LAB REPORT

Course: **CSE 4108**

Sessional Based on CSE 4107

System Analysis & Design of Vivasoft Ltd.

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Chapter **1**
Problem Identification

1.1 About Vivasoft

Founded in 2016, Vivasoft provides IT consulting and software development services. The company specializes in software outsourcing and provides robust, scalable, and efficient solutions to clients around the world.
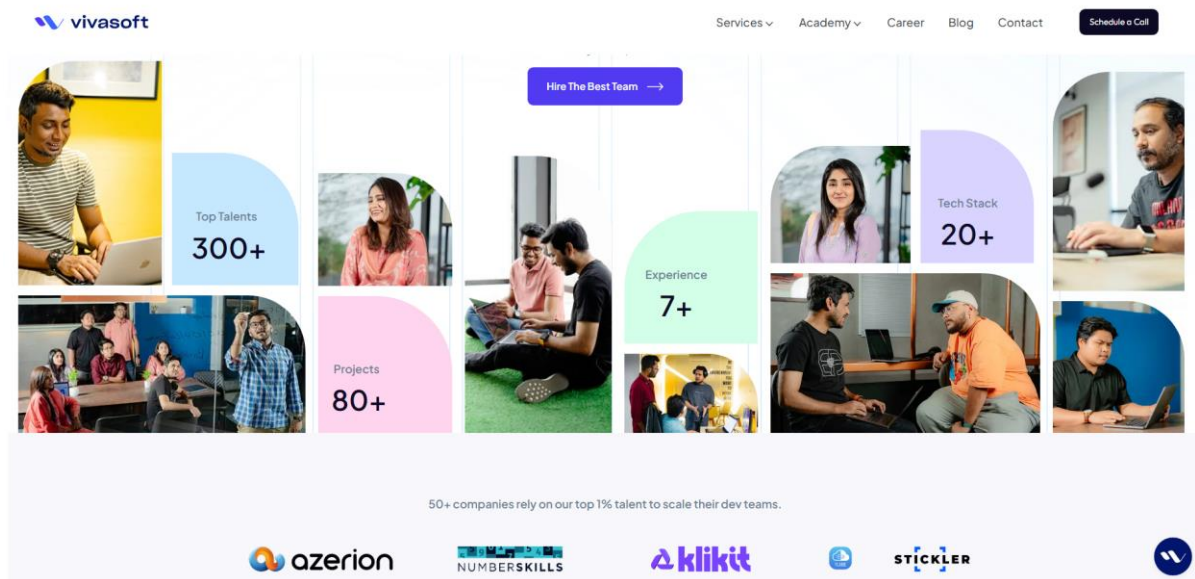
Fig.1 Vivasoft's Website – www.vivasoftltd.com

They have expertise in diverse industries Finance & Banking, E-commerce, Telecom, Real estate, Software, Health & Fitness, Automotive, Photo & Video, Business, Startup, AR/VR, Legal Services, Non-profit, Govt. & Public Sector, Sports & Fitness, Gaming, Fashion & Apparel, Energy & Utilities, Agriculture, Logistics.

1.1.1 Background History

Vivasoft began its journey in 2016 with the help of a passionate team and talented individuals, aiming to create digital experiences that would make user's lives simpler and more enjoyable. Initially, the company started with around 20 engineers in a tiny rooftop space, eventually expanding to a 25,000-square-foot office in the capital and another one in the Rajshahi city.

1.1.2 Services provided by Vivasoft

• **Team Augmentation:** The company's developers collaborate with clients as integral members of their team.

• **MVP as a Service:** Enhancing client's businesses with skilled developers who create successful Minimum Viable Products (MVPs).

• **End-to-End Deployment**: Addressing and resolving any client issues, and deploying solutions effectively.

• **Offshore Office Expansion:** Facilitating growth in client's businesses by providing skilled resources and offshore expertise.

1.1.3 Organizational Structure

The organizations structures can be figured as follows:
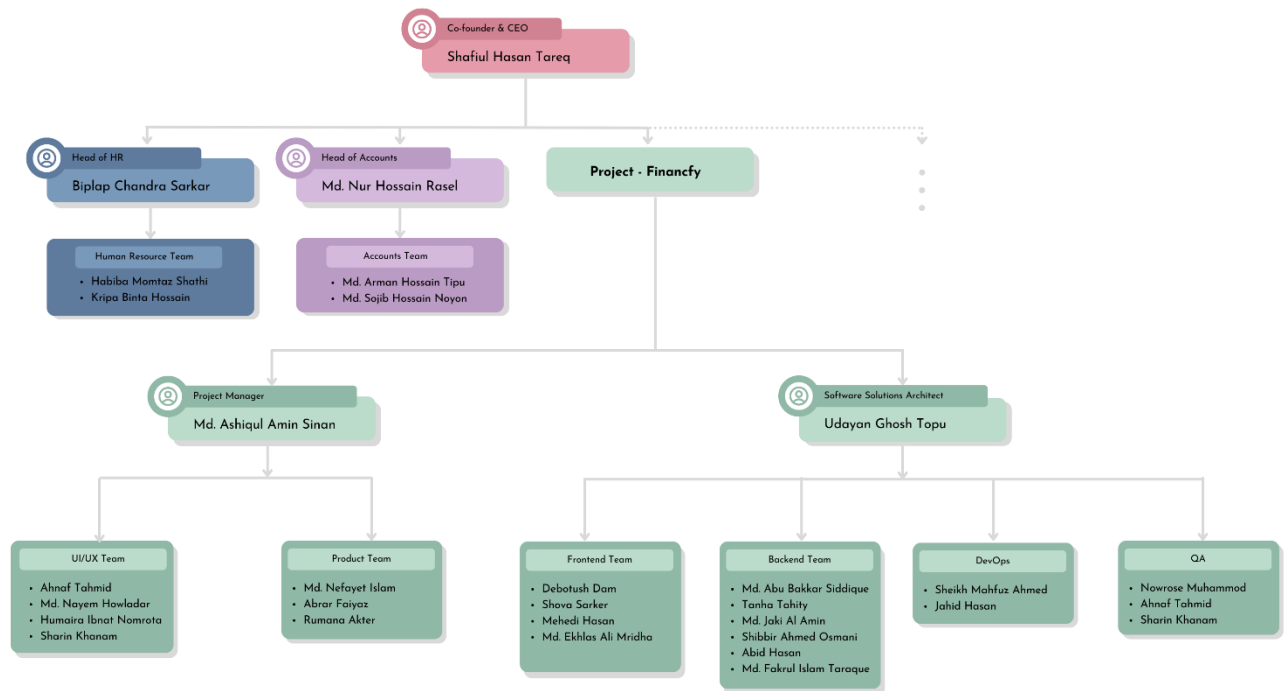
1.1.4 Mission

At Vivasoft, the company's mission is to empower businesses worldwide with innovative software solutions that drive growth and success. The company's commitment to excellence and dedication to clients aim to simplify complexities, enhance user experiences, and positively impact communities across the globe.

1.1.5 Vision

The company's vision is to be a leading global provider of software outsourcing services, renowned for its robust, scalable, and efficient solutions. The company strives to continuously exceed expectations, foster long-term partnerships, and inspire technological advancement. With a diverse team of passionate individuals, the company envisions a future where its expertise revolutionizes industries, transforms businesses, and enhances lives worldwide.

1.1.6 Values

•**Teamwork:** At the company, working together as a united team is prioritized. So, a culture that celebrates collaboration and support is cultivated.

•**Professionalism:** The team consists of experienced professionals who incorporate a constant drive for excellence.

•**Efficiency:** At Software Group teamwork is a core value that comes from within. No matter where employees are positioned, they all have a common goal to support each other and work together to achieve it.

•**Innovation:** The company is always on the lookout for new and better ways to solve problems and enhance its services.

1.2 Conclusion

In this way, defining these problems offers a clear view for the succeeding phases of the analysis and, ultimately the design. Solving these problems will prove beneficial for the improvement of the key performance indicators of Vivasoft Ltd., its reputation with clients, and the company's position within the competitive field of software development.

Chapter **2**
System Planning & Initial Investigation

2.1 Introduction

In response to the challenges identified in Chapter 1, a structured and detailed system planning phase is essential to ensure that Vivasoft Ltd.'s operations, project management, communication, and infrastructure are optimized. This chapter focuses on system analysis, strategic MIS (Management Information System) planning, and both managerial and operational planning processes. These components will lay the foundation for addressing the company's existing issues and align system design with organizational goals.

2.1.1 Objectives of System Planning

The objectives of system planning at Vivasoft Ltd. are to:

- **Base planning on system analysis** by identifying the root causes of inefficiencies and aligning the system design with operational needs to improve workflows and productivity.

- **Establish a strategic MIS plan** that ensures long-term scalability, aligning technological infrastructure with the company's future business growth.

- **Develop a managerial and operational MIS plan** to improve key areas such as project tracking, resource allocation, and internal/external communication, thereby increasing operational efficiency.

- **Identify the organization's information requirements** to ensure effective decision-making across all levels of the company, from senior management to operational teams.

2.1.2 Stakeholder Involvement

The planning phase at Vivasoft Ltd. requires the active participation of:

- **Senior Management and Project Leaders**: They provide strategic direction, ensure alignment of the system with business goals, and offer insights on critical areas such as system design, performance metrics, and resource allocation.

- **IT Support Team**: The IT department will play a vital role by contributing technical expertise regarding the infrastructure, ensuring system reliability, scalability, and performance improvements.

- **Human Resources (HR) and Finance Teams**: These departments will identify needs related to employee feedback mechanisms, talent retention, and financial operations automation to ensure efficient HR management and transparent financial workflows.

2.1.3 System Analysis as a Basis for Planning

System analysis at Vivasoft Ltd. forms the foundation for the system planning phase. By thoroughly understanding the company's current systems and workflows, the organization can:

- **Identify gaps in existing systems** such as inefficiencies in project management, communication issues, and challenges in billing processes, as outlined in Chapter 1.

- **Analyze the flow of information** between departments to detect bottlenecks that hinder efficient communication and coordination, leading to fragmented information sharing.

- **Map out existing processes** and evaluate areas where automation or integration can provide the most significant improvements, such as transitioning from manual billing to automated systems or implementing unified communication platforms.

The insights gained from this analysis allow Vivasoft Ltd. to make informed decisions on necessary system upgrades or new implementations to resolve existing issues and align with the company's long-term goals.

2.1.4 Strategic MIS Planning

Strategic MIS planning at Vivasoft Ltd. focuses on aligning the company's IT systems with its long-term business strategy. This involves:

- **Defining a clear vision for the MIS infrastructure** that supports Vivasoft Ltd.'s goal of offering scalable, efficient, and robust software solutions. The MIS should be adaptable to the evolving needs of the company, especially as it expands into new industries and global markets.

- **Identifying long-term technology requirements** that will support Vivasoft Ltd.'s future growth, such as expanding internationally or handling increasingly complex projects. The MIS should be built to handle larger volumes of data, integrate with advanced technologies, and support diverse client needs.

- **Ensuring Scalability and Flexibility**: The system must be scalable, allowing Vivasoft Ltd. to grow seamlessly without overhauling the infrastructure. Flexibility in the system design will ensure that it can adapt to changing client requirements and emerging technological trends.

