

ABSTRACT

Crowdfunding has emerged as a transformative tool for entrepreneurial financing, enabling individuals and organizations to secure funding through online platforms. This study examines the critical success factors influencing crowdfunding campaigns, particularly on Kickstarter, by analyzing datasets from 2021 to 2024. Key variables such as backer count, campaign category, funding goal, pledged amount, and success rate were explored to identify patterns that contribute to successful fundraising.

A Mann-Whitney U test revealed a statistically significant difference in the amount of funds raised between successful and unsuccessful campaigns ($p < 0.05$), highlighting that successful projects secure substantially higher funding. Additionally, a Kruskal-Wallis H test confirmed significant variations in fundraising success across different campaign categories ($p < 0.05$), indicating that certain sectors perform better than others. A detailed scatter plot analysis further demonstrated that lower goal amounts tend to increase the likelihood of success, as many campaigns fail to meet high funding targets.

The findings provide valuable insights for campaign creators, investors, and platform administrators by emphasizing the importance of goal setting, category selection, and realistic funding expectations. This research contributes to the growing field of crowdfunding analytics and offers data-driven recommendations to enhance campaign success rates.

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CHAPTER 1

INTRODUCTION

The research project titled "**Critical Success Factors of Crowdfunding Platforms: An Analytical Study**" aims to explore the key determinants that influence the success of crowdfunding campaigns. By analyzing Kickstarter and Indiegogo datasets from 2021 to 2024, this study examines how factors such as backer count, funding goals, pledged amounts, campaign categories, and duration contribute to the likelihood of campaign success or failure.

Utilizing statistical methods and data visualization techniques, this research seeks to identify patterns and trends that distinguish successful campaigns from unsuccessful ones. The findings will provide data-driven insights for entrepreneurs, campaign creators, and platform operators, helping them optimize their crowdfunding strategies. This study contributes to the broader understanding of digital fundraising dynamics, offering practical recommendations to enhance campaign success rates in the evolving crowdfunding landscape.

Crowdfunding is a method of raising funds through small contributions from a large number of people, typically via digital platforms. It is broadly categorized into four types:

1. Reward-based crowdfunding – Backers receive a tangible reward (e.g., products, merchandise) in return for their support.
2. Equity crowdfunding – Investors receive equity shares in the venture they are funding.
3. Donation-based crowdfunding – Contributions are made without expecting anything in return, commonly used for charitable causes.
4. Debt-based crowdfunding (Peer-to-Peer Lending) – Investors provide loans that are repaid with interest over time.

Among the numerous crowdfunding platforms available, Kickstarter and Indiegogo are two of the most prominent, particularly in the reward-based crowdfunding category. These platforms have helped numerous startups, creative projects, and technological innovations gain financial support from a global audience.

Kickstarter

Kickstarter, founded in 2009, is one of the largest and most well-known crowdfunding platforms. It primarily supports creative projects in categories like technology, arts, film, music, and gaming. Kickstarter operates on an "All-or-Nothing" funding model, meaning that if a campaign does not meet its funding goal within the set time frame, the backers are not charged, and no funds are collected. This model reduces risk for backers while ensuring that creators have enough resources to fulfill their project commitments.

Since its inception, Kickstarter has funded thousands of successful projects, with some of the most famous including the Pebble smartwatch, Oculus Rift VR headset, and Exploding Kittens card game. However, not all projects reach their goals, and understanding the factors that contribute to success or failure is essential.

Indiegogo

Indiegogo, launched in 2008, is another leading crowdfunding platform known for its flexible funding model. Unlike Kickstarter, Indiegogo allows creators to opt for either:

- Fixed funding: If the goal is not met, backers get their money back.
- Flexible funding: The creator keeps the funds raised, regardless of whether the target is met.

Indiegogo supports a broader range of projects, including technology, film, social impact, and even personal fundraising causes. The platform has helped fund notable innovations such as the Flow Hive (beekeeping technology) and Solar Roadways.

While both Kickstarter and Indiegogo provide unique opportunities for campaigners, their success rates vary based on factors like category, campaign strategy, backer engagement, and external market conditions. This study aims to analyze these variables systematically and identify the key determinants of success across both platforms.

CHAPTER 2

REVIEW OF LITERATURE

A comprehensive understanding of the factors influencing crowdfunding success is essential for campaign creators, investors, and platform operators. Existing research highlights that crowdfunding success is multifaceted, shaped by project quality, social capital, strategic planning, and contextual factors.

Liu, Ben, and Zhang (2016) examine the determinants of crowdfunding success, emphasizing the role of a fundraiser's human capital, project location, team size, and investor behavior. Their study finds that fundraisers with strong experience and extensive networks are more likely to achieve their funding goals. Additionally, campaigns based in regions with a robust entrepreneurial ecosystem and those led by larger, well-coordinated teams tend to perform better. Investor behavior, shaped by social networks and previous investment experiences, further influences funding decisions. Koch and Siering (2015) take a holistic approach to crowdfunding success, analyzing not only individual success factors but also their interrelations. They propose a research model demonstrating that the interplay between these factors significantly impacts funding outcomes. Their study underscores the importance of considering crowdfunding success as a result of multiple interconnected variables rather than isolated influences.

