Design Thinking Project Workbook

Design solutions around your customers, not customers around your solutions

12. Team

Team Name: City Guide Trio

Team Logo (if any): -

Team Members:

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**2. Problem/Opportunity Domain**

**Domain of Interest:**  
Our project focuses on leveraging machine learning to enhance travel experiences in smart cities by providing real-time, location-based recommendations.

**Description of the Domain:**  
The travel and tourism sector, particularly in smart city environments, presents unique challenges and opportunities for providing tailored recommendations. The project, titled "Travel Estimator in Smart Cities using Machine Learning", aims to address the need for quick, data-driven solutions in travel estimation and local recommendations.

**Key Elements:**

* Real-Time GPS Data: Utilising live GPS feeds to pinpoint users’ locations and recommend nearby restaurants, hotels, and food places based on real-time ratings.
* Machine Learning Algorithms: Implementing decision trees or neural networks to analyse user movement and suggest optimal places within a defined radius.
* User Comfort: Enhancing convenience by dynamically updating suggestions as the user’s direction of travel changes.

**Challenges:**

* Data Accuracy: Ensuring the precision of real-time GPS tracking and maintaining up-to-date information on nearby establishments.
* Dynamic Environment: Adapting to shifting user paths and urban developments, providing real-time recommendations that match changing conditions.
* User Feedback Integration: Effectively incorporating feedback to improve the accuracy and relevance of recommendations over time.

**Opportunities:**

* Enhanced Travel Experience: Offering users timely, personalised recommendations that improve their overall travel satisfaction.
* Smart City Growth: Contributing to the development of more connected and efficient urban systems by making travel within smart cities easier.
* Continuous Model Improvement: Regularly updating the machine learning model with new data, adapting to changing user preferences and locations.

**Why did we choose this domain?**  
We are passionate about applying machine learning to real-world problems, and travel estimation is an area where we can make a tangible impact. With the rapid rise of smart cities, the ability to offer dynamic, data-driven travel recommendations can significantly enhance user experiences, making urban life smarter and more efficient.

**3. Problem/Opportunity Statement**

**Problem Statement:**  
With the rapid advancement in technology, travellers today demand quick and efficient solutions for travel planning. A major challenge is offering real-time, location-based recommendations for restaurants, hotels, and food outlets while users navigate a city. The project, *Travel Estimator in Smart Cities Using Machine Learning*, aims to create a dynamic system that provides personalised suggestions based on users' locations, movements, and preferences. This project focuses on improving user convenience, minimising the need for manual searches, and supporting smarter and more efficient urban living.

**Problem Description:**  
Travellers often struggle to find suitable places to eat or stay while navigating busy urban areas. Manually searching for options is not only time-consuming but can also lead to suboptimal choices. This project utilises machine learning to provide real-time recommendations based on the user's exact location, direction of travel, and preferences, ensuring optimal solutions for the user's needs.

**Context (When does the problem occur):**  
The problem arises when users are moving through the city and require quick, accurate recommendations for dining or lodging options. Traditional search methods are often inefficient and may not deliver the best or most relevant results in real time.

**Alternatives (What does the customer do to fix the problem):**

* **Manual Search:** Users browse the internet or ask locals for recommendations.
* **Pre-Planning:** Users pre-plan their trips, but this lacks flexibility for real-time changes.
* **Review Apps:** Users rely on apps with static reviews, which might not offer real-time updates.
* **Word of Mouth:** Users seek suggestions from friends or family, which may not always be comprehensive.

**Customers (Who has the problem most often):**

1. **Tourists:** Visitors exploring a new city who need reliable and convenient recommendations.
2. **Business Travellers:** Professionals who need quick, efficient solutions while on work trips.
3. **Locals:** Residents looking to discover new places to eat or stay.
4. **Event Planners:** Individuals managing events who need quick access to venue and accommodation options.

**Emotional Impact (How does the customer feel):**

* **Frustration:** Users feel overwhelmed with the time and effort required to find good recommendations.
* **Anxiety:** Concerns about making the wrong choice for their travel needs.
* **Satisfaction:** Relief and happiness when receiving accurate and timely suggestions.
* **Convenience:** Users appreciate the ease of receiving personalised recommendations without effort.

**Quantifiable Impact (What is the measurable impact):**

* **Time Saved:** Reduction in the time spent searching for recommendations.
* **User Satisfaction:** Improved user experience and higher satisfaction rates.
* **Increased Usage:** Higher engagement and retention in the system.
* **Economic Impact:** Potential revenue growth for businesses benefiting from increased visibility and patronage.

