Project Presentation

SMART FACTORY

Designing Smart Factories with Innovation, Ethics, and Scale – Because Every Detail Matters.

HCD+VALUE SENSITIVE DESIGN

TYPE OF PROJECT:
UXR | UXD

CREATED & PRESENTED BY:
Priyanshi Singh

Universität Siegen

PROJECT OVERVIEW

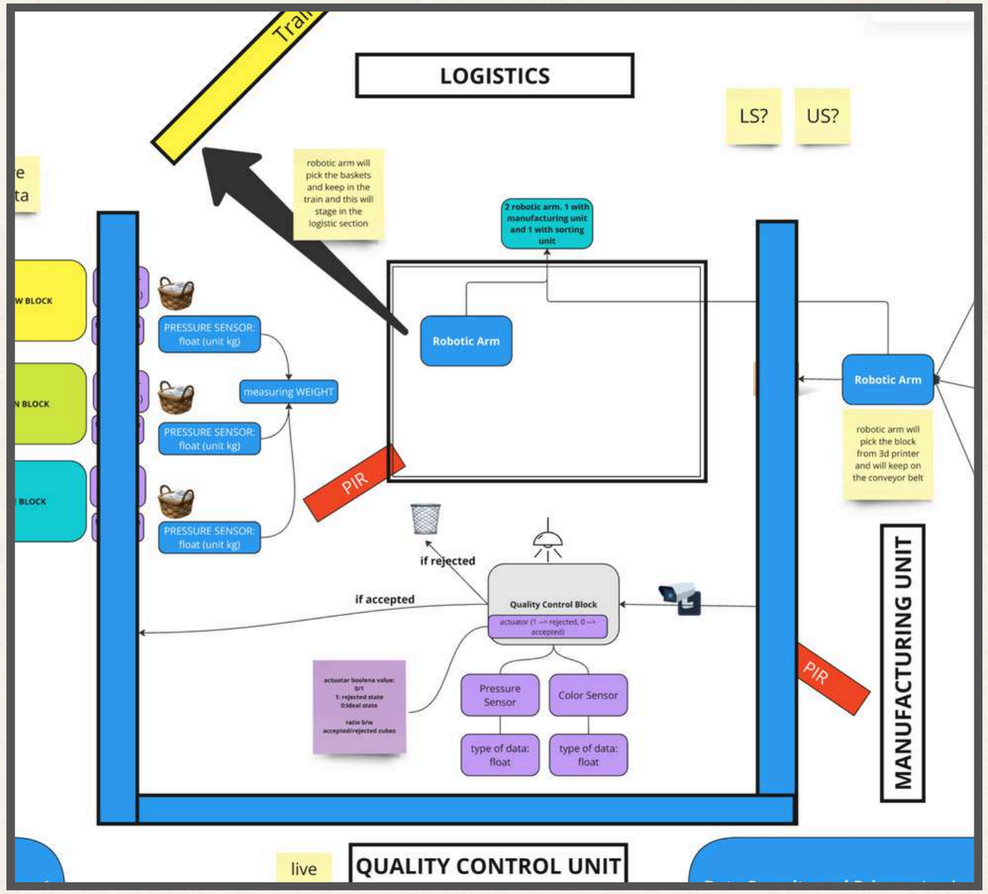
- Workflow Overview
- Units/Departments
- Sensors
- Products
- Conveyor Belts
- Robotic Arms

01 **What is Smart Factory?**

- The smart factory was an initiative by the university startup centre and HCI faculty.
- To develop a digital smart platform for **traditional workplaces.**
- To observe, collect and use **real-time data** from various factory operations and optimize their processes to improve efficiency, and enhance productivity.

02 **Factory Overview:**

- It comprises of several departments/units.
- Units are manufacturing, quality control, sorting, and logistics.
- Units are installed with sensors for detecting temperature, humidity, and time.
- **Each unit has different operations and tasks.**



SMART FACTORY BLUEPRINT

PROJECT OVERVIEW

03 Problem Statement:

Traditional factories and workplaces lack:

- A central, intelligent system for monitoring and controlling various units and their workflow.
- Lack of smart visualization to visualize data from sensors which led to difficulty in decision-making.
- A user-centered solution is **needed** to boost productivity while upholding **ethical values.**

04 Objective: 🎯

- To design and implement a smart factory system that integrates:
  - Real-time data
  - Monitoring Factory operational workflow
  - Integrates ethical considerations (VSD).
  - Improve worker's (**at all levels**) efficiency, decision-making, and productivity.

Initial Identification

	Target Audience:
	Factory Managers
	Factory Operators
	Unit Heads
	Engineers
	Technicians
	Executive Stakeholders
	New Workers

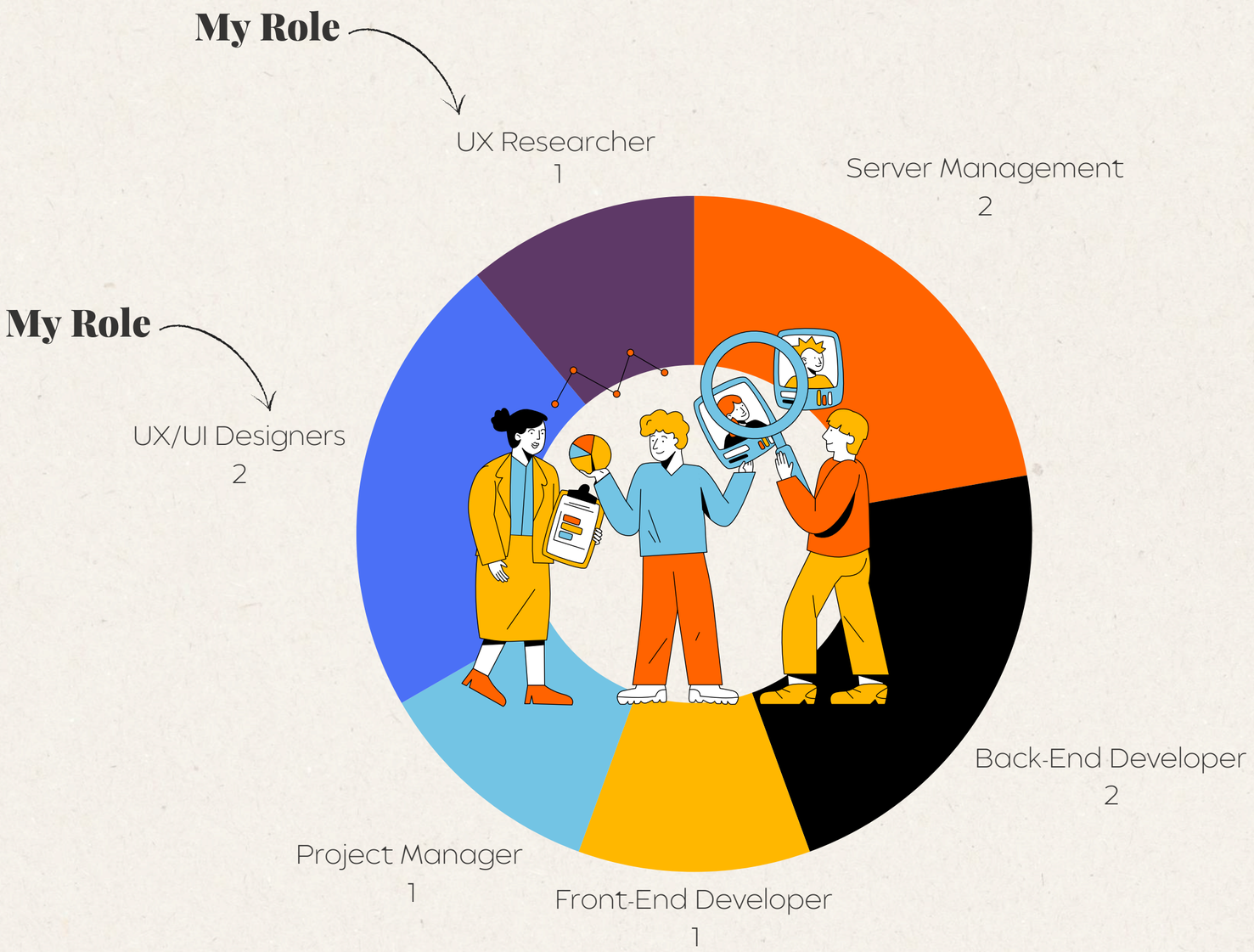
MY ROLES & RESPONSIBILITIES

01 My Role:
Lead UX Designer & Researcher, leading research, design, and collaboration efforts.

02 My Responsibilities:

- Understanding my users.
- Understanding factory operations.
- Implementing a dual-framework approach (HCD+VSD)
- Conducting extensive research.
- Translating research into designs.
- UX Project Management

03 My Team:
I worked closely with cross-functional members from various fields and domains.



TOOLS & SOFTWARES USED

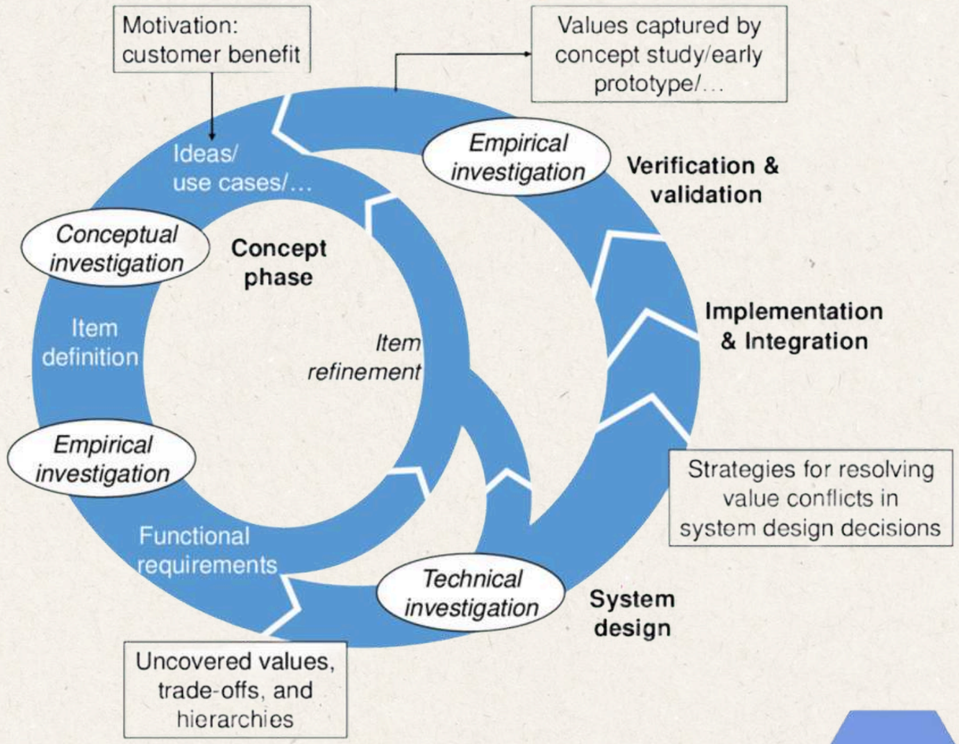
MAXQDA

FigJam

Forms

MY APPROACH

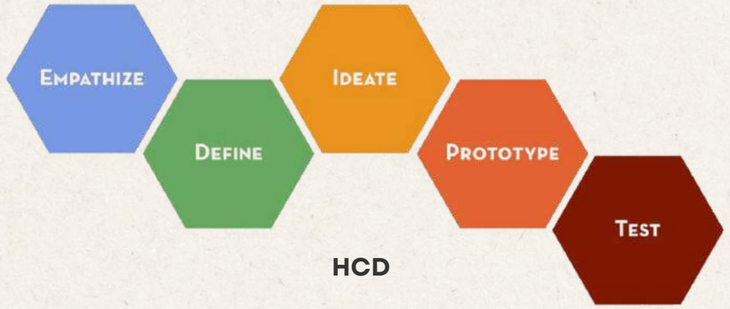
UX Framework - HCI (VSD+HCD) Methodology



Original VSD Framework

IDENTIFY	REVIEW	DESIGN	EVALUATE
Understanding the values and needs most important to users.	**Evaluating** the project's goals and how they impact user values.	**Creating** solutions that minimize negative impacts on user values.	**Assessing** the project's outcomes to **ensure** alignment with users' values.

