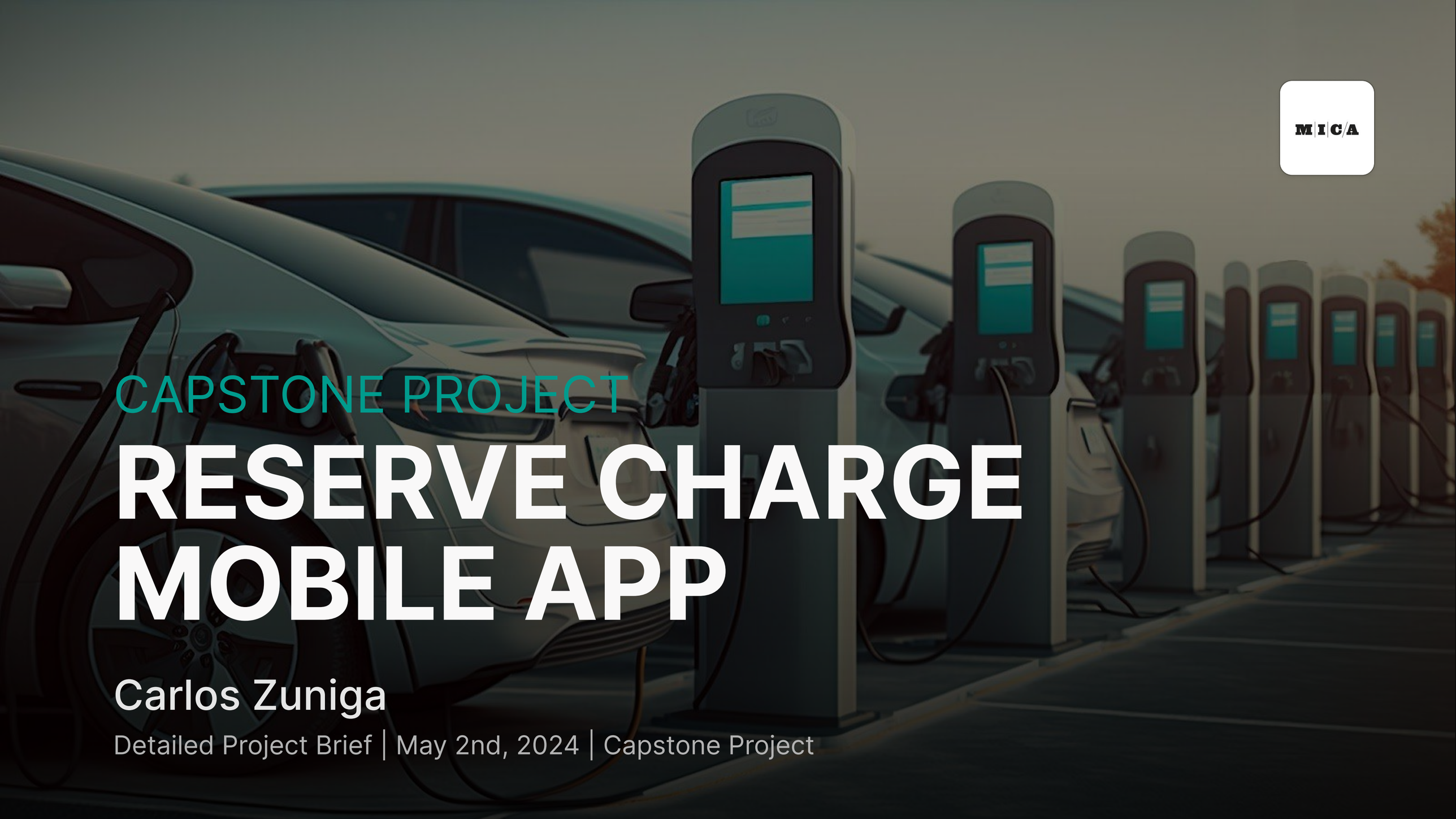


CAPSTONE PROJECT

RESERVE CHARGE MOBILE APP

Carlos Zuniga

Detailed Project Brief | May 2nd, 2024 | Capstone Project

Table of Content:

- The Strategy: Page 05
- The Timeline: Page 11
- The Process: Page 13
- Reflections: Page 23
- Next Steps: Page 27
- Appendix: Page 29
- References: Page 43

CUSTOMER
PROBLEM STATEMENT

Current State of The EV Charging Infrastructure

Poses a significant challenge across the EV ecosystem, from owners to infrastructure providers. Existing solutions often lack seamless integration, real-time data, and user-centric design, leading to frustration and inefficiency.

The Purpose

Unveiling My Purpose:
The Reason Behind My Focus

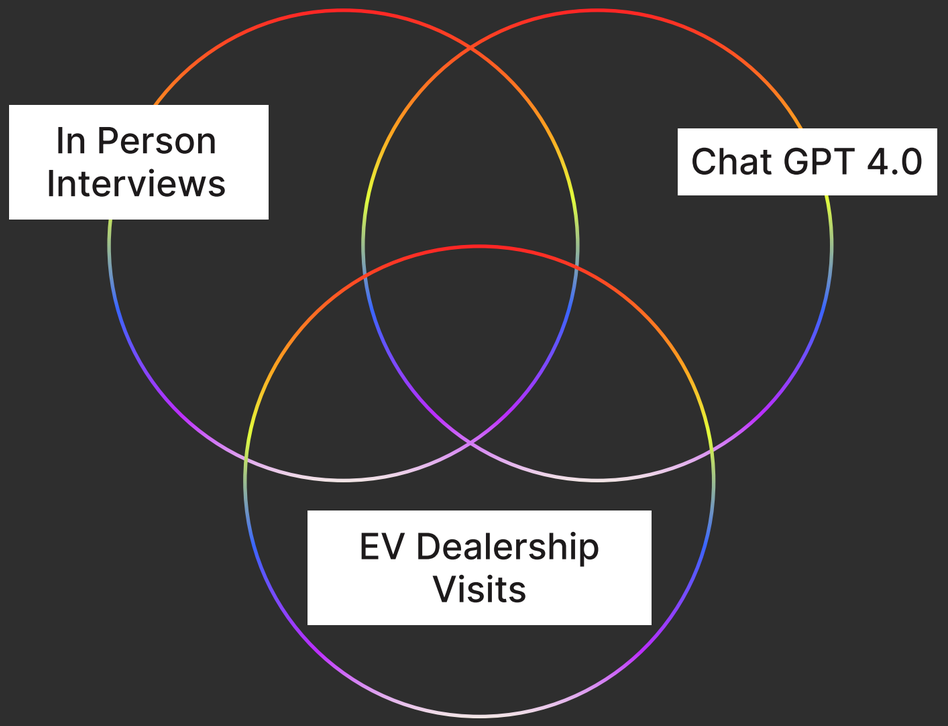
Having experienced firsthand the challenges associated with charging stations, I understand the frustration and inefficiency caused by their lack of seamless integration, real-time data, and user-centric design.

