**IBM NAAN MUDHALVAN AI PHASE 1**

**SENTIMENT ANALYSIS FOR MARKETING**

**Problem Definition:** Problem definition is the first step in any problem-solving or design thinking process. It involves clearly understanding and articulating the problem or challenge you are trying to solve. A well-defined problem statement serves as a roadmap for the rest of the process and helps ensure that efforts are focused on the right issues. Effective problem definition typically includes:

1. **Problem Statement:** Clearly state what the problem is in a concise and specific manner. Avoid vague or overly broad statements.
2. **Context:** Understand the background and context of the problem. What are the underlying factors or causes? How does it affect stakeholders?
3. **Stakeholders:** Identify who is impacted by the problem, including end-users, customers, employees, and other relevant parties.
4. **Scope:** Define the boundaries of the problem. What aspects will be addressed, and what will be excluded?
5. **Goals and Objectives:** Determine what success looks like. What are the desired outcomes or objectives once the problem is solved?

**Design Thinking:** Design thinking is a human-centered approach to problemsolving and innovation. It is a structured process that emphasizes empathy for the end-user, creativity, and iterative testing and refinement. Design thinking typically consists of the following stages:

1. **Empathize:** Understand the needs, desires, and pain points of the people who will be affected by the solution. This involves conducting interviews, observations, and surveys to gain insights.
2. **Define:** This stage aligns with problem definition. Based on the empathy research, define the problem from the user's perspective. Create a clear problem statement that serves as a guide.
3. **Ideate:** Generate a wide range of creative solutions to the defined problem. Encourage brainstorming and creative thinking without judgment.
4. **Prototype:** Develop rough, low-cost, and quick representations of the potential solutions. These prototypes help you visualize and communicate ideas.
5. **Test:** Put the prototypes in front of users and gather feedback. Use this feedback to refine and iterate on the solutions.
6. **Implement:** Once a viable solution has been identified and refined, implement it and monitor its performance.

**Interconnection:** Design thinking and problem definition are closely interconnected:

1. **Problem Definition in Design Thinking:** The "Define" stage in design thinking aligns with problem definition. Before ideating solutions, it's crucial to have a well-defined problem statement that reflects the user's perspective and needs.
2. **Iterative Nature:** Both processes are iterative. Problem definition might need refinement based on insights gained during the empathize and test phases of design thinking. Similarly, design thinking cycles back to problem definition if necessary.
3. **User-Centered Focus:** Both approaches prioritize understanding and meeting the needs of end-users and stakeholders.
4. **Flow Chart:**

**TESTING THE MODEL WITH REALTIME DATA**

**IMPLEMENTING**

**ALGORITHMS**

**SPLITTING TRAIN AND TEST DATA**

**DATA PREPROCESSING**

**DATASET INPUT**