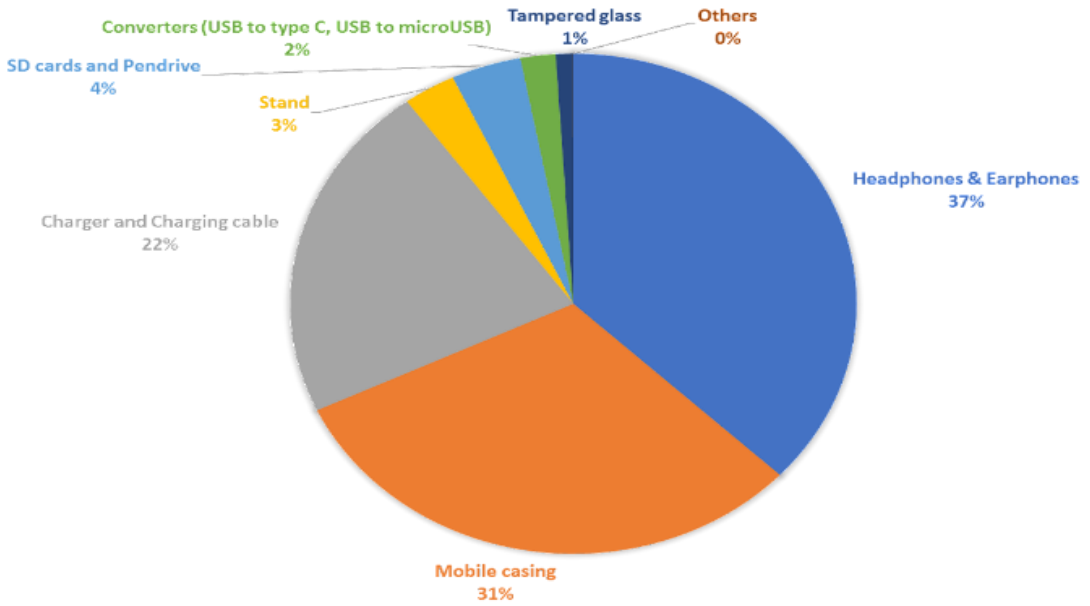

Fig. 5.16 : Mobile Accessories Purchase Trend

The pie chart in **Figure 5.16** shows the percentage of mobile accessories purchased by consumers in one of the Mumbai suburbs. The researchers used a descriptive statistical study, summarizing survey data, to determine how common it is for suburban Mumbai people to acquire mobile phone accessories. The pie chart is a circular diagram that has been broken into slices to show how much of a whole each category takes up. The proportion of residents who bought each kind of mobile phone accessory is shown in a pie chart. According to sales data, which represent 37% of the total, headphones and earbuds are the most widely used mobile phone accessories. At 31%, mobile cases didn't far behind, underscoring their significance for phone protection. With 22% of sales, chargers and charging cords were also significantly high demand. But tempered glass displays, SD cards, and USB converters all saw sharp declines in sales, accounting for only 4%, 2%, and 1% of total sales, respectively. Lastly, stands came in last with just 3% of the total, indicating that among this consumer group, they were the least desired phone accessory.

Table 5.2 : Mobile Accessories Table

Mobile Accessories	Actual device sold
Headphones & Earphones	1110
Mobile casing	930
Charger and Charging cable	660
Stand	90
SD cards and Pen drive	120
Converters (USB to type C, USB to micro USB)	60
Tampered glass	30
Others	1

Table 5. shows the actual Mobile accessories sold. Some intriguing customer preferences are shown by the "Mobile Accessories Table". With an astounding 1110 units sold, headphones and earbuds are the most popular item by a wide margin. With 930 units sold, mobile cases trail closely behind, underscoring their significance in safeguarding devices. Another popular category is chargers and charging cords, which move 660 units. But sales of stands (90 units), SD cards and pen drives (120 units), and converters (60 units) show a significant decline in popularity. Thirty pieces of tampered glass are sold, although not nearly as many as the best-selling items. There is a "Others" category in the table as well, but no sales data is given for those products.

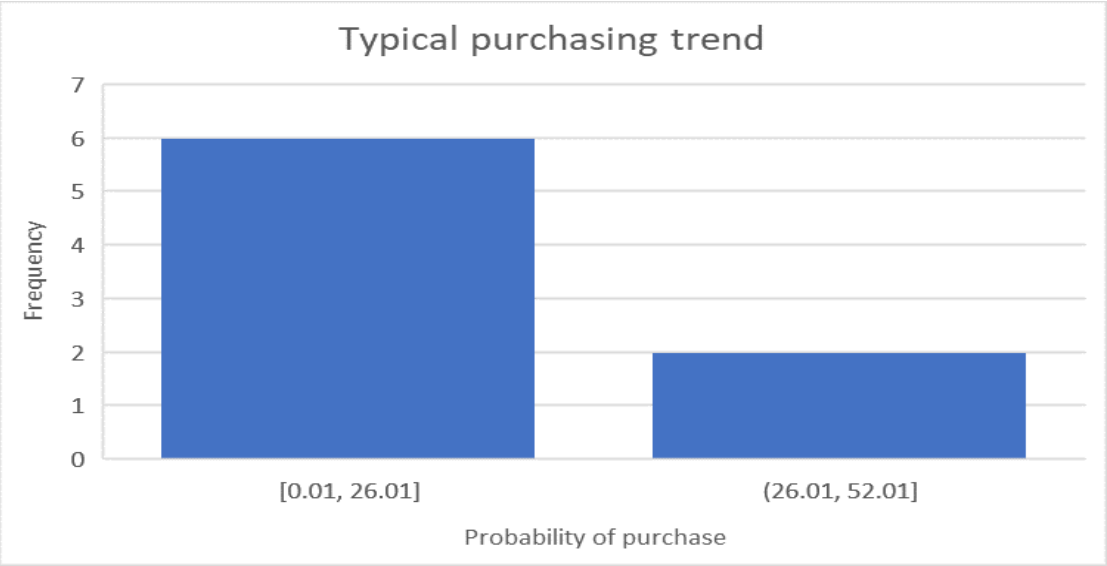

Fig. 5.17 : Purchasing trend in Mobile accessories

Figure 5.17 This study analysed mobile accessory purchasing trends to determine physical property-based merging. The first two are important stakeholders in mobile phones and casings. The remaining six goods have a probability of less than 25% and are heavily sold. You may open a mobile accessory business with eight goods. If you have less money, you can start your shop with headphones and cell phone casings, which make up over 50% of the overall value. The first column lists the essentials, while the second lists supplementary retail accessories. This research calculated frequency and found that only two products- earphones or headphones and smartphone cases, which account for more than 50% of total revenue are enough to establish a mobile accessories shop in India. Business success requires eight products, with 99.9% of purchases covered.

5.4 Success rate of Entrepreneur through Stock market – Startup success

The aim of this study is to conduct an analysis of the stock exchange listings of all ent repreneurs of start-up companies over the past five years. This research explores the complex link between innovation, research, and the success of startup companies in the Indian stock market, focusing on those that reach "unicorn" status—that is, a value of $1 billion or more. Using a unique dataset that encompasses all new listings on the National Stock Exchange (NSE) and the Bombay Stock Exchange (BSE) in the last five years, the study carefully examines the trends and patterns these startups displayed between 2021 and 2023 when they went public.

From a methodological standpoint, the study collects and analyzes large amounts of stock market data from the BSE and NSE in order to try to understand the complex dynamics that are present in the startup scene. The goal of this analytical project is to unearth subtle insights into the variables influencing these emerging businesses' success paths.

Important conclusions drawn from the investigation highlight a range of outcomes seen in initial public offerings (IPOs) in various industries. Successful examples include firms like Mankind Pharma and Nexus Select, which have made significant profits since going public. Such successes are ascribed to a number of things, such as the strong Indian startup scene, an abundance of skilled individuals, and encouraging government programs that promote development and innovation. Furthermore,

promising businesses in industries like healthcare, agriculture, financial services, and logistics are expected to have a big influence on the Indian economy, even outside of the limelight cast by the top 10 unicorns. This study has global implications that go beyond the Indian setting, providing a useful guide for entrepreneurs and governments who want to foster innovation-driven economies. The report promotes encouraging an innovative culture and stressing the critical role that research plays in driving technical developments, employment creation, and economic prosperity.

