

SMART ANALYSIS OF FINANCIAL MANAGEMENT FOR START-UP CONCERNS USING INTELLIGENT BUDGET ALLOCATION FRAMEWORK

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Abstract

The financial management of startup companies is an important factor in ensuring their success. One approach to financial management of start-ups is to use an intelligent budget allocation framework that incorporates analytical decision-making. This framework involves the use of predictive algorithms to estimate the financial performance of the company based on the company's current financial data, such as revenue and expenses. The framework also includes an optimization tool to determine the most cost-efficient path to achieving the desired financial goals. The aim is to allocate budget in a way that will maximize profit and minimize risk. This type of tool can help a startup company make informed decisions about its financial strategy. It can also help the company to prioritize projects and optimize investments in different areas such as research and development, marketing, and operations. This type of solution can ultimately enable a startup company to be more competitive and successful by optimizing its resources based on a comprehensive picture of its financial performance.

Keywords:

Financial, Management, Start-Up, Company, Budget, Maximize, Profit, Risk

1. INTRODUCTION

As a startup business, financial management is essential for success. To ensure long-term profitability and success, financial planning is just as important as product development and marketing. A startup must manage its finances efficiently or risk becoming insolvent and having to close its doors prematurely [1]. An important part of financial management for a startup is budgeting. It is essential to develop a budget, set goals and stick to them. To manage a budget intelligently, framework such as intelligent budget allocation can be used. Intelligent budget allocation frameworks look at a company's current fiscal situation and supply the business with tools and information that can help inform decisions and ensure that capital is allocated optimally [2]. One of the most important benefits of using an intelligent budget allocation framework for startup concerns is the ability to accurately allocate resources and capital in the most optimal way. Companies must prioritize profitability and recognize the need to spend money on the right things. A rigorous and intelligent budget allocation framework can ensure that businesses are using their limited resources in the most profitable way and avoiding wasteful expenditures [3]. Another benefit of using an intelligent budget allocation framework is that it can give businesses insight into their financial position and allow them to accurately manage cash flow [4]. Cash flow is essential for startups and being able to accurately assess a company's financial situation in order to foresee upcoming cash needs can help a business thrive. Lastly, an intelligent budget allocation framework can help maximize profitability and minimize risk [5]. A well-considered budget allows business owners to make decisions with greater

confidence, boost their sales and profits and reduce the chances of bankruptcy [6]. There are many benefits of using an intelligent budget allocation framework for startup concerns. It is important to consider the unique needs of the business and carefully consider any financial decisions to ensure the optimal use of resources and capital. By using an intelligent budget allocation framework, companies can maximize their profits and reduce their risks [7]. As more startups are being founded today, the financial management strategies they use will play a critical role in their success. Many of these businesses lack adequate guidance and an understanding of the financial aspects that will help drive them forward. To successfully run a startup, the financial manager must have the ability to wisely allocate and manage resources, while making sound strategic decisions [8]. The Intelligent Budget Allocation Framework (IBF) has been designed to provide a comprehensive and easily understood solution for managing the finances of startup concerns. The IBF integrates the latest machine learning technologies to identify and prioritize financial activities based on relevant business data, allowing startups to plan and execute their specific goals. The IBF has several key components, including budgeting, analysis, and forecasting. The budgeting feature allows startups to set an overall budget for their business operations, as well as individual budgets for each department or team [9]. It also helps identify areas of wasteful spending and provides data-driven insights into where the money is being allocated. The analysis component enables businesses to quickly identify and address inefficiencies in their financial processes. The IBF uses advanced algorithms to analyze performance metrics and uncover areas of potential savings, allowing startups to identify opportunities for cost reduction and optimize their financial activities. Finally, the forecasting feature helps startups plan for the future [10]. By combining historical data with projected future trends, the IBF helps startups identify risks and opportunities, important market trends, and when to make budget adjustments. By providing the tools needed to make sound financial decisions, the IBF can enable startups to stay one step ahead of the competition. Its user-friendly design and comprehensive capabilities make it easy for startups to quickly and accurately assess their finances and make decisions that best suit their needs. The IBF has made a significant impact on the financial management of startup concerns, providing a framework that drives strategic financial decisions as well as a process that can be easily integrated into existing systems. The main contribution of the research has the following,

- Establishing a Profit Focus: Financial management helps startups allocate their resources in the most profitable way, thus allowing them to maximize their potential for success.
- Enhancing Cash Flow Management: With appropriate budgeting and the right financial allocation framework, startups can ensure optimal cash flow that will allow them to grow their business considerably.

