



Contributing Factors Impacting Project Successfulness

Tanmay Bhosale^{1,*}, Aniket Pawar², Anagha Shinde³

¹ Department of Electronics and Telecommunication Engineering, Rajarambapu Institute of Technology, India

² Department of Mechanical Engineering, Rajarambapu Institute of Technology, India

³ Department of Computer Science Engineering, MKSSS Cummins College of Engineering for Women, India

*Correspondence: E-mail: bhosaletanmay88@gmail.com

ABSTRACT

This research paper comprises three different case studies taken under consideration and involves a step-by-step analysis of all three. The analysis of these case studies is based on the fundamentals of Project Management Techniques and the way it was implemented by the Project Managers during the different phases of the project to achieve success. The purpose of this research is to study the projects which avoided failure even at the toughest times and proved any project can be successful if managed and executed with proper project management techniques. The methodology used for conducting this research was Interview methodology aligned with the Case study approach. Project Managers of the mentioned projects were interviewed to accumulate accurate and authentic information to analyze, discuss and reach conclusion. Overall, the reason behind the study is to demonstrate that under appropriate guidance by project managers and the use of relevant project management techniques, factors leading to project failure could be identified and mitigated to ensure success.

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1. INTRODUCTION

Project Management Methodology is referred to a set of guiding principles and processes for owning a project through its life cycle and ensuring optimum performance as well as results. It is also referred to be a framework that helps to manage the project in the best way possible. There are various methodologies in Project Management, however, selection of the befitting methodology might be a tedious task. Moreover, factors vary from project to project and the impact of each may turn out the results in different directions.

A Preliminary study demonstrated a variety of critical causal factors in unsuccessful projects. The research focused on 42 Information systems projects that were completed during the period 1994-2001. These prior findings included deficiencies in project management and technical techniques.

The purpose of this research was to explore the relations between the mentioned three case studies at the management level and identify the factors leading the projects towards successful completion without disturbing the triple constraint model: Scope, Time, and Cost. This research also explores the role of project managers throughout the process and their transition in the responsibility to ensure success (Alkhudary & Gardiner, 2021).

The novelties of this research are authorities and employees of Mapro Foods Pvt. Ltd., TGP Bioplastic Pvt. Ltd., and Jaywant Sugars Limited. The data mentioned in the paper is acquired from these authorities and is accurate.

2. THEORY

The most common practiced Project Management Methodologies are distinguished into two types: - Linear & Iterative. These are further classified as Waterfall, Agile, Lean, and Six Sigma.

2.1. Waterfall Methodology

It is a sequential methodology. One at a time, down the line approach. Project plans and deliverables are well-established and reported in the early stages of initiating and planning. Moreover, a formal change request process is observed. The project manager continuously communicates progress toward milestones and other key measures to stakeholders, warranting the project on track to meet the customer's expectations. Usually, one phase doesn't begin until the previous one is finished.

2.2. Agile Methodology

It is a flexible and iterative methodology. The overall planning occurs in shorter iterations and focuses on delivering value quickly. Succeeding iterations are adjusted in response to feedback or unpredicted issues. Time is organized into different phases called Sprints. Each Sprint has a defined duration, with a setlist of deliverables planned at the start of the Sprint. The team is customer-focused, with consistent communication between users and the project team.

2.3. Lean Methodology

Lean methodology is often referred to as Lean Manufacturing since it originated in the manufacturing world. The main principle in Lean methodology is the removal of waste within an operation and finding a way of optimizing the people, resources, effort, and energy of the

organization towards creating value for the customer. By enhancing process steps and eradicating waste, the only value is added at each phase of production.

2.4. Six Sigma Methodology

Six Sigma is a methodology used to mitigate variations by ensuring that quality processes are followed every time. The term “Six Sigma” derives from statistics and generally means that items or processes should have 99.9996% quality. The seven key principles of Six Sigma are: Always focusing on the client; Identifying and understanding how the work gets done; Making processes flow smoothly; Reducing waste and concentrating on value; Stopping defects by removing variation; Involving and collaborating with the team; Systematically approaching improvement activity.