Through an examination of unicorn businesses' paths, the report highlights the importance of research in fostering sustainable development and highlights the powerful effects of innovation-driven tactics. These results have significant ramifications for all parties involved in the startup ecosystem. They provide them with the information they need to make well-informed choices, create winning strategies, and create an atmosphere that supports businesses' long-term success.

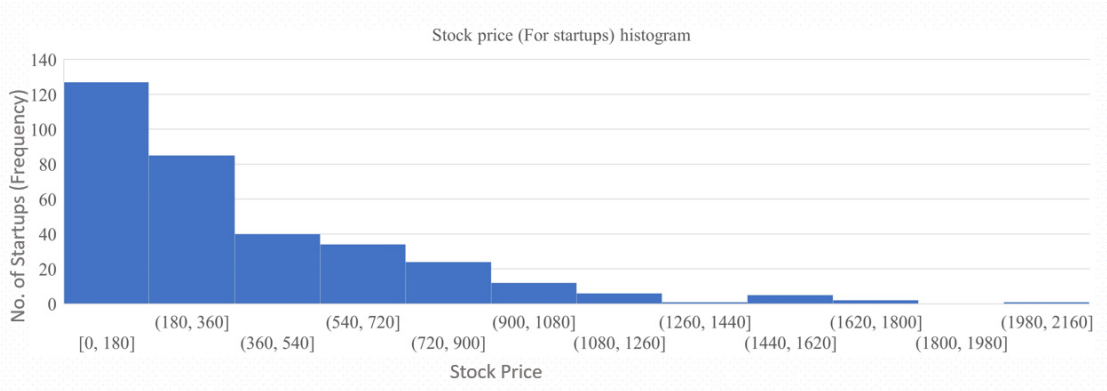

Fig. 5.18 : Histogram for the stock prices of startups (from 2019-2023)

Figure 5.18 The stock exchange statistics for 2021 and 2022-2023 listed IPOs showed startup success tendencies. The Bombay Stock Market and National Stock Exchange listed 49 IPOs in 2021. PayTM, Zomato, and Policybazaar raised considerable funding and were valued at 6,000 to 18000 crores. Others with successful IPOs include Metro Brands, FSN E-Comm, Nykaa, and Windlas Biotech.

A distribution is represented graphically by a histogram. It shows the frequency of each value in a data collection using bars. The vertical axis (y-axis) in Figure 18 displays the frequency (number of startups) within each price range, while the horizontal axis (x-axis) most likely depicts the range of startup stock values (in

rupees) shown in the data. Understanding the distribution of the data, the presence of a central tendency (average price), and if the data is biased toward higher or lower values are all made easier with the aid of this kind of presentation.

In the last five years (2019–2023), startup stock prices have ranged from Rs. 10 to Rs. 2160, with the majority of businesses' stock values lying between Rs. 180 and Rs. 360. The distribution of these prices is shown in further detail in the histogram (Figure 18). It probably indicates that a greater proportion of startups have stock values between Rs. 180 and Rs. 360, indicating that this may be the most typical price range or the center trend. The high-value anomalies, with values beyond the most common range (Rs. 180-360), such as PayTM, Zomato, and Policybazaar.

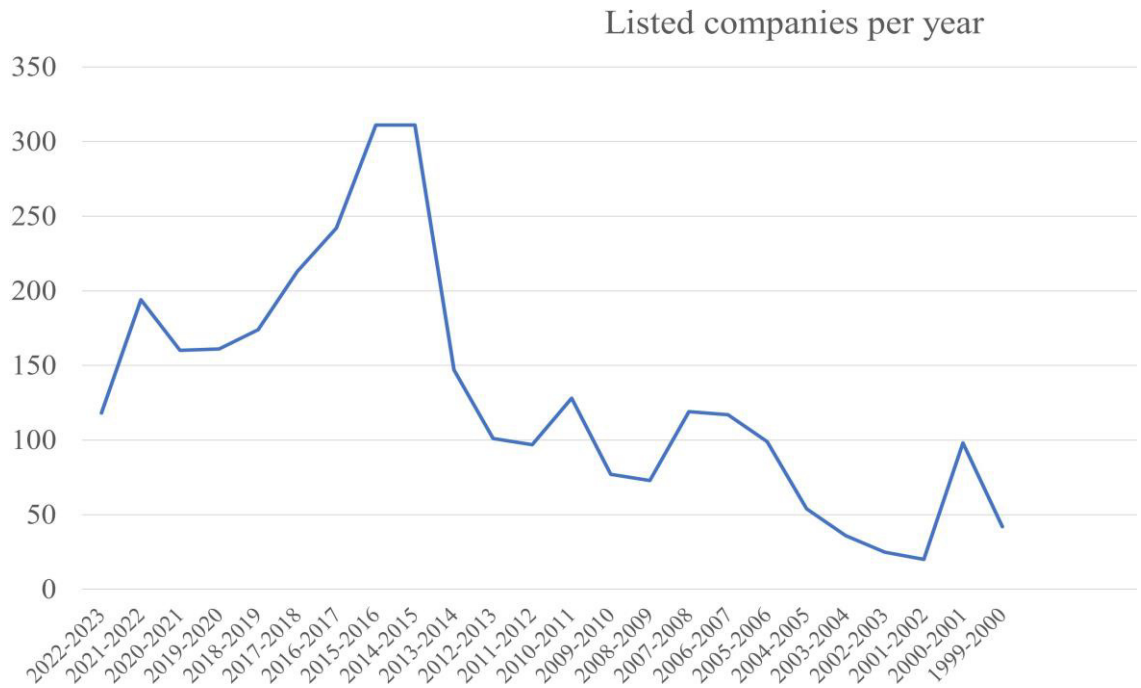

Fig. 5.19 : Company listing trend over last 23-years

Figure 5.19 displays the listed companies from 2000 to 2023 (this 23-year data was collected to assess trends over numerous years). A line graph, which is a graphic depiction of data points linked by a line throughout time, is used to display the data. When it comes to seeing patterns and trends across time, this kind of graph is helpful. **Figure 5.19's** vertical axis (y-axis) most likely depicts the number of businesses listed on the stock market for that year, while the horizontal axis (x-axis) reflects the years 2000 to 2023. The number of listed firms has fluctuated over time, with a notable spike in 2014 and a subsequent period of stability until 2019. It also reveals a drop in

firm listings after 2019, which might be brought on by COVID-19. The trend of business listings over the last 23 years is shown graphically in Figure 19. Listings seem to have increased significantly about 2014, then stabilized for a while until 2019. **Figure 5.19** along with a potential pattern of rising firm listings, which may have been followed by a fall in recent times. It would be beneficial to take into account other economic variables outside of COVID-19 that could have affected firm listing activity in order to get more solid results.

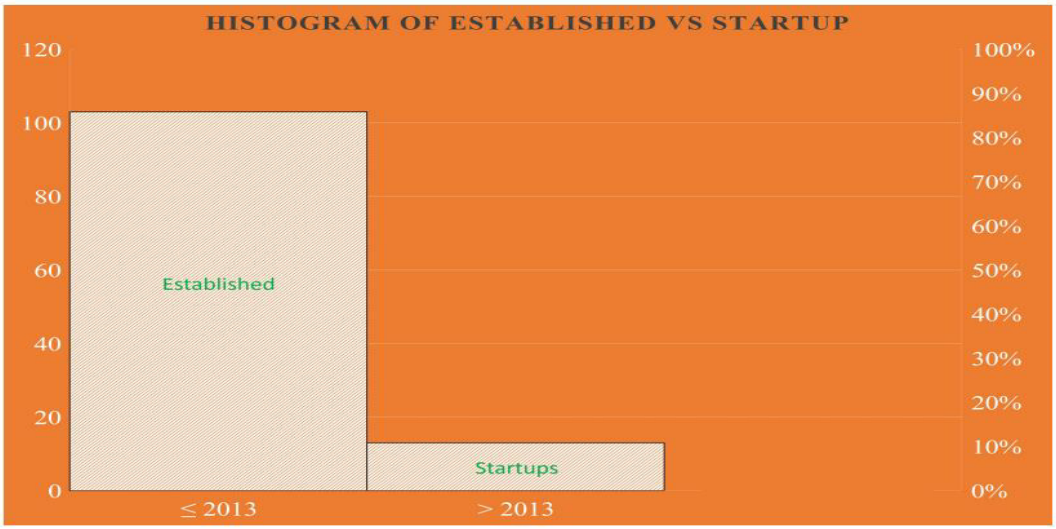

Fig. 5.20 : Histogram of established and startups in the listed companies, over the period of 5 years. X-axis shows start date of company so in 2023 all companies started after 2013 are treated as Startups and rest all are established.

