**Design Thinking Project Workbook**

**Don't find customers for your product but find products for your customers**

**1. Team**

**Team Name:** NeuraVision

**Team Logo (if any):NA**

**Team Members:**

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**2. Problem/Opportunity Domain**

**Domain of Interest:** The domain of interest for this project is **Campus Security and Surveillance** within the broader field of Artificial Intelligence and Machine Learning (AIML). This system will apply AI technologies like facial recognition and real-time location mapping to enhance safety and security on educational campuses.

**Description of the Domain:** Campus security is a critical concern for educational institutions, with challenges including managing large numbers of students, monitoring unauthorized access, and ensuring the safety of individuals in real-time. Traditional security methods like ID card checks and manual surveillance are inefficient in crowded or large campus settings. AIML provides a solution by automating these processes using facial recognition, data extraction from ID cards, and integration with surveillance cameras to streamline the identification of individuals and track their locations in real-time. The key elements include:

* **Real-time monitoring** using surveillance feeds.
* **Facial recognition** to match identities quickly.
* **Data privacy and security** to ensure personal information is protected.
* **Automation of manual processes** for increased efficiency.

Opportunities in this domain include improving safety protocols, offering seamless access control, and using predictive analytics for campus management. The main challenges are balancing security with privacy, ensuring system accuracy, and managing large data sets in real-time.

**Why did you choose this domain?:** We chose this domain due to its **practical relevance** and potential to make a significant impact in improving campus safety. With growing concerns over campus security and the inefficiencies of manual monitoring, there is a clear need for an automated system that leverages AIML to identify and locate individuals in real-time. This project also aligns with our interest in **AI technologies** like facial recognition, making it both a learning opportunity and a chance to solve a real-world problem. Additionally, this domain offers long-term potential for scalability, as such systems could be expanded to other environments like workplaces or public areas.

**3. Problem/Opportunity Statement**

**Problem Statement:** The current manual security system on college campuses is inefficient in real-time identification and locating of individuals, making it difficult to enhance security and streamline access control. The inability to monitor large campus areas simultaneously poses a risk to the safety of students, staff, and visitors.

**Problem Description:** College campuses, often large and populated, require constant monitoring for security reasons. The traditional process of manually checking ID cards and monitoring surveillance cameras is slow, prone to errors, and lacks scalability. This project addresses the challenge of automating the identification and location of individuals by integrating AI-based facial recognition and real-time camera feeds to track individuals across the campus.

**Context (When does the problem occur):** The problem arises in situations where campus security needs to quickly locate or identify individuals for safety, such as during emergencies, unauthorized access, or routine monitoring of large areas. Additionally, during crowded events or daily campus activities, manual checks become inefficient and time-consuming.

**Alternatives (What does the customer do to fix the problem):** Currently, campuses rely on manual ID checks at various access points, security guards monitoring surveillance cameras, and physical patrols. Some campuses may also use basic access control systems that require card scanning but are not integrated with facial recognition or location tracking.

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

* **Campus security teams** who are responsible for monitoring and ensuring safety.
* **Students and staff** who are concerned about security on campus.
* **College administration** looking for efficient, real-time solutions to improve security and manage large numbers of individuals across the campus.

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

* **Security staff** may feel overwhelmed, under-equipped, and frustrated by the limitations of manual processes.
* **Students and faculty** might feel unsafe or anxious about potential security threats if the system fails to quickly identify suspicious individuals.
* **College administrators** could experience stress and frustration over the inability to efficiently monitor campus security.

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

* **Time wasted** in manual ID verification and camera surveillance.
* **Increased response times** to locate individuals during emergencies.
* **Higher operational costs** for employing large security teams.
* **Potential financial losses** due to theft, vandalism, or breaches in security.

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

* **Manual ID checks** are time-consuming and cannot cover all areas.
* **Camera monitoring by humans** is prone to errors and fatigue, leading to potential security lapses.
* **Physical patrols** are limited by the number of security personnel available and cannot provide 24/7 coverage of all areas.
* **Basic access control systems** without facial recognition or real-time tracking are less secure and can be circumvented.

**4. Addressing SDGs**

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

* **SDG 11: Sustainable Cities and Communities** – By improving safety and security on campuses, the project contributes to safer spaces for learning.
* **SDG 9: Industry, Innovation, and Infrastructure** – The project promotes innovation in AI-based security solutions and enhances the digital infrastructure of campus surveillance systems.

**How does your problem/opportunity address these SDGs?:**

* **SDG 11**: Enhancing campus security through an AI-based system will create safer, more sustainable environments for students and staff, aligning with the goal of making communities safer.
* **SDG 9**: The implementation of cutting-edge AI technology to automate and improve surveillance and identification on campuses fosters innovation and strengthens campus security infrastructure.

**5. Stakeholders**

Answer these below questions to understand the stakeholder related to your project

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

* **Campus security teams**: They will be using and managing the system.
* **College administration**: Overseeing the security framework and investing in technology.
* **Students and staff**: The primary individuals who will be monitored for security purposes.
* **IT and technical staff**: Responsible for the installation, maintenance, and optimization of the AI system.

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

* **Campus security teams** will provide feedback on the system’s effectiveness and suggest areas for improvement.
* **College administration** is responsible for funding, policy decisions, and ensuring compliance with privacy regulations.
* **Students and staff** will be end users who must trust the system for it to be effective.
* **IT staff** will maintain and optimize the system, ensuring it runs smoothly.

