

Project-Title: Advanced AI-Based Solution for Facial Recognition, License Plate Recognition, and QR Code Decoding

Project background Information

- **The project's domain**
 - a. **Security & Surveillance:** FR is widely used in security for person authentication and video surveillance.
 - b. **Access Control:** Access control systems use FR to permit or deny entry to restricted areas based on individual identification.
 - c. **HR Management:** Businesses use FR for time management, employee attendance monitoring, and workforce management.
- **External Factors Impacting Project Business Strategy (PESTLE Analysis)**
 - a. **Political Factors:**
 - **Regulation and Legislation:** Changes in government regulations regarding data privacy, surveillance can significantly impact the project.
 - b. **Economic Factors:**
 - **Cost of Technology:** The cost of hardware, software, and infrastructure can impact project feasibility and pricing.
 - c. **Socio-cultural Factors:**
 - **Public Perception:** Public sentiment regarding privacy and surveillance can affect acceptance and adoption of facial recognition and ANPR technology.
 - d. **Technological Factors:**
 - **Technological Advancements:** Rapid advancements in facial recognition and ANPR technology can lead to obsolescence or require continuous updates.
 - **Cybersecurity:** Threats to data security and potential breaches are critical considerations in project design and strategy.
 - e. **Legal Factors:**
 - **Data Privacy Laws:** Compliance with data protection regulations (e.g., GDPR (General Data Protection Regulation)) is crucial and can impact data handling and storage.
 - **Intellectual Property:** Legal issues related to patents and intellectual property rights may arise in the development and deployment of technology.
 - f. **Ethical Factors:**
 - **Ethical Use:** Ethical considerations surrounding the responsible use of facial recognition, ANPR, and data handling can impact public perception and influence business strategy.
 - **Bias and Fairness:** Concerns about algorithmic bias and fairness in AI systems may necessitate ethical adjustments.

Project Stakeholders

Owners	<ul style="list-style-type: none">• JESA Digital Transformation Department
Managers	<ul style="list-style-type: none">• Mr. Benzakour Anouar (Data Hub & Automation Manager)
Employees	<ul style="list-style-type: none">• Mr. Saouadogo Salifou (Associate Data System Engineer)
Partners	<ul style="list-style-type: none">• Mr. Benaou Mouad (Senior Digital & Data Analyst)• Ms. Tajir Oumayma (Associate Data System Engineer)• Mr. Mangad Mohammed (Associate Data System Engineer)
Customers	<ul style="list-style-type: none">• HSE Manager• HR Manager
End Users	<ul style="list-style-type: none">• Employees and safety officers

Project Business Objectives (SWOT Analysis)

Main Objective:

The main objective of this project is to use facial recognition (FR), automatic number plate recognition (ANPR) and QR code technology to enhance security, improve operational efficiency and provide an improved user experience. By capitalizing on our technical expertise and technological advancements, we aim to create advanced security solutions that meet growing market demand while ensuring compliance with applicable regulations. This project leverages our internal strengths in technology and expertise, as well as market opportunities to provide significant added value to our customers and end users, while strengthening our position in the intelligent security industry.

Strengths (S)

Accuracy: Facial recognition and ANPR technologies can provide high accuracy in identifying individuals and license plates, enhancing security and efficiency.

Efficiency: These technologies can automate tasks like access control, traffic management, and parking, leading to time and cost savings.

Security Enhancement: Improved security through real-time monitoring and identification of potential threats.

Data Analytics: The project can leverage data analytics for valuable insights into user behavior and traffic patterns.

Market Demand: Growing demand for security and surveillance solutions in industrial sector.

Weaknesses (W)

Privacy Concerns: Public concerns about privacy and data security may limit the widespread adoption of facial recognition and ANPR.

Technology Complexity: Developing and implementing these technologies can be complex and require significant technical expertise.

Legal and Regulatory Challenges: Adherence to evolving data privacy and surveillance laws can be challenging and costly.

Costs: Initial setup and maintenance costs can be high.

Ethical Considerations: Ethical issues, such as bias and misuse, can pose reputational risks.

Opportunities (O)

Market Expansion: Opportunities to expand into various industries, including security, transportation, healthcare.

Technological Advancements: Leveraging advancements in AI and machine learning for improved accuracy and functionality.

Customization: Tailoring solutions to meet specific industry and client needs.

Global Growth: Potential for international market expansion as security concerns continue to rise worldwide.

Data Monetization: Utilizing collected data for additional revenue streams through analytics and insights.

Threats (T)

Regulatory Changes: Evolving and stricter regulations regarding data privacy and surveillance may limit the use of these technologies.

Competitive Landscape: Competition from established players and emerging startups in the facial recognition and ANPR market.

