

Analyzing a Problem

The first step in resolving a problem is to define the problem and clearly articulate it.

What is a Business Problem

A Business Problem is a scenario or a challenge which adversely affects the *profitability, reputation or business continuity*. A business problem is an opportunity for an organization to improve. However, not all business problems need can be resolved.

Also when defining a problem statement always focus on solution to what than what is the solution. It is vital to understand beforehand that if it is actually a problem which needs to be solved.

Characteristics of problem:

- Presence of a symptom (e.g. - Gross sales dropped)
- Magnitude of the problem (e.g. - By 25% (\$3.5M))
- Time of the event (e.g. - In Q3 2019)
- Seriousness of the problem (e.g. - Impacted overall P/L)
- Spatial location (e.g. - Organization)

Complete Example: Company's gross sales dropped by 25% (\$3.5M) in 3rd quarter (Q3) of 2019. This drop has significantly impacted the overall P/L (Profit/Loss) of the organization

Methods of preliminary analysis to clearly define the problem (one or any combination of more than one can be used):

- ❖ Rephrase the problem
- ❖ Expose and challenge assumptions
- ❖ Chunk up [Scaling up a problem]
- ❖ Chunk down [Scaling down a problem]
- ❖ Find multiple perspectives
- ❖ Reverse the problem
- ❖ Gather facts and numbers

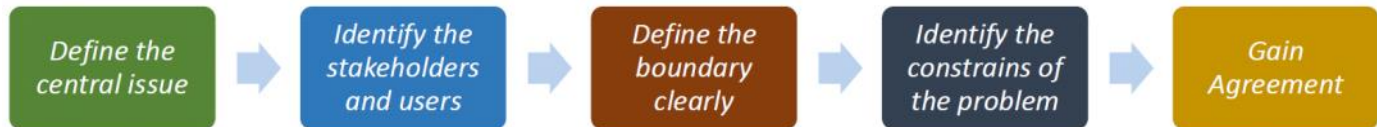
Stakeholder: Includes everyone involved in a project. Customer, team, PIM, STLs, tech team support resource and everyone involved will be stakeholder

Customer: Someone who is benefitting from the problem resolution or opportunity. Customer could be user or someone trying to get a solution that will make it better for the customer

User: Person who hands on uses the product or solution

Sponsor: The STL or Leader or Manager who is sponsoring the project

Problem Analysis Steps:



Defining a Business Problem will help:

- Identify the primary problem that needs to be resolved in any scenario
- Define the scope of the problem and its impact
- Identify the root causes of the problem and not just the symptoms of the problem
- Identify sustainable solutions for business problems
- Focus on 'Solution to than 'What is the solution

Business problem can exist in:

- Finance
- Business
- Process
- Customer
- Product/Service

What is problem analysis?

Problem analysis is a process that includes

a set of analytic tasks performed to increase the understanding of a problem scenario. It helps to simplify the problem, identify root causes of the problem and eventually resolve the problem effectively.

Problem Analysis Tools:

- **Pareto Chart (or 80:20 principle)** - Used to prioritize the issues needs to be solved and help to focus on those with maximum impact
- **Cause and Effect or Ishikawa or Fish Bone Diagram** - It is used to classify potential causes of a problem to identify root causes. All causes are classified under 6M (Machine, Manpower, Materials, Methods, Mother Earth, Measurement)
- **Failure Mode Effect Analysis (FMEA)** - It can be used for new as well as existing processes and involves identifying potential failures and their corresponding cause and effects.
- **GAP Analysis** - It involves the comparison between Actual Performance with Desired Performance and helps to identify the gaps to reach the desired state.
- **Problem Tree Analysis** - Tree structure to show causes leading to a problem and the effects because of the problem
- **Surveys & Interviews**

Requirements Gathering

In order to start any project, it is required to create clear, concise and agreed set of customer/stakeholder requirements. This enables setting expectations and focusing on delivering what the customer/stakeholder wants.

Steps in Requirement Gathering :

The 5 key steps in requirements gathering:

- Establish project goals and objectives early
- Document every activity to be performed in requirements gathering
- Perform quick brainstorm to identify the right stakeholders (sponsors, customers and users)
- Focus on business requirements and not tools
- Remember that you didn't get everything

Goal vs Objective :

Goal: High level statements that provide overall context for what the project is trying to achieve, and should align to business goals.

Objective: Lower level statements that describe the specific, tangible deliverables that the project will deliver.

Addressing Gaps in Requirements:

Define Success Metric: Ask stakeholders to define the success metric clearly

Mind Change: Stakeholders mindset is prone to change

Problem and Objective: Always focus on the problem and objective of the project

Stakeholder Priority: Take time to address conflicting stakeholder priority

Divert Stakeholder focus: Divert stakeholder focus on one particular focused solution to the problem

Parts of a Requirement Document - Business Requirements Document (BRD) :

BRD emphasizes on the needs and expectations of the customer. BRD indicates what the business wants to achieve, and indicates all the project deliverable and the associated inputs and outputs.