In a subsequent study, Koch and Siering (2016) further explore the characteristics of successfully funded projects across various crowdfunding platforms. They identify three key factors: project quality, social media presence, and timing. High-quality campaigns with well-structured descriptions, compelling visuals, and realistic funding goals tend to attract more backers. A strong social media presence enhances visibility and engagement, increasing the likelihood of success. Additionally, the timing of a campaign launch, particularly during peak online activity periods, contributes to better funding outcomes.

Focusing on a niche domain, Hou, Wu, Chen, and Zhou (2021) conduct a systematic review of medical crowdfunding campaigns, identifying unique success factors in the healthcare context. Their study finds that clear communication of medical conditions, urgency of funding needs, and the strength of the patient's social network play a critical role in campaign success. Transparency regarding the use of funds and regular updates to donors also enhance credibility and encourage contributions. While medical crowdfunding shares common success factors with other types of crowdfunding, the emotional appeal and ethical considerations are particularly pronounced in this sector.

Together, these studies demonstrate that crowdfunding success is not determined by a single factor but by a combination of elements that work in tandem. Understanding these dynamics—whether in general crowdfunding campaigns or specialized domains like medical crowdfunding—can help campaign creators optimize their strategies and improve funding outcomes across different platforms.

CHAPTER 3

DATA DESCRIPTION

This research study leverages comprehensive datasets from two of the most prominent crowdfunding platforms, Kickstarter and Indiegogo, to analyze the critical success factors that determine the outcome of crowdfunding campaigns. The datasets span multiple years and provide insights into the characteristics of successful and unsuccessful campaigns across different categories. The following section provides a structured overview of the datasets, their key variables, and the preprocessing steps undertaken to ensure data quality.

3.1 Kickstarter Dataset

The Kickstarter dataset used in this study contains campaign-level data from 2011 to 2024, covering thousands of campaigns launched globally. Kickstarter operates on an "All-or-Nothing" funding model, meaning that campaigns only receive funds if they meet or exceed their goal amount.

The dataset consists of the following key variables:

- **Backers Count:** The total number of people who contributed to a campaign. This variable helps in understanding the role of community engagement in campaign success.
- **Main Category:** The primary category of the campaign (e.g., Technology, Arts, Games, Music, Film, Publishing, etc.). Campaigns are grouped into categories that reflect their nature and target audience.
- **Goal:** The amount of money the campaign creator set as the funding target. This variable indicates the financial expectations of the project.
- **Pledged Amount:** The total amount of funds pledged by backers during the campaign period. This variable helps assess the financial performance of campaigns.
- **State:** The final outcome of the campaign, classified as either:
 - "Successful" – The campaign reached or exceeded its funding goal.
 - "Failed" – The campaign did not meet its funding goal.
- **Year:** The year in which the campaign was launched. This variable allows for a time-based analysis of success trends.

3.2 Indiegogo Dataset

The Indiegogo dataset contains campaign-level data from multiple years. Indiegogo differs from Kickstarter as it offers both Fixed (All-or-Nothing) and Flexible (Keep-What-You-Raise) funding models, making it an interesting platform to study.

The dataset consists of the following key variables:

- **Category:** The classification of the campaign (e.g., Film, Health, Technology, Music, etc.). Categories influence campaign success by attracting different types of backers.
- **Close Date:** The date when the campaign ended. This variable helps analyze seasonality in fundraising trends.
- **Open Date:** The date when the campaign started.
- **Funds Raised Amount:** The total amount of money raised by the campaign (in USD). This is a key indicator of financial success.
- **Funds Raised Percentage:** The proportion of the goal that was achieved, expressed as a percentage.
- **Year:** The year in which the campaign was launched

CHAPTER 4

METHODS AND METHODOLOGY

4.1 Descriptive Statistics

Descriptive statistics provide essential summaries and measures about the dataset, offering insights into the distribution, central tendency, and variability of the data. These measures include mean, median, mode, standard deviation, variance, range, and percentiles, which help in understanding the overall characteristics of crowdfunding campaigns.

In this study, descriptive statistics are used to summarize key attributes of crowdfunding campaigns on Kickstarter and Indiegogo, such as funding goals, amount pledged, backer count and fund raised percentage. By analyzing these measures, the research provides a clear picture of the general trends, dispersion, and distribution of crowdfunding success.

4.2 Correlation Analysis

Correlation analysis is a statistical method used to measure the strength and direction of relationships between two or more variables. The coefficient ranges from -1 to 1, where 1 indicates a perfect positive relationship, -1 indicates a perfect negative relationship, and 0 indicates no linear relationship. In this research, correlation analysis is employed to examine how different factors, such as funding goal, funds raised, number of backers, and campaign success, are related to each other. By using correlation coefficients, the study identifies whether an increase in one variable is associated with an increase or decrease in another.