Value Sensitive Design Process
Practical and Applied Approach



HCD

📌 Phase 1 : Research Findings & Delivery

1. **Situation:**
   - **45%** of research objectives defined.
   - Only **30%** clear understanding of end-user pain points and needs.
   - Lack of insights to shape next steps.
   - Missing Visual Layout of the factory.

2. **Task:**
   - Deliver insights that would define the UX problems and guide future design.
   - Focus on the right research **inputs** to ensure right **UX outcomes.**

3. **Action:**
   - Defined Project and buisness goal.
   - Planned detailed research initiatives.
   - Mapped **50%** of **initial** pain points - artefacts.
   - Documented findings in a structured report.

4. **Result:**
   - Delivered a study report with **some** top actionable insights.
   - Identified some key inefficiencies in factory space.
   - Delivered **99%** of research results on time, enabling a seamless transition to the design phase.

SPOILER ALERT

RESEARCH PROCESS

01. Identify

I collected and analyzed **11+** old industrial articles to familiarize myself with the factory system.

02. User Interviews

Conducted in-depth interviews with industrial SMEs to gather qualitative insights on daily factory operations and challenges.

Qualitative User Insights

03. Surveys

Conducted surveys to capture broader responses from frontline workers across factory departments.

Quantitative User Insights

04. Competitive Analysis

Identification of existing features and technologies for factory management.

Learning & Find Gap

05. Research Insights

Successfully identified actionable insights and formulated next UX recommendations 'mobile app' for improving worker experience.

Research Process Step I

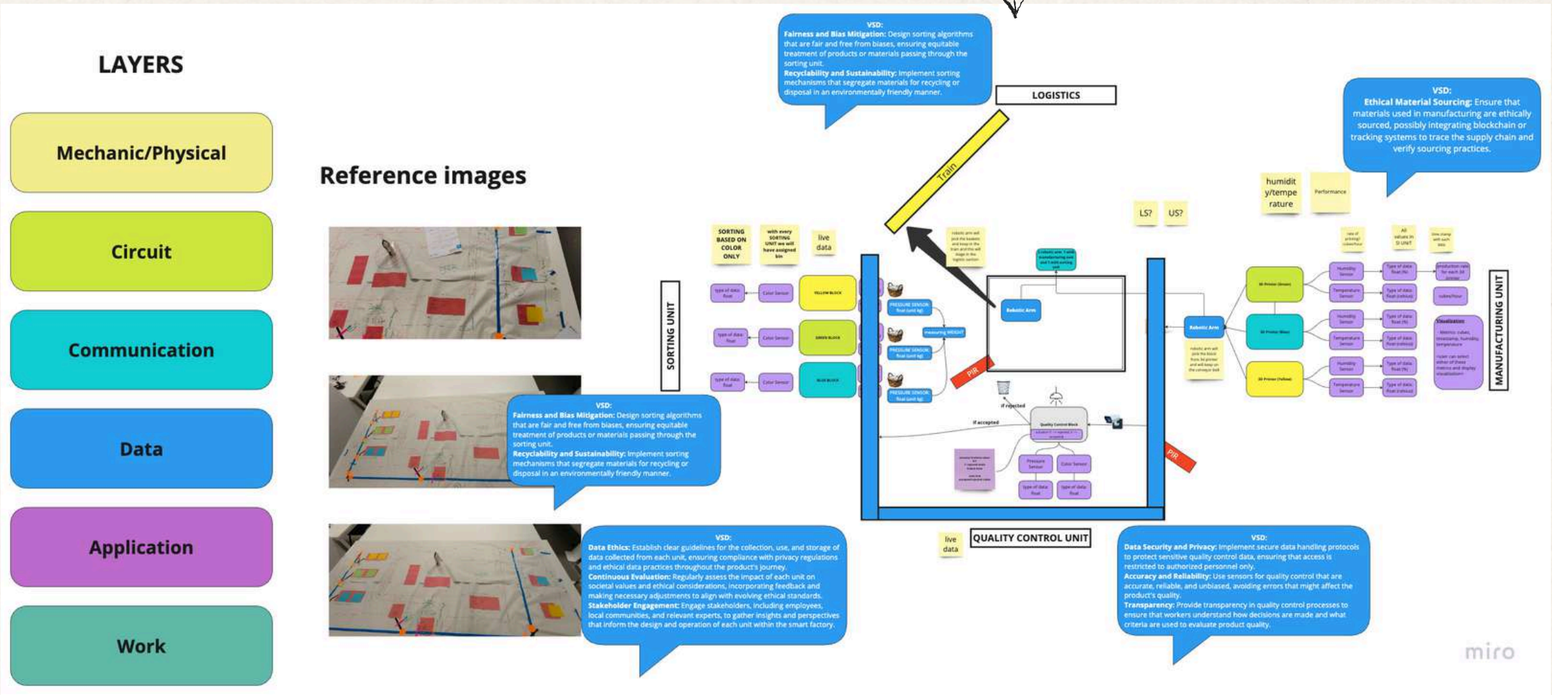
- Paper Sketch
- Digital Factory Blueprint
- Defined VSD Implications
- UX tools determined

1. Identify -> Pre-Ideation

- Literature Review: **11+** industrial papers and articles were reviewed.
- Conducted **5** Brainstorming sessions.
- This phase laid the **foundation** for an innovative solution addressing the diverse and basic needs of factory stakeholders and customers.

1.1 Research Questions:

- Q1. How can a solution or a platform help factory operators and decision-makers improve efficiency and productivity while adhering to VSD principles?
- Q2. How can users monitor real-time data in a way that promotes transparency and sustainable practices?
- Q3. What ethical concerns arise in a real factory environment, and how can the solution mitigate them?



Went beyond surface-level understanding and created a visual blueprint (Reference)

Dive Deep

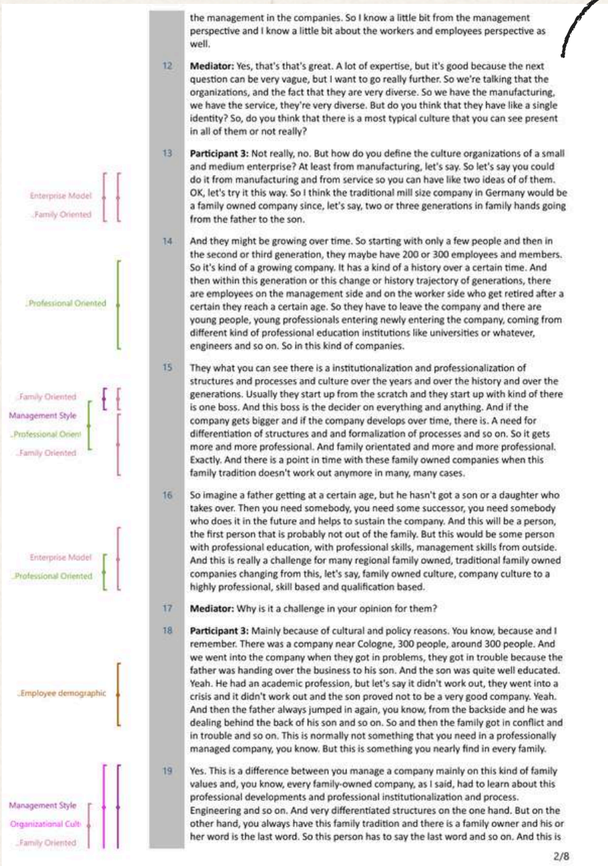
Research Process Step II

2. User Interviews

- Based on the initial research and pre-ideation step, basic **interview questions** were prepared for the target audience.
- User insights, pain points, and field observations were gathered from the **7 interviews.**
- Deductive analysis techniques, both qualitative and quantitative data were scrutinized to extract meaningful insights.

Key Findings: 🎯

- The lack of a real-time monitoring system leads to **80%** downtime and delays.
- All **7 users** struggled with data overload - lack of data visualization.
- Lack of workers management platform.
- Lack of awareness and outdated IT systems.
- **90%** Reluctance to adopt new technologies.



the management in the companies. So I know a little bit from the management perspective and I know a little bit about the workers and employees perspective as well.

12 **Mediator:** Yes, that's that's great. A lot of expertise, but it's good because the next question can be very vague, but I want to go really further. So we're talking that the organizations, and the fact that they are very diverse. So we have the manufacturing, we have the service, they're very diverse. But do you think that they have like a single identity? So, do you think that there is a most typical culture that you can see present in all of them or not really?

13 **Participant 3:** Not really, no. But how do you define the culture organizations of a small and medium enterprise? At least from manufacturing, let's say. So let's say you could do it from manufacturing and from service so you can have like two ideas of of them. OK, let's try it this way. So I think the traditional mill size company in Germany would be a family owned company since, let's say, two or three generations in family hands going from the father to the son.

14 And they might be growing over time. So starting with only a few people and then in the second or third generation, they maybe have 200 or 300 employees and members. So it's kind of a growing company. It has a kind of a history over a certain time. And then within this generation or this change or history trajectory of generations, there are employees on the management side and on the worker side who get retired after a certain they reach a certain age. So they have to leave the company and there are young people, young professionals entering newly entering the company, coming from different kind of professional education institutions like universities or whatever, engineers and so on. So in this kind of companies.

15 They what you can see there is a institutionalization and professionalization of structures and processes and culture over the years and over the history and over the generations. Usually they start up from the scratch and they start up with kind of there is one boss. And this boss is the decider on everything and anything. And if the company gets bigger and if the company develops over time, there is. A need for differentiation of structures and and formalization of processes and so on. So it gets more and more professional. And family orientated and more and more professional. Exactly. And there is a point in time with these family owned companies when this family tradition doesn't work out anymore in many, many cases.