Table 5.3 : Start-up companies listed on stock market

Company name	Foundation Year	Year of listing	Valuation (INR Crore)
Nexus Select	2023	2023	291.88
Udayshivakumar	2019	2023	185.00
Dharmaj Crop	2015	2022	164.40
Electronics Mart India	2018	2022	1689.07
Veranda Learning Solutions	2018	2022	199.92
HP Adhesives	2019	2021	233.00
Latent View	2021	2021	539.00
Fino Payments	2017	2021	348.31
FSN E-Co Nykaa	2012	2021	1,428.55
Nuvoco Vistas	2016	2021	9318.00
Glenmark Life	2011	2021	2123.21
PowerGrid InvIT	2021	2021	324.32
Nureca	2016	2021	42.759
Route	2014	2020	2002.00
Happiest Minds	2011	2020	1216.22
Sterling Wilson	2017	2019	1206.93

Figure 5.20 displays the 5-year histogram of listed firms' established and startup firms. 10% of listed companies are startups; the rest are established. The survey also

indicated that 14% of 2021 businesses will become unicorns within ten years. The stock market valued this group of companies due to their growth and innovation. However, most firms did not become unicorns during this time, highlighting the complexity of startup success and the hurdles many new ventures encounter. The year 2022-2023 had 47 IPOs. LIC, Delhivery, and Pardeep Phosphates were influential IPOs. LIC raised 21008 crores. Despite selling shares at a cheap price (|39 to |42 per share), firms like Pardeep Phosphates gained market interest. Overall, stock market data research revealed firms' journeys to unicorn status. The analysis showed that successful IPOs become unicorns, indicating startup ecosystem development and innovation. The findings also highlight the hurdles many businesses have in reaching similar success, highlighting the need for more research and strategic methods to promote and foster creative stock market startups. Prince Pipes and Fittings Ltd., listed on December 30, 2019, at 178, has performed well. Its listing day gain was -6.40%, as the stock finished at 166.6. The stock price has since risen to 645.5, yielding a 262.64% profit. However, equities like FSN E-Commerce Ventures Limited gained 96.15% on listing day but then fell 88.96%. The research paper also highlights equities like Rolex Rings Limited, which had an issue price of 900 and is now worth 1923.55, a 113.73% profit. Other firms like HP Adhesives Limited and Global Surfaces Limited have faced stock price changes but still managed to stay profitable, gaining 48.03% and 48.18%, respectively. Brookfield India Real Estate Trust and KFin Technologies Limited also saw stock prices drop, with listing day gains of -1.83% and -0.55%, respectively. Overall, the study paper shows the diversified performance of stock market stocks during the given period, demonstrating financial market complexity and uncertainty. It stresses the significance of thoughtful stock investment analysis and decision-making. The data covers July 2022–May 2023. The data comprises company name, listing date, list price, high price, low price, LTP, and trading volume. Stock prices and trading volumes varied widely for various corporations during the period. In particular, on May 11, 2023, Innokaiz India was listed at 148.2 and traded between 147.83 and 163.39 with 350,400 shares. With 105,469 shares traded, Mankind Pharma, launched on May 9, 2023, opened at 1300 and ranged from 1439 to 1355.95. Other firms, including Retina Paints, Sancode Technologies, Avalon Technologies, Exhicon

Events Media, and others, had stock price and trading volume changes. Some companies grew, while others struggled, according to the data. The study paper examines market fluctuations' causes and their effects on investors and businesses. The data shows that certain IPOs have made big gains, while others have struggled. Nexus Select, listed on May 19, 2023, has gained 7% since listing. Mankind Pharma, which debuted on May 9, 2023, has gained 50.57% since its IPO. Some companies have had negative returns. Since listing, Agni Steels, listed on February 14, 2023, lost 4.44%, and Elin Electronics, listed on December 30, 2022, lost 30.85%. The research paper examines the elements that affected these IPOs' stock market success and their effects on investors and corporations. The rise of unicorn businesses in India is a milestone in entrepreneurship. India has 108 unicorn businesses worth above $300 billion as of January 2023. These unicorns demonstrate their rapid growth and ability to alter India's economy and technology. Of the top 10 Indian unicorn firms, Byju's, Flipkart, Paytm, Oyo Rooms, Swiggy, Zomato, PolicyBazaar, Unacademy, and Freshworks have solved major problems for Indians. These startups have created new markets, disrupted industries, and improved millions of lives with creative solutions. Byju's and Unacademy have reinvented education, while Flipkart and Paytm have transformed shopping and digital payments. The vibrant Indian startup ecosystem has promoted innovation and growth, contributing to its success. India's rich talent and government backing for startups through legislative initiatives and financial programs have helped them succeed. India is becoming a global innovation hub, attracting investors and entrepreneurs. Beyond the top 10 unicorns, India has several potential startups in healthcare, agriculture, financial services, and logistics. These firms will boost job creation, technology, and socioeconomic growth in India. These firms could boost India's startup ranking by relentlessly seeking innovative solutions. Startup growth brings hurdles and uncertainties. As they scale, unicorns and promising firms must manage growth, profitability, and competition. The next generation of businesses will need government backing and venture capital investment to grow. In conclusion, India's unicorn startup boom shows its innovation and entrepreneurship prowess. India might lead the global startup ecosystem with these startups' success. With a strong startup culture, talent access, and supporting laws, India is prepared to continue its innovation path and contribute to the Indian economy and the world.

5.5 Success rate of Entrepreneur through Patent publication and granting

The study looks at the relationship between patent filings and innovation in India. It makes the hypothesis that there is no connection (null hypothesis H0) between these two variables. On the other hand, the alternate hypothesis (H1) suggests that there is a relationship between the quantity of patents filed by profitable business owners and their level of success. The study investigates innovation levels by evaluating patent filings together with other affecting variables including research and development spending, educational access, and governmental regulations. It does this by using patent data from the India Patent Office from 2019 to 2022. The results show a positive relationship between innovation and patent filings, suggesting that higher levels of innovation follow increases in patent filing activity. The modest strength of this link, however, indicates that innovation is driven by a variety of variables in addition to patent filings.

The research highlights the role that patents play in innovation, but it also highlights the necessity for an all-encompassing approach to innovation policy that goes beyond just encouraging patent applications. It highlights the rising tendency in both published and granted patents by interpreting a bar graph showing patent application patterns during the research period using mathematical analytic methods. The research does, however, concede that more information is required to ascertain the application success rate and provides a circumspect analysis of the graph's meaning.

In order to identify spatial patterns and variations in the data, the paper also explores potential mathematical analysis methods for interpreting a state-by-state colored map of India with labeled values. These methods include descriptive statistics, choropleth map analysis, and spatial autocorrelation analysis. In conclusion, it looks at a pie chart that shows how various businesses are distributed within Patents Granted in India. It offers descriptive statistical techniques to evaluate the information on the chart, but it also notes its limits and takes into account a more thorough interpretation.

Finally, using rigorous mathematical analytic approaches supporting the interpretation of pertinent data visualizations, the research provides insightful information on the relationship between patents and innovation in India.

This research delves into the relationship between innovation and patent filings in India, analyzing data from the India Patent Office from 2019 to 2022. It further explores the distribution of patents across both states and technological domains.

The number of patent applications and entrepreneur success have a very strong positive link, as seen by the correlation coefficient of 0.974. This indicates that there is a tendency for the number of patents filed to rise dramatically in tandem with the success rate of entrepreneurs.

The p-value of 1.95e-06, which is extremely low and much less than the usually accepted significance level of 0.05, indicates that the observed association is statistically significant.

The remarkably low p-value and the extremely high correlation coefficient lead to the acceptance of the alternative hypothesis (H1) and the rejection of the null hypothesis (H0).The alternative hypothesis that successful entrepreneurs are more likely to submit patents is supported by a statistically significant positive correlation between the number of patents filed and the success of entrepreneurs.