These issues highlight the pressing need for improvements in the electric vehicle charging infrastructure to enhance user experience and promote widespread adoption of electric vehicles.

THE STRATEGY

Unveiling Insights

We've utilized various methods



In Person Interviews

We're utilizing SurveyMonkey.com to develop 10 insightful survey questions for in-person interviews. This streamlined approach ensures we gather user data efficiently and effectively.

Chat GPT 4.0

Leveraging ChatGPT 4.0, we're swiftly gathering essential data on the total number of EVs sold, stakeholder benefits, and existing partnerships with EV charging stations. This AI-driven approach enables us to access accurate information efficiently, informing our strategic decisions and enhancing our understanding of the EV landscape.

EV Dealership Visits

I visited multiple EV dealerships, delving into EV charging intricacies through engaging questions and firsthand exploration of charging infrastructure.

Research Quiries

Charging Forward:
Illuminating Pathways with EV Infrastructure Inquiries

In our quest to optimize the EV charging infrastructure, we've designed a concise survey using SurveyMonkey.com.

Join the Charge Crew

Volt Voyagers:
Power Pilots on the Move for Electric Thrills

8
Participants

Participant
Debrief

Participant
Agreement

$5
Reward

ChatGPT Empowers Discovery

Conversational Intel:
ChatGPT Unveils Wisdom

Leveraging ChatGPT 4.0, we're swiftly gathering essential data on the total number of EVs sold, stakeholder benefits, and existing partnerships with EV charging stations.

This AI-driven approach enables us to access accurate information efficiently, informing our strategic decisions and enhancing our understanding of the EV landscape.

Charging Up:
Exploring EV Options

Embarking on a journey to understand the intricacies of EV charging infrastructure, I ventured into various EV dealerships, armed with probing questions aimed at unraveling the mysteries of charging compatibility, network accessibility, and user experience.

With a keen eye and an insatiable curiosity, I immersed myself in the world of electric vehicles, seeking firsthand insights into the present landscape of charging infrastructure and envisioning the possibilities for future enhancements.

TIMELINE

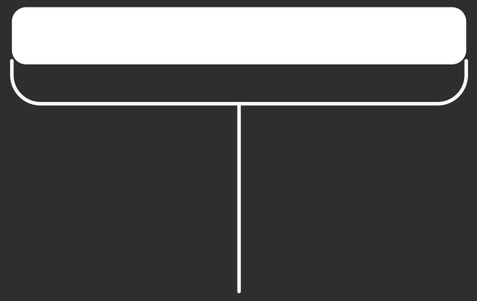
Mapping Success:
Journey Through Our Activity Timeline

USER RESEARCH & DATA ANALYSIS

DISCOVERY & RISK MITIGATION

PROTOTYPING & DESIGN

USABILITY TESTING & INTERVIEWS



We are here!

THE PROCESS

Empowering EV’s

Charging Ahead:
Crafting Your EV Charging Interface with Precision

By following a structured approach, we effectively gathered user requirements, insights, and feedback to inform the design and development of your EV charging interface.

By actively listen to users, remaining flexible in my approach, and adapting the discussion as needed to accommodate a diverse perspectives and experiences.

