# Requirement Analysis

## Feasibility Study

Feasibility is defined as the practical extent to which a project can be performed successfully. To evaluate feasibility, a feasibility study is performed, which determines whether the solution considered to accomplish the requirements is practical and workable in the software. Information such as resource availability, cost estimation for software development, benefits of the software to the organization after it is developed and cost to be incurred on its maintenance are considered during the feasibility study. The results of the feasibility study should be a report that recommends whether or not it is worth carrying on with the requirements engineering and system development process.

## Economical feasibility

Economic feasibility determines whether the required software is capable of generating financial gains for an organization. It involves the cost incurred by the software development team, the estimated cost of hardware and software, the cost of performing a feasibility study, and so on.

- Cost incurred on software development to produce long-term gains for an organization.
- Cost required to conduct full software investigation (such as requirements elicitation and requirements analysis).
- Cost of hardware, software, development team, and training.

## Technical feasibility

Technical feasibility assesses the current resources (such as hardware and software) and technology, which are required to accomplish user requirements in the software within the allocated time and budget. Technical feasibility also performs the following tasks.

- Analyses the technical skills and capabilities of the software development team members.
- Determines whether the relevant technology is stable and established.
- Ascertains that the technology chosen for software development has a large number of users so that they can be consulted when problems arise or improvements are required.

## Behavioral feasibility

Behavioral Feasibility assesses the extent to which the required software performs a series of steps to solve business problems and user requirements. This feasibility is dependent on human resources (software development team) and involves visualizing whether the software will operate after it is developed and be operative once it is installed. Operational feasibility also performs the following tasks.

- Determines whether the problems anticipated in user requirements are of high priority.
- Determines whether the solution suggested by the software development team is acceptable.
- Analyzes whether users will adapt to a new software.
- Determines whether the organization is satisfied by the alternative solutions proposed by the software development team.

## Feasibility Study Questionnaire

**Question1:**Project Overview

**Answer:** The project aims to revolutionize waste management in urban areas through an online-based system. It involves creating an efficient waste collection and disposal solution using mobile/web applications for administrators, drivers, and the general public. The system integrates route optimization, complaint management, and data analytics to streamline waste collection processes.

**Question 2:** To what extent is the system proposed for?

**Answer:** The system is proposed to manage comprehensive solid waste management processes, including segregation, collection, transportation, and complaint handling. It optimizes resource utilization for more efficient waste management across various city zones.

**Question 3:** Specify the Viewers/Public to be involved in the System?

**Answer:** The system involves three main user groups: Administrators responsible for overseeing the entire waste management process, Drivers tasked with waste collection and route optimization, and the General Public who can register complaints and track their statuses.

**Question 4:** Identify the users in your project.?

**Answer:** Administrators, Drivers, and the General Public are the primary users interacting with the system.

**Question 5:** Who owns the system?

**Answer:** The system is owned by the governing body responsible for waste management in the city or municipality.

**Question 6:** System is related to which firm/industry/organization?

**Answer:** The system is related to the waste management industry, specifically focused on improving municipal waste collection and disposal.

**Question 7:** Details of the person you have contacted for data collection?

**Answer: Municipal Waste Management Department:** This department oversees and manages waste collection, disposal, and recycling efforts within the city or municipality. They would possess detailed data regarding current collection routes, frequency, complaints received, and the overall efficacy of the existing system.

**Garbage Collection Supervisors/Managers:** Direct supervisors or managers responsible for overseeing garbage collection teams might provide insights into the daily operational challenges, drivers' schedules, and areas where the current system faces inefficiencies.

**Question 8 :** Questionnaire to collect details about the project?

**Question 8.1:** How would the organization cope if this system was not implemented?

**Answer:** Without the smart waste management system, the organization might face inefficiencies in waste collection, leading to higher operational costs, increased environmental impact, and potential health hazards due to improper waste handling.

**Question 8.2: What** are the problems with current processes and how would a new system help alleviate these problems?

**Answer:** Current processes might suffer from lack of real-time monitoring, inefficient route planning for waste collection, and inaccurate data on waste generation patterns. A new system could introduce real-time tracking, optimize collection routes, provide accurate data for better decision-making, and enable proactive maintenance of waste bins.

**Question 8.3:** What direct contribution will the system make to the business objectives and requirements?

**Answer:** The system can directly contribute to cost reduction through optimized waste collection routes, improved resource allocation, and better compliance with environmental regulations. Additionally, it could enhance sustainability efforts by reducing the environmental footprint associated with waste management.

**Question 8.4:** Can information be transferred to and from other organizational systems?

**Answer:** Yes, the system should ideally facilitate seamless information exchange with other organizational systems, such as inventory management, accounting, or analytics platforms. This integration can streamline operations and enhance overall efficiency.

**Question 8.5:** Does the system require technology that has not previously been used in the organization?

**Answer:** Implementing the smart waste management system might require new technologies like IoT sensors, data analytics software, and cloud-based platforms. However, these technologies are increasingly common and have been successfully implemented in various industries, ensuring a wealth of available expertise and support**.**

**Question 8.6:** What must be supported by the system and what need not be supported?

**Answer:** The system must support real-time monitoring, data analytics for predictive maintenance, route optimization, and integration with other systems. Not all features or functionalities might be necessary initially, so prioritizing essential functionalities and scalability would be crucial. Conversely, certain legacy processes or manual workflows might not need immediate integration or support from the new system, depending on their relevance to waste management efficiency.

**Question 8.7:** How often are garbage trucks unable to cover specific zones due to resource limitations?

**Answer:** Garbage trucks might face challenges covering specific zones regularly, possibly due to inadequate staffing or inefficient route planning. These limitations might occur daily or weekly, impacting the timely collection of waste from certain areas.

**Question 8.8**: What kind of complaints are commonly registered by citizens regarding waste collection?

**Answer:** Common complaints from citizens might include issues such as irregular waste collection schedules, overflowing bins, missed pickups, unattended litter, or inefficient disposal causing environmental concerns.

**Question 8.9:** Are there any specific regulatory or logistical constraints to consider when optimizing waste collection routes?

**Answer:** Logistical constraints might include traffic congestion, road conditions, restricted access in certain areas, or specific timings for waste collection in residential or commercial zones. Regulatory constraints could involve compliance with environmental regulations, noise ordinances, or waste disposal guidelines.

**Question 8.10:** What data is currently being collected regarding waste management, and how is it being utilized?

**Answer:** Data typically collected could involve the frequency of waste collection, areas covered by trucks, complaint records, bin capacities, and driver reports. This data might currently reside in manual records or basic databases. Its utilization might primarily involve basic route planning or addressing immediate complaints rather than sophisticated analytics or optimization