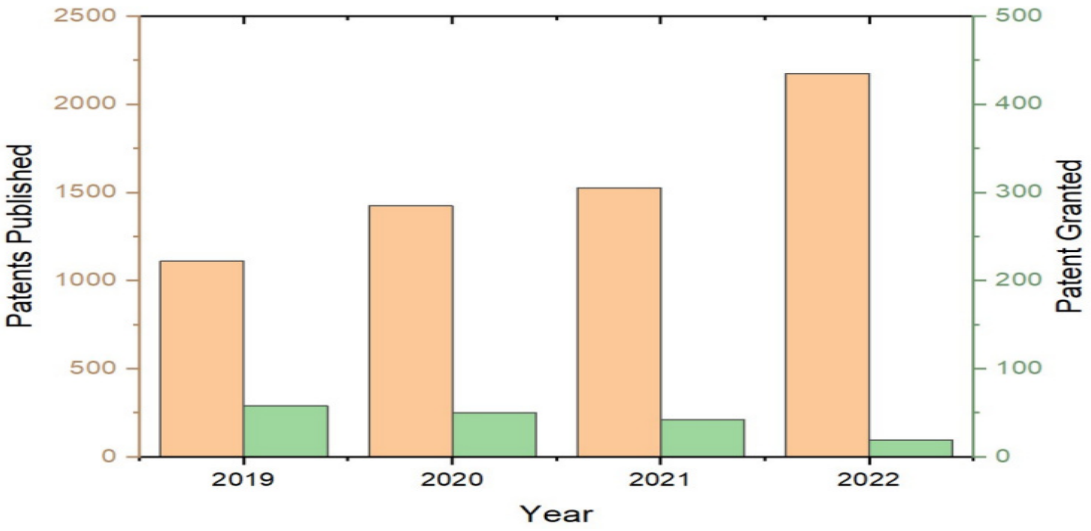

Fig. 5.21 : A Bar Graph illustrating the number of Patents Published and Granted in India between 2019 and 2022

Our investigation showed numerous noteworthy findings: Difference between Published and Granted Patents: The quantity of technical product patents published vs. granted is significant. This highlights the difficulty of patent application-to-grant. Indian patent publication and award trends are shown in the **Figure 5.21** bar graph

(2019–2022). The left y-axis shows patents published, the right y-axis shows patents issued, and the x-axis shows years. From 1109 in 2019 to 2175 in 2022, patent publication increased steadily. However, patents awarded rapidly declined, from 58 in 2019 to 19 in 2022. The difference between published and granted patents indicates a rising inequality in India's patent ecosystem. Several factors may cause this:

Increased Patent Applications: The increased quantity of patent applications strains the patent examination process, which may delay patent approvals. In recent years, India's patent examination procedure may have become more difficult and lengthier, delaying patent grant decisions.

Increased Rejections: India has strict patent approval requirements. The rising number of rejected applications may be lowering patent grants. Finally, the growing discrepancy between published and granted Indian patents is worrisome. Innovation and technological advancement need to address root causes. The government has begun to improve the patent assessment process, but more is needed to promote innovation and develop technology in India.

Company vs. Individual Patents: Company-held patents exceed individual patents, showing a bigger corporate presence in patents.

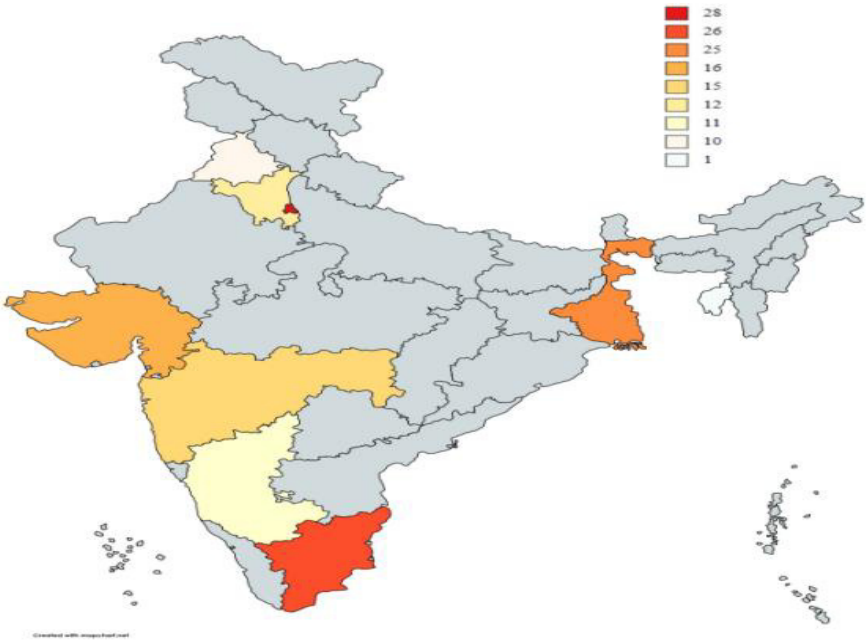

Fig. 5.22 : A Map Illustrating the Trends in Patents Granted in India Between 2019 and 2022

Statewise Trends: Map in **Figure 5.22 shows** Delhi, a manufacturing and sales hub, led patent filings. Tamil Nadu and West Bengal followed closely, while Tripura had the fewest patents.

Technical Domains: Mechanical, Computer, and Chemical Engineering dominated patent filings, demonstrating their importance in innovation.

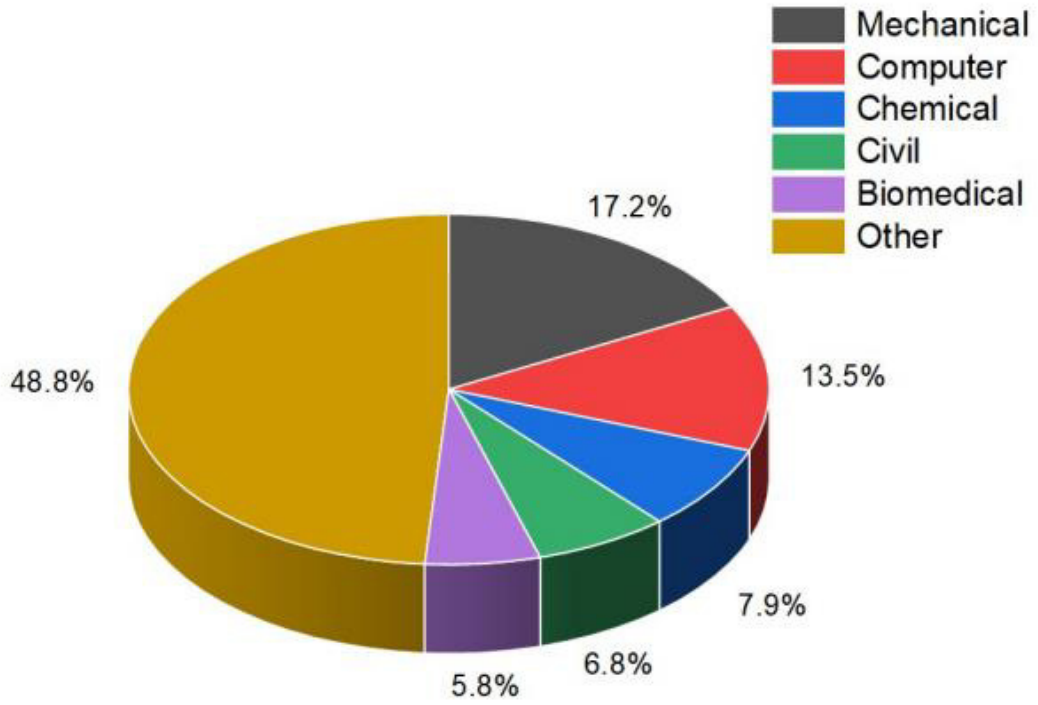

Fig. 5.23 : A Pie Chart Illustrating the Diversity of Innovation with Respect to Engineering Sectors for Patents Granted in India between 2019 and 2022

Figure 5.23 pie chart depicts India's 2019–2022 engineering patent proportion. The "Other" category, which covers electrical, electronics, and materials engineering, received 48.8% of patents. Mechanical engineering received 17.2% of patents, followed by computer (13.5%), chemical (7.9%), civil (6.8%), and biological (5.8%). Despite the diversity of engineering innovation in India, the "other" category accounts for roughly half of all engineering patents, highlighting the need for targeted support in certain engineering disciplines. This includes encouraging innovation in electrical and electronics engineering to boost India's economy.