For example, the relationship between the number of backers and the funds raised is expected to be strongly positive, indicating that campaigns with more supporters tend to achieve higher funding amounts. Similarly, analyzing the correlation between funding goals and success rates helps in understanding whether setting higher or lower funding targets influences the likelihood of campaign success.

This analysis provides valuable insights into the key drivers of crowdfunding success, helping to determine which factors contribute the most to achieving funding goals. Understanding these relationships allows for data-driven recommendations to improve the effectiveness of crowdfunding campaigns.

A correlation heatmap is visualized to highlight significant relationships between variables.

4.3 Non-Parametric Statistical Tests

Due to the presence of skewed distributions and categorical variables, non-parametric tests are employed to analyze differences in campaign success across different groups. Unlike parametric tests, non-parametric tests do not assume normality in data distribution, making them suitable for crowdfunding datasets, which often contain highly variable and non-normally distributed financial data. This research utilizes two widely used non-parametric tests: the Mann-Whitney U test and the Kruskal-Wallis H test, to evaluate differences in campaign success based on backer count and category variations.

The **Mann-Whitney U test** is used to compare two independent groups when the assumption of normality is not met. It assesses whether the distributions of two independent samples differ significantly.

Given two independent samples $X_1, X_2 \dots, X_m$ (of size m) and $Y_1, Y_2 \dots, Y_n$ (of size n), the test statistic U is computed as:

$$U = R_1 - \frac{m(m+1)}{2}$$

where:

- R_1 is the sum of ranks for sample 1.
- m and n are the sample sizes of the two groups.
- The second U statistic is computed similarly for sample 2, and the smaller U value is used.

If both sample sizes are large ($m,n > 20$, $n > 20m, n > 20$), the U statistic approximates a normal distribution, and the Z-score can be used for hypothesis testing:

$$Z = \frac{U - \mu_U}{\sigma_U}$$

The **Kruskal-Wallis H test** is a non-parametric alternative to one-way ANOVA used to compare three or more independent groups. It determines whether there is a statistically significant difference between the distributions of multiple independent samples.

For k independent samples, each with size n_i , the test statistic H is computed as:

$$H = \frac{12}{N(N+1)} \sum_{i=1}^k \frac{R_i^2}{n_i} - 3(N+1) \quad ; i = 1, 2, 3..k$$

where:

- R_i is the sum of ranks for the ith group.
- n_i is the sample size of the ith group.

- N is the total sample size across all groups.

4.4 Data Visualization

Data visualization is a crucial aspect of this research, allowing for the graphical representation of data to highlight patterns, trends, and relationships in crowdfunding success factors. Various visualization techniques, such as bar plots, scatter plots, pie charts, line graphs and heat maps are used to present the findings effectively.

In this study, data visualization is applied to examine key aspects of crowdfunding campaigns on Kickstarter and Indiegogo, including the influence of campaign category, backer count, goal amount, and yearly trends on success rates.

- **Bar plots** are used to compare the success rates of campaigns across different categories, helping to identify which types of projects are more likely to succeed.
- **Scatter plots** illustrate the relationship between the number of backers and the funds raised, showing whether a higher number of supporters significantly impacts the campaign's success.
- **Pie charts** display the proportion of successful and unsuccessful campaigns, providing a clear visual representation of overall success rates.
- **Line graphs** track the changes in success rates over the years (2021–2024), revealing trends and variations in crowdfunding performance over time.
- **Heatmaps** display correlation matrices, helping to identify significant relationships between numerical variables such as backers count, goal amount, and funds raised percentage.

By utilizing these visualization techniques, this study enhances the clarity of statistical results and provides a deeper understanding of the critical factors that contribute to the success or failure of crowdfunding campaigns.

4.5 Software Used

The two software tools employed are **Python** and **Excel**, both widely used for data analysis. Python, with its rich ecosystem of libraries like pandas, NumPy, and scikit-learn, excels in handling large datasets, statistical computing, and machine learning. Excel, known for its accessibility, provides powerful spreadsheet functionalities, built-in statistical tools, and data visualization capabilities, making it a staple for business and financial analysis.