16 So imagine a father getting at a certain age, but he hasn't got a son or a daughter who takes over. Then you need somebody, you need some successor, you need somebody who does it in the future and helps to sustain the company. And this will be a person, the first person that is probably not out of the family. But this would be some person with professional education, with professional skills, management skills from outside. And this is really a challenge for many regional family owned, traditional family owned companies changing from this, let's say, family owned culture, company culture to a highly professional, skill based and qualification based.

17 **Mediator:** Why is it a challenge in your opinion for them?

18 **Participant 3:** Mainly because of cultural and policy reasons. You know, because and I remember. There was a company near Cologne, 300 people, around 300 people. And we went into the company when they got in problems, they got in trouble because the father was handing over the business to his son. And the son was quite well educated. Yeah. He had an academic profession, but let's say it didn't work out, they went into a crisis and it didn't work out and the son proved not to be a very good company. Yeah. And then the father always jumped in again, you know, from the backside and he was dealing behind the back of his son and so on. So and then the family got in conflict and in trouble and so on. This is normally not something that you need in a professionally managed company, you know. But this is something you nearly find in every family.

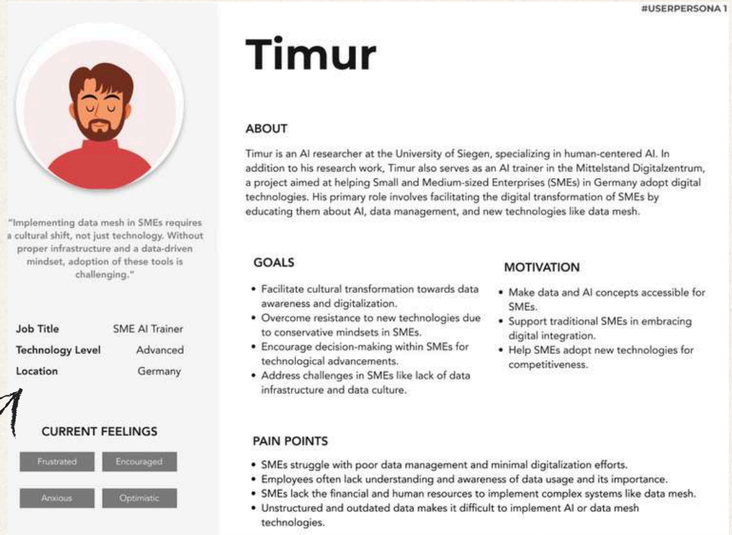
19 Yes. This is a difference between you manage a company mainly on this kind of family values and, you know, every family-owned company, as I said, had to learn about this professional developments and professional institutionalization and process. Engineering and so on. And very differentiated structures on the one hand. But on the other hand, you always have this family tradition and there is a family owner and his or her word is the last word. So this person has to say the last word and so on. And this is

2/8

KEY METRICS

- I prepared 7 Interview transcripts.
- After analyzing, the responses were color categorized using the MAXQDa research tool.

- I created 2 diverse personas to inform the design process and cater to diverse user needs.



#USERPERSONA 1

Timur

"Implementing data mesh in SMEs requires a cultural shift, not just technology. Without proper infrastructure and a data-driven mindset, adoption of these tools is challenging."

Job Title	SME AI Trainer
Technology Level	Advanced
Location	Germany

CURRENT FEELINGS

Frustrated | Encouraged
Anxious | Optimistic

ABOUT

Timur is an AI researcher at the University of Siegen, specializing in human-centered AI. In addition to his research work, Timur also serves as an AI trainer in the Mittelstand Digitalzentrum, a project aimed at helping Small and Medium-sized Enterprises (SMEs) in Germany adopt digital technologies. His primary role involves facilitating the digital transformation of SMEs by educating them about AI, data management, and new technologies like data mesh.

GOALS

- Facilitate cultural transformation towards data awareness and digitalization.
- Overcome resistance to new technologies due to conservative mindsets in SMEs.
- Encourage decision-making within SMEs for technological advancements.
- Address challenges in SMEs like lack of data infrastructure and data culture.

MOTIVATION

- Make data and AI concepts accessible for SMEs.
- Support traditional SMEs in embracing digital integration.
- Help SMEs adopt new technologies for competitiveness.

PAIN POINTS

- SMEs struggle with poor data management and minimal digitalization efforts.
- Employees often lack understanding and awareness of data usage and its importance.
- SMEs lack the financial and human resources to implement complex systems like data mesh.
- Unstructured and outdated data makes it difficult to implement AI or data mesh technologies.

KEY METRICS

Research Process Step III

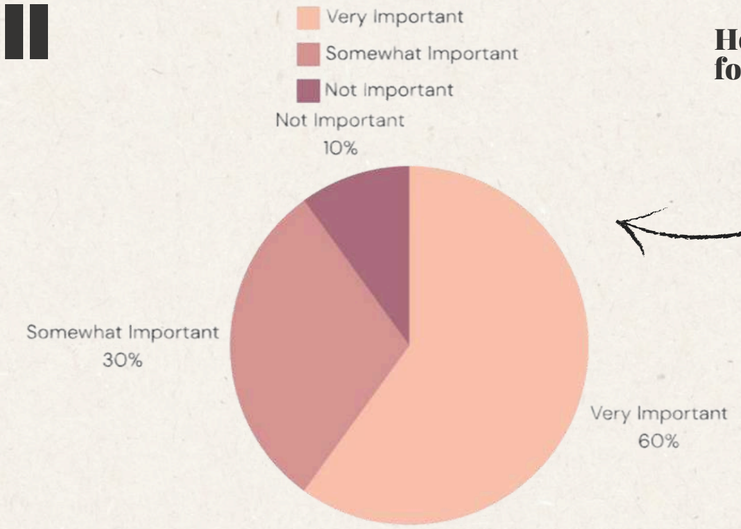
3. User Surveys

- Goal:
  - To obtain quantifiable insights.
  - Delve deeper into the collected feedback.
  - To gather detailed responses and further **validate** my interview findings.

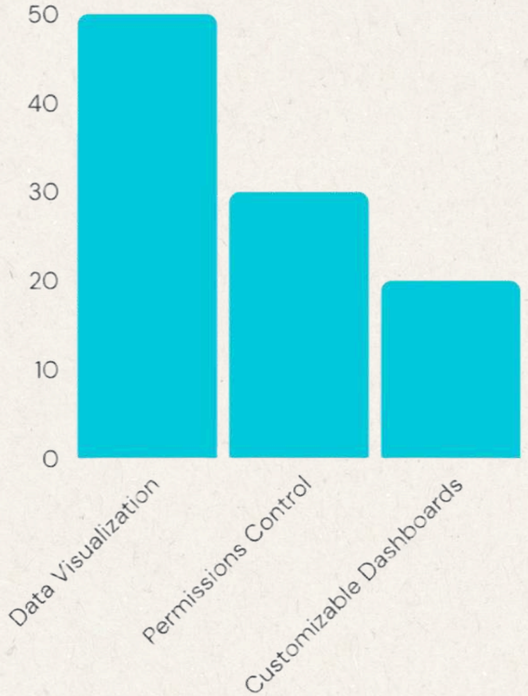
- **7/n key** participant's response noted:
  Factory Workers (2)
  Floor Manager (1)
  Corporate Engineers (2)
  University Staff (2)

- Survey **Result**: 🎯
  - **60%** of users need a real-time monitoring platform.
  - Other: need for data visualization to improve factory workflows.
  - **High demand** for role-based task management & ownership.

How important is real-time monitoring for your factory's operations?



Which feature would most improve operational efficiency in your factory?



Research Process Step IV

4. Competitive Analysis

- UX-focused comparison of **3** popular platforms:
  - Monday.com
  - Tulip
  - Trello

- I evaluated their key features, user interfaces, and functionalities.

- **Goal:** My aim was to identify: 🎯
  - Gaps
  - Opportunities
  - Learn from them that can inspire my design improvements.

- **Outcome:** 🎯
  - Need of an Unified Platform.

APPS	MONDAY.COM (TASK AND PROJECT MANAGEMENT APP)	TULIP (MANUFACTURING APP)	TRELLO (TASK AND PROJECT MANAGEMENT APP)
STRENGTHS			
a	Offers customizable workflows that are adaptable to various industries, including manufacturing.	Specifically designed for manufacturing, it provides real-time monitoring of the production line.	Provides a simple, easy-to-use interface for organizing tasks, which can be helpful for workers who need to track jobs in units like manufacturing or quality control.
b	Easy to assign roles and permissions to team members, ensuring that users only access relevant tasks and features.	Role-based access to different parts of the app, allowing workers to focus on specific tasks like sorting or quality checks.	Flexibility in assigning permissions, so that team members only access boards and lists relevant to their roles.
c	Intuitive UI with drag-and-drop functionality for task prioritization and management.	Easily integrates with existing manufacturing equipment for seamless data collection and task automation.	Highly customizable, with options to integrate tools like Slack or time-tracking apps.
WEAKNESSES			
a	May not offer specialized features for manufacturing or quality control without significant customization.	More suited for larger enterprises; smaller factories may find it overwhelming or costly.	Lack of advanced manufacturing or workflow optimization features.
b	Some users find the interface cluttered when multiple boards are used.	UI might not be flexible enough for all users, especially those with lower tech literacy.	Can become disorganized when used for larger, more complex projects.
OPPORTUNITIES			
a	Can inspire role-based dashboard customization for users in different factory departments like sorting or quality control.	Demonstrates the importance of offering role-specific data views and permissions based on job function.	Its simple task management approach can inform the user interface design for workers in different units, providing role-specific task views.
b	Highlights the need for a simpler interface for workers with specific roles.	Its real-time monitoring system can inspire the data visualization for your app.	Can inspire feature ideas for task assignment and permissions management in the future app.

Result:

1. **Role-based access will ensure workers access only relevant features.**
2. **Customizable interfaces will enhance efficiency by reducing distractions.**
3. **Real-time data monitoring would improve workflow transparency and optimization.**

Final Research Outcomes 🎯

5. Study Impact:

- Focused on understanding real workers pain points.
- **100 %** Research Transparency & Ownership.
- Used data-driven decisions & validated results.
- **Research-led UX recommendations.**

6. Next Proposed Solution:

- Real-time Monitoring
- Ethical & Clear Task Assignment
- Customizable Dashboards **(Bonus UX Fix)**
- Operational Data Visualization

A Quick & Central Platform Solution - Mobile Application📱

1st Phase Delivery

Research Findings

Research as an input. By defining the right inputs early, I ensured I had a strong foundation to drive meaningful UX changes. ✅

Complex Role and Permission Management

Many workers feel overwhelmed by managing or accessing features outside of their roles, suggesting the need for customizable access based on roles and departments within the app.

Lack of Clarity in Task Assignment

Users struggle with unclear task assignments and their roles in sorting, manufacturing, and quality control, highlighting the need for clearer, structured task workflows and permissions in the app.

Need for Real-Time Monitoring

Survey participants expressed a desire for real-time updates and monitoring of work progress, indicating that a strong feature for visibility across units (sorting, manufacturing, quality control) should be prioritized.

Engagement Through Workflow Optimization

Users indicated that seamless transitions between tasks and departments, especially with role-based permissions, will significantly improve their workflow, suggesting a need for improved design solutions to reduce bottlenecks.

