Machine Failure Analysis - Final Report

1. Project Overview

This project analyzes machine failure data to identify causes of failures and suggest preventive measures.

2. Dataset Summary

- Total Machines Analyzed: 50

- Failure Types: Overheating, High Usage, Component Fault, No Failure

3. Key Findings

- Machines exceeding 85°C often experience overheating failures.

- Machines with more than 500 usage hours are prone to high usage failures.

- Component faults occur randomly but require part replacements.

4. Suggested Fixes

- Install Cooling System for overheating machines.

- Schedule Maintenance for high usage machines.

- Replace Faulty Component for component failures.

5. Conclusion

This analysis provides valuable insights to prevent future machine failures and improve efficiency.

The detailed dataset and fixes are available in the attached Excel report.

Complex Problem Table Project

Critical Thinking, Design Thinking,
Leadership, and Teamwork
L&T EduTech

Introduction

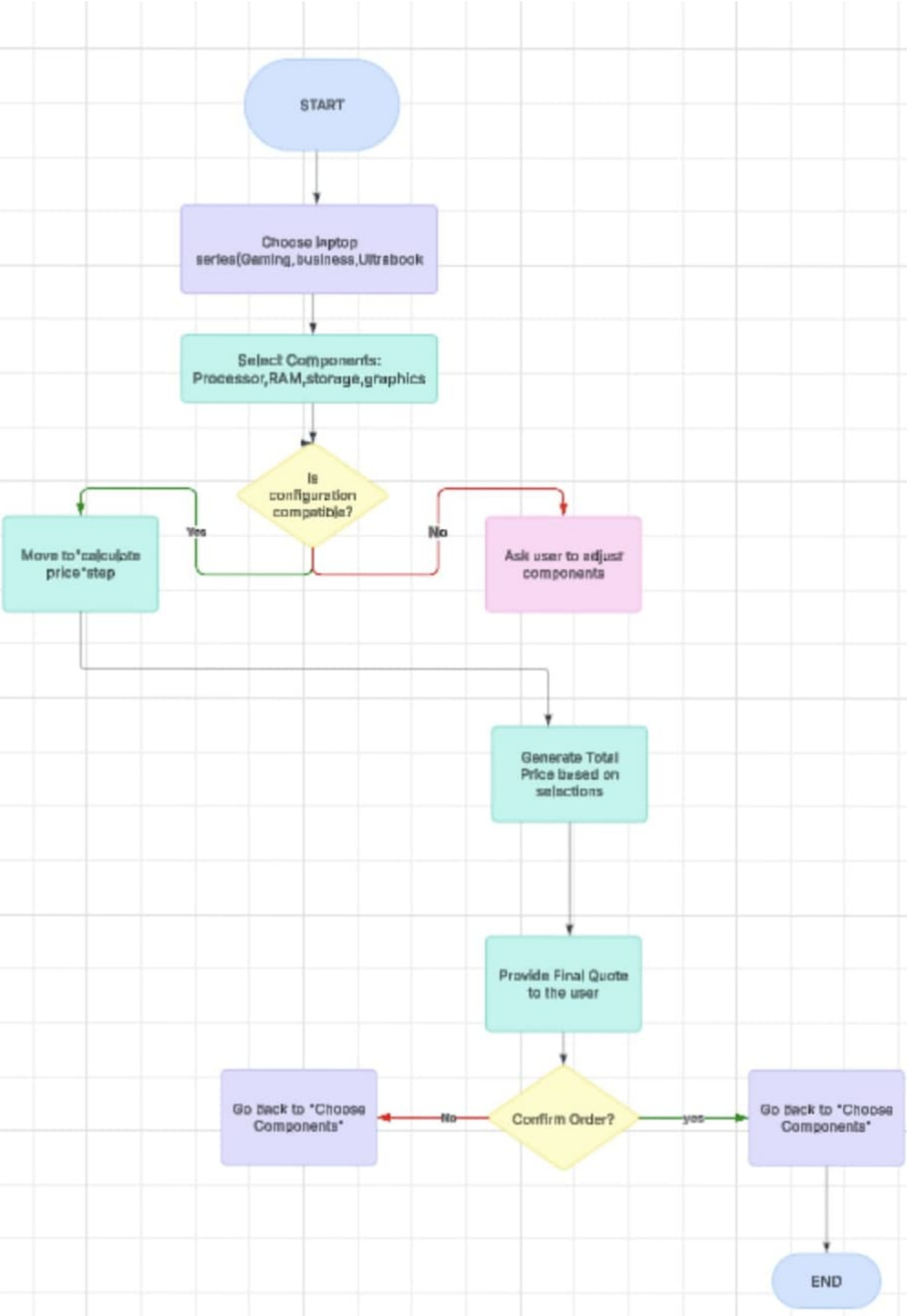
- This project explores complex problems across various domains and applies design thinking to develop effective solutions. The goal is to identify real-world challenges and justify innovative approaches to address them.