CHAPTER 5

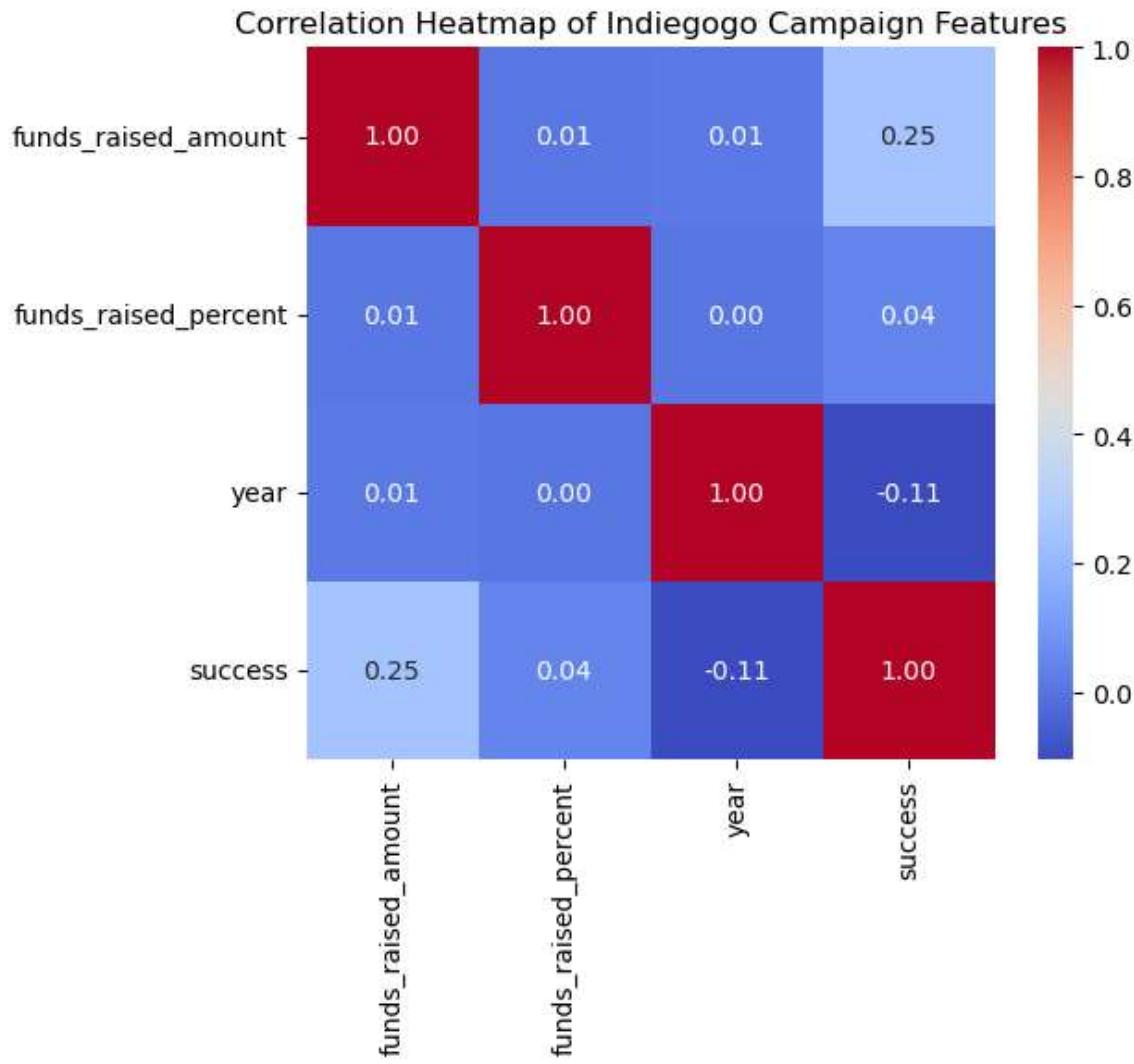
ANALYSIS AND INTERPRETATION

5.1 DESCRIPTIVE STATISTICS

Variables	mean	Standard deviation	minimum	maximum	1st Quartile	2nd Quartile	3rd Quartile
backers count	175.823	1051.39	0	185341	6	35	110
goal	48189.1	1196.04	0	110000	1500	5000	150000
pledged	4643.339	1196.603	0	37932.84	2280	2429	1040
success	619326	485.54	0	1	0	1	1
funds raised amount	33812.29	2826.103	0	198607	15000	709000	3335000
funds raised percentage	1.1124	6.874	1	5.25	0.018	1.04	4.4307

- **Backers Count:** Represents the total number of individuals who contributed financially to a crowdfunding campaign, indicating its popularity and level of public support.
- **Goal:** The target amount of funding that a campaign aims to raise within a specified timeframe, which determines whether the campaign is considered successful or unsuccessful.
- **Pledged Amount:** The total sum of money committed by backers to a campaign, reflecting the financial support received during the funding period.
- **Success:** A categorical variable indicating whether a campaign met or exceeded its funding goal (successful) or failed to do so (unsuccessful).
- **Funds Raised Amount:** The actual amount of money collected by the campaign, which may or may not meet the initially set goal.
- **Funds Raised Percentage:** The proportion of the goal that was achieved, calculated as the pledged amount divided by the goal, helping to assess the relative success of the campaign.

5.2 CORRELATION ANALYSIS



The correlation heatmap of Indiegogo campaign features reveals key relationships among variables. The funds raised amount shows a moderate positive correlation (0.25) with success, indicating that campaigns raising higher amounts are more likely to be successful. However, the funds raised percentage has a very weak correlation (0.04) with success, suggesting that the relative achievement of the funding goal does not strongly determine success. The year variable exhibits a slight negative correlation (-0.11) with success, implying that success rates may have declined over time, though the effect is minimal. Overall, the heatmap suggests that while the total funds raised is a contributing factor to success, other significant determinants might need further exploration.