4-key parameters

From Research to Design

IDENTIFY

Understanding the values and needs most important to users.

REVIEW

Evaluating the project's goals and how they impact user values.

DESIGN

Creating solutions that minimize negative impacts on user values.

EVALUATE

Assessing the project's outcomes to ensure alignment with users' values.

Value Sensitive Design Process
Practical and Applied Approach

To Empower

Action

UX SOLUTION PROPOSED:

- Intuitive Dashboard
- Unit/Department Management
- Customizable Widgets
- Profile Management
- Roles/Permission Feature

Invent & Simplify

📌 Phase 2 : Low-Fidelity Prototype & Delivery

1. **Situation:**
   - I needed to **translate** findings into UX design solutions.
   - Challenge was to ensure that the designs were simple, intuitive, scalable, and aligned with real user needs (HCD).

2. **Task:**
   - To design and deliver a working low-fidelity prototype that my team and stakeholders could test for early feedback.
   - **Iteration** in each step.
   - Continuous improvement.

3. **Action:**
   - Created **early** sketches & Low-Fidelity Wireframes for iterative testing.
   - Multiple Iterations based on feedback.
   - Created task flows, user flow, IA, Moodbaords.

4. **Result:**
   - Delivered a low-fidelity prototype enabling early validation.
   - **4-times iterations** based on feedback ensured faster and more accurate decision-making.

SPOILER ALERT

Design Process Step I

1. UX Design Goals

- Defined goals

User Goals

Users want to control and see only what's necessary for their job, reducing cognitive overload.

Employees need clear, role-specific task assignments that simplify daily responsibilities.

Workers want to track their progress in real-time to stay on top of deadlines.

Improved in-app communication for coordinating with other departments and team members.

Simplify complex tasks and provide motivational tools to keep users engaged.

Project Goals

Ensure that users can only access features relevant to their assigned tasks based on permissions.

Provide clear, real-time monitoring of workflow progress for team leads and managers.

Create a user-friendly design that minimizes confusion and makes task-switching seamless.

Build a flexible platform that can scale as the factory grows in complexity.

Implement features that facilitate smoother transitions between different stages of production and quality control.

Business Goals

Streamline operations across sorting, manufacturing, and quality control units.

Ensure workers can easily access only the tools and information they need based on their roles.

Introduce features that encourage more involvement from employees, improving satisfaction and reducing turnover.

Enhance role-based access to minimize human error during operations.

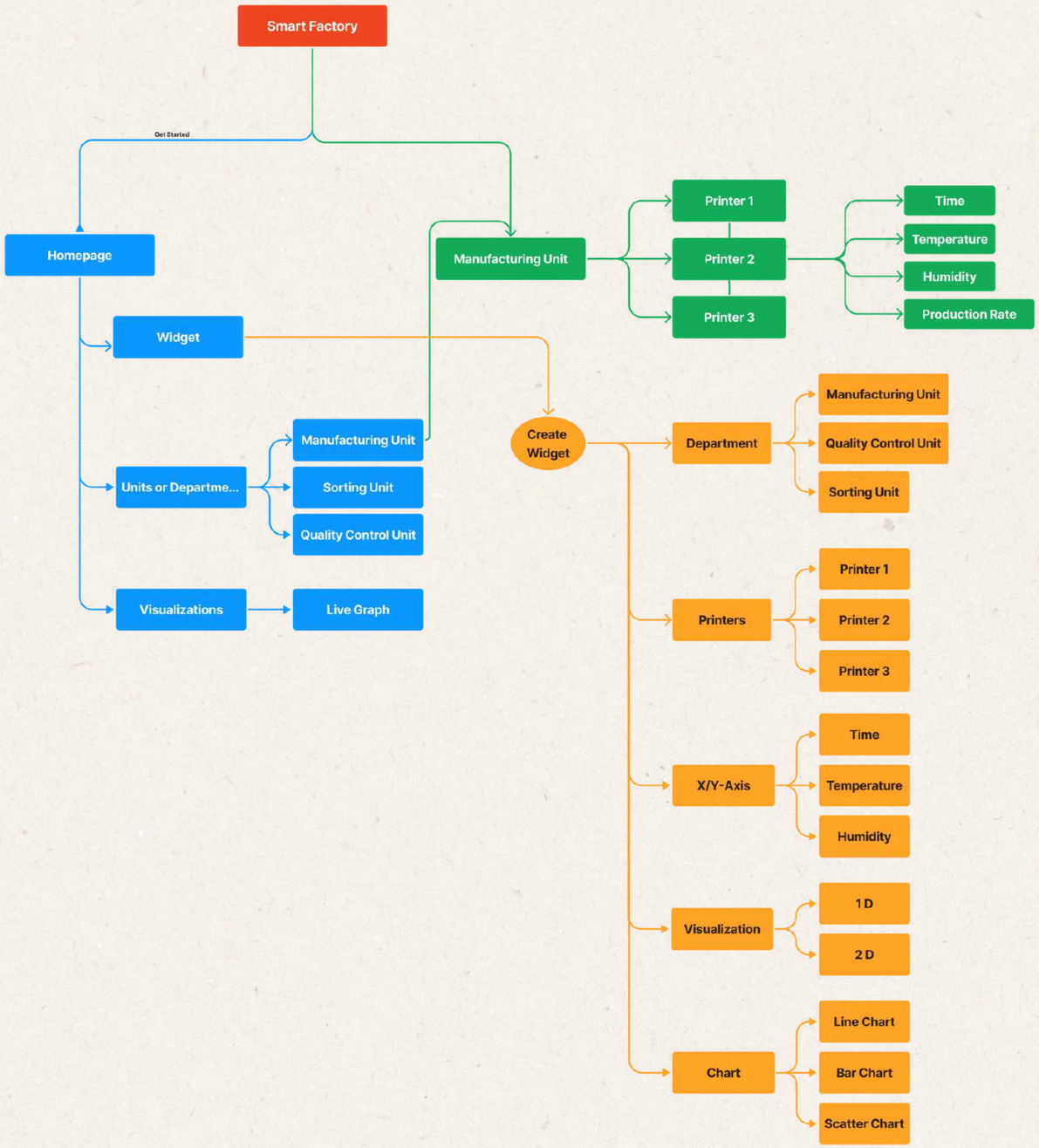
Leverage app feedback to iterate and implement cutting-edge solutions.

Design Process Step II

2. Defining Information Architecture (IA)

- I created a logical, intuitive and structured layout for the app in a way that ensures **easy navigation and interaction** for:
  - Factory workers (quick access to tasks).
  - Engineers & Admins (monitoring & control).
  - Managers (decision-making insights).
- Ensuring users could quickly find and use the correct feature on the app and data at any given time.

🎯 **Goal: Keep the architecture flow frugal yet functional for all user levels.**



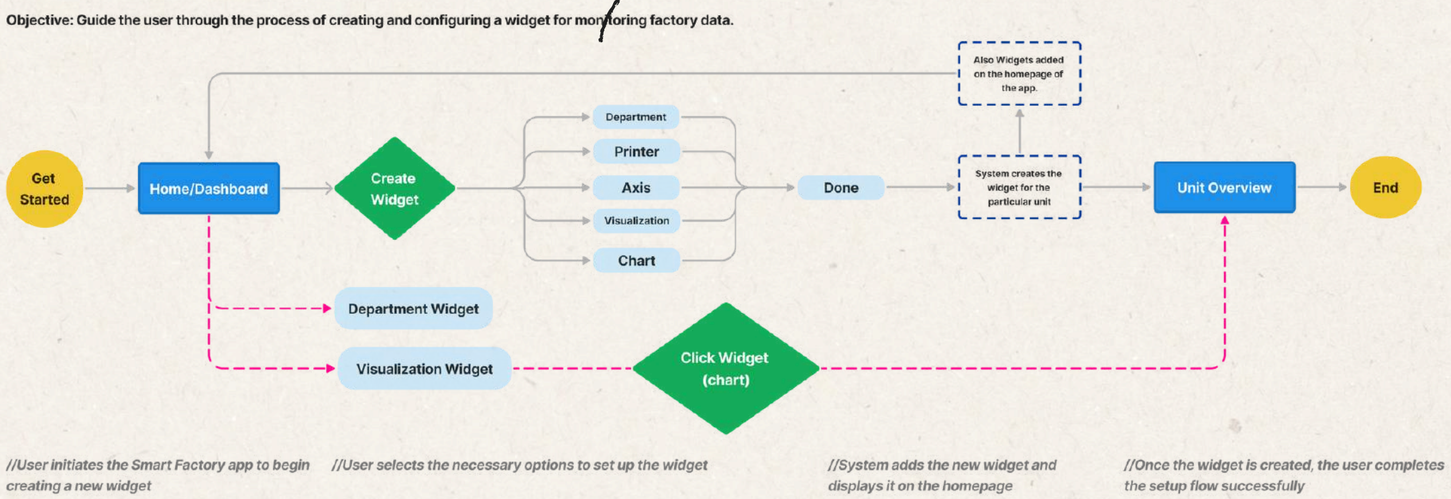
Keeping it Frugal and Simple

Design Process Step III

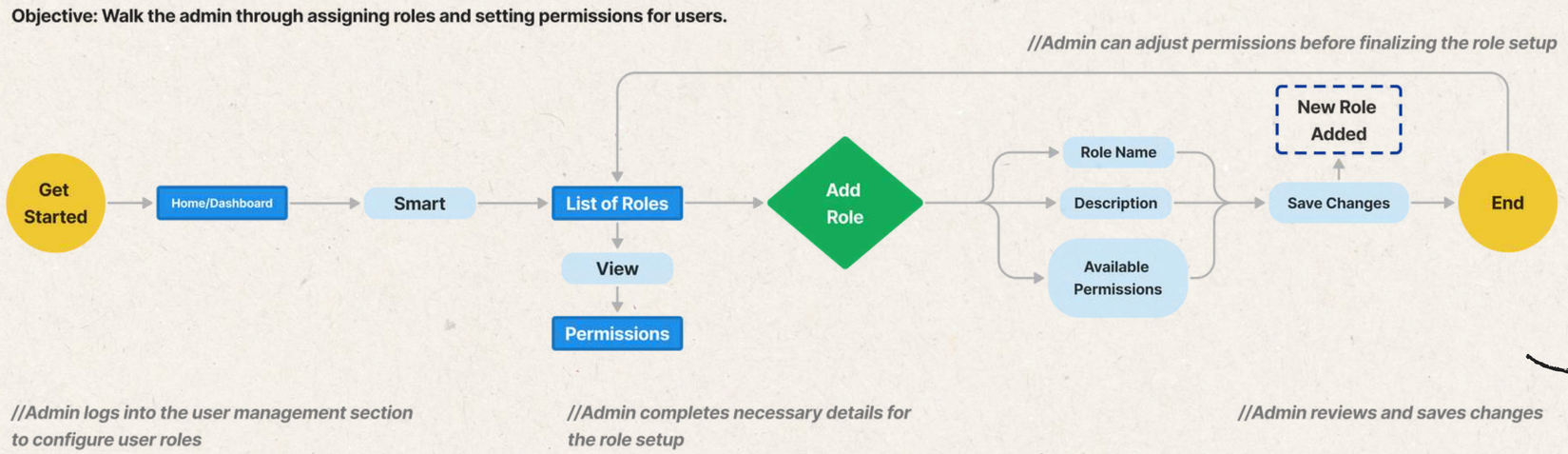
3. User Flows

- I defined the specific path a user will take to complete a task or achieve a goal within a smart factory application.
- Documented and presented the test user flows to the team for **validation**.