Thematic Analysis

Theme 1:
Cost-Conscious Commuter

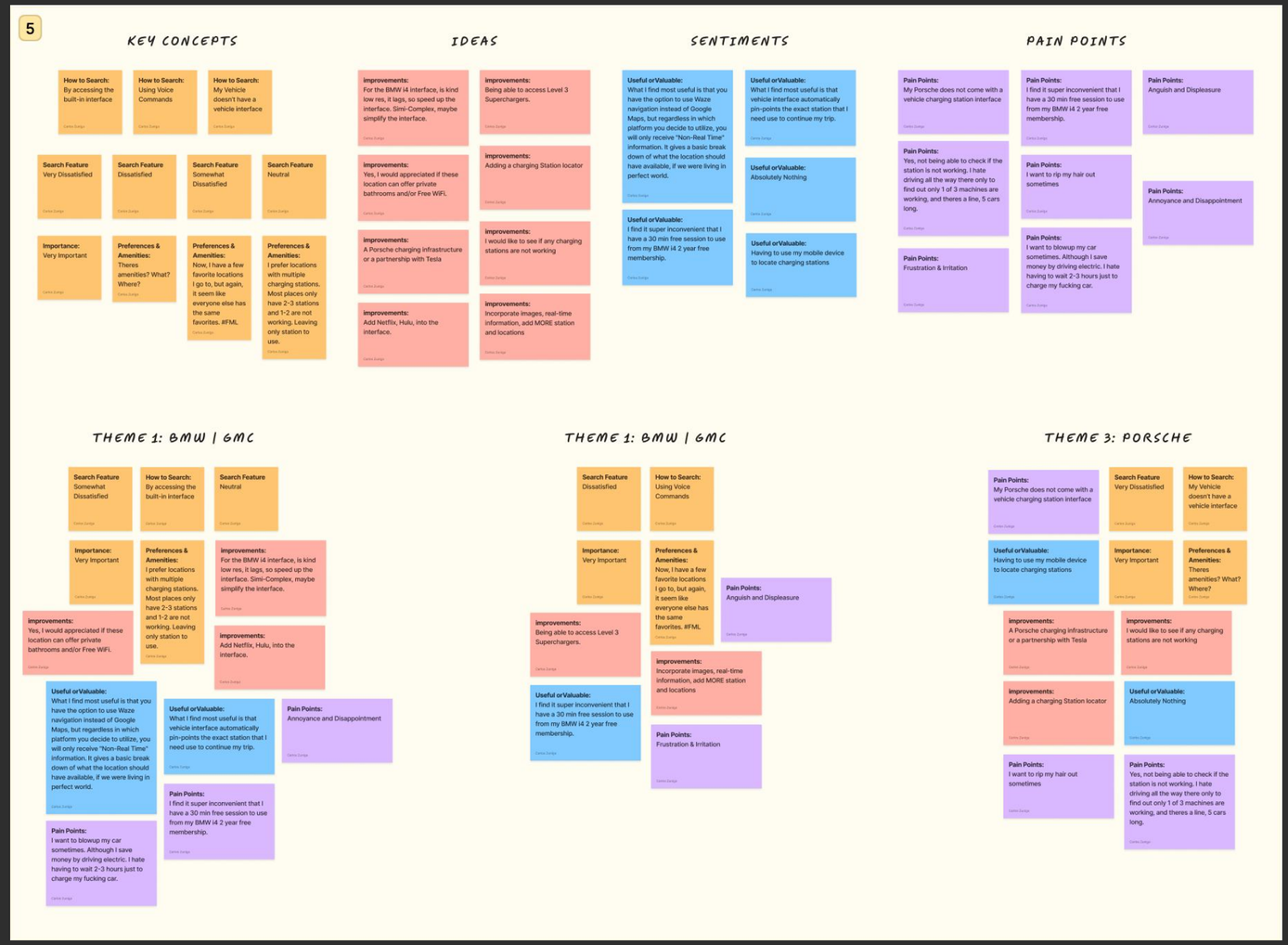
This persona seeks affordable charging options to minimize daily commuting costs while prioritizing convenience.

Theme 2:
Tech-Savvy Enthusiast

This persona values cutting-edge charging technology and seamless user experiences, aiming to integrate their electric vehicle with smart devices for enhanced functionality.

Theme 3:
Eco-Conscious Explorer

This persona is committed to reducing carbon emissions and seeks charging solutions that align with their environmental values, prioritizing access to renewable energy sources for their electric vehicle.



User Pain Points

- Limited Access
- Slow Charging Speed
- High Costs
- Unreliable InfraInfrastructure
- Complex Payment Systems
- Compatibility Issues
- Inadequate Coverage
- Lack of Information
- Charging Speed Discrepancies
- Environmental Concerns

User Persona

Jake Owens

Innovative, Creative Director | Interactive Web Media

Age: 43

Education: Master's Degree in Visual Arts

Status: Married, 2 Kids

Location: Los Angeles, CA

"Mindfulness isn't just a choice for me; it's a lifeline in the storm of deadlines and creative chaos. In the silence of meditation, I find clarity, resilience, and the strength to innovate."

INNOVATIVE | RESILIENT | MINDFUL

Background

Jake is a 43-year-old married man with a background in innovative design and interactive web media. He has been working in the creative industry for over 15 years, specializing in developing cutting-edge digital experiences for various clients.

Goals

Jake aims to stay ahead of industry trends and push the boundaries of creativity in his work. He strives to create engaging and immersive digital experiences that captivate audiences and leave a lasting impression.

Frustration

Jake often feels frustrated by the limitations of traditional design tools and software. He finds it challenging to translate his creative vision into reality due to technical constraints and lack of innovative features in existing platforms.

Needs

Jake needs access to advanced design tools and resources that empower him to bring his ideas to life effectively. He seeks intuitive software solutions that streamline his workflow, enhance collaboration with team members, and enable seamless integration with other creative applications.