5.3 NON-PARAMETRIC TESTS

5.3.1 Mann Whitney U test

H0: No significant difference in fund raised amounts between successful and unsuccessful campaigns.

H1: The fund raised amounts are significantly different between successful and unsuccessful campaigns.

Mann-Whitney U Test: Statistic=1300913262.0, p-value=0.0

Inference : Since the p-value is less than 0.05, we reject the null hypothesis, indicating a significant difference in the amount of funds raised between successful and unsuccessful campaigns.

5.3.2 Kruskal Wallis H test

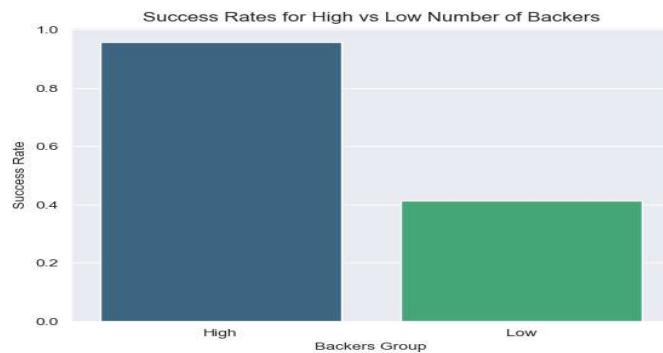
H0: There is no significant difference between amount of fund raised across categories.

H1:There is a significant difference between amount of fund raised across categories.

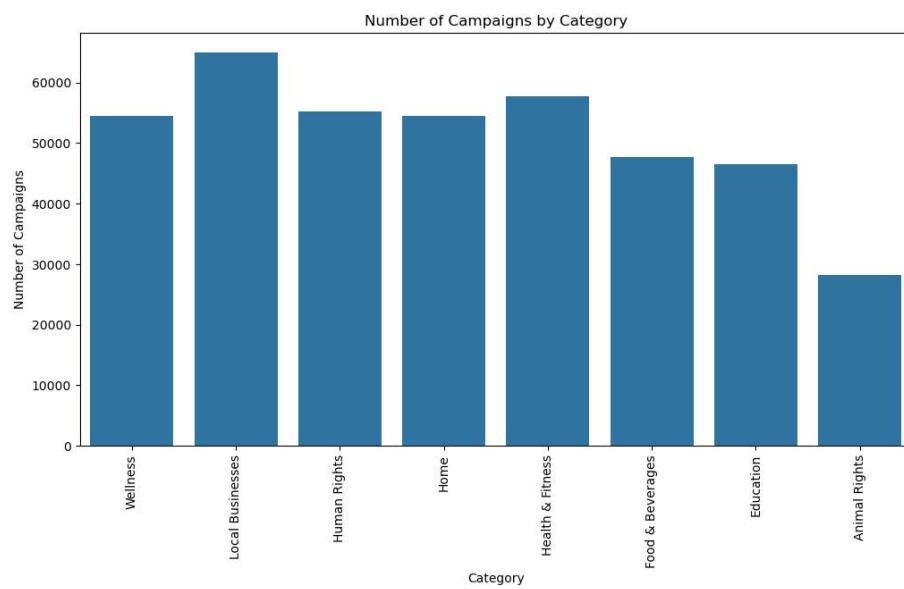
Kruskal-Wallis H Test: Statistic=22378.577979981346, p-value=0.0

Inference : Since p-value is less than 0.05, we reject null hypothesis, indicating a significant difference in fund raised amounts across different categories.

5.4 DATA VISUALIZATION

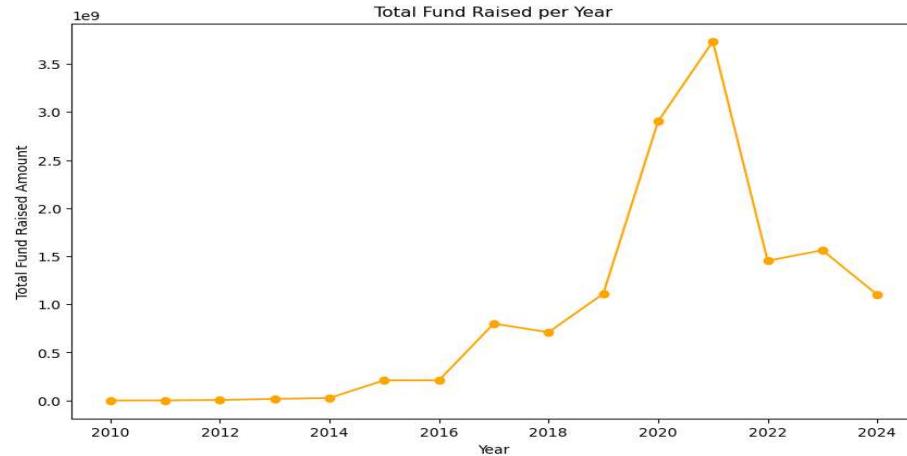


The bar chart indicates a strong relationship between the number of backers and campaign success rates. Campaigns with a high number of backers have a significantly higher success rate compared to those with a low number of backers. This suggests that attracting more supporters is a crucial factor in achieving funding goals, reinforcing the importance of marketing and outreach strategies in crowdfunding success.