Complex Problem Table

S.No	Application Domain	Complex Problem Identified	Justification
1	Healthcare	Delayed Diagnosis Due to Unstructured Patient Data	AI and cloud storage solutions are needed for real-time data management.
2	Transportation	Traffic Congestion in Urban Areas	Smart traffic lights, AI-driven traffic predictions, and public transport optimization are required.
3	Banking	Online Banking Fraud and Cybersecurity Threats	AI models, blockchain security, and multi-factor authentication help in fraud prevention.
4	Smart Cities	Inefficient Waste	IoT-enabled smart

Conclusion

- This table highlights real-world problems in various domains that require innovative solutions through design thinking. Addressing these challenges involves leveraging advanced technologies like AI, IoT, and Blockchain, along with teamwork and leadership skills to drive impactful solutions.


START
Choose laptop series(Gaming, business,Ultrabook
Select Components: Processor,RAM,storage,graphics
Is configuration compatible?
Yes
No
Move to"calculate price"step
Ask user to adjust components
Generate Total Price based on selections
Provide Final Quote to the user
Go back to "Choose Components"
No
Confirm Order?
yes
Go back to "Choose Components"
END

User Persona: Riya Sharma

1. Basic Information

Name: Riya Sharma

Age: 28

Gender: Female

Location: Bangalore, India

Occupation: Software Engineer

Income Level: Upper Middle-Class

Education: Masters in Computer Science

2. Demographics & Lifestyle

Lives in a metropolitan city, prefers online shopping.

Frequently purchases tech gadgets, fashion, and books.

Values efficiency, affordability, and quality in products.

Uses social media for product research and reviews.

3. Goals & Aspirations

Wants to find high-quality tech products at reasonable prices.

Prefers brands that provide excellent customer support.

Seeks convenience in online shopping with easy returns and quick delivery.

4. Pain Points

Difficulty in finding genuine product reviews.

Overwhelmed by too many choices without clear differentiation.

Poor customer service and delayed responses from brands.

Complicated return and refund processes.

5. Solution Alignment

Our product will provide personalized recommendations based on browsing and shopping behavior.

Verified user reviews to help make informed decisions.

AI-powered customer support for quick responses.

Hassle-free return policies to increase trust and satisfaction.

6. Persona Quote

"I want high-quality products at the best price with great customer support and hassle-free shopping!"

STORYBOARDING

Storyboarding is a visual planning tool that organizes ideas or processes into a sequence of frames. It is commonly used in design, animation, filmmaking, product development, and user experience design to illustrate the flow of a concept, process, or story.

PURPOSE OF STORYBOARDING:

1. Visualize Ideas: It helps convey abstract ideas through visual elements.
2. Organize Processes: Break down complex tasks or stories into manageable steps.
3. Improve Communication: Makes it easier to communicate your vision to others.
4. Iterate Efficiently: Allows you to experiment and refine ideas before moving to production.