2.5. Project Goal

The project goal refers to achieving the desired outcome at a specific end date employing a specific number of resources. Goals are superior statements that provide the overall context for what the project is trying to fulfill. One of the goals of a project might be to “elevate the overall satisfaction levels for consumer calling to the company helpdesk with support needs”.

2.6. Project Scope

Project Scope refers to the boundaries of the projects. It is defined before a project starts, which helps mitigate the risk of changes later on. Project scope can be in-scope or out-of-scope proportional to the inclusion of the project plan as well as the contribution to the project goal. The changes, growth, or uncontrolled factors that affect the project’s scope are referred to as scope creep (Fageha & Aibinu, 2013).

3. METHODS

The research conducted consists of statistical analysis of primary and secondary data which has been extensively used in the research. Out of the several different methods of data collection, this research used the Interview and survey method to understand several aspects involved in the planning and execution of the concerned projects. Descriptive and explanatory models to analyze the data have been used. The former being used to acquire data patterns while the latter being used to delineate the appropriate techniques to avoid failure. The questionnaire designed for conducting the interview provided information about the Project Scope, Methodology, Goals, Project Baselines, Scheduling techniques, risk mitigation techniques, and contract and vendor management. The interviews were conducted via online meetings considering the pandemic situation and to provide flexibility and control. Project Managers of the corresponding projects were contacted and the following data of the case studies was cumulated (Mu *et al.*, 2021):

- (i) The first case study is about the new segment introduced by Mapro Foods Pvt. Ltd. This new segment named “Mapro Fresh”, aimed at supplying fresh fruits and vegetables to nearby cities and towns. The project is prospering and is considered profitable despite spending a lot on development.
- (ii) The second case study is about the low carbon-footprint biodegradable plastic developed by TGP Bioplastic Pvt. Ltd. It can be widely used for packaging or can be used to make containers, bags, bottles, and bags. The biodegradable granules can be developed into 3D filaments which is a remarkable achievement.

- (iii) The third case study is about the research & development of Free-floating Jaggery powder produced from sugarcane by Jaywant Sugars Ltd. It was highly profitable and was exported to countries like UAE, Dubai, and few European nations. With the help of this case study, we will be able to understand the contributing factors towards success and risk mitigation.

4. RESULTS AND DISCUSSION

The most recurrent question of all is, why do projects fail? Hence, we will discuss and comprehend the key factors contributing to the failure of the majority of projects as well as the frequent project management mistakes during projects and will try to acknowledge the blunders before embarking on any conclusion of the above-mentioned projects (Matta & Ashkenas, 2003).

- (i) **Poor organizational structure.** The company should deeply understand the need of the project while determining the organizational structure for a particular project. The poor or chaotic structure will lead to project failure.
- (ii) **Undefined Project Objectives.** Initiation of any project requires the appropriate declaration of project goals and objectives. Unclear or undefined objectives may mislead the entire team at moments and may compromise on priorities.
- (iii) **Importance of Cost-Benefit Analysis.** Adding up the expected value of project-the benefits and comparing them to the dollar costs is a required aspect of the Cost-Benefit Analysis. The absence leads the project towards wastage of time and money along with loss of Business value created.
- (iv) **Negligence towards Risk Assessment and management.** Identification, analysis, evaluation, treatment, monitoring, and controlling are the phases of Risk Management in any project following project management techniques. Bypassing any of these may confirm the failure.

Figure 1 represents the comparison of different project management methodology techniques among the three case studies. Agile Methodology is the most preferred since it allows flexibility and better control.

Quality was given the highest priority when compared with Budget, Scope, and Timeline. **Figure 2** depicts that all the three case studies were quality-centric during the development phase and were ready to compromise with the budget, scope as well as a timeline of the project.

Figure 3 illustrates the percentage of Scope Creeps identified during the execution of the project by the Project Manager. The data shows that majority of the scope creeps identified were External and hence it can be concluded that the projects had a lot of external dependencies throughout until completion.