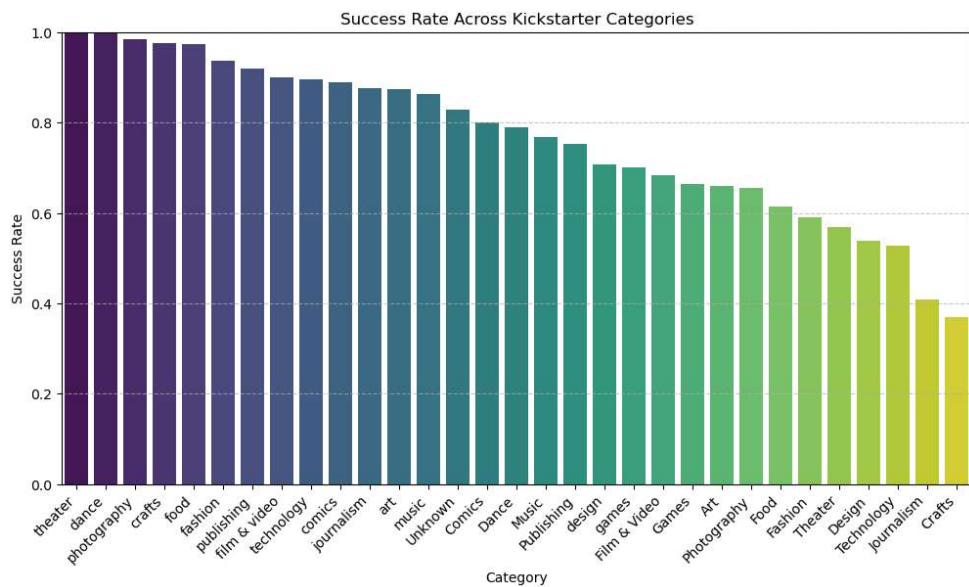


The bar chart illustrates the distribution of crowdfunding campaigns across various categories. Local Businesses have the highest number of campaigns, indicating significant interest in funding entrepreneurial ventures. Other categories such as Health & Fitness, Wellness, and Human Rights also have a large number of campaigns, suggesting

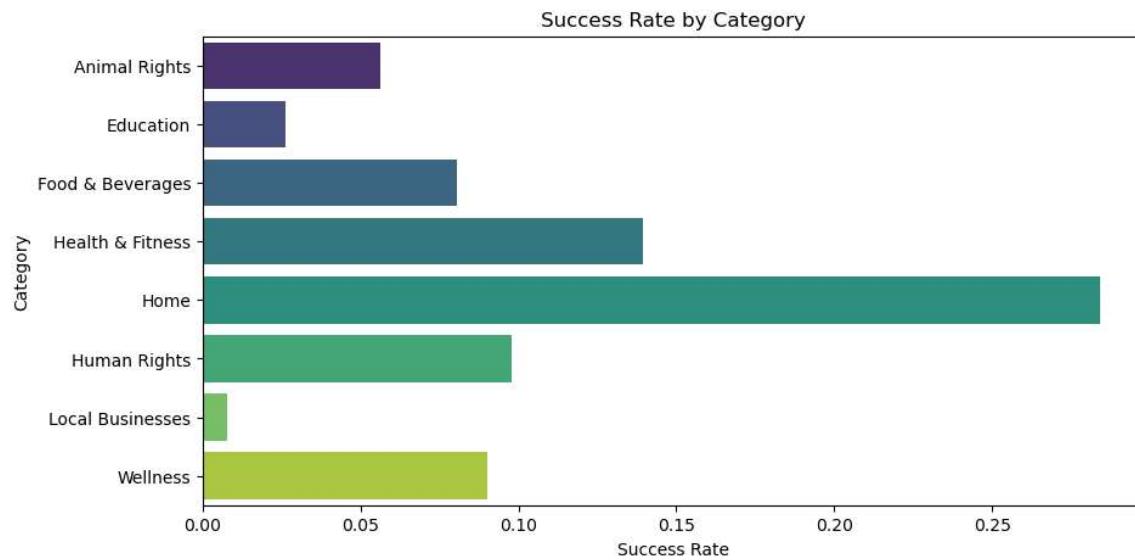
strong public engagement in these areas. In contrast, Animal Rights has the fewest campaigns, implying comparatively lower crowdfunding activity in this category. This distribution highlights sector-specific trends and potential opportunities for targeted crowdfunding efforts.