TYPES OF STORYBOARDING

1. Linear Storyboards: Step-by-step sequences for processes or narratives.
2. Concept Storyboards: Focus on visualizing a single idea or product feature.
3. User Journey Storyboards: Illustrate a customer's interaction with a product/ service.

STORYBOARD: THE JOURNEY OF THE ECO-FRIENDLY WATER BOTTLE

Plastic waste is choking our planet, with billions of bottles ending up in oceans and landfills every year.

"Introducing the **EcoBuddy Bottle** – a reusable, ecofriendly water bottle designed to **reduce plastic waste."**

"**EcoBuddy Bottle** is made from **natural** and **recycled materials,** ensuring **sustainability** at every step."

EcoBuddy inspires a shift to sustainable living, **'Join the movement for a greener tomorrow.'**

The **EcoBuddy** Bottle is **versatile, stylish,** and **convenient** for all walks of life.

we can **reduce plastic** waste and **make our planet health**ier for future generations. **"Together, we make a difference."**

Gap Analysis for a Mobile Product (Smartphone Example)

1. Product Overview

- Product Name: XYZ Smartphone (Example)
- Purpose: A high-end smartphone designed for productivity, gaming, and photography
- Target Audience: Professionals, gamers, and photography enthusiasts

2. Current State (Existing Features)

- High-resolution OLED display
- 5G connectivity
- Fast charging (50W)
- Triple-lens camera system (48MP, 12MP, 8MP)
- Secure facial recognition

3. Desired State (Ideal Features)

- 120Hz refresh rate for a smoother display
- Faster charging (100W or above)
- AI-powered camera enhancements
- Improved battery life (5000mAh+)
- Better durability (stronger Gorilla Glass protection)

4. Gap Identification

Feature	Current State	Desired State	Gap
Display Refresh Rate	60Hz	120Hz	Needs improvement
Charging Speed	50W	100W+	Slower than competitors
Camera AI	Basic AI features	Advanced AI	Lags behind industry leaders
Battery Life	4000mAh	5000mAh+	Shorter usage time
Durability	Gorilla Glass 5	Gorilla Glass Victus	More prone to damage

5. Action Plan

1. Research & Development:
   - Improve display refresh rate and power efficiency
   - Develop AI algorithms for better camera processing

2. Hardware Upgrades:
   - Use a larger battery (5000mAh+)
   - Introduce stronger materials for better durability

3. Competitive Benchmarking:
   - Analyze flagship models from Apple, Samsung, OnePlus
   - Implement missing features in the next release

Category	Details
Persona Name	Riya sharma
Demographic Information	**Age :** 22 **Occupation :** College Student(Final Year) **Location :** Banglore,India **Education :** Bachelor's in computer science **Marital Status :** Single **Income :** 10,000 per month (freelnace projects)
Goals&Objectives	**Primary Goals :** Find the best deals and discounts while shopping - Stay within budget without compromising on quality - Compare prices across different e-commerce sites - Get personalized recommendations based on preferences - Avoid impulsive purchases
Psychographic Information	**Interests :** Technology, Fashion, Budget Shopping, Online Communities **Reading Choices** : Prefers blogs and social media reviews before making a purchase **Personality Traits :** Budget-conscious, Tech-savvy, Curious, Social
Behavior and Preferences	Shops frequently online but researches before purchasing - Uses e-commerce platforms lie Amazon, Flipkart, and Myntra - Watches YouTube reviews and reads blogs before buying products - Uses budget tracing apps to manage expenses - Prefers cashback and reward-based shopping platforms
Tech Habits	Uses smartphone and laptop for most shopping - Active on social media and follows influencers for deals - Uses browser extensions for coupon codes and cashback
User Journey	**Scenario 1: Buying a Laptop** Compares specifications and prices on multiple sites Searches for student discounts or seasonal sales - Reads cutomer reviews and expert blogs - Uses AI shopping Assistant to get personalized recommendaton - Waits for the best deal before purchasing **Scenario 2: Shopping for Clothes** Browser trends on Instagram and Pinterest - Checks different e-commerce sites for prices comparision - Uses AI Assistant to find similar styles at a lower price - Adds items to the wishlist and waits for the discounts - Shares product options with friends before finalizing the purchase
Challenges and Pain Points	**Overwhelming Choices:** Too many options make decision-making difficult -**Time Management:** Spends too much time researching products- **Distracions:** Gets influenced by social media ads and tends- **Privacy Concerns :** Worried about data security while using shopping assistants - **Decision Fatigue:** Struggles to finalize a purchase due to multiple recommendations