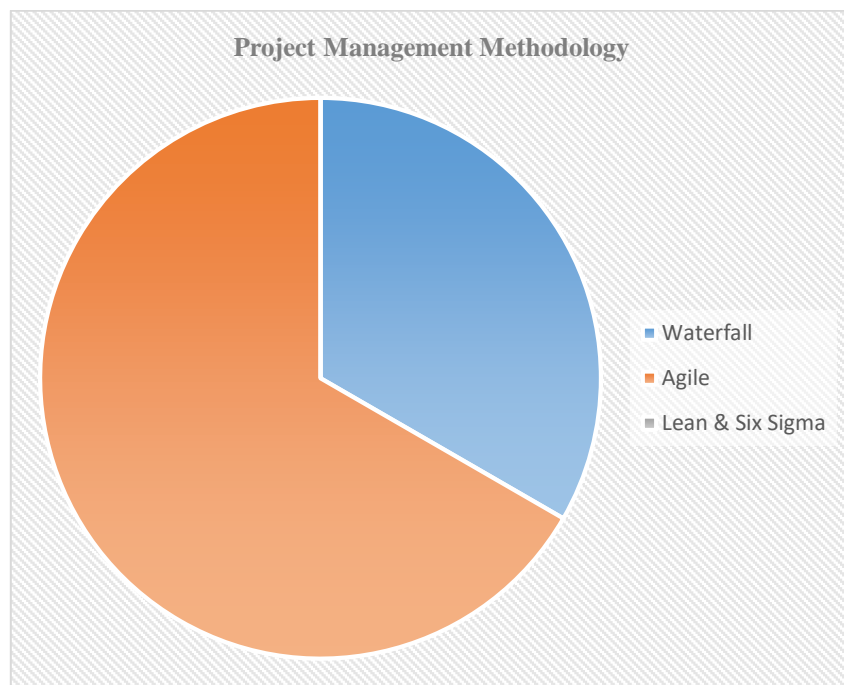


Figure 1. Project management methodology

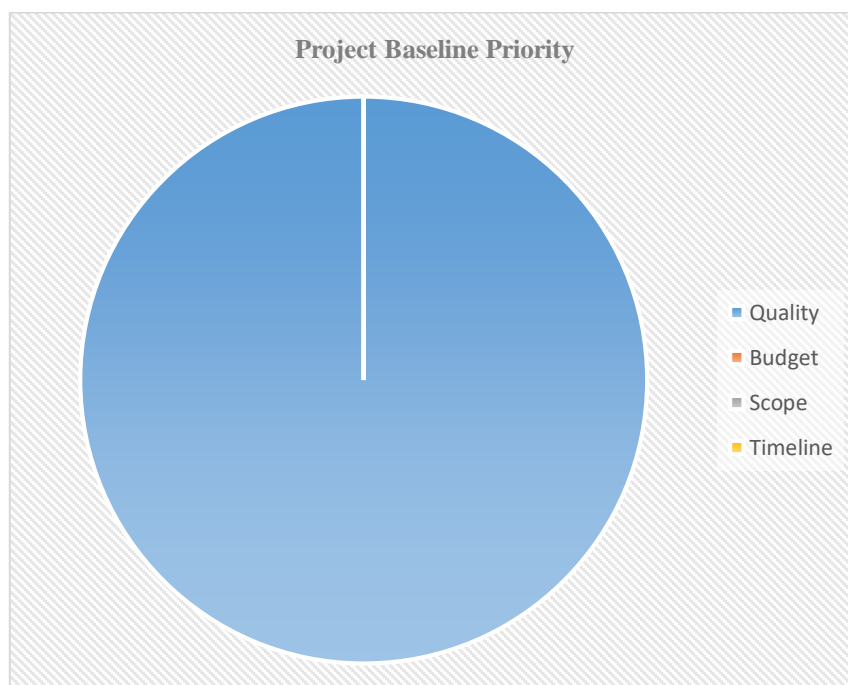


Figure 2. Project baseline priority

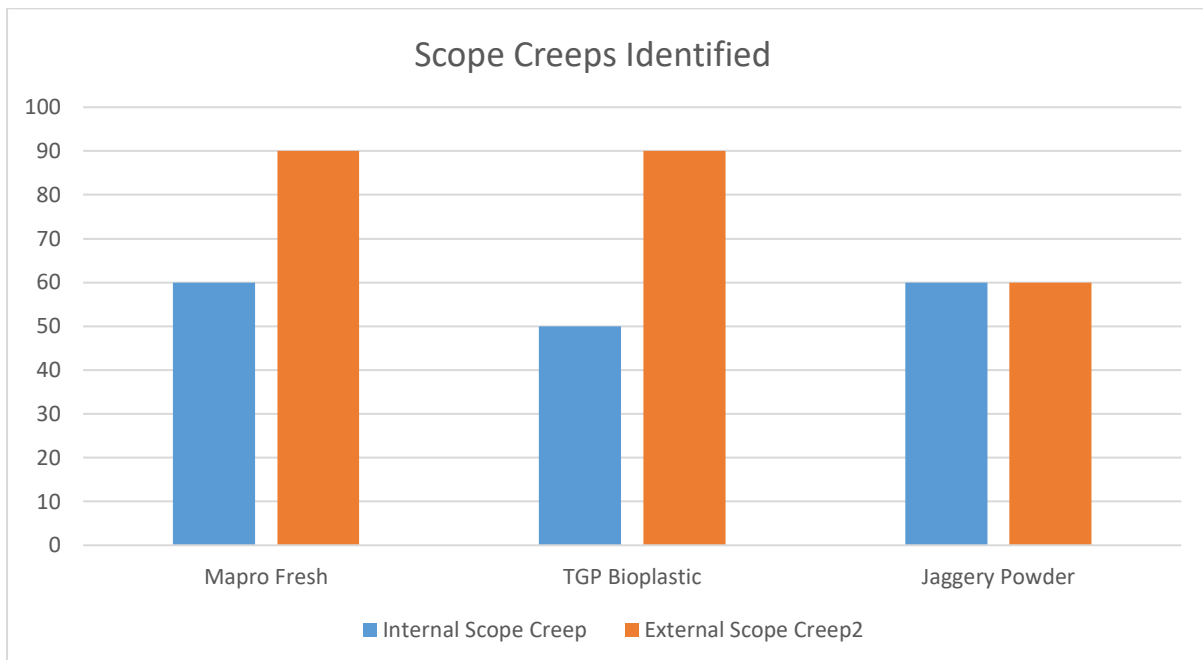


Figure 3. Scope Creeps Identified during Project Execution

Having a closer look at the above-mentioned factors, it can be realized that projects go haywire substantially at three stages: Scheduling, budgeting, and risk management

Flawless enactment of project management techniques at the above-mentioned three stages could ostensibly steer the project towards success. The case studies considered demonstrate such absolute attainment despite being non-IT small scale industrial organizations.

4.1. Case Study 1

4.1.1. Case Study: Mapro Fresh

India's agriculture sector makes a noteworthy contribution to its Gross Domestic Product and assures livelihood for many millions of people. In India, agriculture is not only a means of trade and a source of livelihood but is fundamentally associated with the culture and heritage of the nation. Companies in the Food & Agriculture sector are adding value to this culture by introducing new products or by exporting conventional ones (Ariza-Montobbio & Lele, 2010).

Mapro Foods Pvt. Ltd is one such organization manufacturing and exporting fruit jams, beverages, crushes, and squashes on a large scale. This case study will focus on the planning, execution, and reason behind the success of one of their new segments named "Mapro Fresh" recently introduced in the market.

4.1.2. Background of Case Study 1

Mapro Food Pvt. Ltd. is situated around the blissful hill-town of Panchgani in Western Maharashtra, India, manufacturing Fruit Jams; Fruit beverage concentrates – Crushes and Squashes; and Fruit Bars. It possesses an annual processing capacity of around 30 thousand MT and is a market leader in Western India. The company was established in 1959 and has witnessed organic growth over the last five decades with maintained profitability. 1959 saw Kishore Vora starting the operations in a small room, as a home business with a mutually beneficial relationship with the farmers to make strawberry jam for product sales, which eventually led to the launch of the Mapro brand in 1978. When the farmers in Panchgani were

struggling with their livelihood, Mapro stepped up and extended a helping hand providing them a market and a regular income.

