

## **Project Design Phase**

### **Problem – Solution Fit**

Date	7 February 2026
Team ID	LTVIP2026TMIDS24988
Project Name	Civil Engineering Insight Studio
Maximum Marks	2 Marks

#### **Problem – Solution Fit:**

##### **1.Identified Customer Problem**

###### **Core Problem**

Civil engineers and construction supervisors spend significant time manually analyzing site images and preparing structured engineering reports.

###### **Observable Pain Points**

- Manual image-based documentation is time-consuming.
- Identifying materials and structural components requires detailed inspection.
- Report formatting lacks consistency across projects.
- Tracking project progress through images is inefficient.
- Risk of missing critical structural observations.

###### **Behavioral Patterns Identified**

Example 1: Engineers manually observe site photos and prepare reports in Word or Excel.

Example 2: Supervisors rely on subjective judgment for documenting construction stages.

##### **2.Proposed Solution**

Civil Engineering Insight Studio is an AI-powered web application that:

- Analyzes construction images using Google Gemini Vision API.
- Generates structured engineering reports (structure type, materials, components, construction stage).
- Provides professional documentation format.
- Reduces manual effort in report preparation.
- Delivers AI-generated insights in seconds.

##### **3.Problem–Solution Mapping**

- Manual analysis takes too long → AI generates structured report instantly.
- Inconsistent formatting → Standardized AI-generated documentation.

- Risk of missing details → AI highlights materials and structural components.
- Inefficient progress tracking → Automated analysis from site images.
- Time pressure on engineers → Faster report generation improves productivity.

#### 4. Why This Solution Fits the Customer

- Engineers already take site photos – tool leverages existing workflow.
- Integrates seamlessly into digital documentation process.
- Reduces workload without requiring additional technical skills.
- Enhances professional reporting standards.

#### 5. Purpose Alignment (As Per Template)

- Solves complex documentation problems using AI automation.
- Speeds up engineering reporting process.
- Aligns with existing construction monitoring practices.
- Improves accuracy and professional communication.
- Builds trust through consistent structured output.

#### Template:

Define CS, fit into CC	<b>1. CUSTOMER SEGMENT(S)</b> Who is your customer? I.e. working parents of 0-5 y.o. kids	CS	<b>6. CUSTOMER CONSTRAINTS</b> What constraints prevent your customers from taking action or limit their choices of solutions? I.e. spending power, budget, no cash, network connection, available devices.	CC	<b>5. AVAILABLE SOLUTIONS</b> Which solutions are available to the customers when they face the problem or need to get the job done? What have they tried in the past? What pros & cons do these solutions have? I.e. pen and paper is an alternative to digital notetaking	AS	Explore AS, differentiate
Focus on J&P, tap into BE, understand RC	<b>2. JOBS-TO-BE-DONE / PROBLEMS</b> Which jobs-to-be-done (or problems) do you address for your customers? There could be more than one; explore different sides.	J&P	<b>9. PROBLEM ROOT CAUSE</b> What is the real reason that this problem exists? What is the back story behind the need to do this job? I.e. customers have to do it because of the change in regulations.	RC	<b>7. BEHAVIOUR</b> What does your customer do to address the problem and get the job done? I.e. directly related: find the right solar panel installer, calculate usage and benefits; Indirectly associated: customers spend free time on volunteering work (I.e. Greenpeace)	BE	Focus on J&P, tap into BE, understand RC
Identify strong TR & EM	<b>3. TRIGGERS</b> What triggers customers to act? I.e. seeing their neighbour installing solar panels, reading about a more efficient solution in the news.	TR	<b>10. YOUR SOLUTION</b> If you are working on an existing business, write down your current solution first, fill in the negatives, and check how much it fits reality. If you are working on a new business problem, then keep it blank until you fill in the canvas and come up with a solution that fits within customer limitations, solves a problem and matches customer behaviour.	SL	<b>8. CHANNELS OF BEHAVIOUR</b> 8.1 ONLINE What kind of actions do customers take online? Extract online channels from #7	CH	Extract online & offline CH of BE
	<b>4. EMOTIONS: BEFORE / AFTER</b> How do customers feel when they face a problem or a job and afterwards? I.e. lost, Insecure > confident, in control - use it in your communication strategy & design.	EM			<b>8.2 OFFLINE</b> What kind of actions do customers take offline? Extract offline channels from #7 and use them for customer development.		