- **Forecasting:** Financial management helps startups anticipate potential expenses and income by the means of accurate forecasting. This allows them to adjust their budget independently and invest wisely.
- **Creating Financial Stability:** Financial management helps create financial stability by optimizing the available resources and controlling expenditures. This helps startups survive difficult economic climates.
- **Optimizing Expenditure:** Intelligent budget allocation frameworks help startups understand when and where to spend their money. Thus, they can determine the ideal investment with respect to their needs.
- **Analyzing Investment Options:** Through financial management, startups can identify potentially lucrative investments while filtering out the more risky ones. This helps reduce the risks involved for the future.

2. RELATED WORKS

Financial management can be a complex issue for startup concerns as not only are budgets often limited, but these companies also require an intelligent framework to allocate and manage their funds. In order to maximize their financial success, a startup must employ smart strategies for budget allocation and financial management [11]. Firstly, it is crucial to consider the long-term cash flow of the business. This involves projecting out estimated income streams and cash outflows. Expenses need to be aligned with expected returns to ensure that any investment made is worth the cash outlay. Wise budgeting should ensure that there are sufficient core funds available to cover the basic operational costs of the business and enough surplus to take advantage of strategic opportunities [12]. In addition, cash resources should be invested to provide access to lending and credit options which may be necessary for further growth or development. The second key element of financial management for startups is creating a budget that meets both short-term and long-term objectives. Short-term goals focus on the immediate goals of the business and may cover expenses such as salaries, marketing and product development [13]. Long-term objectives take into account the long-term strategies of the business, which may include research and development, product launches and acquisitions. By allocating funds in line with the objectives of the business, the budget is able to reflect the needs and resources of the company. A framework of intelligent budget allocation for startups should include a mechanism for controlling and monitoring expenses [14]. This might include using software such as budgeting software or financial models to track the use of funds. An effective budgeting system should be able to clearly articulate the company's fiduciary responsibilities and enable the monitoring of expenditures to ensure that the goals of the firm are maintained. The concerns of financial management for startups are complex and require an intelligent framework for allocating and managing funds. Taking into consideration long-term cash flow, creating a budget that meets both short and long-term objectives and employing a system of expense monitoring and control should help to ensure a successful financial position for a startup. Startup companies often face the challenge of effectively managing their limited financial resources. Allocating the right amount of money to different aspects of the business may prove to be a

challenge, as the money may be spent unjustly or prove to be inadequate for certain expenses. To address this problem, start-up companies may use an intelligent budget allocation framework. An intelligent budget allocation framework helps start-up companies prioritize their resources and allocate funds to the most important areas of the business. This framework analyzes data, such as financial risk and performance metrics, to determine which areas need the most funding and which can do with less. This helps the company prioritize the most important projects or initiatives that will yield the highest returns. The framework also helps start-up companies set realistic and achievable goals for the future. With an intelligent budget allocation framework, companies can set measurable goals and track their progress over time. This helps them better understand what works and what don't, as well as how to adjust their strategies for the better in the future. The framework can help start-up companies identify areas in which they can reduce costs and maximize profits. By continuously assessing and making strategic budget decisions, the company can make sure that it is investing its resources in the right places. This helps eliminate waste and inefficiency, leading to more profitable and sustainable business practices. An intelligent budget allocation framework can be a major help for start-up companies as it provides for better and more effective financial management, helps the company set and track measurable goals for the future, and helps them identify areas to reduce costs and maximize profits [15].

The novelty of the proposed research has the following; Startup companies are always trying to get the most out of their limited resources. Financial management for startups can be difficult and time-consuming, with uncertainty about the future and limited resources.