- **Supporting Competitive Advantage**: A strong MIS at Vivasoft Ltd. will enhance its competitive edge by making project delivery more efficient and improving customer satisfaction. With automated processes, better project management tools, and enhanced communication platforms, the company can deliver projects on time, maintain high client satisfaction, and increase market share.

2.1.5 Managerial and Operational MIS Planning

Managerial and operational MIS planning at Vivasoft Ltd. involves strategic system planning, information requirement analysis, and resource allocation. These processes ensure that the system is designed for both day-to-day operations and long-term managerial decision-making.

2.1.6 Strategic System Planning

Strategic system planning at Vivasoft Ltd. is focused on integrating technology into the company's core business functions to improve efficiency and drive growth. This includes:

- **Project Management Tools**: Vivasoft Ltd. will implement a centralized project management system that enables real-time tracking of project progress, task assignments, and automated reporting. This addresses the current inefficiencies in manual project tracking and helps prevent delays in deliverables.

- **Communication Integration**: The company will create a unified communication platform that seamlessly connects internal teams and external clients. By replacing fragmented tools like WhatsApp and Skype, this solution will improve collaboration, enhance client interactions, and ensure smooth communication throughout project lifecycles.

- **IT Infrastructure Planning**: To address network downtimes and internet blackouts, Vivasoft Ltd. will invest in a more robust IT infrastructure. This includes upgrading servers, enhancing network reliability, and adopting cloud-based solutions that provide backup and redundancy, minimizing operational disruptions.

2.1.6.1 Information Requirement Analysis

Information requirement analysis ensures that decision-makers at Vivasoft Ltd. have access to the data necessary for improving operations and making informed decisions. This includes:

- **Project-level Data**: Managers need real-time access to detailed project tracking information, including progress reports, timelines, and resource allocation. This will enable them to manage projects more effectively, address bottlenecks, and ensure timely delivery.

- **Client Data**: The system will provide better access to client feedback, communication logs, and project status updates. By understanding client needs and expectations, Vivasoft Ltd. can improve client satisfaction and ensure the delivery of high-quality solutions.

- **Financial and Billing Data**: An automated billing system will provide real-time financial reporting and transparency for both internal teams and clients. This will reduce errors, improve financial management, and build client trust by making billing processes more straightforward and accessible.

2.1.6.2 Resource Allocation

Resource allocation is essential for optimizing both human and technical resources at Vivasoft Ltd. Through careful planning, the company will ensure that:

- **Development Teams are Optimally Staffed**: Vivasoft Ltd. will use its team augmentation services more efficiently by assigning the right mix of skills to the right projects, ensuring that all projects have the required expertise to succeed.

- **IT Resources are Scalable**: Investments in cloud-based systems, server upgrades, and backup solutions will ensure that the company's IT infrastructure can scale with its growing needs.

This will support operational continuity and help mitigate risks related to network downtimes and internet blackouts.

- **Financial Resources are Appropriately Directed**: Vivasoft Ltd. will prioritize the allocation of financial resources toward system automation, infrastructure upgrades, and improved communication tools. This will lead to a measurable increase in efficiency, reduced operational costs, and improved client satisfaction.

2.2 Initial Investigation

The initial investigation phase is critical for ensuring that the new system aligns with the needs of Vivasoft Ltd. and its users. This phase helps to define the scope, objectives, and specific requirements of the system upgrade. Understanding the core operational challenges and determining the precise information requirements of different stakeholders are central to this process. This section will explore **needs identification**, the complexities of **determining user information requirements**, and **strategies** for effectively gathering these requirements.

2.2.1 Needs Identification

The first step in the initial investigation at **Vivasoft Ltd.** is identifying the company's operational needs and key areas for improvement. This involves recognizing pain points and inefficiencies across multiple departments and processes. The following key areas need attention:

- **Project Management Needs**: Vivasoft Ltd. requires a more structured approach to project tracking. The current manual methods contribute to inconsistencies, delayed deliverables, and inefficient workflows. A robust project management system is needed to streamline tasks, ensure on-time delivery, and improve overall productivity.

- **Communication Needs**: Fragmented communication channels, including reliance on tools like WhatsApp and Skype, have created disconnects between teams and clients. The company needs an integrated communication platform to improve coordination, reduce errors, and enhance client interaction.

- **Billing and Financial Needs**: Manual billing and payment processes are time-consuming and prone to errors, affecting both client satisfaction and internal financial accuracy. Automating these processes will help Vivasoft Ltd. enhance transparency, reduce the risk of mistakes, and increase efficiency.

- **Employee Feedback Needs**: A lack of structured feedback mechanisms makes it difficult to engage employees or gauge their satisfaction. Implementing a consistent, easy-to-use feedback system will improve employee retention, morale, and overall productivity.

- **IT Infrastructure Needs**: Frequent network downtimes and internet blackouts have impacted Vivasoft Ltd.'s operational efficiency. Upgrading IT infrastructure is essential to ensure reliable connectivity, reduce downtime, and improve overall performance, especially given the company's dependence on digital platforms for client service delivery.

2.2.2 Determining User's Information Requirements

At Vivasoft Ltd., understanding users' information requirements is a complex but essential task. Various users, from developers and managers to clients, have different needs, making it challenging to design a unified system that satisfies everyone. Several factors complicate this process:

- **Diverse User Roles**: Different users within Vivasoft Ltd. (e.g., managers, engineers, clients) require varying types of information. For instance, managers may need high-level project overviews, while developers require detailed task updates. This diversity complicates the standardization of information systems.

- **Undefined Needs**: Often, users are unsure of what specific information they need or how it can improve their work. This lack of clarity creates gaps during the requirements-gathering phase and risks misaligning the system with actual user needs.

- **Changing Business Environments**: Vivasoft Ltd.'s evolving client base and project portfolio require dynamic information systems. As the company grows and enters new markets, the information requirements will shift, making it challenging to capture static or long-term requirements.

- **Technological Understanding**: Some users may lack technical knowledge, making it difficult for them to envision how certain data or systems could help their work. This often leads to incomplete or vague requirements that don't fully capture what's needed for system improvement.

Despite these challenges, determining accurate information requirements is crucial to building a system that enhances decision-making, operational efficiency, and user satisfaction at Vivasoft Ltd.

2.2.3 Strategies for Determining Information Requirements

To overcome the challenges of determining users' information needs, Vivasoft Ltd. will implement several strategies to ensure accurate and comprehensive data collection. These include:

i) Asking

Engaging in direct communication with key stakeholders is one of the most effective ways to gather requirements. At Vivasoft Ltd., this strategy involves conducting interviews, surveys, or workshops with managers, team leaders, developers, and clients. Structured questions will focus on understanding what information users need to perform their tasks better, and how existing systems fall short in providing this data. This approach ensures that requirements are clearly articulated and aligned with the company's operational goals.

ii) Getting Information from the Existing Information System

Analyzing the current information system at Vivasoft Ltd. provides valuable insights into what is working and what is not. By reviewing existing project management reports, communication logs, and billing statements, the company can:

- **Analyze Existing Reports and Logs**: This helps to identify gaps in the data being provided and areas where additional information could improve decision-making. For example, reviewing

project timelines could reveal inconsistencies in reporting or missing data points that are essential for better project tracking.

- **User Feedback on Current Systems**: Gathering feedback from current users of the system is essential. Their hands-on experience with the system can highlight bottlenecks, inefficiencies, or any missing functionality that would make their work easier or more efficient.

iii) Prototyping

Prototyping involves creating an initial version of the system that users can interact with before the final design is locked down. This iterative process is particularly useful at Vivasoft Ltd. for ensuring that users' requirements are correctly understood and implemented. The benefits of this approach include:

- **Early User Feedback**: Allowing users to interact with the prototype early in the development process provides a hands-on opportunity for them to express what features or data points are missing. This reduces the risk of costly redesigns later in the process.

- **Visualizing Requirements**: Prototyping helps users, especially those with limited technical expertise, visualize how the system will work, which can help them better articulate their needs and suggest improvements.

- **Iterative Improvements**: Prototypes allow for iterative testing and refinement, ensuring that the final system is closely aligned with the actual requirements and expectations of all users at Vivasoft Ltd.

By applying these strategies, Vivasoft Ltd. will ensure that the system accurately reflects the company's operational needs and supports its long-term goals.

2.2.4 Initial Feasibility

A thorough feasibility study is essential to determine the practicality and success of the proposed system upgrade at Vivasoft Ltd. This phase examines various factors to ensure the project can be completed as planned and delivers the anticipated benefits. The feasibility study will encompass the following key areas:

- **Technical Feasibility**: This will evaluate whether the new systems can be seamlessly integrated into the current technical environment at Vivasoft Ltd. It's essential to determine whether the existing hardware, software, and infrastructure can support the new systems without causing disruptions. This includes assessing compatibility with the company's tools, databases, and platforms, ensuring that the new system meets the required technical standards.

- **Operational Feasibility**: The proposed systems must align with the operational objectives of Vivasoft Ltd., enhancing productivity and workflow efficiency. This section evaluates the system's ability to support the company's daily operations and ensure that its implementation will not interfere with ongoing projects. The system should also reduce bottlenecks and streamline processes across departments.

- **Economic Feasibility**: A detailed cost-benefit analysis will be conducted to determine whether the investment in the new system offers a favorable return on investment (ROI) for Vivasoft

Ltd. This includes the costs of software, hardware, and potential training, as well as the expected financial benefits such as increased efficiency, reduced manual labor, and fewer errors. The project will only move forward if it is financially viable for the company.

- **Time Feasibility**: This aspect examines whether the project can be completed within the required timeframe. For Vivasoft Ltd., it's important to ensure that the system upgrade does not result in extended downtime or delays in deliverables. A detailed project timeline will be created, highlighting key milestones to ensure on-time completion without impacting ongoing projects.

2.2.5 Risk Assessment and Mitigation

To ensure a successful system implementation at Vivasoft Ltd., a comprehensive risk assessment will be carried out, identifying potential obstacles and challenges that may arise during the process. Alongside this, a mitigation plan will be formulated to address and minimize these risks effectively. The key areas of risk and their mitigation strategies include:

- **Resistance to Change**: Employees may resist adopting new tools and processes, which could hinder the successful rollout of the system. To mitigate this, Vivasoft Ltd. will introduce comprehensive employee training programs. These programs will not only familiarize staff with the new tools but also emphasize the benefits of the upgrade in terms of improved efficiency and productivity. Early involvement of key team members will also ensure smoother adoption.

- **Budget Overruns**: Unexpected costs can arise during the implementation phase, leading to budget overruns. To mitigate this, Vivasoft Ltd. will conduct regular budget reviews throughout the project. A financial monitoring team will ensure that any unanticipated expenses are flagged early, allowing for timely corrective actions. Additionally, cost estimates will include a buffer to accommodate unforeseen expenditures.

- **Implementation Delays**: Delays in implementation can disrupt ongoing operations and negatively impact project timelines. Vivasoft Ltd. will develop contingency plans to address this risk, which includes allocating buffer time in the project schedule and ensuring additional resources are available to handle unexpected issues. Regular progress checks will help track timelines and allow the team to respond swiftly to any emerging delays.

By proactively addressing these risks and implementing targeted mitigation strategies, Vivasoft Ltd. aims to ensure the system upgrade proceeds smoothly and successfully without impacting the company's operations.