4.1.3. Execution of Case Study 1

Mapro Foods Pvt. Ltd., Maharashtra's homegrown syrups, jams, and chocolate brand, wanted to step out of its comfort zone by introducing a new segment, Mapro Fresh. This step was taken towards entering the fresh food home delivery market. The planning of this project involved the definition of Project Goal, Scope, Deliverables, and Timelines. Project Directors, investors, stakeholders came on board to announce the idea of a small combo-box of fresh vegetables delivered online. The Project was planned to begin around June 2020 and was estimated to complete by Jan 2021. An interview with the Project Manager of this project apprised that, apart from the ideation and planning using Project Management techniques, the team had to survey the farmers as well as the potential consumers for the varieties of food products in demand as per the geographical availability.

No specific budget was allotted for this project since this being a new segment for the company, the management had decided to monitor the budget in real-time and plan accordingly for Phase-II. Quality is the highest priority, forced the team to spend extra amount wherever required.

The research followed by the Standard product development saw the completion of the first milestone. The Project Manager was assisted by the Procurement & Sourcing Managers who finalized the deal with the vendors and managed the supply chain. The most inevitable factor causing delay was the COVID-19 Pandemic, extending this project to June 2021. Furthermore, this hindered the research, product development, resourcing, and logistics of the project extending it for longer than expected.

4.1.4. Analysis of Case Study 1

The thorough research exploring the available fruit and vegetable producers in the locality succored the team to obtain insights on the market scenario: pricing, availability, suppliers, consumers, and prominently the seasonal demand. Moreover, the relaxation on the total allotted budget added to the team's benefit. In addition to this, the following points aided the project to achieve success:

- (i) Methodology: Agile Methodology aligned with the Asana Project Management tool abetted the overall execution and ensured the project is on right track.
- (ii) Scheduling Buffers: Task buffers scheduled during the planning, to back the unexpected delay by the supplier, helped the team stay on track even after being hit by the pandemic.
- (iii) Work Breakdown Structure: The creation of team leaders for different departments, early delegation, frequent follow-ups along a centralized WBS made a huge difference. Moreover, the Project Manager had sorted the Statement of Work with the employees.
- (iv) Risk Management Plan: Irregular rain was identified as the significant External Dependency during drafting the Risk Management Plan along with the Risk Probability and Impact Matrix. Hence, it was mitigated with proper mitigation techniques such as random checks, multi-level Quality checks, meticulous supervision, and many others.

4.2. Case Study 2

4.2.1. Case Study: TGP Bioplastic

Bioplastics are unique plastics materials manufactured from renewable biomass sources, like straw, corn starch, sawdust, recycled garbage, woodchips, vegetable oils, and fats, etc. Some bioplastics are acquired by operating directly from natural biopolymers including

polysaccharides (e.g. starch and alginate) and proteins (e.g. soy and gelatine), while others are chemically combined from sugar derivatives and lipids (oils and fats) from either animals or plants, or biologically synthesized by fermentation of lipids or sugar. In contrast, common plastics, like fossil-fuel plastics (also called petrol-based polymers) are derived from petroleum or gas. As per one study in 2014, bioplastics represented approximately 0.2% of the worldwide polymer market (300 million tons). As far as commercial viability is concerned, bioplastics are not significant, hence, research continues on this subject (Saharan & Sharma, 2015).

To tackle this cause TGP Bioplastic Pvt. Ltd. has developed 100% biodegradable plastic for application in packaging. Currently, it can replace carry bags, parcel packaging, etc. Unlike other competitors, it's cheaper yet efficient. They aim to percolate the concern towards sustainable packaging through these products.