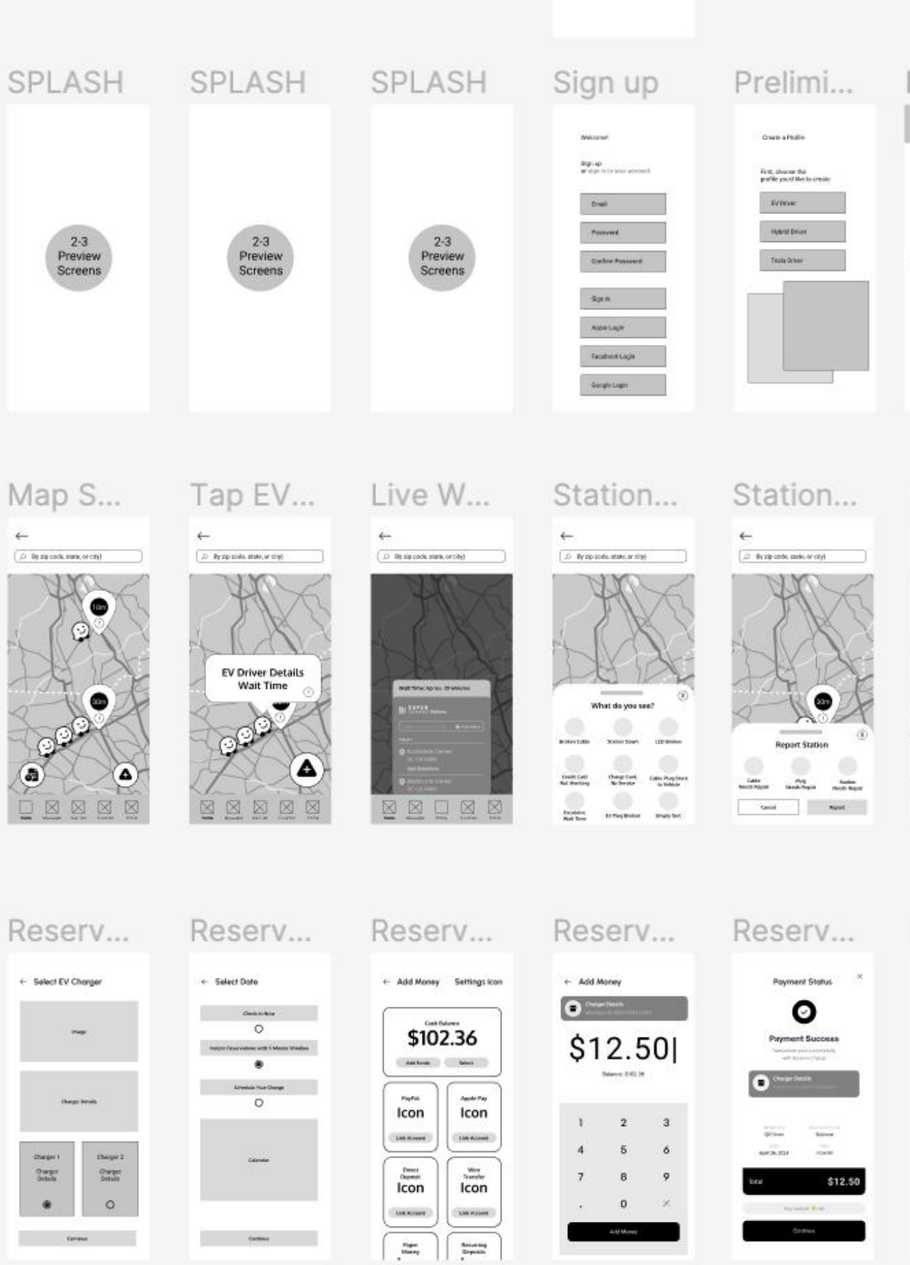
Journey Map

Mapping the Road to Seamless EV Charging Experiences

Sketching the Future:
Lo-Fi Wireframes for EV Charging Solutions

Through a meticulous process of engaging with users, gathering their requirements, analyzing insights, and eliciting feedback, I've effectively shaped the design and development of our project.

By listening attentively to user needs and preferences, we've ensured that our solutions are tailored to address real-world challenges and provide meaningful value to our audience.

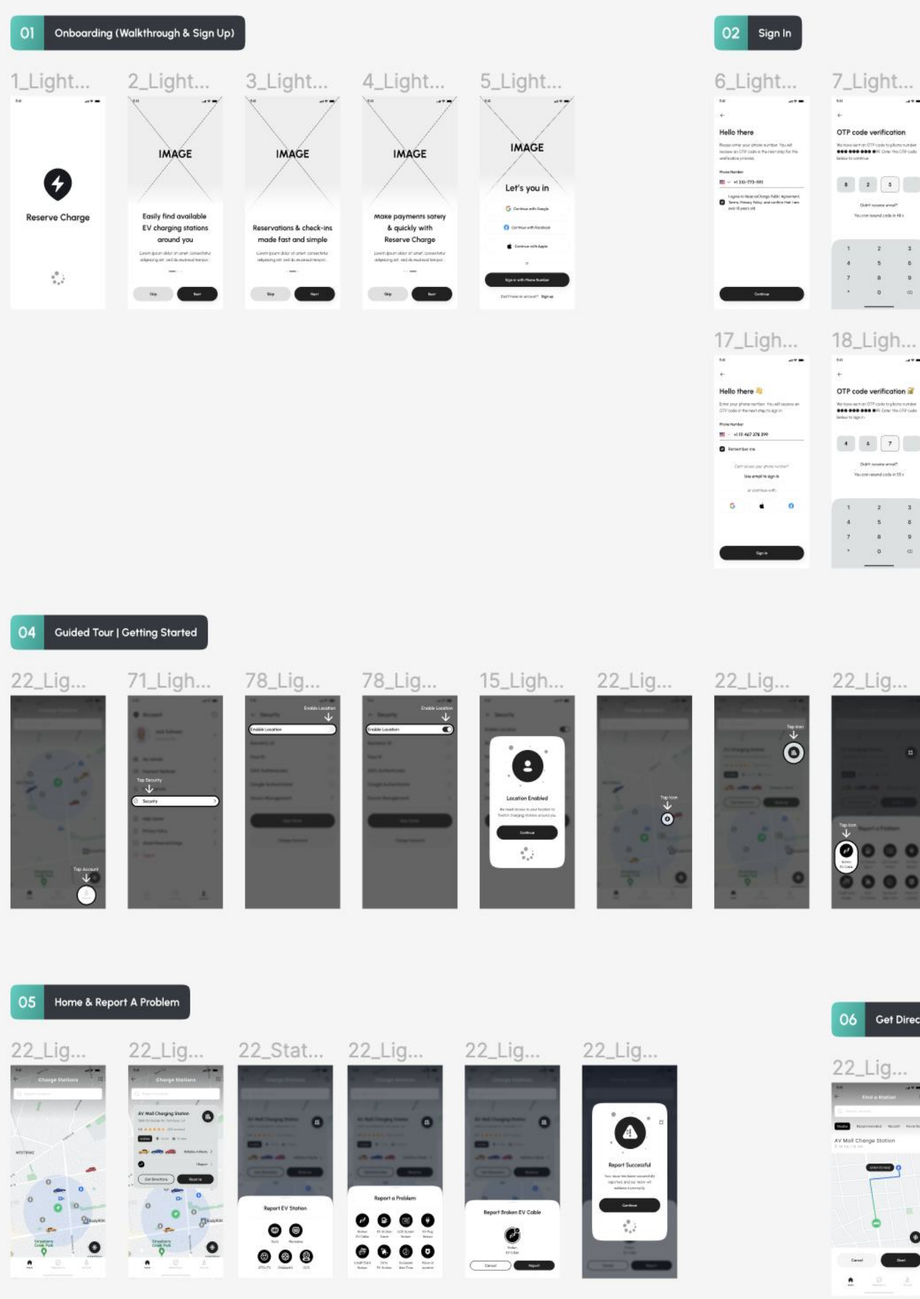


Mid-Fidelity Wireframes

Crafting Concepts:
Mid-Fi Wireframes Illuminate Design Paths

By carefully analyzing user interactions and feedback obtained from the lo-fidelity wireframes, I was able to discern valuable insights and preferences.