User Flow 1: Widget Setup Process



User Flow 2: Role and Permissions Configuration



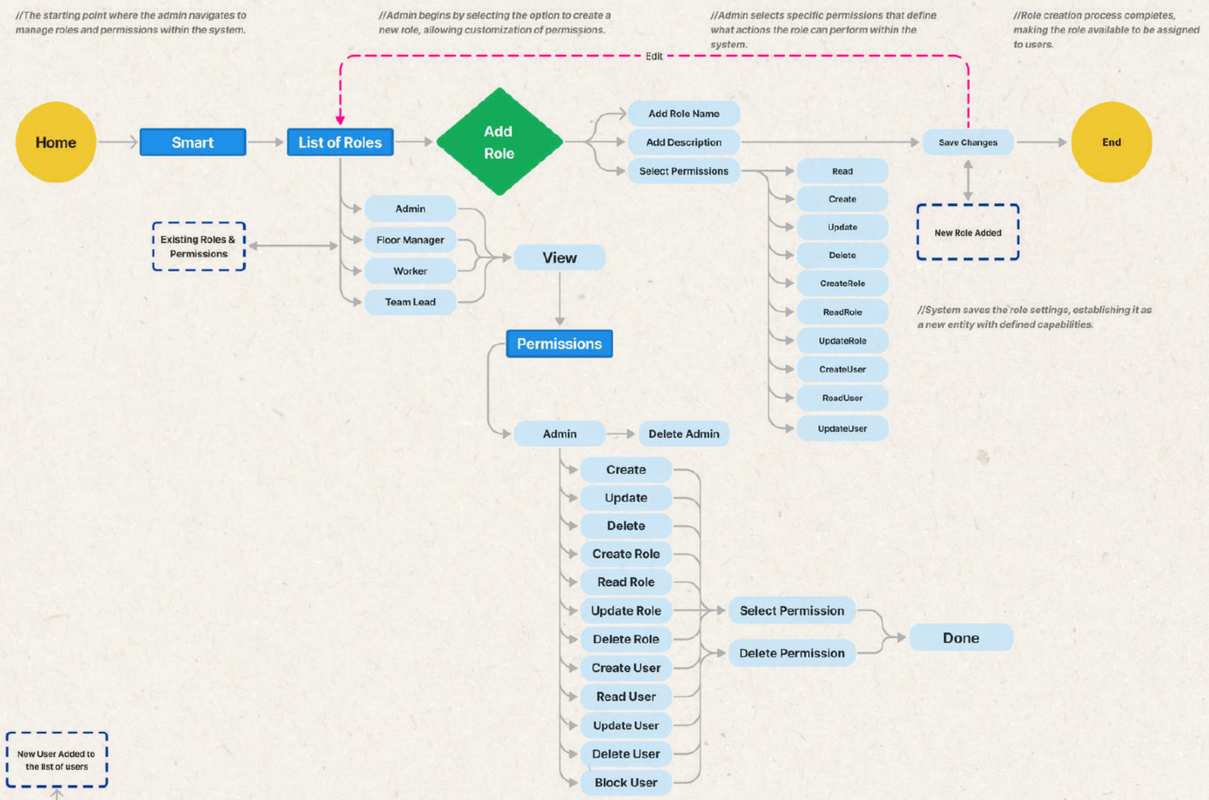
Design Process Step IV

4. Task Flows

- I designed task flows to **break down** specific user interactions within the app.
- It helped to prioritize key actions and guided the creation of more focused, streamlined interfaces and interactions.

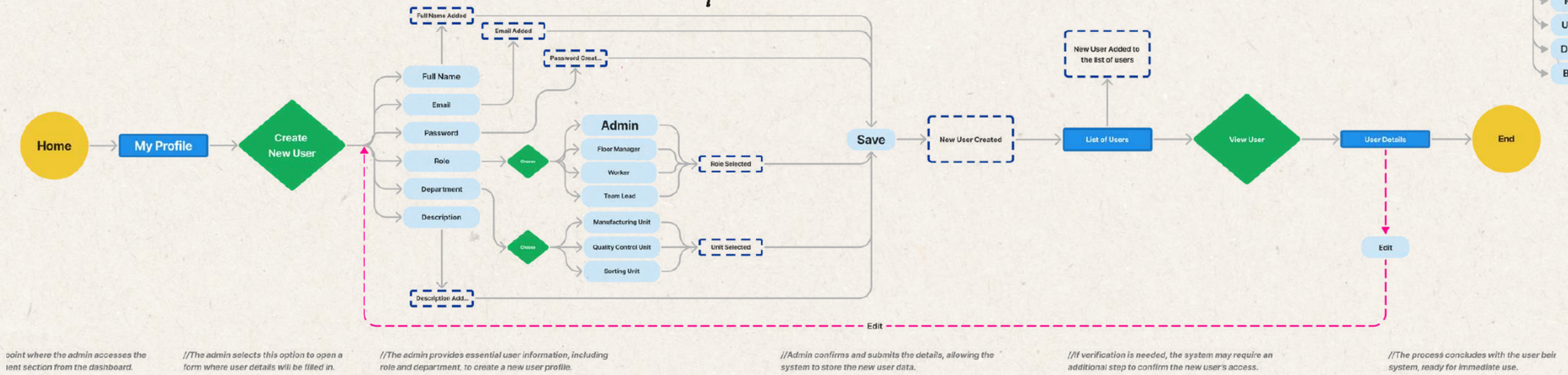
Task Flow 2: Adding a New Role and Assigning Permissions

Objective: Allow the admin to define new roles within the system and assign specific permissions to those roles.



Task Flow 1: Creating a New User

Objective: Enable the system administrator to create and configure a new user in the Smart Factory system.

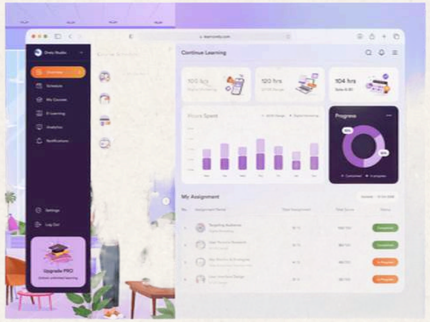


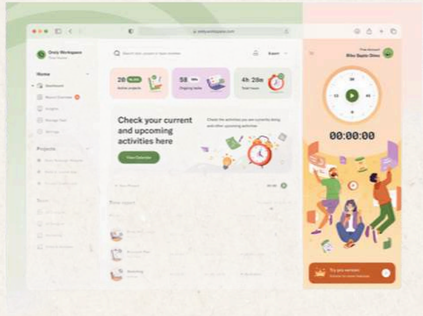
Design Process Step V

5. Moodboard

- I collected relevant images, color schemes, mobile apps and website interfaces as references.
- Made sure that it aligns with the **factory's brand** and environment, creating a professional experience for users.

Dashboarding

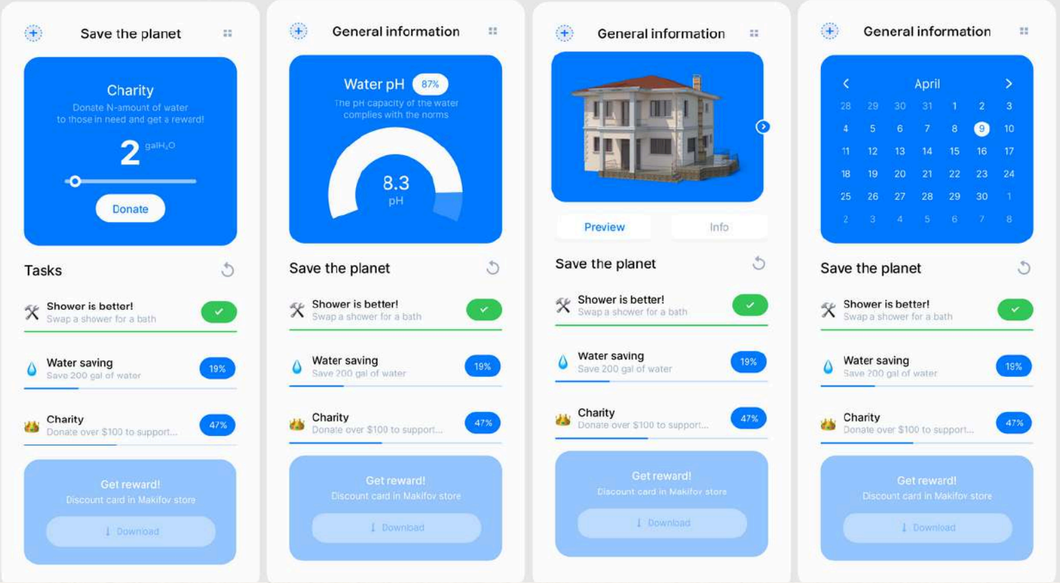




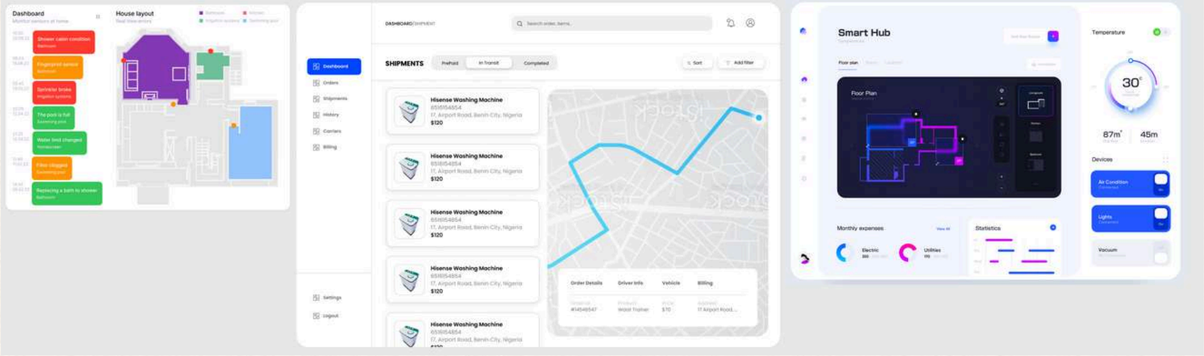
Infographics

(react-native-chart-kit): https://www.npmjs.com/package/react-native-chart-kit

Mobile App Screens



Factory Layout Visualization



Design Process Step VI

KEY METRICS

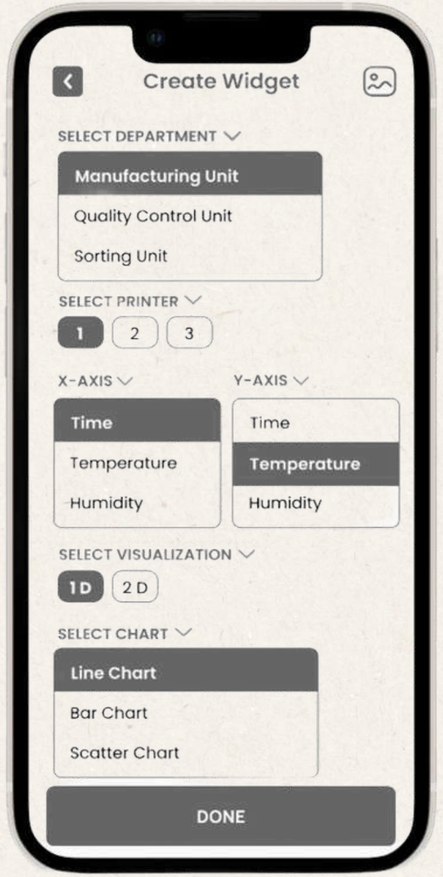
2nd Phase Execution & Delivery

6. Wireframes | Low-Fidelity Screens

Using **Figma**, I created a low-fidelity app UI.