4.2.2. Background of Case Study 2

To tackle the issue of plastic packaging waste and reliance on imported biodegradable materials, TGP Bioplastics has developed the foremost indigenous and commercially viable biodegradable plastic grade which enables its consumers to replace their packaging with our low-cost, low-GHG, and eco-friendly material, unlike other conventional biodegradable manufacturers. TGP Bioplastics won the 'Sustainable Leadership Award' from 'International Centre for Technological Innovations' with crowdfunding of more than Rs. 39,000 and matching funds of Rs. 25,000. They are also the winner of the 169th Start-up Battle that happened at 91Springboard, Bangalore. The start-up was selected from 65+ start-ups across India.

4.2.3. Execution of Case Study 2

TGP Bioplastic is a start-up by 7 Engineering graduate students from Rajarambapu Institute of Technology, Islampur. The idea to produce an indigenous low-carbon biodegradable plastic at a low affordable cost struck the mind of these young entrepreneurs. They began the research through the internet and by reading more than 60 papers in the year 2019. The pilot tests began in March 2019 with the combination changing from time to time. Despite the lack of required equipment and machinery, the team was successful in conducting the first successful testing with the right combination in September 2019, the deficiency of expensive tools was overcome by networking and sourcing with industries across India. By using the Toll manufacturing method, they initiated large-scale prototyping in Pune, India.

In November 2019, TGP Bioplastic applied for the RGSTC grant by the Indian Government and was successfully awarded the same in December 2020. The grant allowed them to purchase manufacturing and testing machinery. The successful first commercial batch was manufactured and stocked until delivery. However, they realized the granules reacted adversely when exposed to extremely humid conditions. Hence, the team decided to put the deliveries on hold and research the issue until solved.

Despite the pandemic and frequent lockdowns, the team completed the project successfully along with recognition from government bodies and various non-profit organizations for their meticulous efforts and sheer will. The scope of the project was extended upon successful testing at the granule level by manufacturing films from these acquired granules and is still under process.

4.2.4. Analysis of Case Study 2

This case study proves that the success of the project is independent of the team size, equipment and resources provided. Whereas, it is the flawless planning, execution, and management throughout the project which defines and assures success.

- (i) Resource Management: Almost all the start-ups face several issues with the equipment, tools, and budget. However, sourcing the required material at a low cost without disturbing the project scope and goal, aided TGP Bioplastic in achieving success.
- (ii) Scope Creep: Identifying as well as managing the changes, growth and uncontrolled factors affecting the project at the early stage avoided project going out-of-scope. External scope creeps, in this case, the weather could have halted the project progress. However, adequate research and change in the pace of the project after identification of scope creep turned the project back on track.
- (iii) Dependencies: Appropriate Project Management Methodology aligned with project management tools helped the team to identify dependencies throughout the planning. Dependency Management to identify, record, monitor, and control inter-related tasks ensured the success on time and within the budget (Bilgin *et al.*, 2017).
- (iv) Organizational Structure: The use of a Matrix organizational structure wherein the functional manager is consistent regardless of which project the employee is supporting ensured effective and clear communication between the employees. The Matrix structure also enabled the employees to have the same level of authority and permitted them to operate more directly (Ahmady *et al.*, 2016).

4.3. Case study 3

4.3.1. Case Study: Free Floating Jaggery Powder

Jaggery is an unrefined natural sugar that is manufactured without adulteration of any chemicals. More than 70% of the entire world jaggery production is done in India. Jaggery, also regarded as the “medicinal sugar”, is nutritionally comparable with honey. While refined sugar mainly consists of fructose and glucose, jaggery contains sucrose and glucose. But jaggery also has minerals and vitamins which lack sugar. The research signifies that powder jaggery/granular with low moisture content (up to 1-2 % d.b.) enhanced storage life up to two years; this advantage is provided due to its free-flowing nature (Murthy & Dasaraju, 2012).

To provide better jaggery granules at a considerable price Jaywant Sugar factory in Maharashtra (India) came up with the technology to produce free-floating jaggery powder on a large scale.