This process enabled me to refine and iterate upon the design, translating user needs into actionable improvements for the mid-fidelity wireframes.

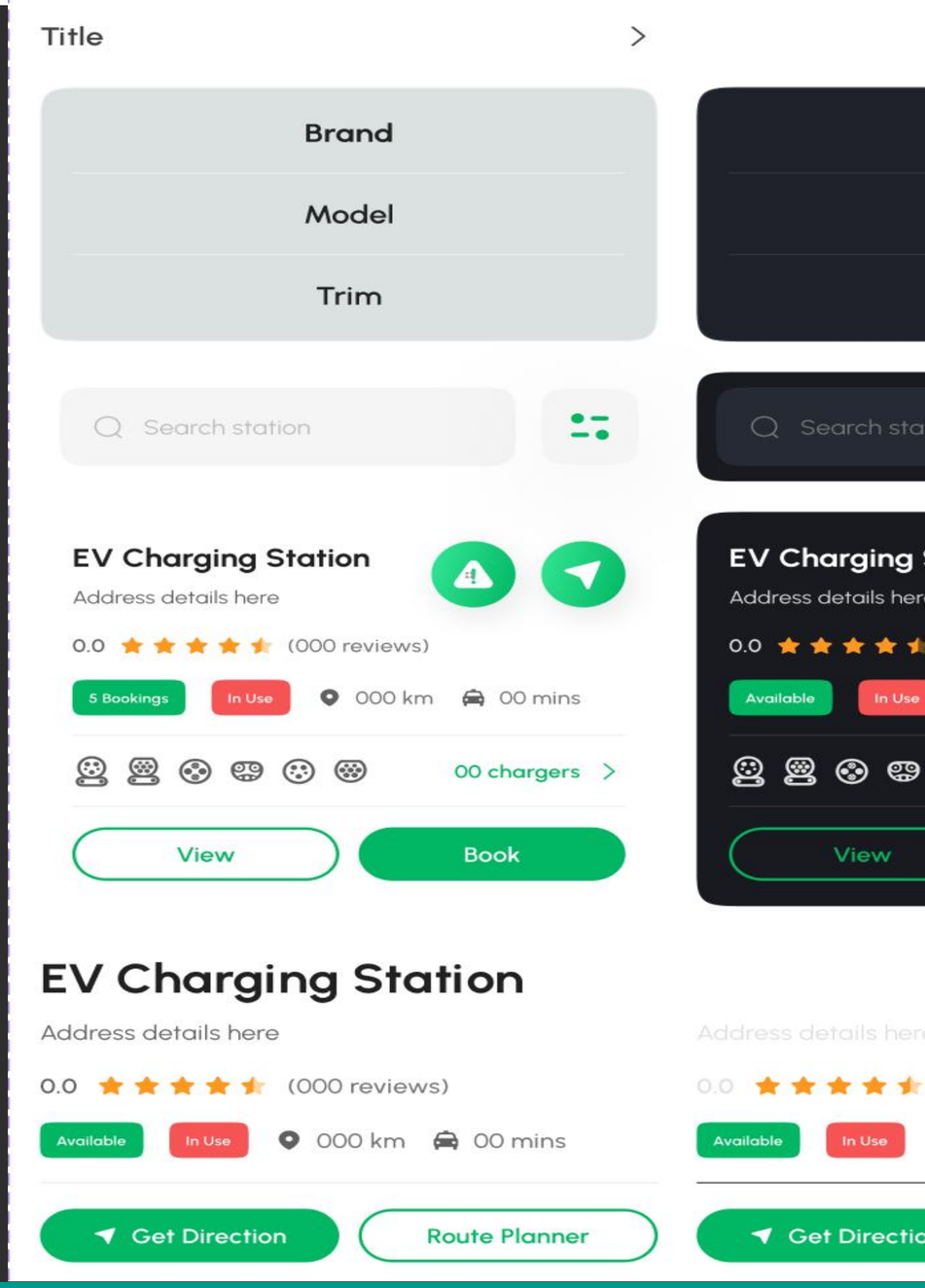


Design System

Figma Fusion:
Streamlining Design Excellence

To ensure consistency and efficiency in the design process, I meticulously crafted a comprehensive design system in Figma, encompassing a wide range of reusable components and styles.

By establishing this foundation early on, I laid the groundwork for seamless collaboration and rapid iteration, setting the stage for the development of high-fidelity wireframes that are both visually cohesive and user-friendly.