2.6 Conclusion

The system planning and initial investigation of Vivasoft Ltd. forms the backbone of the solutions that will align the company's technology infrastructure with its operational needs and future growth objectives One of the key strengths of this process is the involvement of diverse **stakeholders**, including **senior management**, **project leaders**, **IT teams**, and **the HR** and finance departments. Their

collaboration ensures that the system addresses the company's critical needs while also supporting broader operational objectives like talent retention, employee feedback, and financial transparency.

The strategic planning also includes a detailed system analysis to identify existing gaps in workflows, such as inefficiencies in communication, project tracking, and billing processes. By introducing centralized project management tools, integrating communication platforms, and upgrading IT infrastructure, Vivasoft Ltd. aims to significantly reduce **operational bottlenecks** and improve overall **efficiency**. This structured approach will ensure seamless communication, timely project delivery, and reduced risk of system downtime, directly contributing to better **client satisfaction** and enhanced competitive positioning.

In the initial investigation phase, identifying the needs of different users and determining their specific information requirements is critical. The company recognizes the complexity of this task, as different users—from managers to developers and clients—have varying needs. Through methods like direct **communication**, analyzing existing **system data**, and **prototyping**, Vivasoft Ltd. will gather comprehensive insights to design a system that truly meets the operational demands of its users.

The core focus is on resolving inefficiencies in areas like **project management**, **communication**, and **IT infrastructure** through a well-designed system that improves productivity and decision-making across all levels of the organization. The aim is to create a scalable and robust Management Information System (MIS) that not only addresses current operational challenges but also supports the company's long-term growth, ensuring that the infrastructure is adaptable as the business expands.

Chapter **3**
Information Gathering & Analysis

3.1 Introduction

The Information Gathering and Analysis phase is critical for understanding the current state of Vivasoft's information systems, identifying key issues, and determining user requirements for the new system. This chapter outlines the tools and methods used to collect relevant information, followed by a detailed analysis of the findings.

3.2 Information Gathering Tools

To gather comprehensive information about the existing systems and identify areas for improvement, several information gathering tools were employed:

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│   Information Gathering Tools        │
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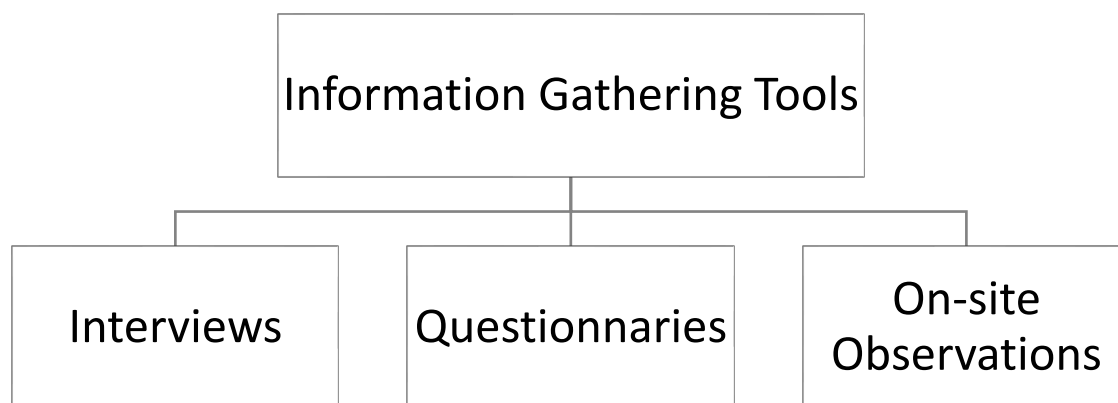
Fig.2 – Information Gathering Tools

3.2.1 Interviews

Interviews with key stakeholders provided valuable insights into the current challenges and potential solutions. Below is a realistic conversation between the analyst and Udayan Ghosh, Software Solution Architect and Branch Manager of Vivasoft's Rajshahi branch.

Analyst: Thank you for meeting with me today, Sir. To start, could you introduce yourself and tell me about your role at Vivasoft?

Udayan Ghosh: Certainly. I'm Udayan Ghosh, the Software Solution Architect of Vivasoft's Rajshahi branch. I've been with the company since its inception, and I know it quite well because the co-founders are my friends. Basically, I'm in charge of the operations here at the Rajshahi branch.

Analyst: It's great to have your insights. Could you tell me about the main challenges you face in managing software projects at the Rajshahi branch?

Udayan Ghosh: Well, we do have some systems in place for tracking project progress, but there's always room for improvement. We use multiple tools, which sometimes leads to small inconsistencies and inefficiencies. It can be a bit challenging to get a real-time view of project statuses.

Analyst: I understand. How do these inefficiencies impact your deliverables?

Udayan Ghosh: Occasionally, these small issues can add up, causing minor delays. It's not a frequent problem, but when it happens, it can impact our ability to meet deadlines, which in turn affects client satisfaction. Proper resource allocation also becomes tricky at times.

Analyst: Communication seems to be a critical aspect of project management. How effective are your current communication channels?

Udayan Ghosh: Communication is another area we are constantly working on. We rely on WhatsApp chats and Skype meetings, but these are not integrated. Important information can sometimes get lost, and coordinating with clients can be cumbersome due to the lack of a unified platform.

Analyst: I see. What about the billing and payment processes? Are there any challenges there?

Udayan Ghosh: Our billing process is largely manual, which is both time-consuming and prone to errors. This not only affects our efficiency but also creates issues with clients who find it hard to understand their billing statements.

Analyst: That's insightful. Finally, could you share your thoughts on the feedback collection mechanisms at Vivasoft?

Udayan Ghosh: Feedback collection is irregular and often informal. We lack structured mechanisms to gather and analyze feedback systematically.

Analyst: Thanks for sharing all this valuable information. Before we conclude, is there anything else you'd like to mention?

Udayan Ghosh: Yes, actually. One challenge we face in Rajshahi is hiring and retaining talent. Many skilled professionals prefer moving to the capital for better opportunities, which makes it tough to maintain a stable team here.

Analyst: Thank you for your time, Sir. Your insights will be incredibly valuable in our analysis and design of the new system.

3.2.2 Questionnaires

To gather feedback from employees, a structured questionnaire was used. The questionnaire focused on various aspects of employee satisfaction and organizational effectiveness. The following questions were included:

1. How satisfied are you with the opportunities for career growth and development at Vivasoft?

    - Not Satisfied

    - Slightly Satisfied

    - Moderately Satisfied

    - Satisfied

    - Very Satisfied

2. To what extent do you feel that your contributions are recognized and appreciated by the company?

    - Not Satisfied

    - Slightly Satisfied

    - Moderately Satisfied

    - Satisfied

    - Very Satisfied

3. To what extent do you feel that Vivasoft provides a supportive and inclusive work environment?

    - Not Satisfied

    - Slightly Satisfied

    - Moderately Satisfied

    - Satisfied

    - Very Satisfied

4. How would you rate the effectiveness of communication between management and employees at Vivasoft?

    - Not Satisfied

    - Slightly Satisfied

    - Moderately Satisfied

    - Satisfied

    - Very Satisfied

5. How satisfied are you with the overall compensation and benefits package offered by Vivasoft?

    - Not Satisfied

- Slightly Satisfied

- Moderately Satisfied

- Satisfied

- Very Satisfied

6. How would you rate the quality of training and development programs available at Vivasoft?

    - Not Satisfied

    - Slightly Satisfied

    - Moderately Satisfied

    - Satisfied

    - Very Satisfied

7. To what extent do you feel that your skills and expertise are being effectively utilized at Vivasoft?

    - Not Satisfied

    - Slightly Satisfied

    - Moderately Satisfied

    - Satisfied

    - Very Satisfied

8. How satisfied are you with the level of collaboration and teamwork within your department?

    - Not Satisfied

    - Slightly Satisfied

    - Moderately Satisfied

    - Satisfied

    - Very Satisfied

9. How satisfied are you with the work-life balance at Vivasoft?

    - Not Satisfied

    - Slightly Satisfied

    - Moderately Satisfied

    - Satisfied

- Very Satisfied

10. How would you rate the overall job satisfaction at Vivasoft?

- Not Satisfied

- Slightly Satisfied

- Moderately Satisfied

- Satisfied

- Very Satisfied

Results from these questionnaires will be analyzed and presented in the form of pie charts to provide a visual representation of employee satisfaction levels.

How satisfied are you with the opportunities for career growth and development at Vivasoft?
14 responses
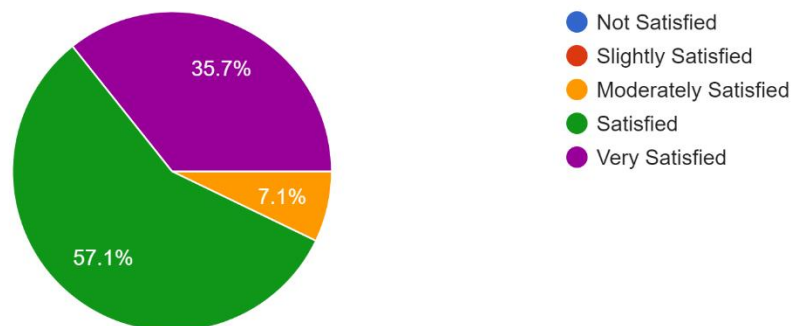
- Not Satisfied
- Slightly Satisfied
- Moderately Satisfied
- Satisfied
- Very Satisfied

To what extent do you feel that your contributions are recognized and appreciated by the company?
14 responses
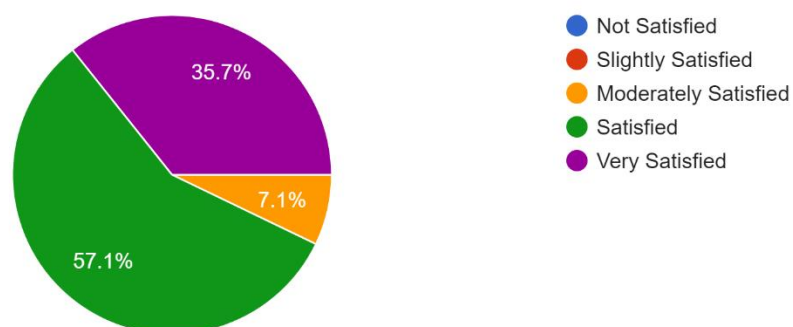
- Not Satisfied
- Slightly Satisfied
- Moderately Satisfied
- Satisfied
- Very Satisfied

To what extent do you feel that Vivasoft provides a supportive and inclusive work environment?

14 responses
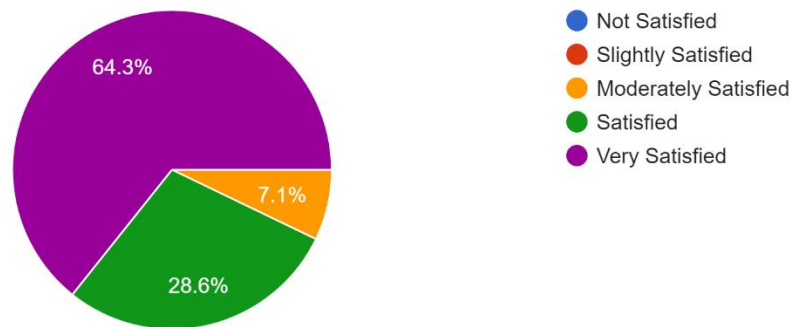
Legend:
- Not Satisfied
- Slightly Satisfied
- Moderately Satisfied
- Satisfied
- Very Satisfied

Values shown: 64.3%, 7.1%, 28.6%

How would you rate the effectiveness of communication between management and employees at Vivasoft?