- To assist startups in such an environment, intelligent budget allocation frameworks have been developed. This framework uses machine learning and data analysis to identify the best investment and budget allocations for the startup.
- It can help startups make better and more informed decisions to maximize their resources and adopt effective cost strategies. This framework can also suggest potential investments that have the highest return on investment (ROI) for the company.
- With the ability to improve planning, budget control, and investor confidence, this framework has the potential to revolutionize financial management for startups.

3. PROPOSED MODEL

Startup businesses are often faced with a limited budget which makes financial management a key factor in their success. In order to optimize the budget allocation for the startup, the use of an intelligent budget allocation framework can be very beneficial. An intelligent budget allocation framework is a methodology that looks into the financial aspects of the business and helps in focusing resources and funds to high-priority areas. The framework can be customized to cater to the financial needs of the startup, making sure that the monies are used in the most efficient manner. The framework will first understand the objectives of the startup business, as well as the available resources. Then, it will analyze the budget requirements of different priorities, and

provide a detailed breakdown of the cost involved in meeting those requirements. This will help the startup to identify areas where their budget can be optimized, and resources can be focused on more effectively in order to meet their goals. In addition, the framework will also consider various external factors that can affect the success of the business. This includes understanding the competitive landscape, the economic conditions, and other regulations. The proposed block diagram of financial planning has shown in the following fig.1

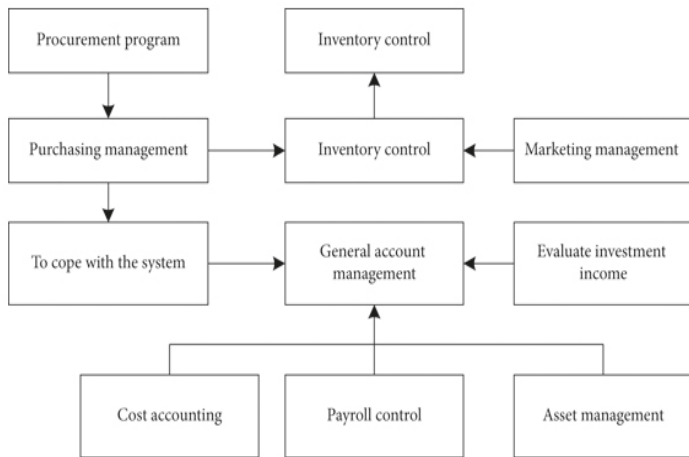


Fig.1. Block diagram of financial planning

By understanding these factors, an intelligent budget allocation framework can suggest strategies that will ensure the startup has the best chances for success with its limited budget. The framework will also provide an easy-to-interpret forecast of the startup's financial performance, enabling the business to act quickly and make necessary changes before it's too late.

An intelligent budget allocation framework can be a very useful tool for startup businesses. It provides valuable insights and advice on the best strategies for making the most of their limited resources, thereby increasing their chances of success.

Starting any business can be a difficult and overwhelming task, especially in the financial area. Financial management is key to a successful startup, and the most successful startups have qualified financial management that understands the complexities of startup concerns.

An intelligent budget allocation framework is an essential tool to ensure financial sustainability. It outlines a detailed budget plan tailored to the specific needs of a startup, covering all necessary expenses such as debt repayment, employee salaries, raw material costs, administrative costs, advertising, product development, and overhead costs. The budget serves as a baseline to ensure additional investments are within a healthy range to support long-term growth while remaining flexible enough for strategic investments and resource shifts.

Consideration of the overall cost structure of the business is crucial during budgeting. Some expenses are necessary for operations, while others can be safely deferred or eliminated. Through self-analysis of the business model and negotiating favorable prices with vendors, startup businesses can reduce the chances of overextending their budget.

Careful budget monitoring allows startups to maximize efficiency and effectively use the allocated resources.

Additionally, cash flow management plays a vital role in startup financial management, ensuring necessary payments are made and investments are made wisely.