Dashboard Overview Screen

Widget Creation Screen



User Management Screen

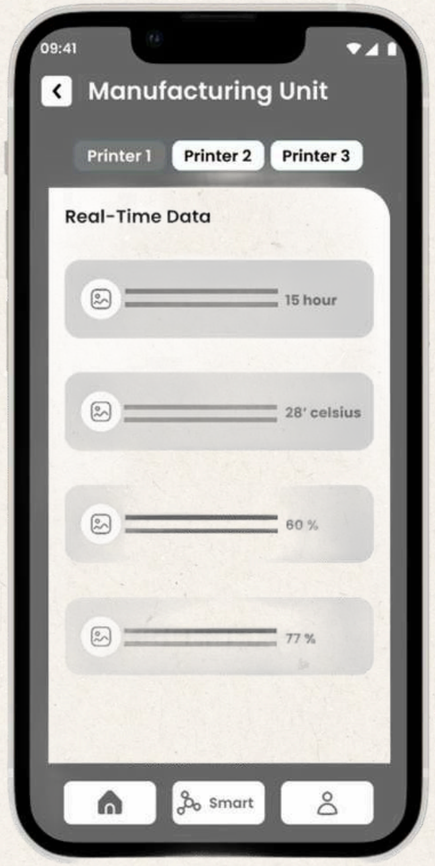
Design Process Step VI

KEY METRICS

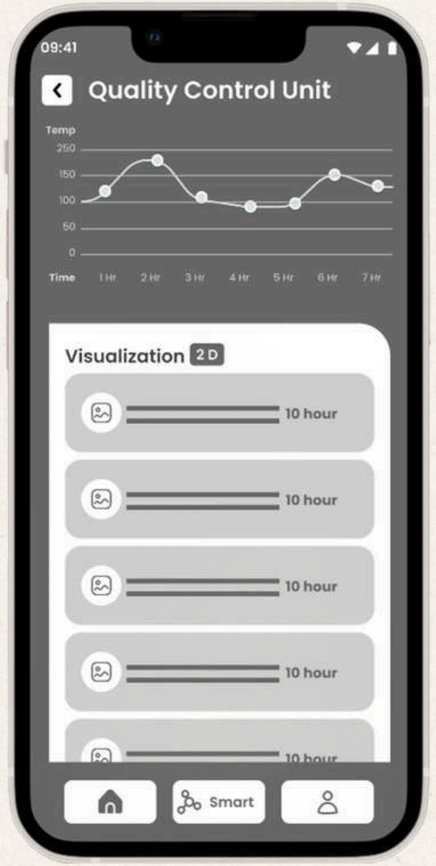
6.1 Wireframes | Low-Fidelity Screens

Using Figma, I created a low-fidelity app UI.

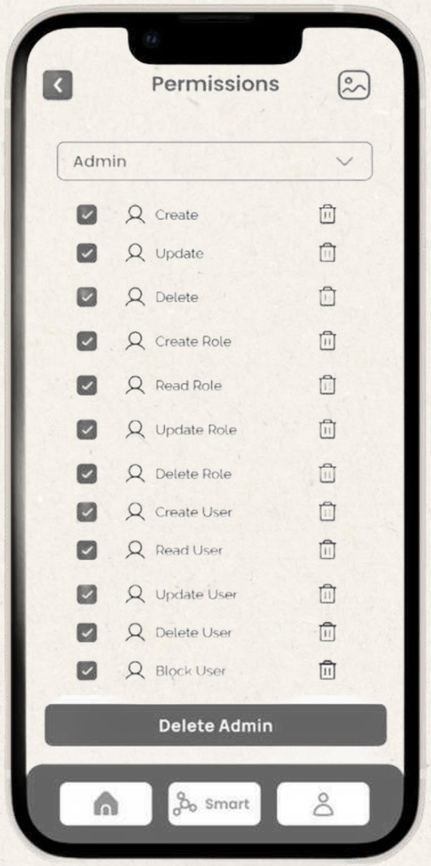
Real-Time Data Visualization Screen



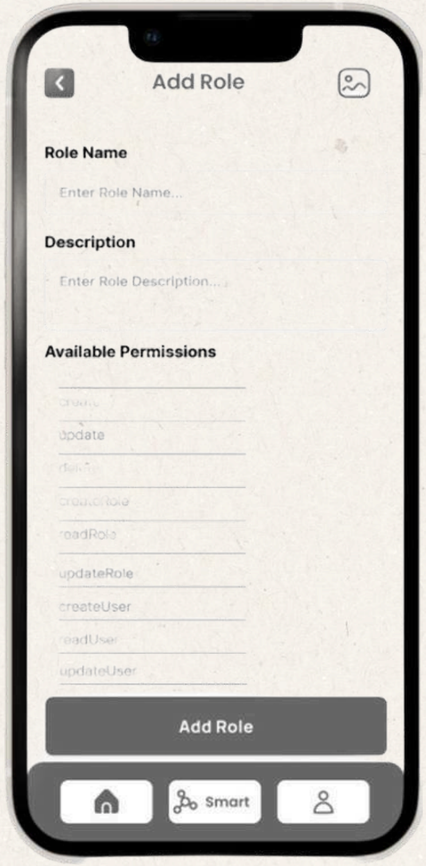
Unit Overview Screen



Permissions Assignment Screen



Adding New Role Screen



📌 Phase 3 : Final High-Fidelity Prototype & Result

1. Situation:

- With the initial low-fidelity prototype validated, I had to refine and finalize the **fully functional** UX high-fidelity prototype before testing.

2. Task:

- Make a visual UI screen.
- Ensure **final prototype** meets both business and user expectations.
- Transformation into mockup look.

3. Action:

- Revising the user needs.
- Collaborative discussion on UI look.
- Selected color schemes & typography.
- Creating high-fidelity prototypes.

4. Result:

- Delivered the final high-fidelity prototype on time.
- **100%** alignment between UX, engineering, and business teams.
- **Delivering is not the finish line; it's the starting point -> Testing Plan.**

SNEAK PEEK

Design Process Step VII

7. UI Library

- The colour theme for the Smart Factory project was carefully chosen in a collaborative discussion with the team members.

Colour Palette

#000000	#4C7380	#B8C7CC	#D8E4E8	#FFFFFF

WHY I PITCHED THIS THEME?

- To enhance clarity and maintain professionalism.
- Create a sense of trust.
- Feel of a factory app.

- Clean and Modern.
- Friendly & Professional.
- Its round and structured letterforms make it ideal for technical applications.

WHY I CHOOSED?

Typography

H1, Poppins 39px Regular

H2, Poppins 24px Medium

H3, Poppins 18px Bold

H4, Poppins 18px Medium

H5, Poppins 14px Medium

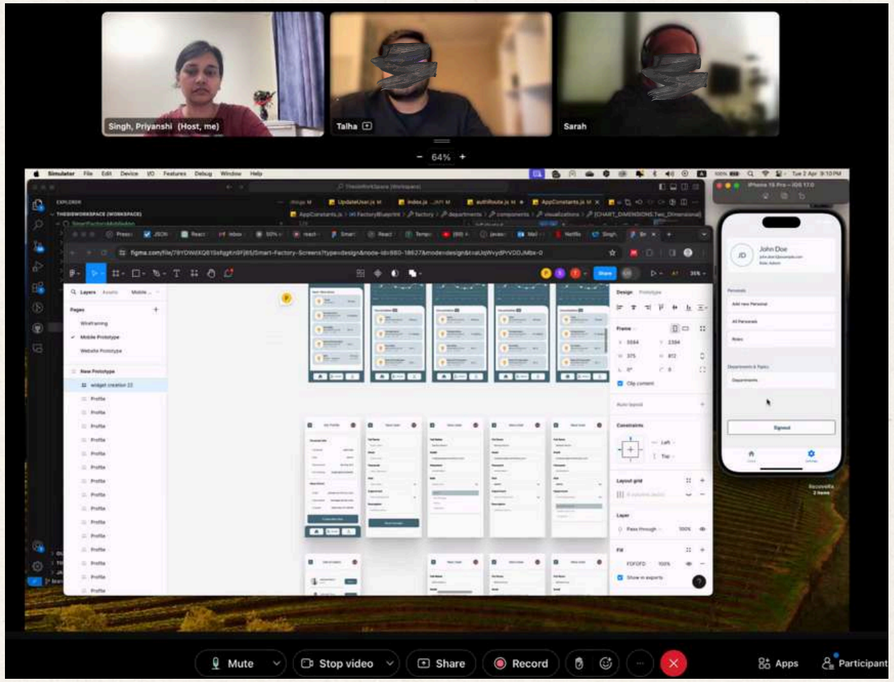
Body, Poppins 16px Regular

Body, Poppins 13px Regular

Design Process Step VIII

8. High-Fidelity Screens

- Adding Color theme and content to low-fidelity wireframe.



Testing the UI
(Iteration Phase)

Feedback, Iteration & Testing

Previous

Now

Design Process Step VIII

8.1 High-Fidelity Prototype

Data Visualization & Monitoring

- Real-time Data Monitor (Visualization)
- Sensor-Based Monitoring
- Department-Specific Insights

User Interaction & Navigation

- Centralized Home Screen
- Quick Access Navigation
- Customizable Widgets

KEY METRICS

User Experience & Interface Design

- Minimalistic, Intuitive UI for effortless navigation.
- High-Contrast Visuals for Industrial Environments.
- Touch-Friendly Buttons & Controls for quick interactions.

Real-Time Data & Monitoring

- Department-Wise Task Listings to streamline operations.
- Live Sensor Data Integration displays metrics like temperature, humidity, and quality control.