14 responses

Legend:
- Not Satisfied
- Slightly Satisfied
- Moderately Satisfied
- Satisfied
- Very Satisfied

Values shown: 42.9%, 21.4%, 7.1%, 21.4%
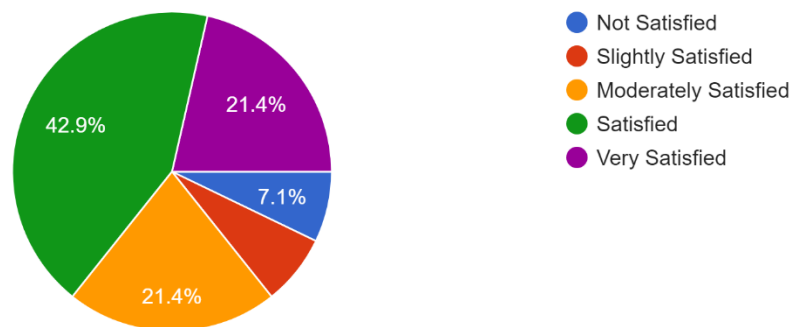
How satisfied are you with the overall compensation and benefits package offered by Vivasoft?

14 responses
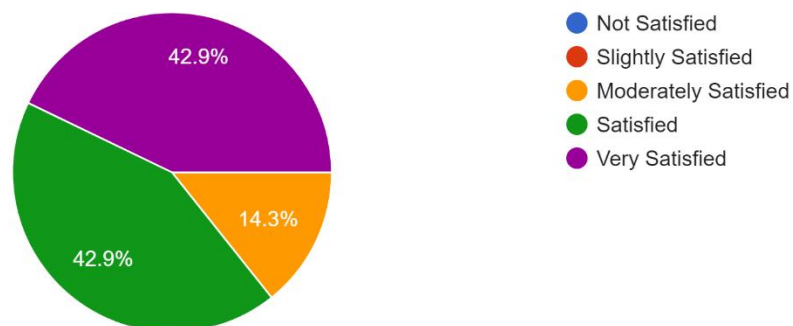
Legend:
- Not Satisfied
- Slightly Satisfied
- Moderately Satisfied
- Satisfied
- Very Satisfied

Values shown: 42.9%, 14.3%, 42.9%

21

How would you rate the quality of training and development programs available at Vivasoft?

14 responses

- Not Satisfied
- Slightly Satisfied
- Moderately Satisfied
- Satisfied
- Very Satisfied

28.6%
21.4%
7.1%
42.9%

To what extent do you feel that your skills and expertise are being effectively utilized at Vivasoft?

14 responses

- Not Satisfied
- Slightly Satisfied
- Moderately Satisfied
- Satisfied
- Very Satisfied

64.3%
14.3%
21.4%
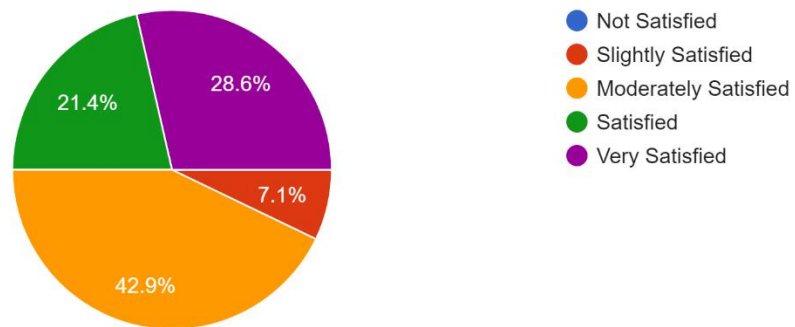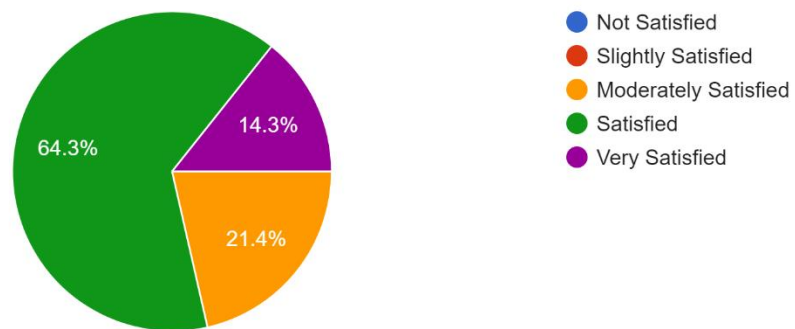
How satisfied are you with the level of collaboration and teamwork within your department?

14 responses
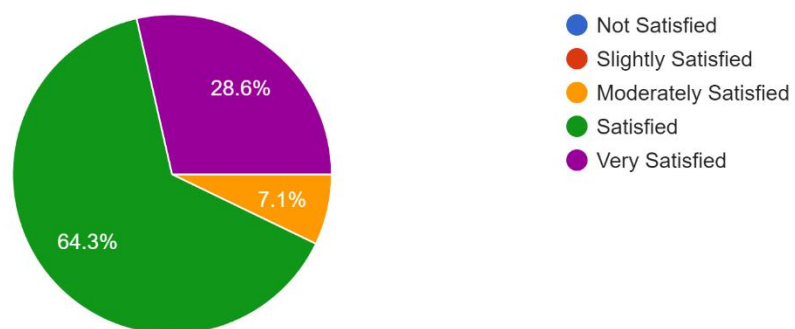
- Not Satisfied
- Slightly Satisfied
- Moderately Satisfied
- Satisfied
- Very Satisfied

28.6%
7.1%
64.3%

How satisfied are you with the work-life balance at Vivasoft?

14 responses

- Not Satisfied
- Slightly Satisfied
- Moderately Satisfied
- Satisfied
- Very Satisfied

How would you rate the overall job satisfaction at Vivasoft?

14 responses

- Not Satisfied
- Slightly Satisfied
- Moderately Satisfied
- Satisfied
- Very Satisfied
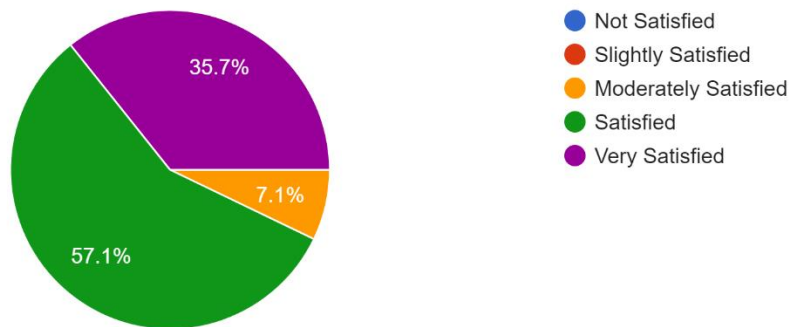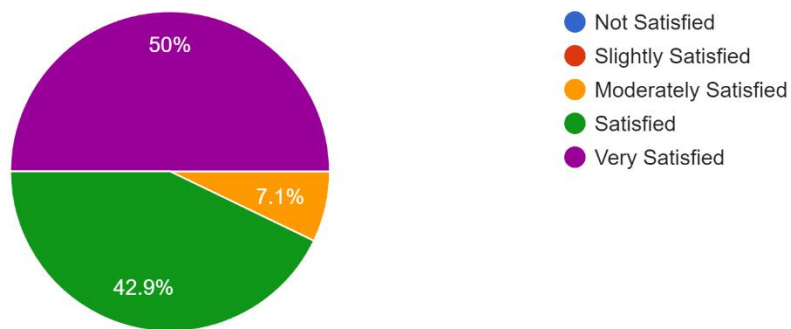
3.2.3 Onsite Observation

Direct observation of day-to-day operations at Vivasoft helped identify inefficiencies in workflows, communication practices, and system usage. Observations were conducted in various departments to ensure a comprehensive understanding of the company's operations.

3.3 Analysis of Findings

The information gathered through interviews, questionnaires, document analysis, and observation revealed several critical issues:

Project Management: Inconsistent tracking and resource allocation issues leading to project delays and inefficiencies.

Communication: Fragmented communication channels affecting information flow and coordination.

Billing and Payment: Manual processes prone to errors and time-consuming.

Feedback Collection: Irregular and informal mechanisms resulting in insufficient actionable insights.

IT Infrastructure: Network downtime and inadequate IT support impacting productivity.

Security: Inadequate security protocols and lack of regular audits posing risks.

Employee Satisfaction: Mixed levels of satisfaction with career growth opportunities, recognition, communication, compensation, and work-life balance.

Talent Retention in Rajshahi: Difficulty in hiring and retaining skilled professionals in Rajshahi due to a preference for opportunities in the capital.

These findings provide a clear direction for designing an integrated information system that addresses the identified issues and enhances overall operational efficiency at Vivasoft Ltd.

Chapter **4**
The Tools of Structured Analysis

4.1 Introduction

Structured analysis is a set of techniques and graphical tools that allow the analyst to develop a new kind of system specifications that are easily understandable to the user. The structured tools focus on the tools – data flow diagram(DFD), data dictionary, structured English, decision trees, and decision tables.

4.2 Data Flow Diagram

The first step of structured analysis is to draw a data flow diagram (DFD). The DFD was first developed by Larry Constantine as a way of expressing system requirements in a graphical form; this led to a modular design.