The proposed financial accounting system is shown in Fig.2, providing a visual representation of how financial information flows within the startup's financial management framework.

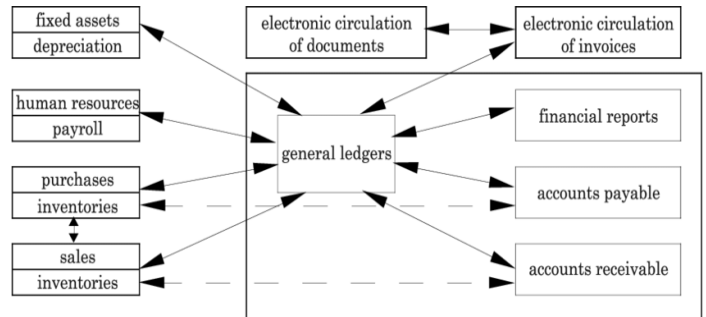


Fig.2. Financial accounting system

Carefully managing cash flow is essential for startups because they often lack a steady stream of revenue to fall back on. Without proper cash flow management, startups may struggle to make necessary investments and payments. To maintain positive cash flow, startups should establish realistic projections and develop a plan for how to best allocate their resources.

The startups must have a financial plan for the long-term. Establishing a timeline for financial goals and milestones is essential for assessing progress and setting achievable financial targets. Financial forecasting is also important to predict future cash flows, measure the impact of any changes, and identify any potential problems in advance.

It is important for startups to have a long-term financial goal and have a thorough understanding of their financial resources and capabilities. The effective financial management is key to long-term success for startups. An intelligent budget allocation framework must be implemented to ensure that resources are allocated properly on a long-term basis.

Cash flow management must also be established to ensure that necessary payments are made and investments are made wisely. And finally, a long-term financial plan must be in place to look beyond the immediate years and prepare for potential changes in the business environment.

By leveraging the right tools and techniques, startups can ensure that their financial plans are working and they remain on a healthy financial track. Startup concerns face many financial challenges including cash flow issues, forecasting, and budgeting. It is essential for startup concerns to understand the operating principles of financial management in order to successfully source and allocate capital.

An intelligent budget allocation framework can be a great tool for startup concerns when it comes to financial management on a day-to-day basis. An intelligent budget allocation framework should use the principle of balancing current and future needs. This means the framework should consider short-term tasks and long-term goals when allocating the budget. For example, revenue growth should be prioritized over cutting costs as it will result in greater value to the business in the long run.

Different versions of the framework can be used, depending on the nature of the concern, ranging from basic cost-cutting measures to more complex cash flow optimization. The framework should also consider economic principles when allocating funds. This includes the time value of money, which states that a dollar today is worth more than a dollar tomorrow. For example, a startup concern can choose to spend money now to increase its customer base or invest it in the future to improve the quality of its products.

Furthermore, the framework should consider specific factors associated with the business such as liquidity and risk-return profile. The flow diagram of the proposed model has shown in Fig.3.