- **Executive Summary:** Outline of the requirements of the project
- **Project Objectives in SMART format:** Objectives should be Specific, Measurable, Attainable, Realistic, and Time bound
- **Need Statement:** Outlines why the project is needed and how the project will be able to meet the needs
- **Project Scope:** Outlines what to be included and what should not be included.
- **Financial Statements:** Indicates the impact of the project and revenue over specific period of time.
- **Functional Statements:** Functional requirements and corresponding features including diagrams, charts, and timelines
- **Schedule/Timelines/Deadlines:** Phases of the project will be covered and Stakeholders will be aware of what is required and when it will be required.
- **Cost & Benefit:** Holds the cost of the project along with the cost benefit analysis. The savings from the project are also captured

Requirements Gathering Techniques:

- **Interviews**
- **Focus Groups**
- **Idea/Mind maps** - A graphical way to represent ideas and concepts. It helps structuring information, helping you to analyze, comprehend, synthesize, recall and generate new ideas.
- **Affinity Diagrams** - A tool that gathers large amounts of language data (ideas, opinions, issues) and organizes them into groupings based on their natural relationships.
- **Brainstorming**
- **Benchmarking** - This is the practice of comparing business processes and performance metrics to industry bests and best practices from other companies.
- **Document/Wiki analysis**
- **Questionnaire**
- **Observation**
- **Prototype** - A replica of the final product to be developed, which will contain the desired features.

Kipling Method [5W 1H] for Effective Questions:

5W 1H is the shorthand of 'Who, What, When, Where, Why, and How'. This is used in both problem solving and requirements gathering.

Steps in Creating Requirement Document:



SMART PROBLEM STATEMENT

SMART Technique:

It is a method of writing a clear and effective problem statement. The characteristics of a SMART problem statement are:

- S (Specific)
- M (Measurable)
- A (Action Oriented/Attainable)
- R (Relevant)
- T (Time Bound)

A good problem statement should be all of those above things. The challenge is to balance being thorough with being concise.

CTQ (Critical to Quality) is an **internal quality parameter** whose performance standards or specification limits must be met in order to satisfy the customer(VOC) or Business(VOB).

Factors apart from SMART principles when writing Problem Statement:

Business Context: Things going on at the company, in the industry, or with customers.

Criteria for success: Business goals for the project in a broad perspective.

Stakeholders and decision makers: People who will approve the project, and assess its success.

Constraints: Limitations that might prevent your client from achieving a solution.

Risk and Appetite for Risk: Assessing the downside implications of this project.

Scope: How far across or deep into the organization the problem goes?

Inputs for writing problem statement:

- Business Context
- Who is affected by it
- Root cause of the issue
- Symptoms
- CTQ (Critical To Quality)

Steps in writing Problem Statement:

- Describe 'Ideal' state of affairs
- Explain your problem
- Explain your problem's financial cost
- Back up your assertions
- Explain the benefits of the project
- Summarizing the problem

PROJECT CUSTOMER IMPACT

Defining the best fit output (Y) for the customer :

- Work backwards from the ideal scenario that you expect customers to enjoy
- Revisit and evaluate the goals/objectives
- Plan the actions to be taken and their corresponding metrics
- Validate metric with the CTQ and VoC/VoB
- Check and ensure that the metric addresses the stated problem

Ways to Define Success Metric:

- Work backwards from an ideal scenario
- Recommended to have one metric
- Choose a metric that is measurable
- Stay away from non-actionable metric
- Consider counter metric if needed
- Constantly reevaluate the metric

Importance of Voice of Customer (VoC)/Voice of Business VoB:

- **Removes Ambiguity:** Real data from customers/business will eliminate doubts and ambiguities in strategy
- **Decision Making:** Helps to take informed decisions that aligns to the business problem
- **Manage Risk:** It helps to eliminate any element of risk

Evaluate Problem from Customer's Perspective:

- Define the Customer Experience (CX) from customer's perspective
- Identify what the customer wants
- Measure using qualitative and quantitative information or data directly from the customers
- Identify customer priorities
- Locate customer pain points and list them down (Financial, Productivity, Process, Support)

Estimate Project Milestones:

Entities	Writing Problem Statement	Framing Hypothesis	Solution Identification	Reporting Results
Project Description	Develop a problem statement that calls out the issues with the current boarding system of ABC Airlines.	Collect measures and assess performance of the boarding system using data drawn and manipulated from data sources.	Identify ways to improve current system or recommend a new boarding system that improves Customer Experience (CX).	Improve boarding system by reducing passengers boarding session time.
Key Stakeholders	<ul style="list-style-type: none">• Boarding Staff• Airlines Division Manager• Airlines Division HQ	<ul style="list-style-type: none">• Boarding Staff• Airport Authority HQ• Airport Regional Head• Data Engineers	<ul style="list-style-type: none">• Boarding Ops Team• Tech Solution Provider	<ul style="list-style-type: none">• Ops Director• Airport Regional Head• Airlines Division Manager
High Level Improvements	Current boarding system wastes ~4 minutes per boarding session, resulting in a total of 20 wasted man-hours per day.	Analysis on the current boarding system assured the hypothesis to be true, and therefore there is a need for a improved passenger boarding system.	Modified boarding system proposed by Dr. Edward has passengers board the plane from the sides instead from back or front.	Proposed boarding system by Dr. Edward will be analyzed for feasibility and steps for implementation will be presented to the stakeholders.
Final Outcome	SMART problem statement describing the issue with the current boarding system, along with the project goal & objective will provide business sign-off.	Feature analysis document on the new Boarding system is presented with data points over new passenger boarding time from the sides.	The new boarding system will eliminate 4 minutes waste time, save \$146,000 which can be reinvested by the organization.	Implement the solution, track the savings of \$146K, present the data to the leadership authority and get final sign off.