Data flow diagram of Vivasoft Ltd. is as follows:
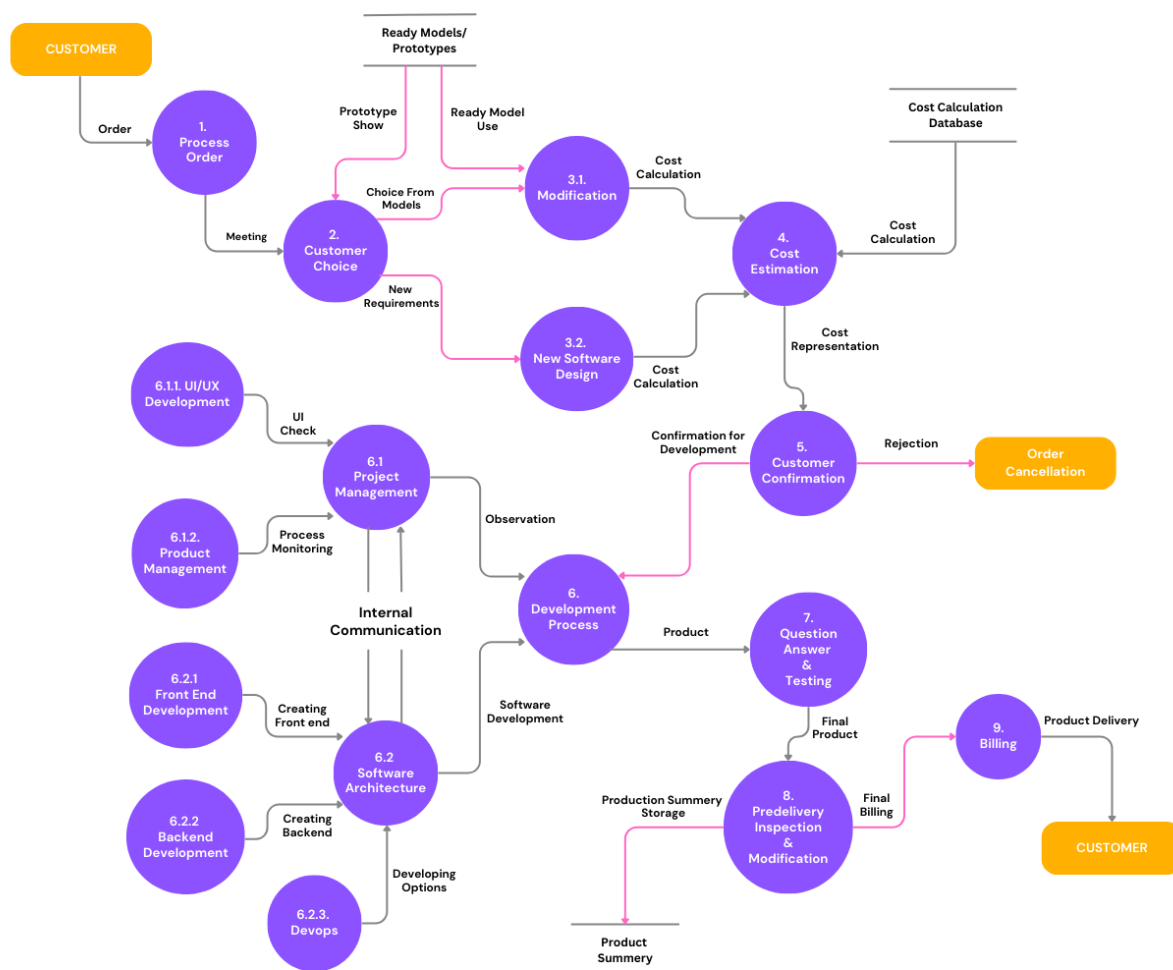
4.3 Data Dictionary

In our data flow diagrams, we give names to data flows, processes, and data stores. Although the names are descriptive of the data they do not give details. So following the DFD, our interest is to build some structured place to keep details of the contents of data flows, processes, and data stores. A data dictionary is a structured repository of data about data.

Here's how we can structure the data dictionary for Vivasoft Ltd:

1. Cost Calculation Database

Field Name	Data Type	Length	Description	Constraints
CostID	Integer	10	Unique identifier for each cost calculation	Primary key, auto-increment
CustomerID	Integer	10	Unique identifier for the customer	Foreign key, Not null
ModelType	String	50	Type of the model (old/new)	Not null
CustomizationDetails	String	255	Customization details provided by the customer	Nullable
EstimatedCost	Float	N/A	Total estimated cost	Not null
DateOfEstimation	Date	N/A	Date the estimation was made	Not null

2. Product Summary Database

Field Name	Data Type	Length	Description	Constraints
ProductID	Integer	10	Unique identifier for each product	Primary key, auto-increment
CustomerID	Integer	10	Unique identifier for the customer	Foreign key, Not null
ModelType	String	50	Type of the model (old/new)	Not null
CustomizationDetails	String	255	Customization details provided by the customer	Nullable
DevelopmentStatus	String	50	Current status of the development process	Not null
QAStatus	String	50	QA testing status	Not null
FinalProductDetails	String	255	Description of the final product delivered	Not null
DeliveryDate	Date	N/A	Date the product was delivered	Not null

3. Customer Confirmation Database

Field Name	Data Type	Length	Description	Constraints
ConfirmationID	Integer	10	Unique identifier for each customer confirmation	Primary key, auto-increment
CustomerID	Integer	10	Unique identifier for the customer	Foreign key, Not null
EstimationID	Integer	10	Unique identifier for the cost estimation	Foreign key, Not null
ConfirmationStatus	String	50	Customer's confirmation status (Accepted/Rejected)	Not null
ConfirmationDate	Date	N/A	Date the confirmation was made	Not null

4. QA & Testing Database

Field Name	Data Type	Length	Description	Constraints
TestID	Integer	10	Unique identifier for the QA testing process	Primary key, auto-increment
ProductID	Integer	10	Unique identifier for the product being tested	Foreign key, Not null
TestStatus	String	50	Status of the QA testing (Passed/Failed)	Not null
TestDetails	String	255	Details of the QA process	Nullable
DateOfTesting	Date	N/A	Date when the product was tested	Not null

These tables represent the structured repositories of data as indicated by the DFD. Each table schema is linked to the various processes in the system, such as cost estimation, product summary, customer confirmation, and QA & testing.

4.4 Decision Tree

Once the data elements are defined in the data dictionary, we begin to focus on the processes. The analyst needs to use tools to describe the processes and policies. The first such tool is the decision tree. A decision tree has as many branches as there are logical alternatives. It simply sketches the logical structure based on the stated policy. In this respect, it is an excellent tool. It is easy to read and easy to update.
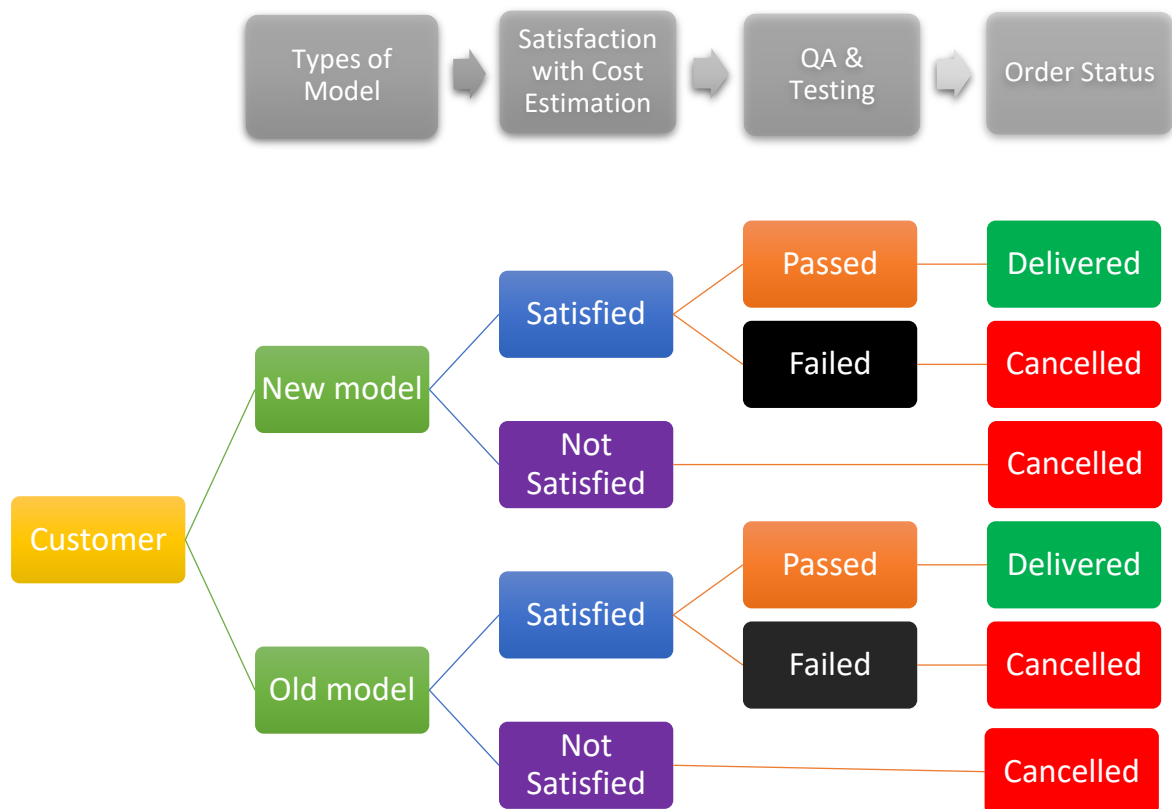
Here's a breakdown of the decision tree:

1. **Customer**: The process starts with the type of model a customer selects.

   o Two model types are considered:

      ▪ **New model**

      ▪ **Old model**

2. **Satisfaction with Cost Estimation**:

   o After selecting a model, the next stage determines whether the customer is satisfied with the cost estimation.

   o Two outcomes are possible:

      ▪ **Satisfied**

      ▪ **Not Satisfied**

3. **QA & Testing**:

   o After determining satisfaction, the process proceeds to quality assurance and testing.

   o The possible outcomes are:

      ▪ **Passed**

      ▪ **Failed**

4. **Order Status**:

Finally, the decision tree leads to different order statuses based on the QA and testing results:

- If QA and testing are **passed**, the order is **delivered** (green box).

- If QA and testing **fail**, the order is **cancelled** (red box).

4.5 Decision Table

A major drawback of a decision tree is the lack of information in its format to tell us what other combinations of conditions to test. This is where the decision table is useful. A decision table is a table of contingencies for defining a problem and the actions to be taken. It is a single representation of the relationships between conditions and actions.

The decision table for Vivasoft Ltd. is as follows:

Condition Entry		Condition Stub					
		1	2	3	4	5	6
IF (Condition)	Customer choose Old model	Y	Y	Y	N	N	N
	Customer choose New model	N	N	N	Y	Y	Y
	Satisfied with Cost estimation	Y	Y	N	Y	Y	N
	Unsatisfied with Cost estimation	N	N		N	N	
	Passed QA & Testing	Y	N		Y	N	
	Failed QA & Testing	N	Y		N	Y	
ELSE (Action)	Product Delivery	X			X		
	Order Cancelled at the very beginning			X			X
	Order Cancelled at the last moment		X			X	

Action Stub   Action Entry

The decision table provides clarity on how Vivasoft Ltd. manages customer orders based on key factors like model selection, customer satisfaction with cost, and QA results. It is a simple way to define rules and map them to corresponding actions. For instance, orders may be canceled early if the customer is unsatisfied with the cost, or canceled later due to failed testing, while successful orders lead to product delivery.

Chapter **5**
Feasibility Study

5.1 Introduction

The feasibility study is an essential step in the Information System Analysis and Design process. It involves evaluating potential solutions to determine their suitability in meeting the specific requirements and goals of the organization. By carefully analyzing different candidate systems, the feasibility study helps ensure that the selected solution not only meets technical specifications but also aligns with the company's budget and strategic objectives. This analysis is crucial for guiding the subsequent stages of system development, ultimately leading to the successful implementation of a robust and efficient information system.

For Vivasoft Ltd., this feasibility study focuses on addressing several key operational challenges identified in earlier stages of analysis, including project management inefficiencies, communication barriers, manual billing processes, inadequate feedback collection, and IT infrastructure issues. The goal is to evaluate potential systems that can effectively resolve these issues and enhance overall productivity and client satisfaction. The study will assess the economic, technical, and behavioral feasibility of each candidate system, ensuring that the chosen solution is practical, cost-effective, and well-received by users. Through this comprehensive evaluation, Vivasoft aims to select a system that will support its growth, improve operational efficiency, and maintain its competitive edge in the software development industry.

5.2 Feasibility Considerations and Steps of Analysis

Feasibility considerations play a critical role in evaluating potential systems for Vivasoft Ltd. They help assess the existing system's strengths and weaknesses, guiding the development of a new system that addresses these issues and enhances overall performance. This feasibility analysis focuses on three key aspects: economic, technical, and behavioral. Each consideration is carefully reviewed to ensure that the proposed system will effectively meet Vivasoft's needs while aligning with the company's resources and objectives.