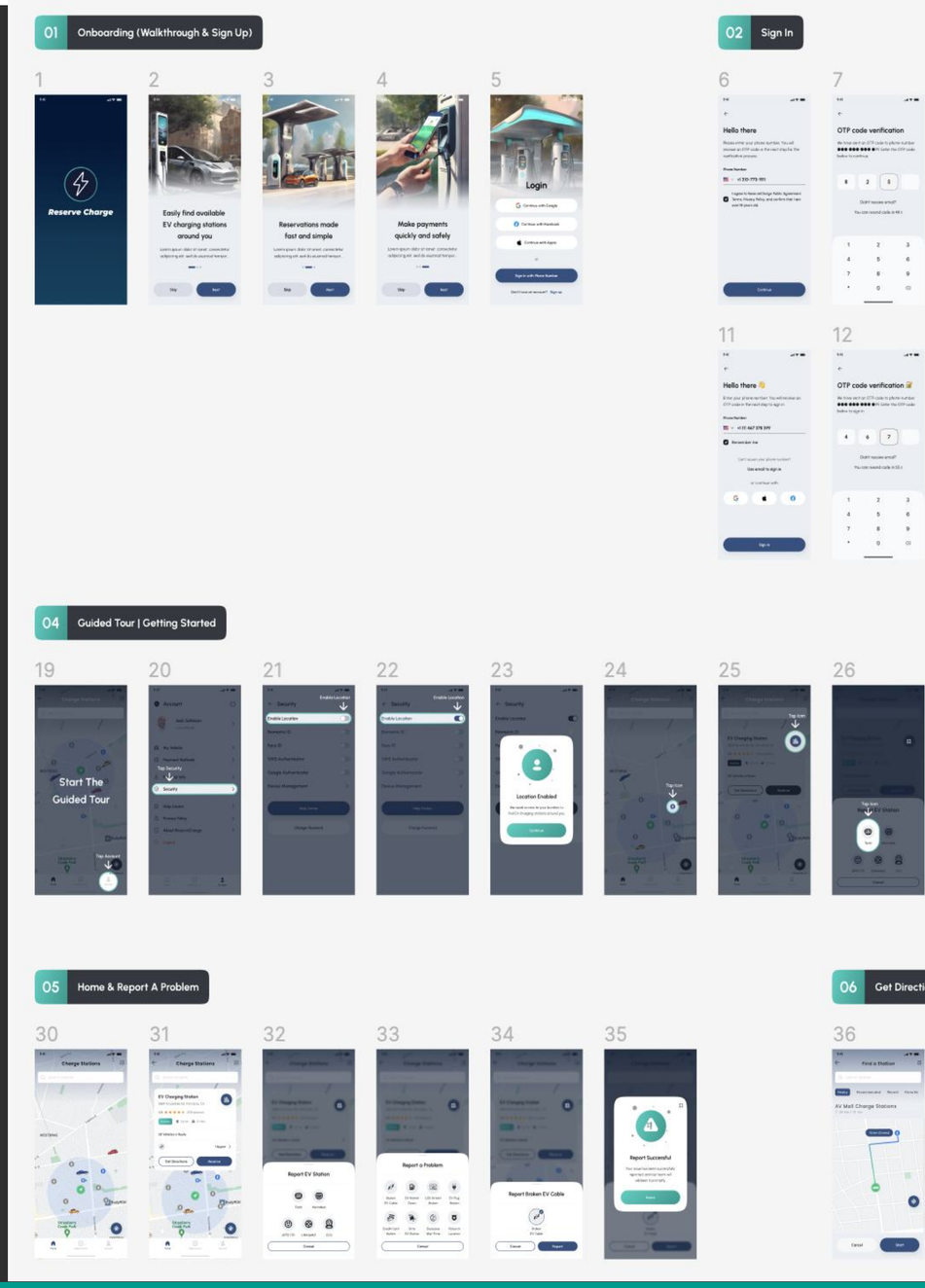


Hi-Fidelity Wireframes

Polished Precision:
Crafting Hi-Fi Wireframes for Peak Performance

With keen attention to detail and user feedback, I meticulously refined the mid-fidelity wireframes, integrating insights and suggestions gathered from user testing sessions.

By leveraging the established design system in Figma, I ensured consistency and coherence across the hi-fidelity wireframes, delivering a refined user experience tailored to meet user needs and preferences.



REFLECTIONS

Time Management

Mastering the Clock: Navigating Time Constraints with Precision

Navigating time constraints is crucial for our project's success. We're challenged to conduct thorough research, design iterations, and user testing within a tight timeframe for this project.

Efficient workflows and precise prioritization are essential to meet our deadlines and deliver quality results.

Inquiry IQ:
Crafting the Perfect Queries

Crafting effective survey questions requires clarity, relevance, and precision to gather accurate insights from participants. Balancing these factors ensures unbiased responses and enhances the quality of the data collected.

From Concept to Creation: The Power of Lo-Fidelity Wireframes!

Begin with Lo-Fi Wireframes: Uncover UX Solutions Effectively! By starting with low-fidelity wireframes, you can efficiently tackle user experience challenges, ensuring a solid foundation for your design process.

These initial sketches allow for quick iteration and exploration, paving the way for innovative solutions tailored to user needs.

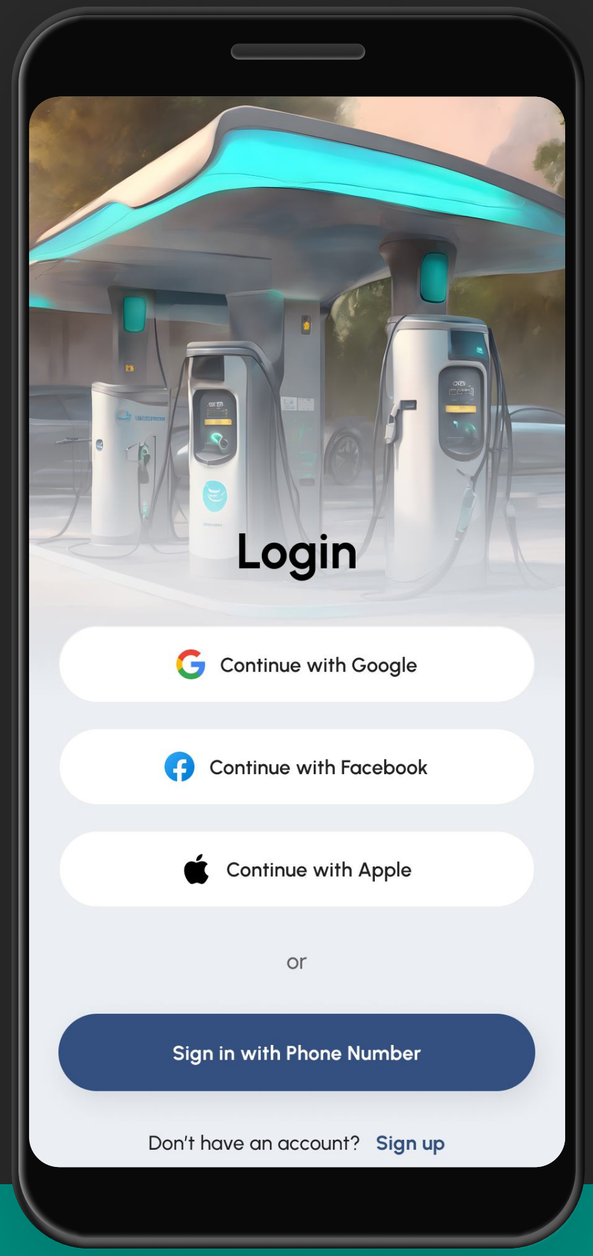
NEXT STEPS

Next Steps

Forward Momentum: What Comes Next in Our Journey

Our journey continues with the next steps focused on enhancing our hi-fidelity prototype by incorporating more interactive components.