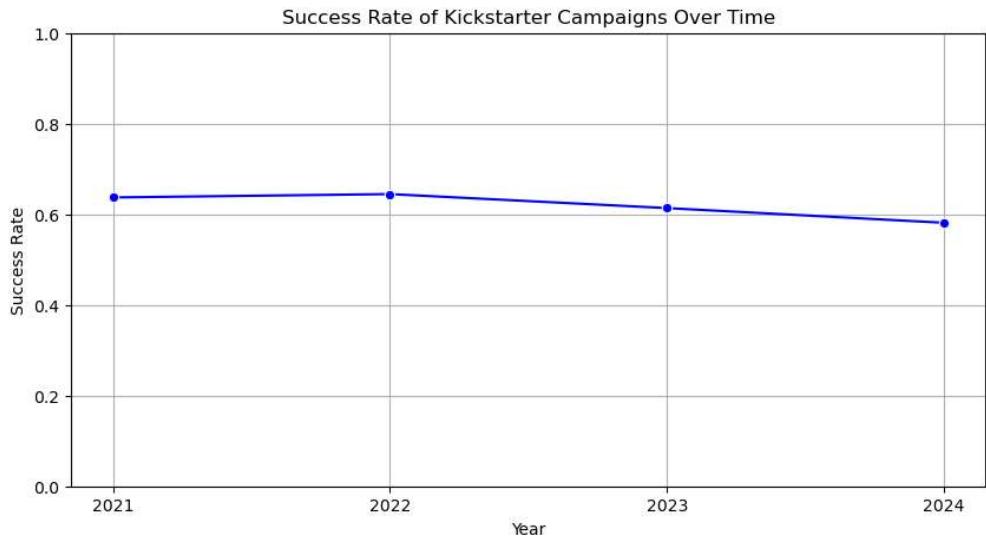
The line chart illustrates the total funds raised per year in crowdfunding campaigns. From 2010 to 2016, the funds raised remained relatively low, followed by a steady increase from 2017 onward. A significant surge is observed between 2019 and 2021, peaking in 2021, likely due to increased crowdfunding activity during the COVID-19 pandemic. However, after 2021, there is a sharp decline, suggesting reduced campaign engagement or shifting economic factors. Despite minor fluctuations, the overall trend indicates growing adoption of crowdfunding over the years, with notable external influences affecting fundraising success.



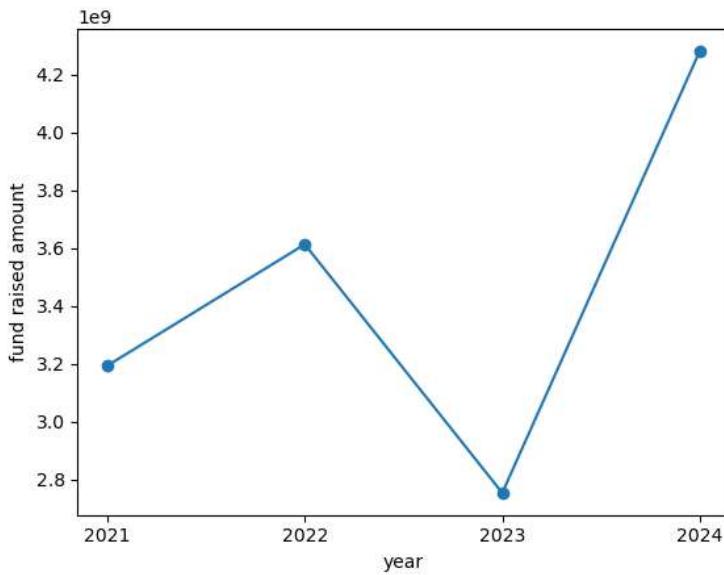
The success rate of Kickstarter campaigns varies significantly across categories. The highest success rates are observed in creative fields like theater, dance, and photography, indicating strong community support for artistic projects. Conversely, categories such as journalism, technology, and crafts have lower success rates, suggesting that these types of projects may face more challenges in securing funding. This pattern highlights the importance of category selection in crowdfunding success.



The success rate of crowdfunding campaigns varies significantly across categories. The "Home" category has the highest success rate, indicating strong support for projects related to housing and living improvements. Other categories like "Health & Fitness" and "Food & Beverages" also show relatively higher success rates. In contrast, categories like "Education," "Local Businesses," and "Animal Rights" have lower success rates, suggesting that these areas may struggle to secure sufficient funding. This insight can help project creators align their strategies to improve their chances of success.