5.2.1. Economic Feasibility
- **Cost-Benefit Analysis**: We performed a detailed cost-benefit analysis, comparing the projected financial benefits of the new system with its implementation and maintenance costs. Key factors included:

  - **Initial Costs**: Upfront investment in new software, hardware, or system upgrades required to support the proposed system.

  - **Operational Costs**: Ongoing maintenance, licensing fees, and personnel training.

  - **Expected Benefits**: Increased productivity, reduced errors, improved customer satisfaction, and enhanced system scalability that would lead to higher revenue in the long term.

o **Return on Investment (ROI)**: We calculated the potential return on investment to determine whether the system would be financially viable for Vivasoft in the long run.

The system was deemed economically feasible if the projected benefits outweighed the costs within an acceptable time frame.

5.2.2 Technical Feasibility

- **Current Infrastructure Compatibility**: We evaluated whether the existing IT infrastructure at Vivasoft could support the proposed system without requiring significant changes. This included:

  o **Hardware Compatibility**: Assessing whether current hardware (servers, storage, etc.) could handle the demands of the new system or if upgrades were necessary.

  o **Software Compatibility**: Analyzing whether existing applications, databases, and tools were compatible with the proposed system or whether new software solutions were required.

  o **Network Capabilities**: Verifying if the network infrastructure was robust enough to support additional traffic or changes in system architecture.

- **Technical Expertise**: We assessed whether the internal IT team at Vivasoft had the necessary expertise to maintain and troubleshoot the proposed system, or whether external support or hiring would be required.

- **Risk Assessment**: We evaluated potential risks, such as data migration challenges, system integration issues, or unplanned downtime during implementation. Mitigating these risks would be crucial for ensuring technical feasibility.

5.2.3. Behavioral Feasibility

- **User Adaptation**: We examined how different groups of employees, from management to technical teams, would react to the new system. This involved:

  o **User Resistance**: Identifying potential resistance from staff who are accustomed to the existing system and may be hesitant to adopt new processes or technologies.

  o **Training Requirements**: Determining the level of training needed for employees to effectively use the new system and reduce resistance. Younger employees may adapt more quickly, while senior staff may require additional support.

- **Change Management**: We considered the need for a structured change management plan, which would involve:

  o **Communication**: Clear communication of the benefits of the new system to employees, highlighting how it would improve their workflows and reduce inefficiencies.

  o **Gradual Transition**: Implementing the system in stages to minimize disruption to day-to-day operations and allow users to adapt gradually.

- o **Support Systems**: Providing help desks, tutorials, and other resources to ease the transition and foster acceptance of the new system.

5.2.4 Steps of Feasibility Analysis

The feasibility analysis involves the following eight steps:

1. **Form a Project Team and Appoint a Project Leader**: Assembling a team of key stakeholders and appointing a project leader to guide the feasibility analysis. The involvement of future system users is crucial for a successful design and implementation.

2. **Prepare System Flowchart**: Developing a flowchart to outline the current and proposed systems' workflows, identifying key processes and potential improvements.

3. **Enumerate Potential Candidate Systems**: Identifying and listing potential systems that could address the issues identified in the initial analysis.

4. **Describe and Identify the Characteristics of Candidate Systems**: Providing a detailed description of each candidate system, highlighting their features, benefits, and potential drawbacks.

5. **Determine and Evaluate Performance and Cost-Effectiveness of Each Candidate System**: Assessing how well each system performs against the identified objectives and comparing the costs involved.

6. **Weight System Performance and Cost Data**: Using a weighted scoring system to evaluating the overall performance and cost-effectiveness of each candidate system, taking into account the importance of various criteria.

7. **Select the Best Candidate System**: Based on the analysis, choosing the system that offers the best balance of performance, cost, and user acceptance for implementation.

8. **Prepare and Report Final Project Directive to Management**: Compiling a comprehensive report of the feasibility analysis, including the selected system, and presenting it to the management for approval and further action.

5.3 Feasibility Analysis

5.3.1 Creation of a Project Team

For the feasibility analysis of Vivasoft Ltd., our project team was formed as part of an academic assignment for the System Analysis and Design course. The team consists of five members:

- Masuma Tasnim Labiba (Roll: 1903160)

- Ayan Sarkar (Roll: 1903162)

- Abrar Al Fahad (Roll: 1903163)

- Mahmud Hasan Faysal (Roll: 1903164)

- Mehedi Hasan Shovon (Roll: 1903165)

Mehedi Hasan Shovon was the team leader, responsible for coordinating our efforts and ensuring that the project stays on track. Our team made multiple visits to Vivasoft's office to gather the necessary information and gain a thorough understanding of the existing systems and processes. This hands-on approach allowed us to closely examine the operational challenges and gather insights directly from the company's stakeholders, which are crucial for our feasibility analysis.

5.3.2 System Flowchart of Existing System

To understand the current operations at Vivasoft Ltd., we developed a system flowchart that maps out the existing processes, from project management to billing and communication workflows. This flowchart serves as a visual representation of how information flows through the company's current systems, highlighting areas where inefficiencies and bottlenecks occur. By examining these processes, we identified key points where improvements could be made, setting the stage for the development of more efficient candidate systems.

5.3.3 Potential Candidate Systems

Based on the analysis of Vivasoft Ltd.'s current operational challenges, two potential candidate systems have been identified to address the inefficiencies in project management, communication barriers, billing issues, feedback collection, and IT infrastructure problems. These systems differ significantly in terms of implementation, cost, customization, and integration capabilities.

Candidate System 1: Off-the-Shelf System

The first candidate system involves implementing a suite of off-the-shelf software solutions designed to address each of the specific issues identified at Vivasoft. This system leverages existing, proven technologies that are readily available and widely used in the industry. The key components of this system include:

- **Project Management Software**: Tools like Teamwork, Microsoft Project, or Monday.com will be used to improve project tracking, resource allocation, and timeline management. These platforms provide robust features for managing complex projects, ensuring that tasks are completed on time and within budget.

- **Communication Platforms**: To resolve communication barriers, Vivasoft can integrate platforms like Slack, Microsoft Teams, or Google Workspace. These tools offer seamless communication channels, enabling better collaboration among team members and more effective client interaction.

- **Billing and Payment Solutions**: The implementation of billing solutions such as Stripe or Sage can automate the invoicing process, reduce errors, and provide clients with transparent and easy-to-understand billing statements. These tools are widely recognized for their reliability and ease of integration with other business systems.

- **Employee Engagement and Feedback Collection**: To improve feedback mechanisms and enhance employee retention, tools like Leapsome or Motivosity can be utilized. These platforms facilitate structured feedback collection, performance reviews, and employee engagement, helping Vivasoft to gather actionable insights and improve overall satisfaction.

- **IT Infrastructure and Network Solutions**: To address network downtime, the system can include a backup satellite internet service for emergencies. This ensures that Vivasoft remains operational even during primary internet outages, minimizing disruptions to workflow and communication.

Advantages:

- **Ease of Implementation**: The off-the-shelf nature of these tools allows for quick deployment with minimal customization required.

- **Proven Reliability**: These platforms are widely used and have a proven track record in enhancing business operations.

- **Lower Initial Costs**: Compared to custom-built solutions, off-the-shelf systems have lower initial costs, as they do not require extensive development work.

- **Scalability**: These solutions can be scaled up or down depending on the company's growth and changing needs.

Disadvantages:

- **Limited Customization**: While these tools are highly functional, they may not perfectly align with Vivasoft's unique processes and requirements.

- **Integration Challenges**: Although many off-the-shelf tools offer integration capabilities, there may still be some challenges in achieving seamless interoperability between different platforms.

- **Ongoing Subscription Costs**: These systems typically require ongoing subscription fees, which can accumulate over time.

Candidate System 2: Custom-Built In-House System

The second candidate system proposes developing a fully custom-built, in-house software suite tailored specifically to Vivasoft's needs. This system would include custom alternatives to the off-the-shelf solutions mentioned in the previous candidate, offering a higher level of integration, security, and customization. The key components of this system include:

- **Custom Project Management Software**: A bespoke project management tool designed specifically for Vivasoft's workflow, offering seamless integration with other in-house systems and tailored features to meet the company's exact needs.

- **Custom Communication Platform**: An in-house communication tool built to integrate perfectly with Vivasoft's project management and client interaction systems, ensuring all communications are centralized and easily accessible.

- **Custom Billing and Payment System**: A custom-built billing solution that automates invoicing, tracks payments, and integrates smoothly with Vivasoft's financial systems. This solution would be designed to meet the specific requirements of Vivasoft's business model and client needs.

- **Custom Feedback and Engagement Tool**: A tailor-made platform for employee feedback and engagement, designed to collect insights relevant to Vivasoft's unique organizational culture and operational goals.

- **IT Infrastructure and Network Solutions**: To address network downtime, this system proposes setting up a team in another country to ensure business continuity during local internet blackouts. This international team would have access to all necessary systems and tools, allowing them to maintain operations without interruption.

Advantages:

- **High Customization**: This system is built from the ground up to meet Vivasoft's specific needs, offering unparalleled alignment with the company's processes.

- **Enhanced Integration**: The custom-built nature of this system ensures that all components work together seamlessly, providing a cohesive user experience and improved efficiency.

- **Superior Security**: In-house development allows for the implementation of advanced security measures tailored to Vivasoft's specific data protection requirements.

Disadvantages:

- **High Initial Costs**: The development of custom software is expensive, requiring significant upfront investment in both time and resources.

- **Longer Implementation Time**: Building a custom system from scratch takes considerably longer than deploying off-the-shelf solutions, potentially delaying the realization of benefits.

- **Ongoing Maintenance**: The custom system will require ongoing support from a dedicated IT team, which could increase operational costs over time.

Both candidate systems offer viable solutions to Vivasoft's current challenges, with the off-the-shelf system providing a quick and cost-effective option, and the custom-built system offering deep integration and tailored functionality at a higher cost and longer implementation time. The final decision will depend on Vivasoft's priorities, budget, and long-term strategic goals.

5.3.4 Characteristics of Candidate Systems

Each of the two candidate systems proposed for Vivasoft Ltd. offers distinct characteristics that cater to the company's needs in different ways. Below is a detailed description of the key characteristics of each system, highlighting how they address Vivasoft's operational challenges and their potential impact on the organization.

Candidate System 1: Off-the-Shelf System

This system is built on pre-existing, widely available software solutions tailored to address Vivasoft's needs in project management, communication, billing, feedback collection, and IT infrastructure.

1. Quick Deployment and Implementation:
The off-the-shelf system can be implemented rapidly since the software is already developed and readily available. This makes it an ideal choice for Vivasoft if they are seeking immediate improvements in their operations.

2. Proven Reliability:
The off-the-shelf tools, such as Monday.com, Slack, Stripe, and Leapsome, have been extensively tested in real-world environments and are known for their stability and reliability. This reduces the risks of system failures or unforeseen issues post-implementation.

3. Limited Customization:
While these tools offer customizable features, they are built to serve a wide audience, meaning they may not perfectly fit Vivasoft's unique workflows. Some processes may need to be adjusted to match the functionality provided by the software.

4. Subscription-Based Pricing:
This system typically operates on a subscription model, meaning that Vivasoft will incur ongoing costs for each tool. While the initial setup cost is lower, the long-term subscription fees must be factored into the overall budget.