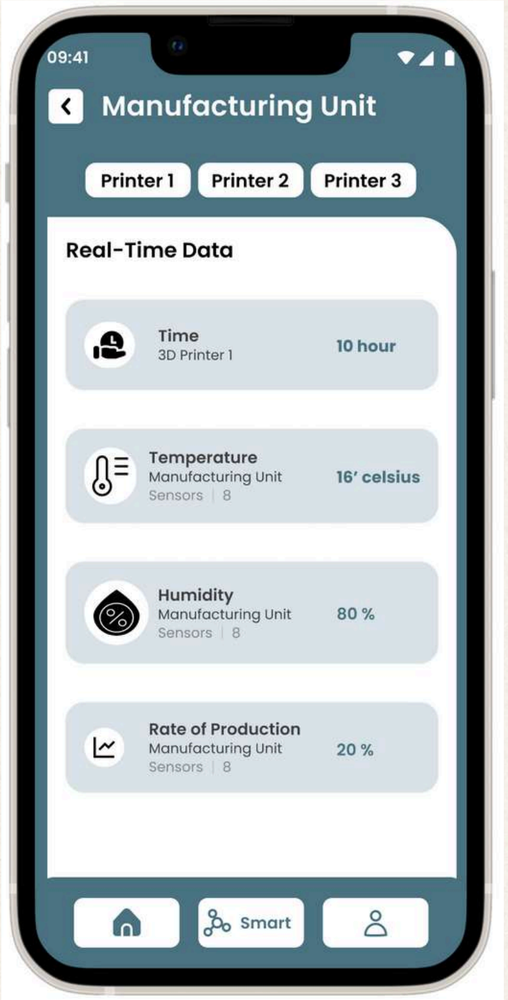
Task Management

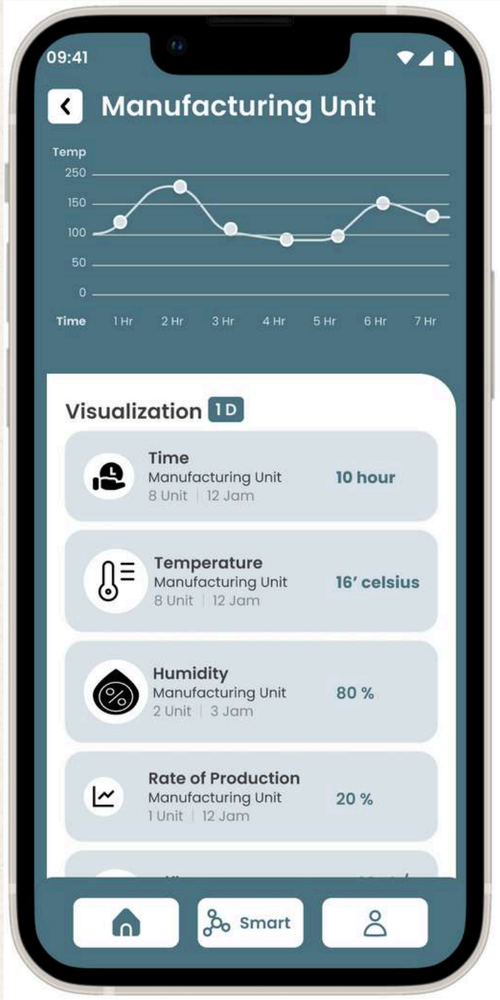
- Graphical Data Representation (charts & graphs) for trend analysis.
- Visualization was the top requirements of the end-users.

Design Process Step VIII

KEY METRICS

8.2 High-Fidelity Prototype





Department Visualization

Department/Unit Management

- View and monitor **100% live data** collected from the sensors or other operations **(scalable opportunity)**.
- Live data visualization through interactive graphs.
- Tracking key parameters like time, temperature, humidity, and production rate.
- Easy and quick navigation between the three printers using a tab-based UI button.

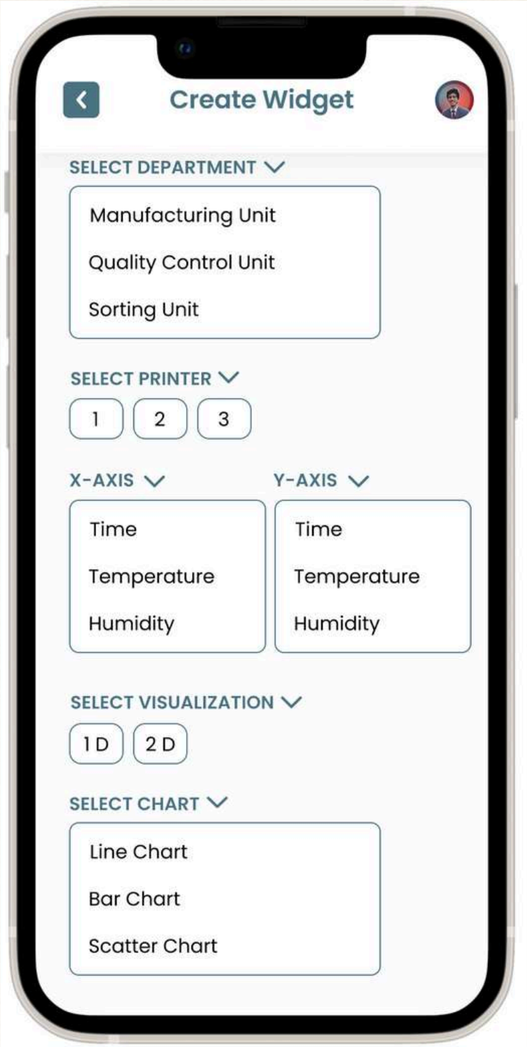
Problem Solved & VSD values adhered?

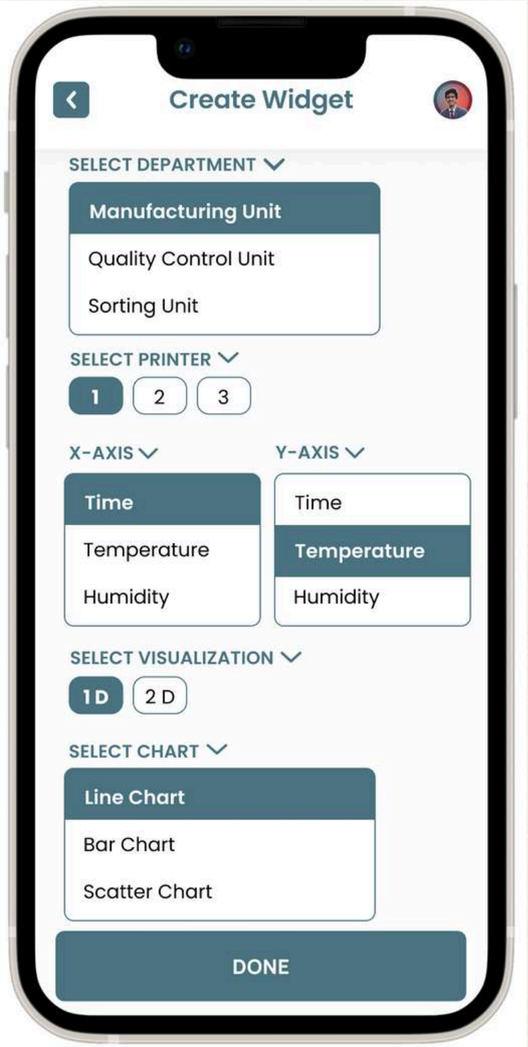
- Enabled factory managers to track performance efficiently.
- Reduced **80%** downtime by providing real-time insights.
- Improved decision-making with visual analytics.
- **VSD:** Transparency, Data Ethics, Efficiency.

Design Process Step VIII

KEY METRICS

8.3 High-Fidelity Prototype (Bonus UX Fix)





Bonus UX Fix

Widget Creation

- Users can create personalized or customize widgets based on their specific needs (unit data, sensors, or graphs) directly on their home screen.
- Choose preferred units, printers, sensors, or charts to **tailor** the personalized dashboard for optimal usability.

Problem Solved & VSD values adhered?

- Enhanced user flexibility and control over factory data.
- Reduced **100% cognitive load** by allowing tailored unit selection.
- Improved user experience with a personalized data view.
- **VSD: User Empowerment**, Data Accessibility, Efficiency.