Our investigation found a significant link between Indian patent filings and grants from 2019 to 2022. Innovation increased with patent filings. Variables other than

patent applications influence innovation, as indicated by the moderate correlation. This includes R&D funding, education quality, and favorable government policies. This research also acknowledged that patent numbers cannot capture India's diversified innovation scene. These findings highlight the complicated relationship between patent applications and innovation, underscoring the complexity of innovation ecosystems and the necessity for holistic policy.

5.6 Survey - Startup Owners

The purpose of this research is to investigate the dynamics of Mumbai's startup ecosystem in order to provide a thorough overview of the existing situation and pinpoint elements that are essential to enhancing Mumbai's standing as a major global startup center. The study uses a mixed methods approach, integrating quantitative and qualitative data to provide a thorough understanding of the variables affecting Mumbai startup success. Stratified random sampling was used to guarantee a representative sample of startups from a range of sectors and stages of growth. Secondary data was obtained from online platforms and questionnaires with company founders were used in the data collecting process.

The study placed a high priority on ethical research practices, ensuring participant anonymity, confidentiality, and informed permission. It also noted certain drawbacks and difficulties with the selected technique, including possible bias, validity issues, and reliability issues. The study begins with a null hypothesis (H0) that claims there is no link between successful entrepreneurs and the amount of crowdfunding they get, and an alternative hypothesis (H1) that contends there is.

The story of Mumbai's startups revolves on funding dynamics, where crowdsourcing, venture capital, and angel investment have become key players in the city's financing scene. Nevertheless, these financing sources' dynamics, patterns, and the difficulties entrepreneurs confront in obtaining them are intricate and varied.

In the highly competitive world of startups, intellectual property becomes strategically important, protecting ideas and acting as indicators of a company's potential and legitimacy. This study will examine the patent environment in Mumbai, looking at sectoral patterns, patent filing trends, and startup tactics for navigating the complexities of IP protection.

Mumbai's startups are shaped by success variables such as talent availability, networking, and mentoring. This study aims to clarify the significance of networking in Mumbai's competitive environment, the influence of mentoring programs, and the crucial relationship between talent availability and startup success.

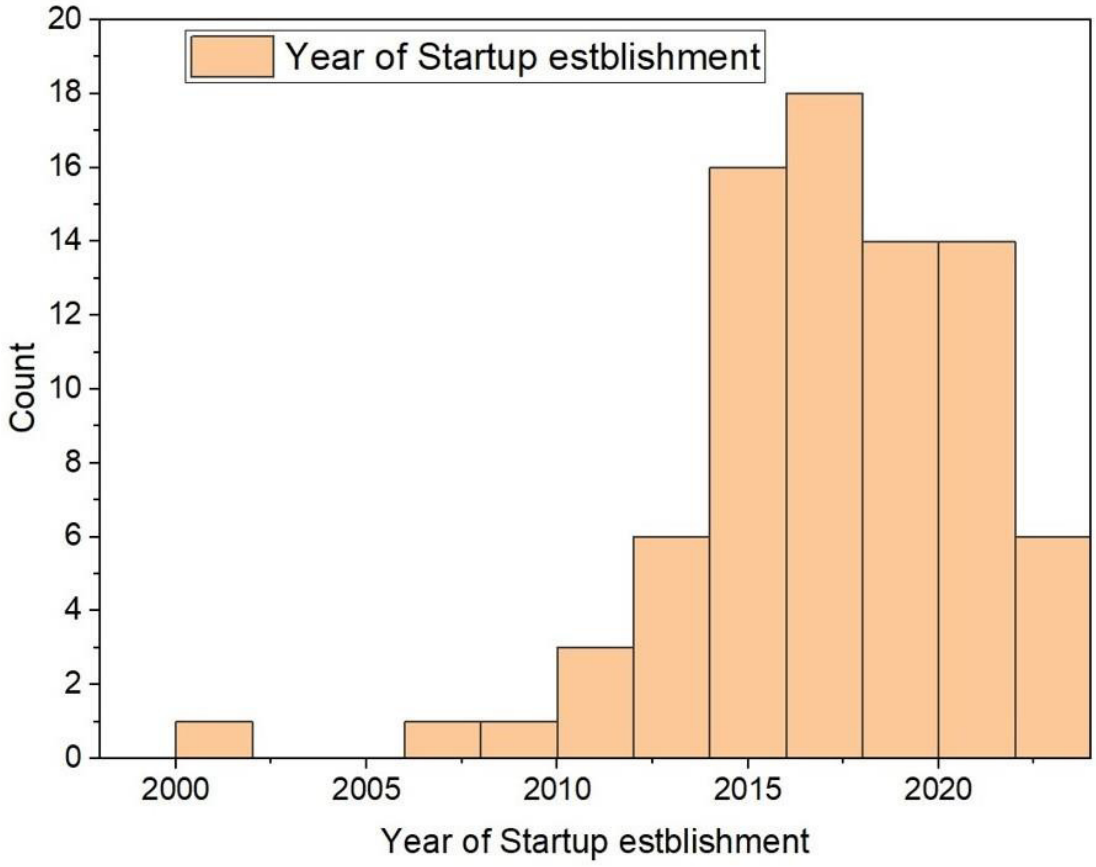

Fig. 5.24 : The bar graph indicates that the majority of startup owners who responded to the survey started their companies in 2010 or later. Out of the 80 companies surveyed, only three referred to themselves as startups before 2010.

Startup Duration: Having founded little more than ten years ago, most firms seem to be rather recent. The number of startup owners who answered the survey is shown in **Figure. 5.24** as a bar graph, classified by the year the firm was founded. Seventy-seven out of eighty respondents said their companies were formed in 2010 or later. Merely three participants said that their firms were founded prior to 2010.