5. Scalable Solutions:
Most off-the-shelf software solutions are scalable, allowing Vivasoft to add or remove users and features as the company grows or changes. This flexibility ensures that the system can adapt to future business needs.

6. Seamless Integration:
While each tool in the off-the-shelf system comes from different vendors, most offer integration capabilities through APIs or third-party services. This allows Vivasoft to create a connected workflow across different platforms, though integration may not be as seamless as a fully custom-built system.

7. Low Maintenance:
The software vendors handle the maintenance and updates for off-the-shelf solutions. This reduces the burden on Vivasoft's IT team, as they will not need to worry about bug fixes, software updates, or system downtime.

Candidate System 2: Custom-Built In-House System

The second candidate system involves developing a fully custom-built software solution tailored specifically to Vivasoft's operations. This system will be developed in-house, offering full control over the design, features, and integration.

1. High Customization and Flexibility:
This system is designed from scratch to meet the specific needs of Vivasoft. Every feature and functionality is built to align perfectly with the company's unique processes and requirements, offering the highest level of customization and flexibility.

2. Longer Development Time:
Building a custom system requires significant development time. While this allows for a tailor-made solution, the extended timeframe could delay improvements to Vivasoft's operations.

3. High Initial Costs:
The upfront cost of designing, developing, and implementing a custom-built system is significantly higher than an off-the-shelf solution. The development process will require dedicated resources and skilled personnel, making this a more costly option in the short term.

4. Superior Integration and Interoperability:
Because all components of the system are built in-house, integration between different modules will be seamless. The project management, communication, billing, and feedback systems will work together cohesively, leading to improved data sharing and operational efficiency.

5. Complete Control Over Features and Security:
Vivasoft will have full control over the security protocols and features of the custom-built system. This allows for the implementation of advanced security measures tailored to the company's specific data protection requirements, reducing the risk of data breaches or cyberattacks.

6. In-House Maintenance and Support:
With a custom-built system, Vivasoft will need to have a dedicated IT team to maintain and support the software. This includes handling software updates, troubleshooting issues, and ensuring that the system remains functional over time. While this adds to operational costs, it also ensures quicker responses to any system issues.

7. Long-Term Cost Savings:
Although the initial costs are high, a custom-built system can result in long-term savings by eliminating ongoing subscription fees associated with off-the-shelf software. Additionally, Vivasoft will own the intellectual property of the system, potentially making it a valuable asset in the future.

8. Network Redundancy Through International Team:
To address network downtime issues, this system includes the formation of an international team capable of continuing operations in the event of a local internet blackout. This adds a layer of reliability, ensuring that the company's productivity is not hampered by unforeseen internet issues.

5.3.5 Performance and Cost-Effectiveness of Candidate Systems
The performance and cost-effectiveness of each candidate system for Vivasoft Ltd. were evaluated based on how well they address the operational challenges identified in Chapter 2.2.1, particularly in the areas of project management, communication, billing, feedback collection, and IT infrastructure. Below is a comparative analysis of the performance and cost-effectiveness of the two candidate systems.

Candidate System 1: Off-the-Shelf System

Performance:
The off-the-shelf system offers strong performance in terms of immediate improvements to project management, communication, billing, and feedback processes. Tools like Monday.com, Slack, and Stripe are designed to handle complex workflows and are widely adopted in the industry. These platforms offer reliable, scalable solutions that Vivasoft can quickly implement to streamline operations.

- **Project Management**: The use of software like Microsoft Project or Monday.com will significantly improve Vivasoft's project tracking, reduce delays, and enhance resource allocation.

- **Communication**: Integrating Slack or Microsoft Teams will streamline communication, providing real-time messaging, file sharing, and integration with project management tools, reducing the fragmentation of communication channels.

- **Billing**: Stripe or Sage will automate billing processes, reduce manual errors, and improve transparency with clients, enhancing trust and satisfaction.

- **Feedback Collection**: Leapsome or Motivosity will enable structured feedback mechanisms, improving both employee engagement and client feedback.

- **IT Infrastructure**: Backup satellite internet service will ensure that Vivasoft remains operational during network downtimes.

Cost-Effectiveness:

While the off-the-shelf system has lower initial costs due to the absence of development expenses, it operates on a subscription-based pricing model, meaning that Vivasoft will need to budget for ongoing costs over time. However, the quick deployment, ease of use, and proven reliability make it a cost-effective solution in the short to medium term.

- **Initial Costs**: Lower, with only setup fees and minor integration costs.

- **Ongoing Costs**: Subscription fees for each tool, which can accumulate over time, though they provide continuous updates and support.

- **Return on Investment (ROI)**: ROI is achieved faster due to the immediate improvements in productivity and operational efficiency, with minimal downtime during implementation.

Overall, this system delivers strong performance with moderate ongoing costs, making it cost-effective in the short term, though long-term costs may add up depending on subscription models and the need for scaling.

Candidate System 2: Custom-Built In-House System

Performance:

The custom-built in-house system offers superior performance in terms of customization, integration, and security. Every component of the system is designed specifically for Vivasoft's unique needs, ensuring that all workflows are perfectly aligned with the company's processes.

- **Project Management**: A custom project management tool will allow for deeper integration with other in-house systems, providing real-time project tracking tailored to Vivasoft's specific workflow.

- **Communication**: A bespoke communication platform can integrate project management and client interaction seamlessly, reducing delays and miscommunication between teams.

- **Billing**: A custom billing system will offer complete control over billing processes, allowing Vivasoft to create tailored invoicing structures that meet client expectations and ensure financial transparency.

- **Feedback Collection**: A tailored feedback platform will address specific organizational needs, improving both employee retention and client satisfaction through custom performance metrics.

- **IT Infrastructure**: The inclusion of a team in another country to manage operations during network downtime ensures business continuity, even during local internet blackouts, providing a robust solution to network issues.

Cost-Effectiveness:

The custom-built system requires a significant upfront investment due to the need for in-house development, but it eliminates ongoing subscription fees. Over time, this system may prove more cost-effective if maintained properly, especially as Vivasoft grows and the system is scaled to meet increasing demands.

- **Initial Costs**: High, as the development and integration of a custom solution require significant time and resources. These costs include software development, testing, implementation, and training.

- **Ongoing Costs**: While there are no subscription fees, ongoing maintenance, updates, and IT support costs must be considered. These costs will vary depending on the complexity of the system and the size of the IT team needed to support it.

- **Return on Investment (ROI)**: The ROI for the custom-built system will take longer to realize due to the extended development and higher initial costs. However, in the long term, this system could provide greater savings by eliminating subscription fees and offering superior integration and efficiency.

Although this system is costlier in the beginning, its long-term benefits include complete control over features, enhanced security, and better integration. If Vivasoft is seeking a solution that scales with the company and provides unique customization, the higher initial costs may be justified.

Comparison Summary:

Criteria	Candidate System 1 (Off-the-Shelf)	Candidate System 2 (Custom-Built In-House)
Initial Costs	Low – setup fees and minimal integration costs	High – development, testing, and training costs
Ongoing Costs	Medium – subscription fees over time	Low – maintenance and support costs (no subscription fees)
Deployment Time	Quick – immediate implementation	Long – requires development and testing

Criteria	Candidate System 1 (Off-the-Shelf)	Candidate System 2 (Custom-Built In-House)
Customization	Limited – built for broad use	High – tailored to Vivasoft's specific needs
Integration	Moderate – integration possible but may require third-party APIs	High – seamless integration with in-house systems
Security	Standard – relies on cloud provider security	High – full control over security features
Scalability	High – scalable depending on subscription plan	High – scalable but requires in-house IT support
ROI	Fast – quick improvements with minimal downtime	Slow – long-term savings after high initial costs

SWOT Analysis for Candidate System 1: Off-the-Shelf System
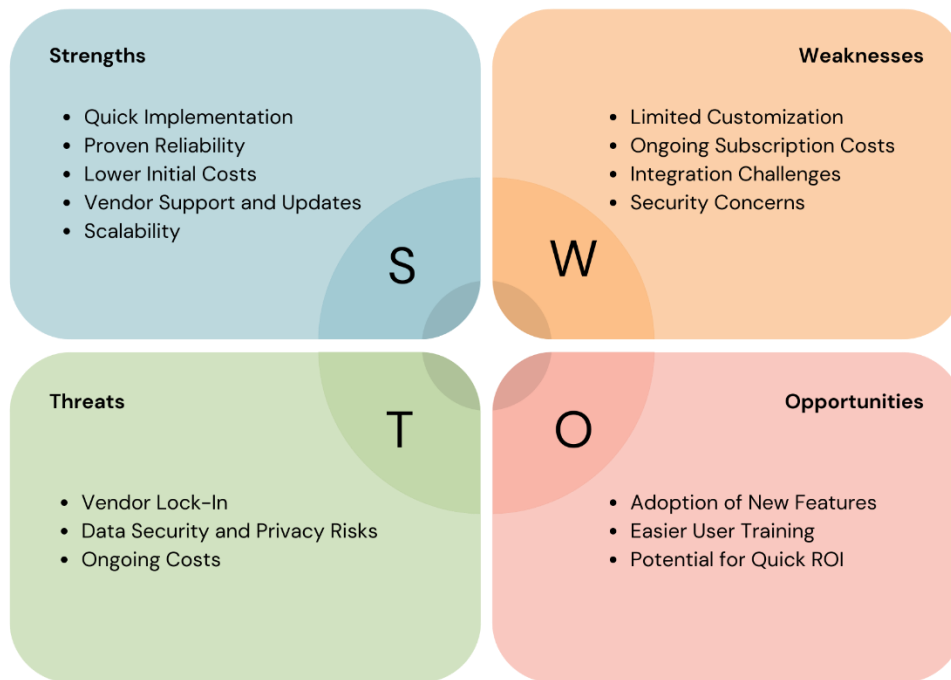
Strengths:

- **Quick Implementation**: The off-the-shelf system can be deployed almost immediately, reducing the downtime typically associated with system transitions.

- **Proven Reliability**: Established software platforms like Microsoft Project, Slack, and Stripe have been extensively tested and are used by many organizations worldwide, ensuring stability and dependability.

- **Lower Initial Costs**: The initial cost is significantly lower than a custom-built system, with the majority of costs coming from subscriptions rather than development.

- **Vendor Support and Updates**: Continuous updates and customer support are handled by the vendors, reducing the burden on Vivasoft's IT team.

- **Scalability**: The system can be easily scaled to meet future growth without significant modifications.

Weaknesses:

- **Limited Customization**: The system is designed to serve a broad range of businesses, so it may not perfectly fit Vivasoft's specific workflows or requirements.

- **Ongoing Subscription Costs**: While the initial cost is low, subscription fees accumulate over time, potentially leading to higher long-term expenses.

- **Integration Challenges**: Since the software components come from different vendors, achieving seamless integration between them can be challenging, possibly requiring additional third-party tools.