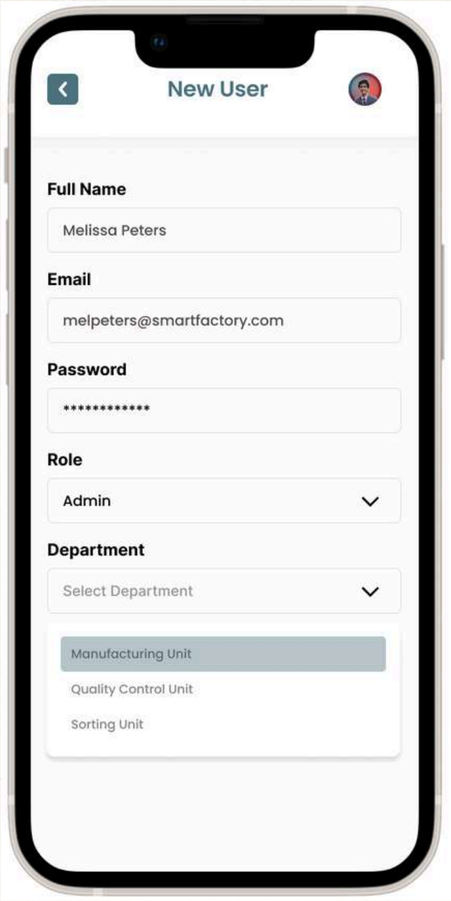
Design Process Step VIII

KEY METRICS

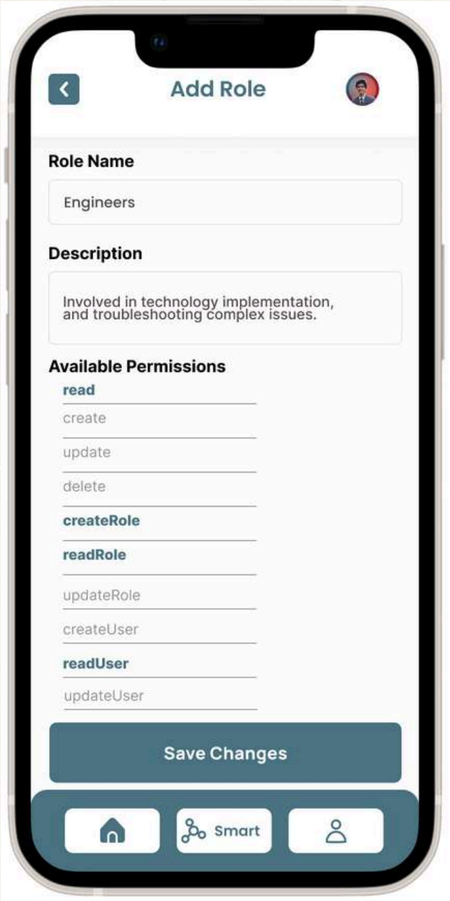
- Empowering User
- VSD

8.4 High-Fidelity Prototype

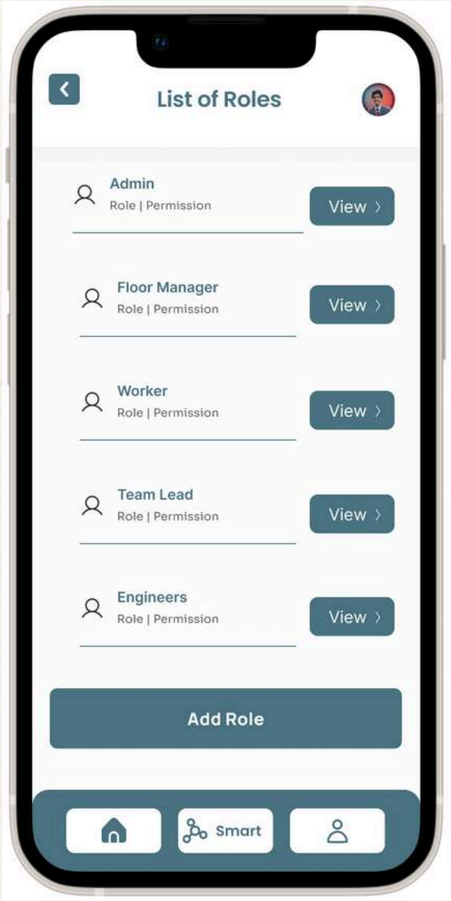
Creating New User



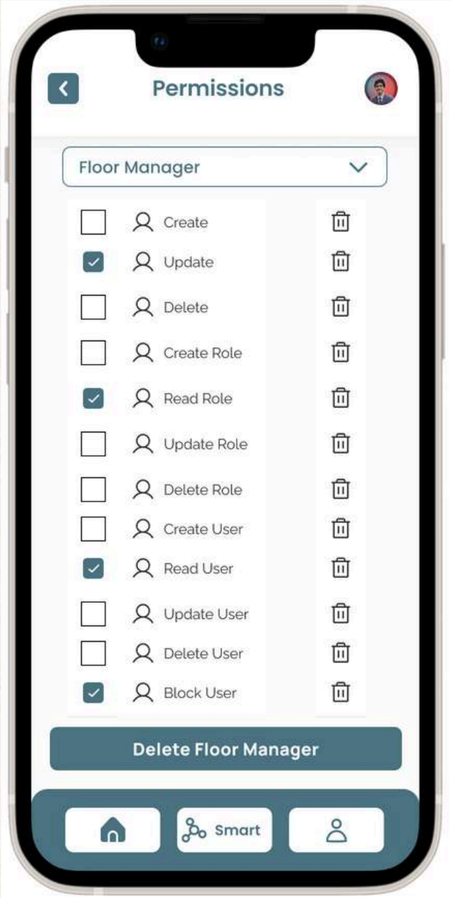
Adding New Role



Role Overview



Permission Overview



From Design to Testing

IDENTIFY

Understanding the values and needs most important to users.

REVIEW

Evaluating the project's goals and how they impact user values.

DESIGN

Creating solutions that minimize negative impacts on user values.

EVALUATE

Assessing the project's outcomes to ensure alignment with users' values.

Value Sensitive Design Process
Practical and Applied Approach

Pain Points Solved ✅

- Easy & Simple UI & Functional
- Intuitive Dashboard
- Widget Customization
- Profile Management
- Roles/Permission Feature
- Unit/Department Management

Next Verifying Usability and VSD implication:

3rd Phase

Delivery

📌 Phase 4 : Final Usability Testing & Implementation Delivery

1. **Situation:**
   - Before full deployment, I needed to **validate** the prototype and ensure it's usability and scalability.

2. **Task:**
   - To conduct the final round of usability testing.
   - Identify remaining **UX friction** points, and iterate them.

3. **Action:**
   - Conducted final usability testing.
   - Implemented last-minute UX quick fixes.
   - Created a VSD+HCD process playbook.
   - Write a **Final UX Report**.
   - Handover to the stakeholders team.

4. **Result:**
   - Usability testing confirmed an **80%** increase in task efficiency.
   - **Successfully** hand off the final design, ensuring on-time project completion.
   - I ensured that what was delivered has a scalable opportunity.

ALMOST THERE

KEY METRICS

Testing Process Step I

1. Usability Test

- Small moderated usability test approach
- Total Participants: **6**
- Focused on **4 key** usability scenarios:
  - Scenario 1: Monitoring Real-Time Data
  - Scenario 2: Creating a Custom Widget
  - Scenario 3: Managing Users and Roles
  - Scenario 4: Analyzing and Comparing Data

1.1 Result 🎯

- The usability test **verified** that the design aligns with these **VSD values**, promoting an ethical, user-centered experience.
- **Design meets user needs.**

1.2 Outcome

✅ **60% faster** decision-making through data visualization.
✅ **Reduced** cognitive overload by **100%** with personalized widgets.
✅ **50% improvement** in efficiency for factory task completion.

What Worked

- Users appreciated the clean and straightforward interface for navigating through the different sections, such as real-time data monitoring and department management. — Priyanshi Singh
- The widget system for real-time data display was praised for its flexibility in visualizing metrics. — Priyanshi Singh
- Participants found it simple to manage user roles and permissions, helping streamline the factory's operations. — Priyanshi Singh
- Users were able to perform their intended actions faster than expected, especially within the dashboard sections. — Priyanshi Singh
- The dashboard was well-organized, allowing users to easily access the widget and all the units. — Priyanshi Singh

Need to Improve

- Users mentioned the need for more specific customizations in the widget-creation process, such as pre-designed templates for common use cases. — Priyanshi Singh
- Feedback indicated a need to simplify the data comparison process to allow for quicker analysis between manufacturing units. — Priyanshi Singh
- Some users suggested adding more tooltips and help guides for first-time users to better understand how to use the app's features. — Priyanshi Singh

Questions

- **Can I assign multiple workers to a multiple department?**
  Users asked if there was a way to allocate more than one worker at a time to a specific/multiple department to streamline unit management. — Priyanshi Singh
- **Is there an option to set task priorities?**
  Participants were curious if they could assign priority levels to tasks, helping departments focus on the most critical work. — Priyanshi Singh
- **Can I monitor multiple machines simultaneously?**
  Users wanted to know if they could track data from multiple machines or units on a single dashboard screen. — Priyanshi Singh
- **How are overdue tasks handled?**
  Participants asked how the system deals with overdue tasks and whether notifications or escalations are automatically triggered. — Priyanshi Singh
- **Can I export performance data?**
  Users were interested in knowing if the real-time performance data displayed on the dashboard could be exported for further analysis. — Priyanshi Singh

Ideas

- Introduce pre-built widget templates for common metrics like temperature, pressure, and productivity. — Priyanshi Singh
- Provide more advanced analysis tools and filtering options for comparing units, periods, and conditions. — Priyanshi Singh
- Consider adding gamification elements to motivate factory workers to improve efficiency and reach production targets. — Priyanshi Singh

From Test to Evaluation 🎯

IDENTIFY

Understanding the values and needs most important to users.

REVIEW

Evaluating the project's goals and how they impact user values.

DESIGN

Creating solutions that minimize negative impacts on user values.

EVALUATE

Assessing the project's outcomes to ensure alignment with users' values.

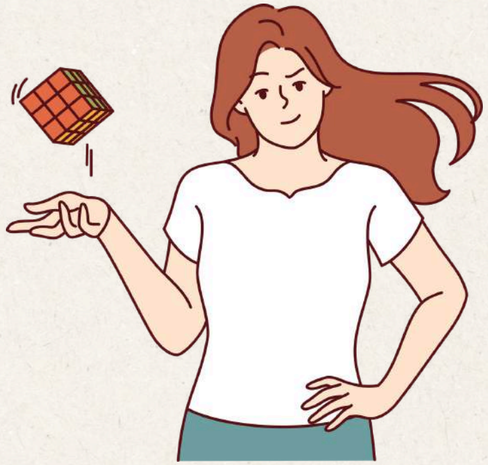
Value Sensitive Design Process
Practical and Applied Approach

CHALLENGES 📌

Major Project Challenge 1

Role-Based Access & Personalization

Designing a system that provides customized dashboards for different roles (e.g., operators, managers) while keeping the interface scalable. ✅



How I overcame?

- **Prioritized** most important users on the basis of daily usage.
- **Selected** critical roles/permissions ✅
- Approach:
  - Selected only **important** roles and permission revealed from interviews.
  - Action --> Created Personalized Dashboards for selected roles to minimize their cognitive load.
- Result: 🎯
  - Reduced user confusion by **60%** through clear role-based dashboards.
  - Improved task efficiency by **50%** as users accessed only relevant features.
- Key deliverables:
  - Successfully developed and presented roles and permissions framework in the Ist phase.
  - Scalable opportunity.
- **Alignment: Customer Obsession**

Challenge 2: Understanding the Factory System & Workflow 📌

- Problem: Initially, understanding the smart factory system, including units, sensors, conveyor belts, and workflows, was challenging due to its complexity.

- Approach: ✅
  - To gain clarity, I proactively engaged with project managers and the team, requesting to create a blueprint.
  - I conducted multiple meetings, workshops, and on-site visits to the in-house smart factory lab, ensuring a complete understanding of the factory.

- Solution & Impact:
  - I developed a **structured blueprint** that visually mapped the factory workflow, making it easier for cross-functional teams to understand the system. 🎯

- **Alignment: Dive Deep** –
  - I immersed myself in the smart factory environment to thoroughly understand the problem before designing a solution.

Learn and be curious

Dive Deep

Challenge 3: Implementing VSD Across All Steps 📌

- Problem:
  - How to ensure ethical considerations are integrated into my prototypes.
  - Balancing requirements with user needs and values like privacy, and fairness.

- Approach: ✅
  - Using stakeholder interviews and surveys, I understood user values and ethical concerns.

- Solution & Impact:
  - Design interface features that prioritize users' privacy, like a personalized dashboard and role assignment by the manager/head. 🎯

- VSD Alignment–
  - I focused on values and ethics in the design process and ensured that features were not just functional but also inclusive. 🎯

- **Alignment: Earn Trust –**
  - I implemented the VSD+HCD design framework in factories focused on workers needs.

Why I did what I did ?

Think Big

📌 I followed one core principle: **user needs & values,** then creating a seamless, efficient user experience.

📌 But this project wasn't just about designing a smart factory **interface**—it was about 💡:

- Transforming workflows
- Improving decision-making
- Ensuring an ethical, scalable UX solution.

📌 My **attention to detail, problem-solving mindset, and collaborative execution** align with Amazon's high standards and obsession with customer impact.

📌 Ultimately, I did what I did because I believe in designing systems that **empower people** to perform at their best, reduce operational conflict, and increase productivity. My goal was not just to solve problems—but to create a smarter factory that enhances the experience. ✅

🚀 **Big-Picture Thinking Led to a Scalable, Future-Ready Application.**

My Learning

- Empathy
- Diving Deep
- Problem-Solving
- Critical Thinking
- Cross-Functional Collaboration

- UX/UI Design Tools
- User Research
- Requirement Gathering
- Iterative Ideation
- Prototyping
- Wireframing
- Usability Testing
- Smart Factory Systems

- Design Thinking
- Research Methodology
- User-Centered Design
- Value Sensitive Design

PROJECT PRESENTATION END

Thank You

EMAIL YOUR FEEDBACK

Start

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