**Alternative Shortcomings (What are the disadvantages of the alternatives):**

1. **Manual Search:** Time-intensive and not always effective.
2. **Pre-Planning:** Lack of adaptability to real-time changes or new discoveries.
3. **Review Apps:** Often static, with outdated reviews and overwhelming options.
4. **Word of Mouth:** Limited scope and may not always be accurate or up-to-date.

**4. Addressing SDGs**

**Relevant Sustainable Development Goals (SDGs):**

* **SDG 11 (Sustainable Cities and Communities):** Improving urban living standards through smart city innovations.
* **SDG 9 (Industry, Innovation, and Infrastructure):** Promoting advancements in the travel and tourism sectors through AI and machine learning.
* **SDG 8 (Decent Work and Economic Growth):** Contributing to local economies by driving traffic to well-rated businesses.

**How does your problem/opportunity address these SDGs?**  
The project directly addresses SDG 11 by enhancing urban living through smarter, more efficient travel solutions. By leveraging AI and machine learning, the project aligns with SDG 9, promoting innovation in the travel and tourism industry. It also supports SDG 8 by helping local businesses increase visibility and attract more customers, fostering economic growth.

**5. Stakeholders**

**1. Who are the key stakeholders involved in or affected by this project?**

* **Users:** Tourists, business travellers, and locals who benefit from improved recommendations.
* **Local Businesses:** Restaurants, hotels, and food outlets that gain visibility and foot traffic.
* **City Planners:** Authorities aiming to improve urban infrastructure through smart city solutions.
* **Technology Providers:** Companies providing the necessary AI/ML infrastructure and data services.

**2. What roles do the stakeholders play in the success of the innovation?**

* **Users:** Provide valuable feedback to refine the recommendation system.
* **Local Businesses:** Collaborate with the platform by offering real-time data and promotions.
* **City Planners:** Facilitate the integration of the system into the city's smart infrastructure.
* **Technology Providers:** Develop, maintain, and improve the AI/ML models, ensuring data accuracy.

**3. What are the main interests and concerns of each stakeholder?**

* **Users:** Interested in the convenience, accuracy, and reliability of recommendations.
* **Local Businesses:** Concerned with visibility and customer acquisition through the platform.
* **City Planners:** Focused on improving the city's living standards and incorporating new technologies.
* **Technology Providers:** Prioritise innovation, data security, and service reliability.

**4. How much influence does each stakeholder have on the outcome of the project?**

* **Users:** High influence through usage patterns and feedback.
* **Local Businesses:** Moderate influence through partnerships and data sharing.
* **City Planners:** High influence due to their role in supporting urban infrastructure and integration.
* **Technology Providers:** High influence in terms of technical implementation and data management.

**5. What is the level of engagement or support expected from each stakeholder?**

* **Users:** High engagement through feedback and active usage.
* **Local Businesses:** Moderate support by providing data and promotional offers.
* **City Planners:** High support for urban integration and planning.
* **Technology Providers:** High engagement in development and system maintenance.

**6. Are there any conflicts of interest between stakeholders? If so, how can they be addressed?**

* **Potential Conflicts:** Users may prefer unbiased recommendations, while businesses may seek promotional visibility.
* **Resolution:** Ensure transparency in the recommendation algorithm and set clear, fair criteria for all recommendations.

**7. How will you communicate and collaborate with stakeholders throughout the project?**

* Regular updates via meetings and reports.
* Feedback sessions and surveys to collect user insights.
* Collaborative workshops with local businesses and city planners.
* Continuous interaction with technology providers for technical support.

**8. What potential risks do stakeholders bring to the project, and how can these be mitigated?**

* **Risks:** Concerns over data privacy, inaccurate recommendations, and resistance to adoption.
* **Mitigation:** Implement strong data security protocols, continuously improve the recommendation algorithm, and offer support and training for users and businesses.

6. Power Interest Matrix of Stakeholders

Power Interest Matrix: Provide a diagrammatic representation of Power Interest Matrix

A diagram of a business

Description automatically generated with medium confidence

* High Power, High Interest: [City Planners, Technology Providers]
* High Power, Low Interest: [Local government , Tourism Boards]
* Low Power, High Interest: [Tourists, Business Travellers]
* Low Power, Low Interest: [ Tech Enthusiasts, General Public]