- **Security Concerns**: The company is dependent on the security measures implemented by third-party vendors, which may not always align with Vivasoft's specific security needs.
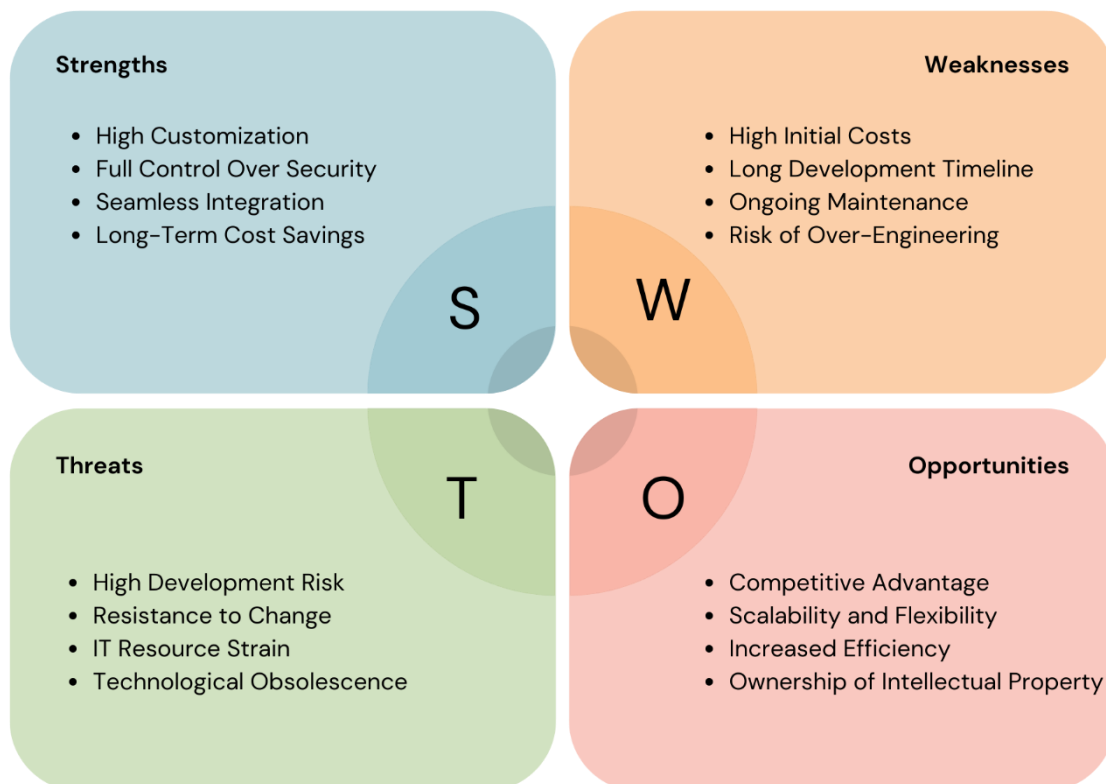
Opportunities:

- **Adoption of New Features**: Off-the-shelf software providers often introduce new features and improvements that Vivasoft can benefit from without additional costs.

- **Easier User Training**: Most employees are likely familiar with widely-used platforms like Slack and Microsoft Teams, reducing training time and improving user adoption.

- **Potential for Quick ROI**: With immediate improvements in project management and communication, the system can deliver a fast return on investment through enhanced operational efficiency.

Threats:

- **Vendor Lock-In**: Relying on third-party software can create vendor lock-in, making it difficult to switch providers if costs increase or service quality declines.

- **Data Security and Privacy Risks**: Data hosted on external servers (cloud-based) could be vulnerable to breaches or misuse, and may not fully comply with specific internal or regional security policies.

- **Ongoing Costs**: As the company grows, subscription fees could become burdensome, especially if additional features or users are required.

SWOT Analysis for Candidate System 2: Custom-Built In-House System

Strengths

- High Customization
- Full Control Over Security
- Seamless Integration
- Long-Term Cost Savings

S

Weaknesses

- High Initial Costs
- Long Development Timeline
- Ongoing Maintenance
- Risk of Over-Engineering

W

Threats

T

- High Development Risk
- Resistance to Change
- IT Resource Strain
- Technological Obsolescence

Opportunities

O

- Competitive Advantage
- Scalability and Flexibility
- Increased Efficiency
- Ownership of Intellectual Property

Strengths:

- **High Customization**: The custom-built system is tailored specifically to Vivasoft's needs, ensuring that it perfectly aligns with the company's workflows and operational requirements.

- **Full Control Over Security**: Since the system is developed and managed in-house, Vivasoft has complete control over its security measures, ensuring that data protection is handled according to the company's standards.

- **Seamless Integration**: All components of the system are built to work together, leading to a more seamless user experience and better integration across different functions like project management, communication, and billing.

- **Long-Term Cost Savings**: While the initial costs are high, the lack of ongoing subscription fees means the custom system could offer significant long-term savings.

Weaknesses:

- **High Initial Costs**: The development and implementation of a custom-built system require a substantial upfront investment in both time and resources.

- **Long Development Timeline**: Building the system from scratch will take time, potentially delaying the benefits that Vivasoft needs to realize quickly to improve operational efficiency.

- **Ongoing Maintenance**: Unlike off-the-shelf systems, maintenance and updates are the responsibility of Vivasoft's IT team, adding to operational costs and requiring dedicated resources.

- **Risk of Over-Engineering**: Since the system is custom-built, there is a risk of creating overly complex solutions that may be difficult to use or maintain.

Opportunities:

- **Competitive Advantage**: A highly tailored system could give Vivasoft a competitive edge by offering unique features that competitors using off-the-shelf systems may lack.

- **Scalability and Flexibility**: The custom system can be designed to scale seamlessly with the company's growth, ensuring that future needs are met without the limitations imposed by pre-built solutions.

- **Increased Efficiency**: By integrating all core operations into one cohesive platform, the custom system can significantly improve efficiency across departments, reducing bottlenecks and improving productivity.

- **Ownership of Intellectual Property**: Vivasoft will own the intellectual property of the custom-built system, which could become an asset in future business endeavors.

Threats:

- **High Development Risk**: Building a custom system involves higher risk in terms of potential delays, budget overruns, and system performance issues during development.

- **Resistance to Change**: Employees may resist adopting a new custom system, especially if they are comfortable with current tools, potentially slowing down the transition.

- **IT Resource Strain**: The need for ongoing in-house maintenance and support can strain Vivasoft's IT resources, diverting attention from other critical projects or requiring the hiring of additional personnel.

- **Technological Obsolescence**: The system may become outdated if not regularly maintained and upgraded, requiring costly overhauls or new development work in the future.

5.3.6 Weighting System Performance and Cost Data
Candidate System Performance/Cost Evaluation Matrix

| Criteria	Off-the-Shelf System	Custom-Built In-House System
Performance		
System Customization	Limited	Full Customization
Integration	Moderate (may need third-party tools)	High (integrated as per needs)
Response Time	Dependent on external provider	Optimized for internal use
User-Friendly	Yes, intuitive, and widely adopted	Custom interfaces; higher training required
Growth Potential	Limited to vendor's roadmap	Unlimited (can scale internally)
Costs		
System Development	$2,000 - $4,000	$20,000 - $50,000
User Training	1-2 days (varied based on software)	5-10 days
System Operations	$100 - $500/month (licensing and subscription)	$200 - $1000/month (maintenance)
Payback Period	6-12 months	2-3 years (higher initial cost)

This matrix compares the performance, customization, integration, costs, and other critical aspects of the off-the-shelf system and the custom-built in-house system based on their respective advantages and trade-offs.

5.3.7 Selection of the Best Candidate System

Evaluation Criteria	Weighting Factor	Off-the-Shelf System (Rating)	Off-the-Shelf System (Score)	Custom-Built In-House System (Rating)	Custom-Built In-House System (Score)
Performance					
System Customization	4	3	12	5	20
Integration	3	4	12	5	15
Response Time	3	4	12	5	15
User-Friendly	2	5	10	4	8
Costs					
System Development	5	4	20	2	10
User Training	3	5	15	2	6
System Operation	2	4	8	3	6
Payback	2	4	8	2	4
Total Score			**97**		**84**

Based on the results from the Weighted Candidate Evaluation Matrix, the Off-the-Shelf System has a total score of **97**, while the Custom-Built In-House System scores **84**. This evaluation reflects that the Off-the-Shelf System outperforms the Custom-Built System in most criteria, particularly in terms of cost-effectiveness, user-friendliness, and quicker payback.

Although the Custom-Built System excels in areas like system customization and integration, it is less favorable when considering development costs, operational complexity, and user training requirements. The Off-the-Shelf System provides a more balanced and reliable solution with a higher score, due to its established reliability, faster implementation, and overall lower financial burden. It also offers a better return on investment, making it a more feasible choice for Vivasoft's project management needs.
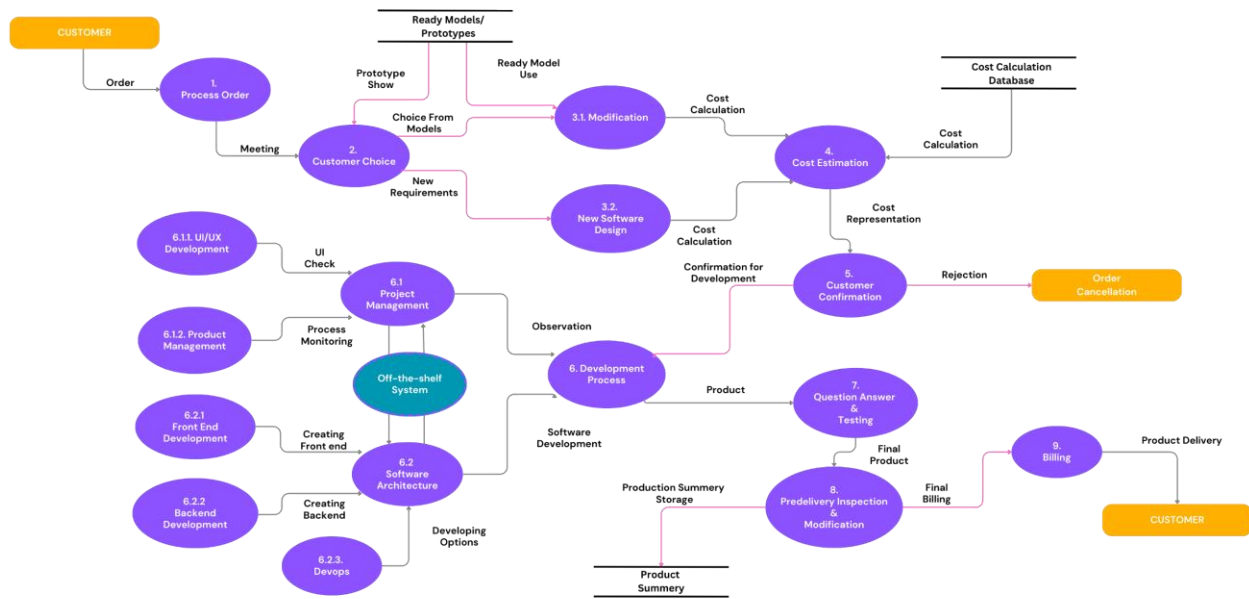
Considering these factors, **the Off-the-Shelf System is the best candidate system for Vivasoft**, given its superior performance across multiple evaluation criteria. It meets the organization's needs efficiently without incurring the high costs associated with custom development, and it ensures quicker system deployment with minimal disruptions.

5.3.8 Reporting to the Management

After completing the feasibility analysis and evaluating potential systems, the findings and recommendations are compiled into a formal report. This report, detailing the comparison between the Off-the-Shelf System and the Custom-Built In-House System, will be presented to the authorities at Vivasoft for their review and consideration.