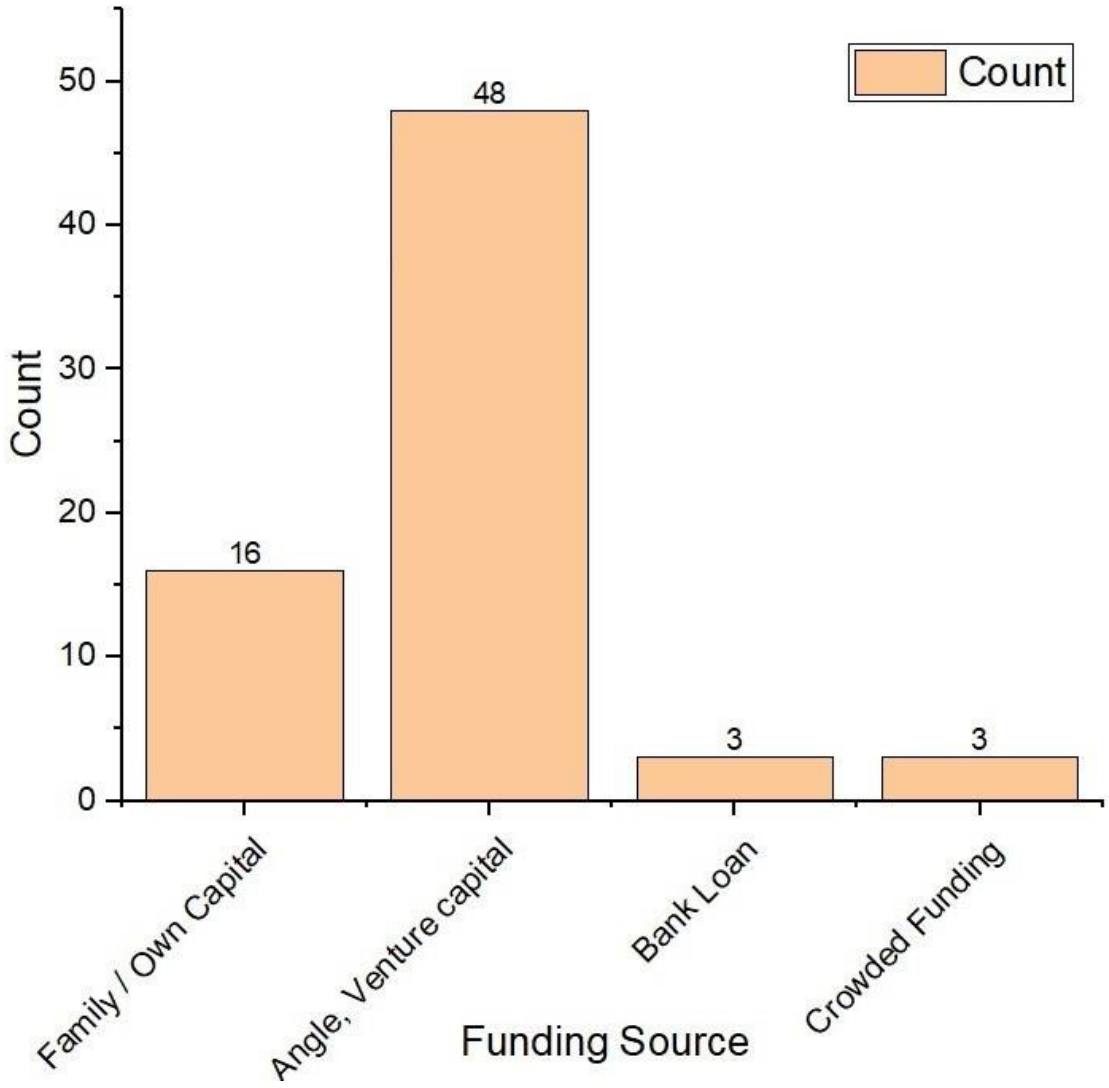

Fig. 5.25 : Startup Funding Sources Distribution Among Survey Respondents

Finance Sources: Family or personal money serves as the main source of finance for most firms. One notable exception is "Tech Cryptors Private Limited," which has drawn venture and angel funding with success.

The financing sources that startups use is shown in the bar graph in **Figure 5.25**, which was provided by company owners in a survey. Remarkably, 16% of the examined firms received investment from family and friends, making them the most common source of funding. This suggests a dependence on personal networks for early finance. Together, angel and venture capitalists account for 48% of startup financing, making them the second most common source. This indicates that professional investors play a big role in the startup ecosystem. With bank loans making up just 3% of total investment, they are a far smaller source than professional

investors and personal networks. This may be because early-stage companies have difficulty obtaining traditional loans. In a similar vein, crowdsourcing accounts for just 3% of financing sources, suggesting that companies do not generally use crowdfunding platforms even if they exist. It is essential to acknowledge that the information shown here is based on a single poll and could not accurately represent the whole startup ecosystem. Still, it provides insightful information about the varied financial environment that entrepreneurs face.

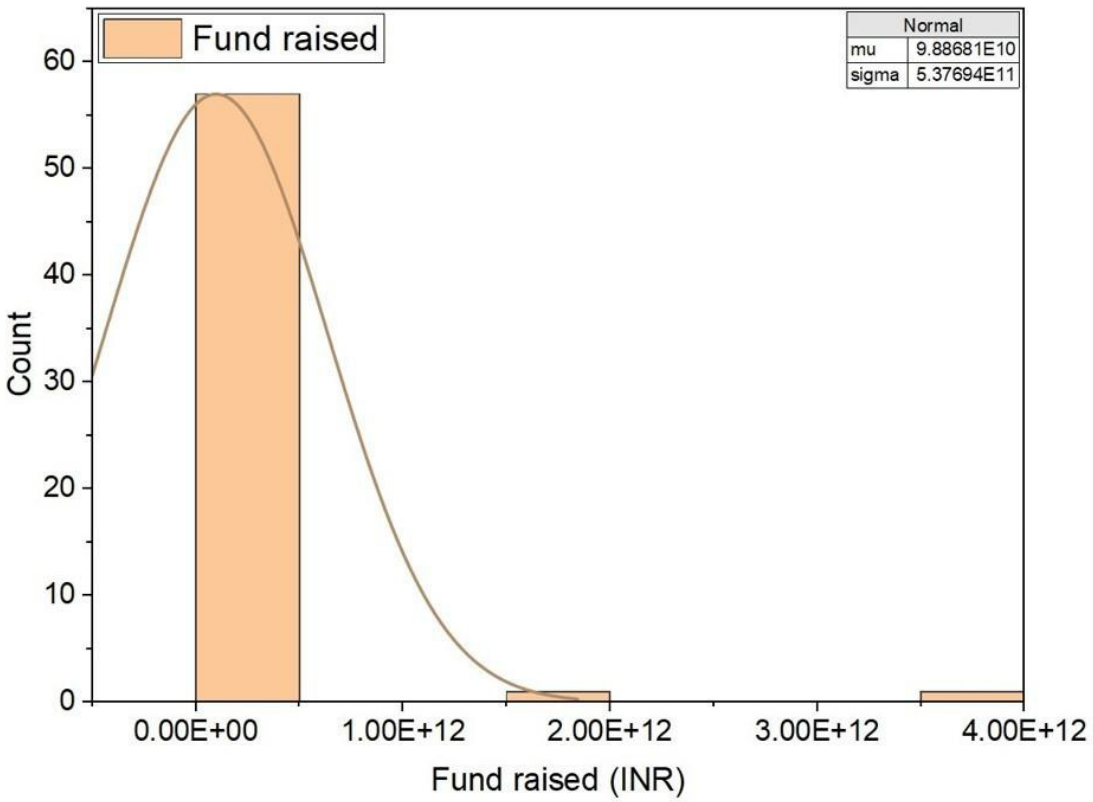

Fig. 5.26 : The bar graph and curve fitting indicate the amount of funds raised by startups. The majority of startups fall below 10 lakhs, while a few have reached up to 4000 billion.

Variability in financing Amounts: The startup cohort's varied financial environments are highlighted by the wide variety of financing sources, which include crowdsourcing, venture capital, and personal or family savings. The money raised by startups is shown in **Figure. 5.26** with a bar graph and curve fitting. While some businesses raise as much as Rs. 4000 billion, the majority are around Rs. 10 lakhs.