By adding these elements, we aim to further refine the user experience and ensure that our final product meets the needs and expectations of our target audience.



APPENDIX

Unlocking Solutions:
Putting EV Charging Challenges in Context

In contextualizing the problem of improving EV charging interfaces, it's essential to explore past approaches and successes/failures in related sectors that may offer insights. Here are some approaches that have been tried and their analysis:

IN-VEHICLE INTERFACE | **MOBILE APPS FOR CHARGING** | **THIRD-PARTY NAVIGATION** | **CURRENT INFRASTRUCTURE**

Success | Failures

In-Vehicle:
Charging Interface

Analysis:
Tesla's in-vehicle charging interface, with features like real-time Supercharger availability, automatic routing to nearby stations, and remote monitoring via the Tesla mobile app, sets the standard. Yet, non-Tesla EV owners often lack such integration and may resort to less advanced solutions.

Comparison:
Tesla's approach demonstrates the potential for seamless integration between vehicle systems and charging interfaces, highlighting the gap for non-Tesla electric vehicles.

Success | Failures

Mobile Apps:
Charging Network Navigation

Analysis:
Charging infrastructure providers have developed mobile apps for locating and navigating to charging stations. However, these apps often lack integration with vehicle interfaces, resulting in disjointed user experiences.

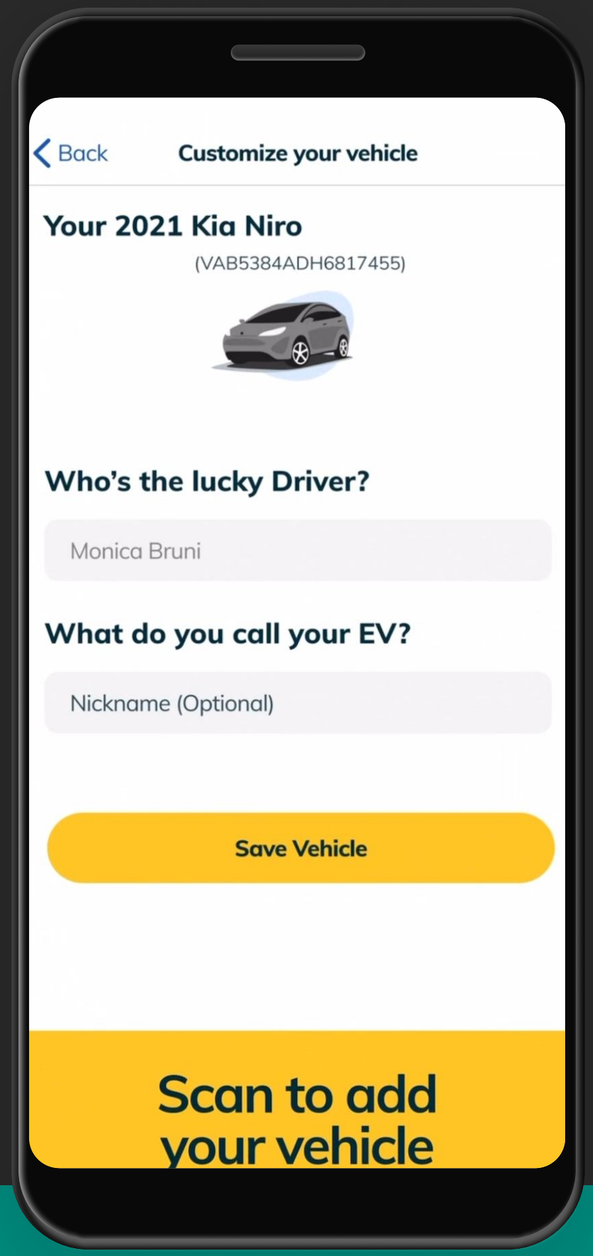
Comparison:
While offering convenience, these apps fall short in seamless integration with vehicle systems.

Success | Failures

Third-Party:
Navigation Systems Integration

Analysis:
Some EV makers integrate third-party navigation systems like Google Maps or Apple Maps, enabling users to locate charging stations along their route. Yet, these integrations may lack real-time data on station availability or compatibility with specific charging networks.

Comparison:
While these integrations offer broader navigation capabilities, they may not prioritize charging-specific features or provide a tailored user experience for electric vehicle owners.



> *"Cadillac has been bolstering its EV lineup, aiming to offer **ONLY** a fully electric portfolio by 2030"*

EV Revolution:

A Decade in Review

From a spark to a surge, electric vehicles (EVs) have transformed the automotive landscape over the past 10 years. With exponential growth, EV sales have skyrocketed, reshaping the future of transportation. Dive into the numbers and witness the electrifying evolution firsthand.

2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
50K EVs sold	70K EVs sold	100K EVs sold	150K EVs sold	200K EVs sold	300K EVs sold	350K EVs sold	400K EVs sold	450K EVs sold	500K EVs sold
400K Hybrids	450K Hybrids	500K Hybrids	550K Hybrids	600K Hybrids	650K Hybrids	700K Hybrids	750K Hybrids	800K Hybrids	850K Hybrids
12M Gasoline	13M Gasoline	14M Gasoline	15M Gasoline	16M Gasoline	17M Gasoline	18M Gasoline	18M Gasoline	18M Gasoline	18M Gasoline

Desired Benefits:
For All Stakeholders

Electric Vehicle Manufacturers

Desired Benefits:

- Enhance customer satisfaction and loyalty.
- Increase sales of electric vehicles.

Measurement Metrics:

- Customer satisfaction scores and feedback surveys.
- Sales data and market share growth for EV models.

Electric Vehicle Manufacturers

Desired Benefits:

- Promote sustainable transportation and reduce greenhouse gas emissions.
- Advance environmental conservation efforts.