User Journey Map for AI-Fridge

Task: Create a user journey map for the AI-Fridge by exploring the given link.

1. Entice (Awareness & Interest)

- Customers become aware through social media, advertisements, or word of mouth.
- Emotional appeal and technological innovation attract interest.
- Initial curiosity is triggered by smart features such as automatic grocery tracking and AI-powered suggestions.

2. Enter (First Impressions & Onboarding)

- Customers visit stores or online platforms to explore the AI-Fridge.
- First impressions are shaped by visual appeal and environmental setup in showrooms.
- Customers interact with a demo unit to understand its features.
- Installation process and initial setup influence satisfaction.

3. Engage (Usage & Interaction)

- Users interact daily with the AI-Fridge for food tracking, grocery list creation, and meal planning.
- AI-generated recipe suggestions based on available ingredients enhance engagement.
- Integration with mobile apps allows remote monitoring and control.
- Voice and touchscreen interfaces improve usability.

4. Exit (End of Experience)

- Users evaluate their experience with the AI-Fridge after prolonged use.
- AI-driven maintenance reminders ensure long-term reliability.
- Customers either continue using it, recommend it, or face challenges that require customer support.
- Dissatisfaction may lead to service requests or discontinuation.

5. Extend (Retention & Loyalty)

- Personalized follow-ups from the company encourage continued use.
- Loyalty programs, software updates, and additional smart home integrations enhance user retention.
- Positive experiences lead to word-of-mouth recommendations and repeat purchases.

Visual Representation

(Attached is the user journey map created using Lucidchart)

Select a sticky note and press enter or tab to create a new sticky note.

Customer journey

	Entice How will a customer become aware of us and what will trigger their interest?	Enter What impressions do we create for new customers when they come to visit?	Engage What activities do customers engage in (make quick purchases, browse website, create personal relationships)?	Exit What last impression do you leave your customers with when they know they've reached the end of the experience?	Extend What do you do to invite the customer back?
Customer points	social media emotional appeal	visual & environmental impression emotional & psychological impact interaction & experience	quick purchase	sense of satisfaction & fulfillment	personalized follow-ups

Task 11: Empathy Process Flow

Task Details

1. Identify and fix any product.

2. Explore its features.

3. Prepare an empathy process flow using an empathy map template.

Example: Mobile Banking App

Issue Identified: Users struggle to find the 'Fund Transfer' option.

Step 1: Exploring Features

- Current features: Balance Check, Fund Transfer, Bill Payments.

- Problem: Fund Transfer is difficult to locate.

Step 2: Empathy Map

Section	User Feedback
Says	"Where is the Fund Transfer option?"
Thinks	"This should be easier to use."
Does	Calls customer support for help.
Feels	Frustrated, impatient.

Step 3: Solution

- Move 'Fund Transfer' to the homepage.

- Add a search bar for easy access.

Critical Thinking, Design Thinking, Leadership, and Teamwork

Task#09: Waterfall Models and Product Development

Introduction

The Waterfall Model is a structured software development methodology that follows a linear, sequential approach. It ensures each phase is completed before moving to the next. This model is beneficial for projects with well-defined requirements and minimal expected changes.

Product Idea for Startup

For this project, we will consider a Smart Home Automation System. The product will enable users to control home appliances remotely using a mobile application. Features include:
- Controlling lights, fans, and devices via an app.
- Scheduling automation for energy efficiency.
- Security features such as smart locks and camera integration.