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

* **Campus security teams**: Interest in a reliable, efficient tool; concerns about false positives or system errors.
* **College administration**: Interest in improved security and operational efficiency; concerns about costs and privacy implications.
* **Students and staff**: Interest in enhanced safety; concerns about privacy, data misuse, and constant surveillance.
* **IT staff**: Interest in the technical aspects and smooth implementation; concerns about system complexity and maintenance.

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

* **College administration**: High influence as they make the final decision on implementation and funding.
* **Campus security teams**: Medium to high influence based on their operational needs and feedback.
* **IT staff**: High influence in ensuring the system functions properly.
* **Students and staff**: Medium influence as their acceptance is crucial for the system’s success.

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

* **College administration**: High support needed for funding and policy decisions.
* **Campus security teams**: High engagement for day-to-day use and optimization.
* **Students and staff**: Moderate engagement as users who must be informed about the system.
* **IT staff**: High engagement for technical support and maintenance.

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

* **Privacy vs. Security**: Students and staff may feel their privacy is being infringed upon, while the administration and security teams prioritize safety. This can be addressed by ensuring transparency, implementing strong privacy controls, and adhering to privacy regulations.
* **Cost vs. Technology**: The administration may have concerns about the cost, while IT and security teams may push for advanced technology. Budget management and phased implementation could mitigate this conflict.

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

* **Regular meetings** with the administration for updates and approvals.
* **Training sessions** for campus security teams on using the system.
* **Surveys and feedback sessions** with students and staff to address privacy concerns.
* **Technical updates** and support from IT staff through a dedicated communication channel.

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

* **Resistance from students/staff** due to privacy concerns: Mitigated by educating them on the security benefits and privacy protections in place.
* **Technical failures or system inaccuracies**: Regular system checks and updates by IT staff can reduce this risk.
* **Budget constraints** from the administration: Proposing a cost-benefit analysis to justify the investment and offering a phased approach to implementation may help.

**6. Power Interest Matrix of Stakeholders**

**Power Interest Matrix:**

* High Power, High Interest: College Administration, IT and Technical Staff
* High Power, Low Interest: Regulatory Bodies (Privacy & Security Compliance) , External Partners (e.g., Vendors or System Providers)
* Low Power, High Interest: Students and Faculty, Security Personnel
* Low Power, Low Interest: General Campus Visitors

**7.Empathetic Interviews**

**Conduct Skilled interview with at least 30 citizens/Users by asking open ended questions (What, why/How etc) and list the insights as per the format below**

|  |  |  |
| --- | --- | --- |
| **I need to know**  **(thoughts, feelings, actions)** | **Questions I will ask**  **(open questions)** | **Insights I hope to gain** |
| Thoughts | What do you think about the current security system on campus? | Understand users' general perceptions, whether they believe the current system is effective, and how they view the use of advanced technology like AI. |
| How do you feel about integrating AI and facial recognition technology into campus security? |
| Feelings | How safe do you feel on campus, especially during peak hours or crowded events? | Gain insight into how secure students and staff feel currently and understand any emotional concerns related to privacy, safety, and technology. |
| Do you have any concerns about your privacy if we implement this system? |
| actions | What actions do you usually take if you feel unsafe on campus? | Learn about users' current behavior when faced with security issues and understand their daily interactions with the ID system, identifying areas for improvement in the new system. |
| How often do you use your ID card on campus, and in which locations do you find it most inconvenient to show your ID? |

**SKILLED INTERVIEW REPORT**

|  |  |  |
| --- | --- | --- |
| **User/Interviewee** | **Questions Asked** | **Insights gained (NOT THEIR ANSWERS)** |
|  | How important is improving campus security to you? | It's very important. We want students and staff to feel safe, and we’re always looking for new ways to improve security |
| Srinivasan P., Parent | What is the biggest technical challenge you see in using facial recognition? | Making sure the system works smoothly with our current cameras and networks without causing delays or issues. |
|  | How do you think facial recognition would help your work? | It would help us identify people faster and focus more on urgent tasks rather than manual ID checks. |
|  | Do you have any concerns about using AI for facial recognition on campus? | Yes, mainly about privacy and how our personal data will be used and stored. |
|  | What do we need to consider to protect people’s privacy with this system? | You need to make sure the data is secure and that people know how it’s being used. Also, limit access to the data to only those who need it |

**Key Insights Gained:**

* **College Administration:**

Administrators prioritize improving campus security and are open to facial recognition technology, but they emphasize the importance of privacy compliance and clear communication with the campus community.

* **IT and Technical Staff:**

Integration with current systems and ensuring real-time data processing without delays are key concerns. Data security will also need to be a top priority during implementation.

* **Campus Security Teams:**

Security personnel believe facial recognition will improve efficiency by automating ID checks but are cautious about false positives and system errors, which may require additional training.

* **Students and Faculty:**

Privacy is the main concern for students and faculty, particularly regarding how personal data is stored and used. Misidentification and potential misuse of data evoke discomfort.

* **Privacy and Compliance Regulators:**

Ensuring compliance with privacy laws, including data protection and user consent, is essential. Clear guidelines on data usage, storage, and access must be in place and communicated to users.