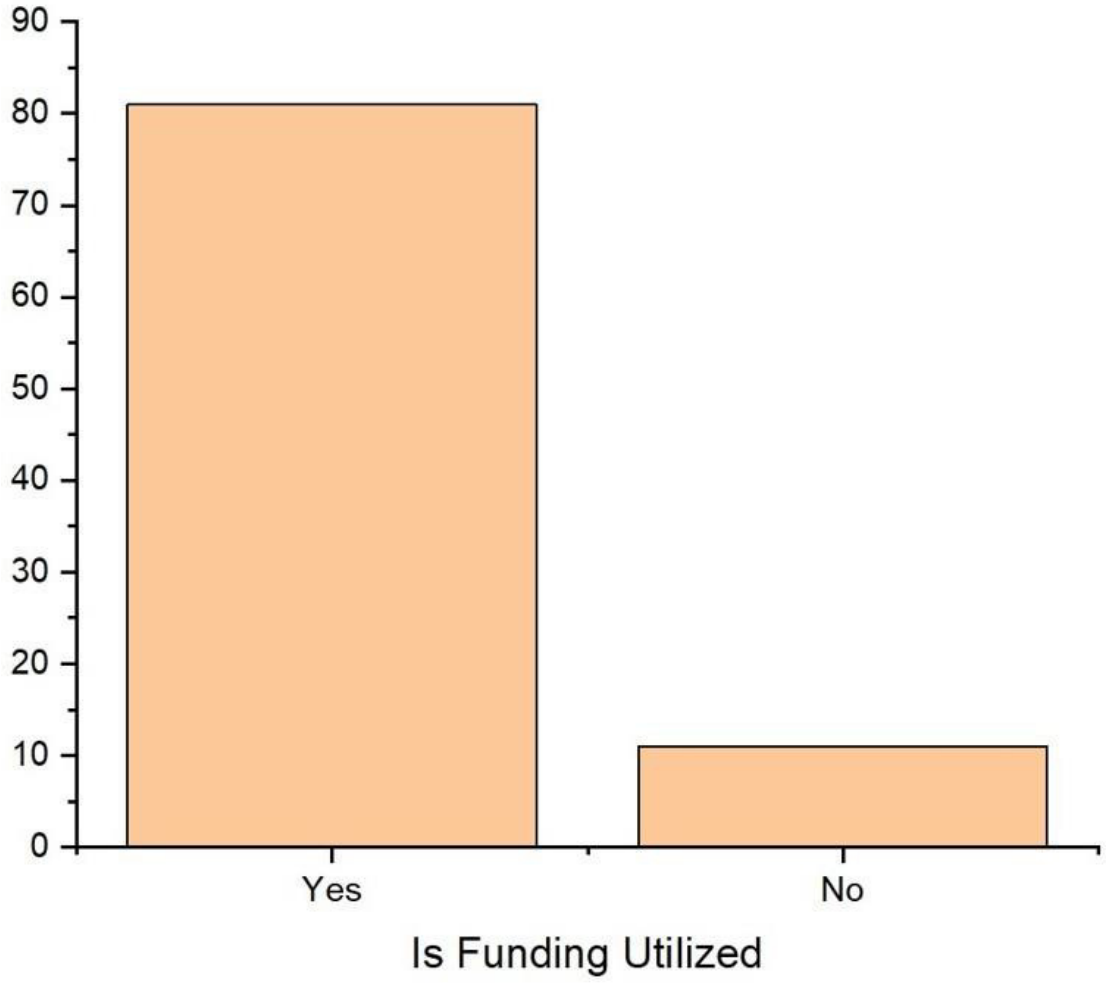

Fig. 5.27 : The bar graph illustrates the utilization of the budget

Funding Utilisation: It's interesting to note that a number of businesses haven't made the most of the capital they've raised. This highlights the need for more research to identify the underlying causes.

The "Teach Us App" and "E-Gefier Technology" are notable for their adept use of crowdsourcing. Though "Av Consultant" did try crowdfunding, the fact that the sum is reported as "000" raises the possibility of a mistake or a failed campaign.

The association between respondents' responses to the question "Is funding utilised?" is shown in **Figure 5.27** bar graph. There is a clear difference in the funding utilisation rates between the "Yes" and "No" respondents.

The percentage of responders that selected "Yes" was 83%. This suggests that a sizable majority of those who were able to get funds were able to devote a significant percentage of it to their projects.

Conversely, those who gave a "No" response used, on average, 12% of their funds. This discrepancy might be due to a number of things, such as not having received financing at first or using a modest amount for early expenses or research. Remarkably, only 5% of respondents did not answer this question.

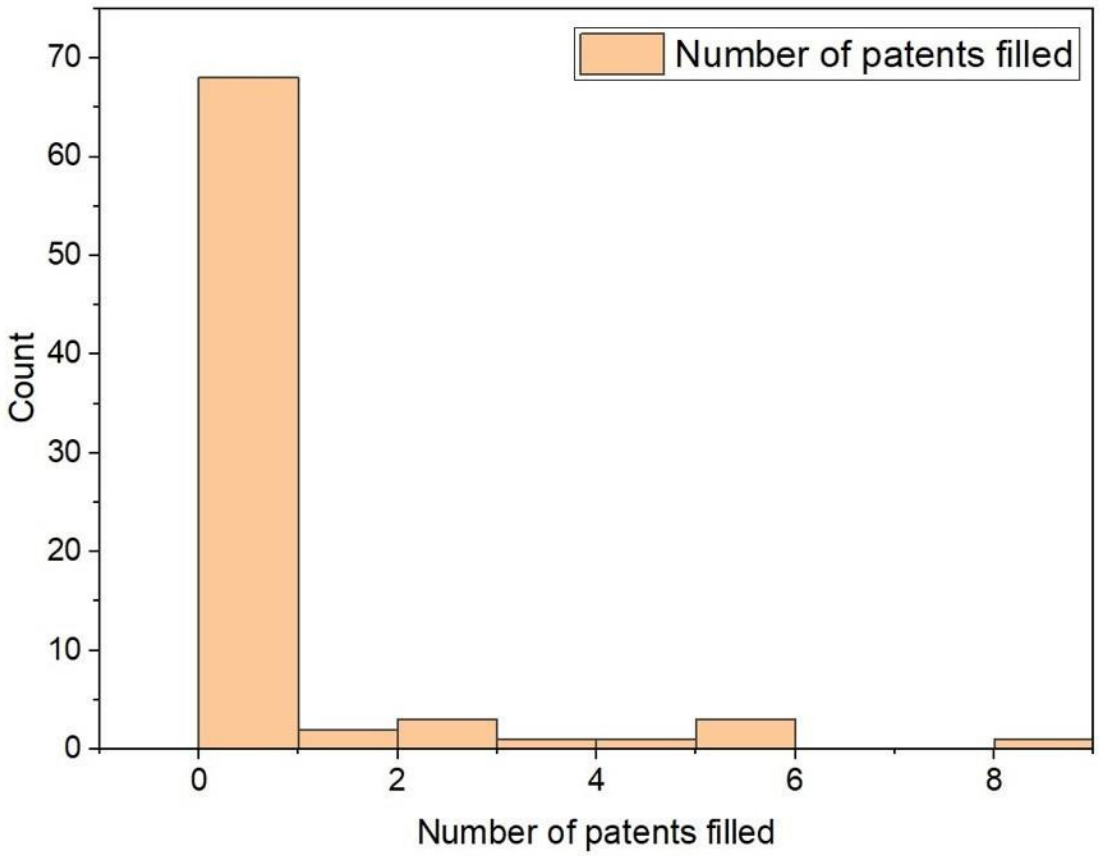

Fig. 5.28 : The bar graph explores the number of patents filed by startups. It was found that almost 67% of companies are not filing patents; conversely, there are a few that have filed up to 8 patents as well.

Patents: "Shri IPR consultancy" sets itself apart by applying for and obtaining over five patents, demonstrating a strong dedication to intellectual property. Conversely, it's possible that other firms have not explored filing patents or that the relevant information is not accessible.

The bar graph in **Figure 5.28** explores the number of patents that startups have filed. According to the research, about 67% of businesses do not register patents; just a small percentage—up to 8%—have done so. "Shri IPR consultancy" distinguishes out

due to its significant number of patent applications that have been approved, demonstrating its dedication to intellectual property.