Measurement Metrics:

- Reduction in carbon emissions from the transportation sector.
- Progress toward sustainability goals (e.g., percentage of electric vehicles on the road).

Charging Infrastructure Providers

Desired Benefits:

- Increase utilization of charging networks.
- Generate additional revenue streams.

Measurement Metrics:

- Charging session data (frequency, duration, etc.).
- Revenue generated from charging sessions and network usage fees.

Desired Benefits:
For All Stakeholders

Software Developers | Interface Designers

Desired Benefits:
- Establish market leadership and reputation for innovation.
- Attract new clients and business opportunities.

Measurement Metrics:
- Market recognition and industry awards.
- Growth in client base and project opportunities related to EV technology.

Environmental Group | Advocacy Organizations

Desired Benefits:
- Accelerate adoption of electric vehicles and sustainable transportation practices.
- Mitigate climate change impacts and promote environmental conservation.

Measurement Metrics:
- Increase in public awareness and support for electric vehicles.
- Progress toward sustainability goals (e.g., reduction in carbon emissions).

> *By categorizing risks into these key categories and identifying triggers, project teams can better anticipate potential challenges and proactively implement mitigation strategies to minimize their impact on project outcomes.*

Mapping the Journey:
Anticipating Risks & Triggers in EV Charging

Technical Risks:

Trigger:

- Implementation of complex features or functionalities that require specialized technical expertise.

Examples:

- Integration challenges with existing systems, scalability issues, and compatibility issues with diverse hardware or software environments.

User Engagement Risks:

Trigger:

- Low participation or engagement from target users in research activities or usability testing.

Examples:

- Difficulty recruiting representative user samples, lack of interest or incentive for users to participate, and privacy concerns regarding data collection.

Regulatory & Compliance Risks:

Trigger:

- Changes in government regulations or industry standards affect EV charging infrastructure development or deployment.

Examples:

- New legislation impacting EV adoption incentives, regulatory barriers to charging station installation, and data privacy and security compliance requirements.

Navigating the Currents:
Identifying Risks & Triggers in EV Infrastructure

Market Risks:

Trigger:
- Shifts in market dynamics or competitive landscape affecting consumer preferences or industry trends.

Examples:
- Emergence of new competitors, changes in consumer demand for EVs or charging solutions, fluctuations in energy prices or government subsidies.

Stakeholders Risks:

Trigger:
- Misalignment of interests or conflicting priorities among project stakeholders.

Examples:
- Lack of support or buy-in from key stakeholders, disagreement on project scope or objectives, and competing agendas within partner organizations.

Environmental Risks:

Trigger:
- External factors such as natural disasters, climate change, or infrastructure limitations affect charging infrastructure's availability or reliability.

Examples:
- Extreme weather events disrupting power supply, insufficient infrastructure capacity during peak demand periods, and environmental regulations impacting charging station placement.

Charging Ahead:
Defining Desired Outcomes For EV Interface

Enhance Usability of EV Charging Interface:

Risks:
- Limited availability of user data due to low user engagement or participation in research activities

Mitigation Strategy:
- Offer incentives or rewards to encourage user participation in research activities. Additionally, leverage existing data sources such as market research reports or competitor analysis to supplement user insights.

Ownership:
- UX Research Lead

Improve User Satisfaction with Charging Experience:

Risks:
- Technical challenges or limitations in implementing desired features and functionalities identified during the design phase.

Mitigation Strategy:
- Conduct thorough feasibility assessments and technical evaluations early in the design process to identify potential roadblocks. Collaborate closely with developers and engineers to find alternative solutions or workarounds.

Ownership:
- UX Design Lead, Development Team Lead

Powering Progress:
Envisioning Desired Outcomes For EVs

Optimize Charging Station Utilization:

Risks:
- Inaccurate demand forecasting leading to over-investment or underutilization of charging infrastructure.

Mitigation Strategy:
- Implement data-driven analytics and predictive modeling techniques to forecast future demand for charging stations accurately. Continuously monitor charging station usage and adjust capacity planning strategies accordingly.

Ownership:
- Data Analytics Lead, Project Manager

Ensure Seamless Integration with EV Charging Networks:

Risks:
- Compatibility issues or interoperability challenges between different EV charging networks, resulting in fragmented user experiences.

Mitigation Strategy:
- Collaborate with industry partners and standards organizations to establish common protocols and interoperability standards for EV charging networks. Prioritize seamless integration and compatibility testing during the development and testing phases.

Ownership:
- Technical Integration Lead, Stakeholder Engagement Lead

Empowering EV Evolution:
Crafting Desired Outcomes For EV Charging

Increase Adoption of Electric Vehicles:

Risks:
- Resistance from traditional automotive manufacturers or regulatory hurdles that hinder the integration of new charging infrastructure.

Mitigation Strategy:
- Engage in strategic partnerships with key stakeholders, including government agencies, automotive manufacturers, and energy providers, to address regulatory challenges and advocate for policies that support electric vehicle adoption. Additionally, conduct targeted marketing campaigns to educate consumers about the benefits of electric vehicles and charging infrastructure.

Ownership:
- Project Manager, Stakeholder Engagement Lead

REFERENCES

Citations of Sources

https://www.teslarati.com/ford-sweetens-tesla-supercharger-deal-3000-new-locations-blueoval-network/#:~:text=In%20May%2C%20Ford%20became%20the,locations%20beginning%20in%20Spring%202024.

https://media.ford.com/content/fordmedia/fna/us/en/news/2023/05/25/ford-ev-customers-to-gain-access-to-12-000-tesla-superchargers--.html

https://stories.rivian.com/supercharger-network-access

https://media.polestar.com/global/en/media/pressreleases/669136/polestar-will-adopt-north-american-charging-standard-to-enable-access-to-tesla-supercharger-network

Citations of Sources

https://chat.openai.com

https://www.youtube.com/watch?v=ORKuZxrFr6A

https://www.youtube.com/watch?v=3osbw6Pd9Mw

https://www.youtube.com/watch?v=OuQ0TPC2Wv0