Waterfall Development Model

Requirement Gathering

Identify user needs, conduct market research, document requirements.

System Design

Define software architecture, hardware planning, UI/UX design.

Implementation

Develop the mobile application, integrate IoT hardware, establish backend services.

Testing

Unit testing, system integration testing, security validation.

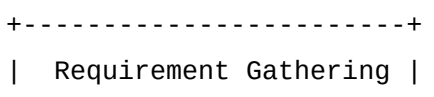
Deployment

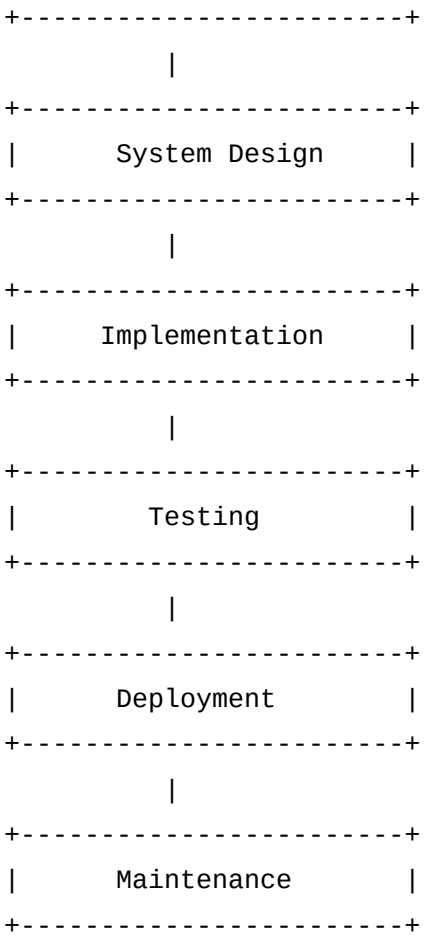
Release to users, deploy cloud services, provide documentation.

Maintenance

Monitor performance, roll out updates, provide customer support.

Waterfall Model Diagram





Conclusion

The Waterfall Model is an effective methodology for structured product development. By following its step-by-step approach, our Smart Home Automation System can be developed efficiently with clear progress tracking and well-defined deliverables.

Task #10: Analytical Thinking Driven by Design Thinking

User Persona & Journey for a Startup Product

User Research

Conducted user research to identify key challenges faced by students in AI learning. The research involved surveys, interviews, and analysis of existing platforms like Coursera and Khan Academy.

Persona Creation

User Persona: Rahul Sharma

Demographic Information:

- Name: Rahul Sharma
- Age: 20
- Location: Bangalore, India
- Education: 2nd-year B.Tech CSE (AIML)
- Tech-Savvy Level: High

Goals & Objectives:

- Improve coding skills for placements.
- Get personalized study recommendations.
- Balance academics with personal projects.

Psychographic Information:

- Passionate about AI and automation.

- Enjoys self-paced learning but struggles with consistency.

- Values efficiency and dislikes wasting time.

Behavior & Preferences:

- Prefers video tutorials over reading.

- Uses multiple learning platforms (YouTube, Coursera, Leetcode).

- Learns best with interactive challenges and real-world examples.

User Journey

1. Struggles to find structured AI learning paths.

2. Searches for AI study tools.

3. Discovers the Smart AI Learning Assistant.

4. Tries the free version, likes the personalized roadmap.

5. Upgrades to the premium plan for advanced features.

Challenges & Pain Points:

- Gets overwhelmed with too many resources.

- Finds it hard to track progress.

- Needs motivation and reminders to stay on track.

Journey Mapping (Lucidchart Flow)

User Journey Flow:

Start -> Sees an ad -> Clicks website & explores features

-> (Decision) Interested? -> No -> Exit

-> Yes -> Signs up for trial

-> (Decision) Finds it useful? -> No -> Exit

-> Yes -> Uses app regularly

-> Upgrades to premium -> Refers to friends -> End