4.3.2. Background of Case Study 3

Jaywant Sugars Ltd. (JSL) is an agribusiness & bio-energy corporation. The organization is a result of an engrossing vision to manufacture the most effective sugar processor and to navigate a motivating business model. The company is founded by Dr. Suresh Jaywant Rao Bhosale in 2006. It has several most mesmerizing performances i.e., attaining minimal sugar losses, the highest standards of technical efficiency, and therefore the highest mill efficiency. The Sugar Factory features a 45 KLPD HiFerm GR-Fermentation with Integrated and Stand-Alone Evaporation (Jaywant & Arif, 2019).

4.3.3. Execution of Case Study 3

In the year 2010, the R&D department of Jaywant Sugar Industry landed on a thought to produce Free-floating Jaggery powder from sugarcane on a large scale. Production capacity

was increased from 500 TCD (Tons of Canes per Day) to 750 TCD approximately manufacturing 105 tons of jaggery powder per day. This project was scheduled to complete in 7 months.

Since the current factory was occupied with other ongoing projects, the investors and stakeholders decided to rent an old sugar factory outlet on lease. The Project Manager and team commenced the project in March, by visiting similar projects in the localities to understand the reasons behind the failure. Upon discussion and analysis of similar projects, it was realized that the fundamental cause of failure was the Design. However, hiring an expert person to design the layout of the system would increase the external dependency as well as the cost resulting in budget overrun.

The Project Manager working on this project took the mantle to design the layout on his own to avoid any external dependency and mitigate project failure chances. The system was designed to operate at 750 TCD which produced 140 kg of jaggery per ton. Sugarcane being a seasonal crop forced the team to complete the project before the succeeding season arrived to avoid the extension of the project. However, the downturn of a few of the machinery stretched this project for one more month taking it to a total of 8 months of period. Nevertheless, the team was successful in completing the project by the end of October and manufactured the first batch of jaggery powder mid-season to witness commercial success.

4.3.4. Analysis of Case Study 3

With the introduction of sugar mills and their accelerated growths, better per capita income, and a better standard of living, the sweetener demand had shifted to white sugar, which contains unadulterated sucrose (about 99.7%). Therefore, Khansari and Jaggery's production got setbacks to some extent. However, upon realization of the medicinal benefits of Jaggery, the slow inclination towards jaggery was witnessed. This increased the production of jaggery, however as per the mentality, the variety and flexibility of use were restricted. Jaywant sugar apprehended the right time and determined to introduce the free-floating jaggery powder. The success of the project could be categorized according to the mentioned project management techniques:

- (i) Identification of Project Deliverable: The right time to enter the market is the most table-turning and impactful moment for any business. Hence, analyzing it with proper planning and execution can take any small business to greater heights. Similar was the case with free-floating jaggery powder, the scope of this project entirely involved the need of the market and its deliverability as a tangible outcome.
- (ii) Defining Roles & Responsibilities: From realizing one's position in the team to understanding the impact of achieving individual milestones through the project in the provided period is the accountability of each team member. The project Manager drafted and imparted the RACI chart which involves the Responsibility, Accountability, Consultation, and Informed personnel to ensure the tasks get done efficiently.
- (iii) Responsible Leadership: Apart from working as the responsible authority to complete the project while managing the planning, execution, project progress, changes, and adjustments. The Project Manager, upon realizing, took the responsibility of System Designer to design the layout of the entire production line to avoid external dependency and running over budget.
- (iv) Communication Plan: Effective communication regarding the status updates, issues, feedback, suggestions, daily check-ins were observed among the team members as well as with the stakeholders. Collaborative tools for clear, frequent, and centralized communication throughout the project span helped the team in the identification and elimination of potential risks.

5. CONCLUSION

The above-illustrated case studies prove that Project Management techniques when implemented with appropriate guidance at relevant stages of any project could avoid failure and ensure success without disturbing the scope, time, or budget of the project. Project Managers can effectively identify the factors leading to a project failure and mitigate the risks to recover as early as possible. Moreover, appropriate measures should be taken by the trained project managers at the concerning time to eliminate the chances of a project going haywire. Following the above-mentioned techniques at appropriate stages could help project managers identify and reduce failure chances.

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7. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

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