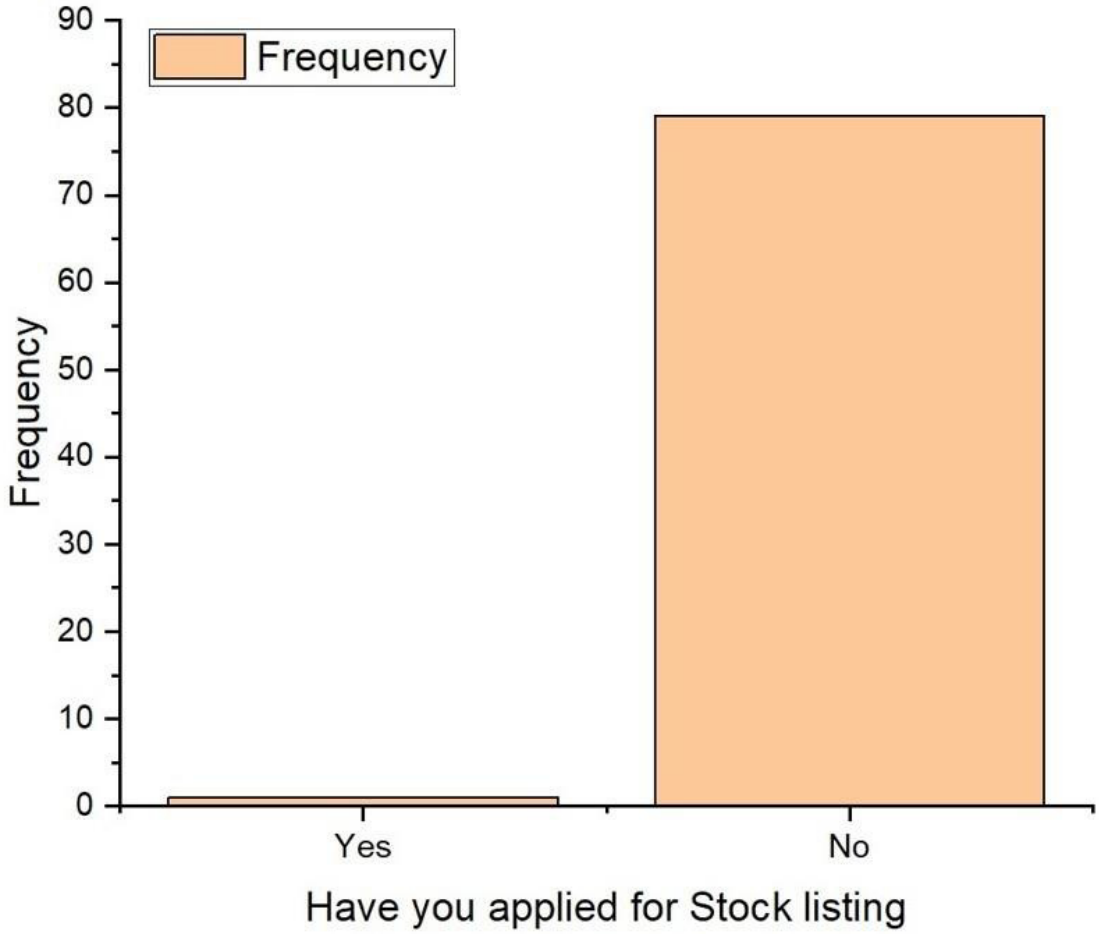

Fig. 5.29 : A bar graph illustrates companies that are eligible and have applied for stock market listing. It was observed that over 80% of startups do not meet the criteria for being listed on the stock market, and they also refrain from applying, preferring to retain full control of their companies.

Public Listing: It seems that there are currently no intentions to go public since none of the companies in the dataset have started the process of being publicly listed.

Date of IPO:

Since no company offers an IPO date, it is clear that none of them have gone through the process of being listed on a public exchange.

A bar graph showing the firms that are qualified and have applied for stock market listing is shown in **Figure 5.29**. According to the observation, more than 80% of companies don't meet the requirements to be listed on a public exchange.

Furthermore, some firms decide not applying in order to keep total control over their businesses.

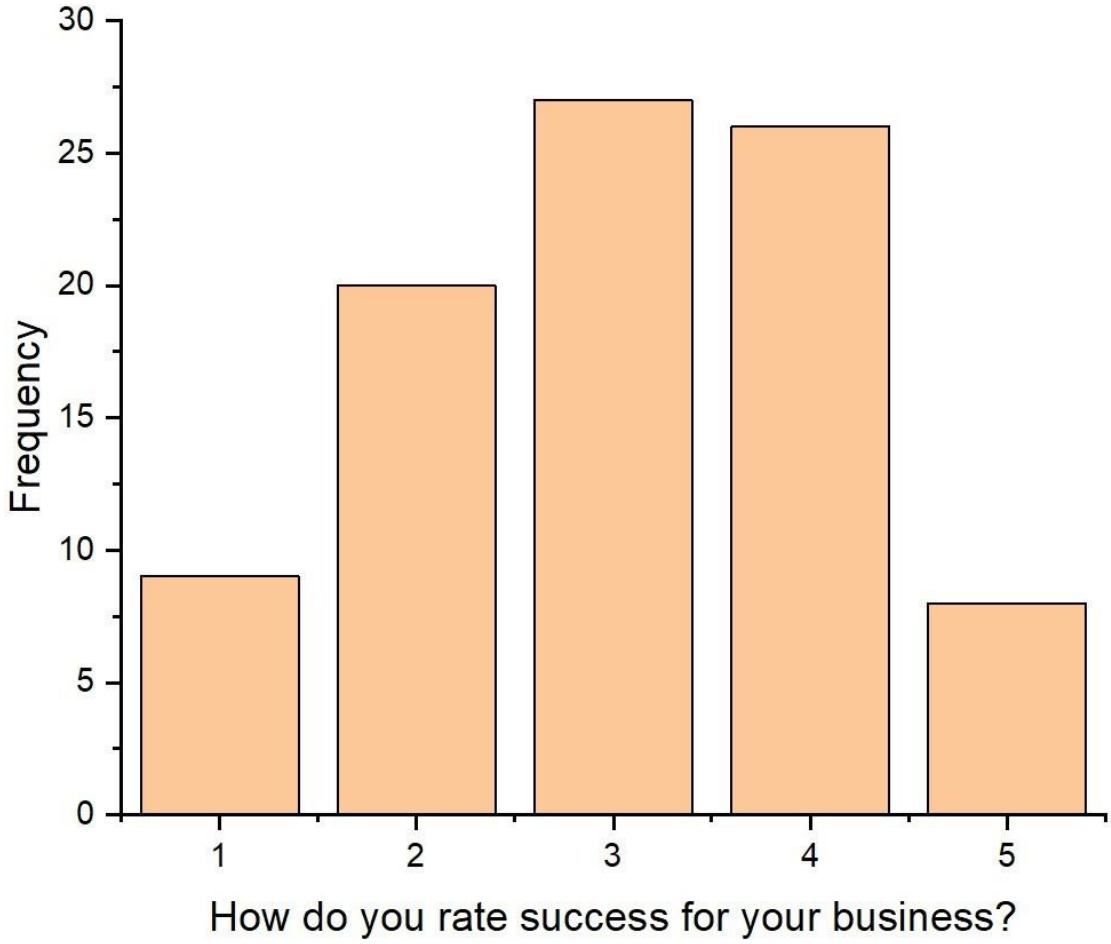

Fig. 5.30 : Bar graph Indicating success ratio as per the owner's opinion. Rating is between 1 to 5 and distribution is Gaussian. Few think they are successful and few thinks they are un-successful most of them rate themselves between 2 to 4

Success Definition: One noteworthy finding is that each business lacks clearly stated success criteria, which makes it difficult to determine success consistently across the board.

The industries:

The companies are diverse across a range of areas, including business supplies and equipment, technology and services, and others.

The information shown in the bar graph in **Figure 5.30** provides insight into how entrepreneurs see the success of their businesses. Founders were asked to rank their businesses from 1 (least successful) to 5 (most successful) on a scale in this survey. A

bell-shaped curve shows that although a lesser percentage of entrepreneurs think they have had notable success (rating 5), a comparable percentage think their initiatives have not gone well (rating 1). Most entrepreneurs rate their businesses between two and four, placing them in the centre.

There are complications with interpreting these ratings, however. The definition of "success" is arbitrary and varies widely throughout individuals. As a result of the lack of a common definition, measuring the performance of startups across various sectors becomes difficult. The research is further complicated by the fact that the data covers a wide range of businesses, including technology, services, and business supplies and equipment.

The study's main conclusions include the wide range of businesses represented in the startup scene, the diversity of founders' views of success, and the challenge of standardising success across industries.

Future-focused, significant queries come up. What standards do entrepreneurs use to evaluate their own achievements? What effects do elements unique to the sector have on these perceptions? Is it possible to compare subjective self-reported success with more objective performance metrics? Through further exploration of these questions, our research might arrive at a more sophisticated comprehension of the arbitrary yet crucial notion of success in the ever-changing startup landscape.

Fig. 5.31 : The word cloud is created from the responses of startup owners answering domain-related questions.

The startup domain's related keywords are graphically represented by the word cloud in **Figure 5.31** where the magnitude of each term indicates its relative popularity in the dataset. Some terms of note are: "financial services," "technology," "commerce," "education," "human resources," "internet," "learning," "fintech," "edtech," and "services."

The word cloud's collection includes details about the sectors and industries in which startups operate, as well as the technology they utilise and the services they provide. Among the noteworthy observations are:

1. Put Financial Services and Technology Front and Centre: The use of terminology such as "financial technology (fintech)" suggests that there are a lot of companies that are using technology and financial services to create innovative goods and services.
2. Diverse Range of businesses: Words like "internet," "human resources," "education," and "commerce" imply that the dataset include startups from a wide range of businesses.
3. Emphasis on Services: Terms like "human resources" and "services" suggest that a large number of companies in the dataset provide services to customers directly or to other enterprises.
4. Emerging Trends: The term "edtech" appears in the dataset, indicating that it may also include companies in rapidly growing industries like education technology.

Essentially, the word cloud provides an overview of the most common themes and patterns in the startup industry, which is indicative of the dataset's particular emphasis. It's important to understand that certain phrases may not be entirely indicative of the startup ecosystem as a whole; rather, their prevalence may reflect the specific focus of the dataset that was utilized.