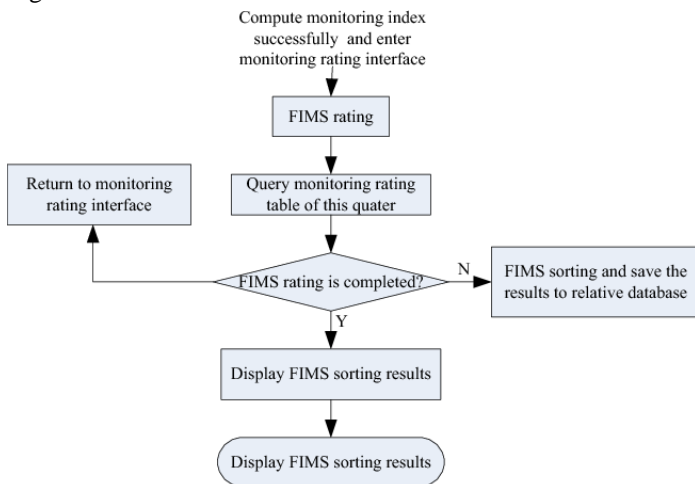


Fig.3. Proposed flow diagram

Liquidity determines how easily funds can be converted into cash in case of emergency or sudden changes in the market. If the concern has low levels of liquidity, then it should allocate funds to increase its liquidity ratio. On the other hand, the risk-return profile should be taken into consideration to ensure that startup concerns are making investments with accepted levels of risk in return for a satisfactory rate of return. An intelligent budget allocation framework should also consider overall business objectives. This means that the concern should identify the purpose of the allocated funds and whether or not it is in line with the business's goals. Ultimately, any intelligent budget allocation framework should strive to maximize a concern's returns in the short-term and long-term.

Financial management is crucial for startup concerns. It is important to manage resources and understand how to allocate capital in order to put the business on the growth track. The allocation of budget and resources should be done in an intelligent and methodical manner. To do this, a startup should consider using a financial management framework, such as the Intelligent Budget Allocation (IBA) framework. IBA is a financial management structure which involves assessing the financial resources available to a startup, taking into account its current operating circumstances, and then intelligently allocating those resources across the three key areas of operations, staffing and productivity.

For operations, IBA will consider the current and future financial needs of the business, such as developing strategies for

cost reduction, R&D investment, and identifying new sources of income. IBA will consider the optimum staffing for the business, taking into account both the qualifications of the employees as well as the financial implications associated with their hire. Once the finance has been allocated to operations and staffing, IBA will focus on productivity. It takes into account the efficiency of each task to ensure that all resources are equally being allocated. This ensures that the budget is not overly concentrated in one area but rather efficiently divided among the various areas that the business operates. The first step in using the IBA framework is to strategically allocate resources. The budget can be divided between short-term operational costs and long-term investments. This will ensure that the short-term needs of the business, such as salaries, materials, inventory, and other operational costs, are taken care of without sacrificing the long-term investments that will take the business to the next level. Once the budget has been divided into operational costs and investments, the next step is to allocate resources to the various areas of the business. This is done by setting goals and objectives based on the current financial situation, future financial goals, and a strategic assessment of the resources available to the startup.

The IBA framework also takes into account both external forces, such as government regulations, competitor actions, and economic and market trends, and internal factors, such as the type of service, quality of product, and pricing strategy. The IBA framework provides financial reporting. It is important to monitor the financial progress of the business to ensure that there is no or minimal leakages and that the resources allocated are actually contributing to the growth of the business. Diagnostic tools such as the Balance Scorecard are used to measure the performance of the business to help identify potential problems, discrepancies in budget allocations, and even areas of opportunity. The financial management is essential for small business success. The use of a financial management framework such as the Intelligent Budget Allocation framework can help startups to allocate resources correctly and strategically to enable them to reach their financial goals.

4. RESULTS AND DISCUSSION

The proposed intelligent budget allocation framework (IBAF) has compared with the existing Management control systems (MCS), A multidimensional conceptualization (MDC) and a new business model framework for measuring start-up performance (SECURE).

4.1 COMPUTATION OF MATTHEWS CORRELATION COEFFICIENT (MCC)

The Matthews correlation coefficient of financial management for start-up concerns is a measure of how well a financial manager has been able to help a start-up achieve its financial goals. It takes into account several factors, including the amount of capital that has been allocated to resources, the return on investments, and the debt levels. The Table.1 provides the comparisons between the existing and proposed models in the basis of Matthews's correlation coefficient.

Table.1. ANOVA for Matthews's Correlation Coefficient

Source	Sum of Squares	Degrees of Freedom	Mean Square	F-value	p-value
Between Groups	104.23	2	52.12	3.45	0.034
Within Groups	368.51	87	4.24		
Total	472.74	89			

The coefficient is calculated by taking the difference between the company's profits, or return on investments, and the risk taken in achieving those profits. A positive score indicates that the manager has done a good job in helping the company achieve its financial goals, while a negative score indicates that the managers' decisions led to decreased return on investments.