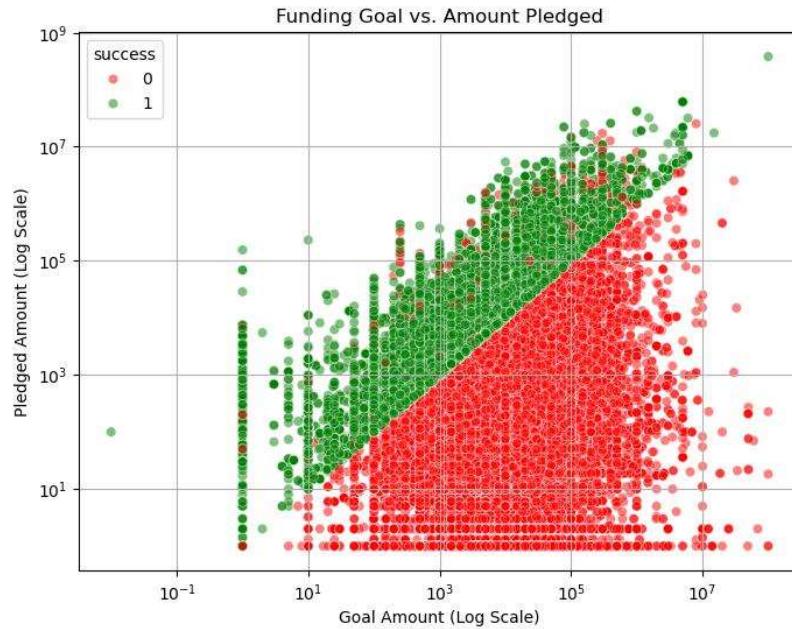


The success rate of Kickstarter campaigns has shown a slight decline from 2021 to 2024. While the success rate remained relatively stable between 2021 and 2022, a gradual decrease is observed in 2023 and 2024. This downward trend may indicate increasing challenges in achieving funding goals, possibly due to market saturation, economic factors, or changes in backer engagement. Future research could explore the reasons behind this decline and identify strategies to improve campaign success rates.



The trend in funds raised on Kickstarter between 2021 and 2024 shows fluctuations. There was an increase in funding from 2021 to 2022, followed by a significant drop in 2023. However, in 2024, there was a sharp increase, reaching the highest funding amount in the observed period. This suggests that while funding success varies from year to year, 2024 saw a strong recovery. The reasons for these fluctuations could be explored further,

possibly linked to economic conditions, changes in campaign strategies, or shifts in backer engagement.



This scatter plot visualizes the relationship between the funding goal and the pledged amount for crowdfunding campaigns, with success indicated by green points and failure by red points. Campaigns with lower funding goals have higher success rates, while those with higher goals face greater failure rates. Successful campaigns cluster around or above the goal-pledged diagonal, highlighting the importance of setting realistic funding targets for crowdfunding success.

CHAPTER 6

CONCLUSION

This study aimed to identify the critical success factors of crowdfunding campaigns on Kickstarter, focusing on trends in success rates, funding amounts, and category-wise performance from 2021 to 2024. By analyzing key variables such as backers count, campaign category, goal amount, pledged amount, and success or failure status, we uncovered significant patterns influencing crowdfunding outcomes.

The analysis of success rates over time revealed a slight decline in campaign success from 2021 to 2024, despite fluctuations in total funds raised. This suggests that while crowdfunding remains a viable funding model, external factors such as economic conditions, competition, or evolving backer preferences may influence campaign outcomes. The Home category demonstrated the highest success rate, indicating that certain categories may inherently attract more backer engagement and funding.

Statistical tests further validated these observations. The Mann-Whitney U test confirmed a statistically significant difference in the amount of funds raised between successful and unsuccessful campaigns. This finding underscores the importance of campaign planning, goal setting, and engagement strategies in determining funding success. Additionally, the Kruskal-Wallis H test demonstrated a significant difference in funds raised across different categories, highlighting category-specific variations in backer interest and financial support. A deeper investigation into the relationship between funding goals and pledged amounts, visualized through scatter plots, showed that successful campaigns generally receive pledges close to or exceeding their goals. In contrast, unsuccessful campaigns tend to fall significantly short. This reinforces the idea that setting realistic funding goals and effectively communicating the value of a campaign are crucial determinants of success.

These insights provide practical implications for future crowdfunding initiatives. Campaign creators can enhance their chances of success by setting attainable goals, choosing campaign categories strategically, and employing data-driven promotional strategies. Furthermore, crowdfunding platforms can leverage these findings to refine their recommendation algorithms, provide better guidance to campaigners, and enhance user engagement. Future research could explore additional variables such as campaign duration, marketing strategies, social media influence, and geographic trends to gain a more comprehensive understanding of crowdfunding dynamics. Expanding the scope to other crowdfunding platforms, such as Indiegogo or GoFundMe, could also offer comparative insights into the evolving landscape of online fundraising.

Overall, this study contributes to the understanding of the factors influencing crowdfunding success, providing valuable insights for campaign creators, backers, and platform developers in optimizing crowdfunding strategies.

REFERENCE

1. Liu, Z., Ben, S., & Zhang, R. (2016). Factors affecting crowdfunding success. *Journal of Computer Information Systems*. Taylor & Francis.
2. Koch, J.-A., & Siering, M. (2015). The recipe of successful crowdfunding campaigns: An analysis of crowdfunding success factors and their interrelations. *Electronic Markets*, 30(4), 739–759. Springer Nature.
3. Koch, J.-A., & Siering, M. (2016). Crowdfunding success factors: The characteristics of successfully funded projects on crowdfunding platforms. *SSRN Electronic Journal*.
4. Hou, X., Wu, T., Chen, Z., & Zhou, L. (2021). Success factors of medical crowdfunding campaigns: A systematic review. *Journal of Medical Internet Research*, 24(3), e30189. JMIR Publications.