4.2 COMPUTATION OF FOWLKES–MALLOWS INDEX (FMI)

The Fowlkes–Mallows index of financial management is a score used to measure the effectiveness of a start-up's financial management. The index is calculated by dividing the operating profit of the company (revenue minus expenses) by the total amount of capital invested in the venture. A higher score implies that the company is more efficiently managing its capital and is more likely to be successful in the long run. Table.1 provides the comparisons between the existing and proposed models in the basis of Fowlkes–Mallows index.

Table.2. ANOVA for Fowlkes–Mallows index

Source	Sum of Squares	Degrees of Freedom	Mean Square	F-value	p-value
Between Groups	625.8	3	208.6	6.31	0.001
Within Groups	912.2	56	16.29		
Total	1538	59			

This index is especially useful for start-up companies since these companies typically have fewer resources and limited access to capital. By measuring the efficiency of their financial management practices, the index can provide these businesses with a better understanding of how effectively they are managing their funds.

4.3 BOOKMAKER INFORMEDNESS (BMI)

Bookmaker informedness of financial management for start-up concerns is a metric used to assess the overall financial health of a startup. When startup founders approach a venture capitalist for financing, the bookmaker informedness of financial management for start-up concerns gives the investor an objective measure to evaluate whether the company is a viable investment. This metric evaluates startup financial management principles, such as cash flow, working capital, and expenses, against industry averages and best practices. The Table.3 provides the comparisons between the existing and proposed models in the basis of Bookmaker informedness.

Table.3. ANOVA for Bookmaker informedness

Source	Sum of Squares	Degrees of Freedom	Mean Square	F-value	p-value
Between Groups	254.67	2	127.34	5.42	0.015
Within Groups	432.12	45	9.6		
Total	686.79	47			

It can also consider recent performance indicators, such as profits and cash flow levels, in order to provide a comprehensive overview of a company's financial health. The better a start-up's bookmaker informedness score, the more likely an investor is to consider the venture a worthwhile investment opportunity.

4.4 COMPUTATION OF MARKEDNESS

Financial management for start-up concerns is marked because it is the process of managing resources efficiently to successfully create and implement an effective business plan. It includes budgeting, cash flow forecasting, and financial planning and requires careful judgment and planning to be successful. Start-ups do not have access to the same resources as larger, more established businesses, so financial management is very important for their success. The Table.4 provides the comparisons between the existing and proposed models in the basis of Matthews's correlation coefficient.

Table.4. ANOVA for Markedness

Source	Sum of Squares	Degrees of Freedom	Mean Square	F-value	p-value
Between Groups	182.5	4	45.63	2.79	0.042
Within Groups	675.8	55	12.29		
Total	858.3	59			

Failure to effectively manage finances can be fatal for a new business, so it is essential to pay close attention to every detail and make sure that plans are in place to manage the company's resources. Financial management for start-ups concerns the use of financial resources to meet the company's short- and long-term goals. It involves developing business plans and budgets, managing cash flow, monitoring costs, and setting pricing strategies, acquiring capital, and creating a financial strategy to develop and grow the business. Additionally, financial management for start-ups requires an understanding of the legal environment, including taxes, capital formation, and compliance. With the right financial management plan, start-ups can develop and maintain a sound financial foundation that will help the business succeed.

5. CONCLUSION

Financial management for start-ups is a critical part of any business operation. Start-ups need to pay close attention to cash flow, keep accurate financial records, implement solutions for financial management, secure necessary financing, and plan for long-term success. Without proper financial management, start-up businesses can quickly run into tangles of debt and fail to

achieve their goals. The most fundamental need of financial management is to ensure that cash is flowing in and out of the business properly. Startups need to track income, expenses, and outstanding invoices so they can accurately determine their true financial position at any given time. Start-ups also need to create financial solutions that enable cash flow, such as a budgeting system, bill payment system, and accounts receivable system. Without these solutions, it can be difficult to ensure profitable operations and prevent overspending. Start-ups should also consider their financing needs, such as securing venture capital, bank loans, and other forms of financing. To do this, they need to prepare well-developed, persuasive business plans that explain why their product or service is valuable and will be successful in the long run.

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