Security Risks: Vulnerabilities to cyberattacks and misuse of collected data can damage trust in the technology.

Public Resistance: Public resistance to facial recognition and ANPR due to privacy and civil liberties concerns.

Negative Public Perception: Negative media coverage and public opinion could lead to a backlash against the project.

Project Scope

Development Elements Concerned:

FR algorithm development: Design and development of a robust and accurate facial recognition algorithm capable of detecting and identifying faces in images and videos.

Development of the ANPR algorithm: Design and development of a license plate recognition algorithm allowing the detection and accurate reading of plates in images and videos.

Development of the QR Code algorithm: Design and development of a QR Code data extraction algorithm allowing the detection and accurate reading of QR Code in images and videos.

Software integration: Integration of FR, ANPR, QR Code algorithms into a complete software solution, providing a user-friendly interface for use and management.

Testing and Validation: Conducting comprehensive testing to ensure the accuracy and reliability of algorithms, as well as their successful integration.

Out of Scope Development Elements:

Sensor Hardware: The purchase and installation of sensor hardware, such as cameras and image acquisition devices, is not included in the scope of the project and is the responsibility of the client.

On-site deployment: The physical deployment of on-premises systems, including cabling, hardware configuration, and installation, is the responsibility of the customer or a third party.

User Training: Training of end-users for the use of the system is not included in the scope of the project, although user guides may be provided.

Integrations covered:

Database integration: The integration of a database for the secure storage of biometric data and recognition results is included in the project.

Integration with Alarm Systems: Integration with alarm systems for incident detection is planned.

Out-of-Reach Integrations:

Integration with Specific Cameras: Integration with specific cameras, outside of standard specifications, is not included in the scope and will be dealt with on a case-by-case basis.

Project Requirements

Use case department:

- The use case is destined for HSE department.

Functional requirements:

- **Facial detection & Recognition:**
 1. Ability to detect faces in images and videos.
 2. Accurate identification of facial features such as eyes, nose, and mouth.
 3. Ability to distinguish between different faces.
 4. Ability to identify individuals based on their facial features.
 5. High accuracy in identifying people, even in low light or blur conditions.
- **License Plate Recognition & QR Code :**
 1. Ability to accurately detect and read vehicle license plates & QR Code.
 2. Reconnaissance in various conditions, including at night and in bad weather.
- **Integration with External Systems:**
 1. Integration with existing security systems, such as alarm or access control systems.
 2. Integration with databases for searching.
- **Security and Data Protection:**
 1. Security of biometric data collected and stored.
 2. Compliance with data protection and privacy regulations.

Non-functional requirements:

- **Performance:**
 1. Fast response time for facial detection and recognition/ANPR.
 2. Ability to handle a large volume of data and concurrent queries.
- **Security:**
 1. Protection against cyber-attacks and security threats.
 2. Reliability in face and license plate detection.
- **Ease of use:**
 1. User-friendly interface for operators and administrators.
 2. Possibility of customization of parameters and rules.
- **Compatibility:**
 1. Compatibility with a range of hardware, cameras, and operating systems.
- **Extensibility:**
 1. Ability to add new features or expand the system to meet future needs.
- **Scalability:**
 1. Ability to scale to support potential growth in users and applications.
- **Maintenance and Support:**
 1. Availability of software updates, security patches, and ongoing technical support.
- **Costs:**
 1. Respect of the budget allocated for the project, including development, installation, and operating costs.

Business Analysis

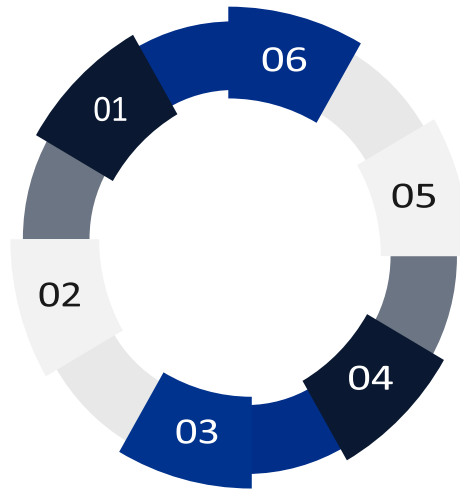
CATWOE Analysis: Project's Ecosystem Identification

Customers:

- **Internal:** HSE Managers, HR Managers, and project teams.
- **External:** Contractors, auditors for security

Actors:

- Benaou Mouad – Senior Digital & Data Analyst
- Saouadogo Salifou – Associate Data System Engineer/Specialist



Environmental constraints:

- Data privacy & availability
- Resources acquisition delays
- Understanding of security practices

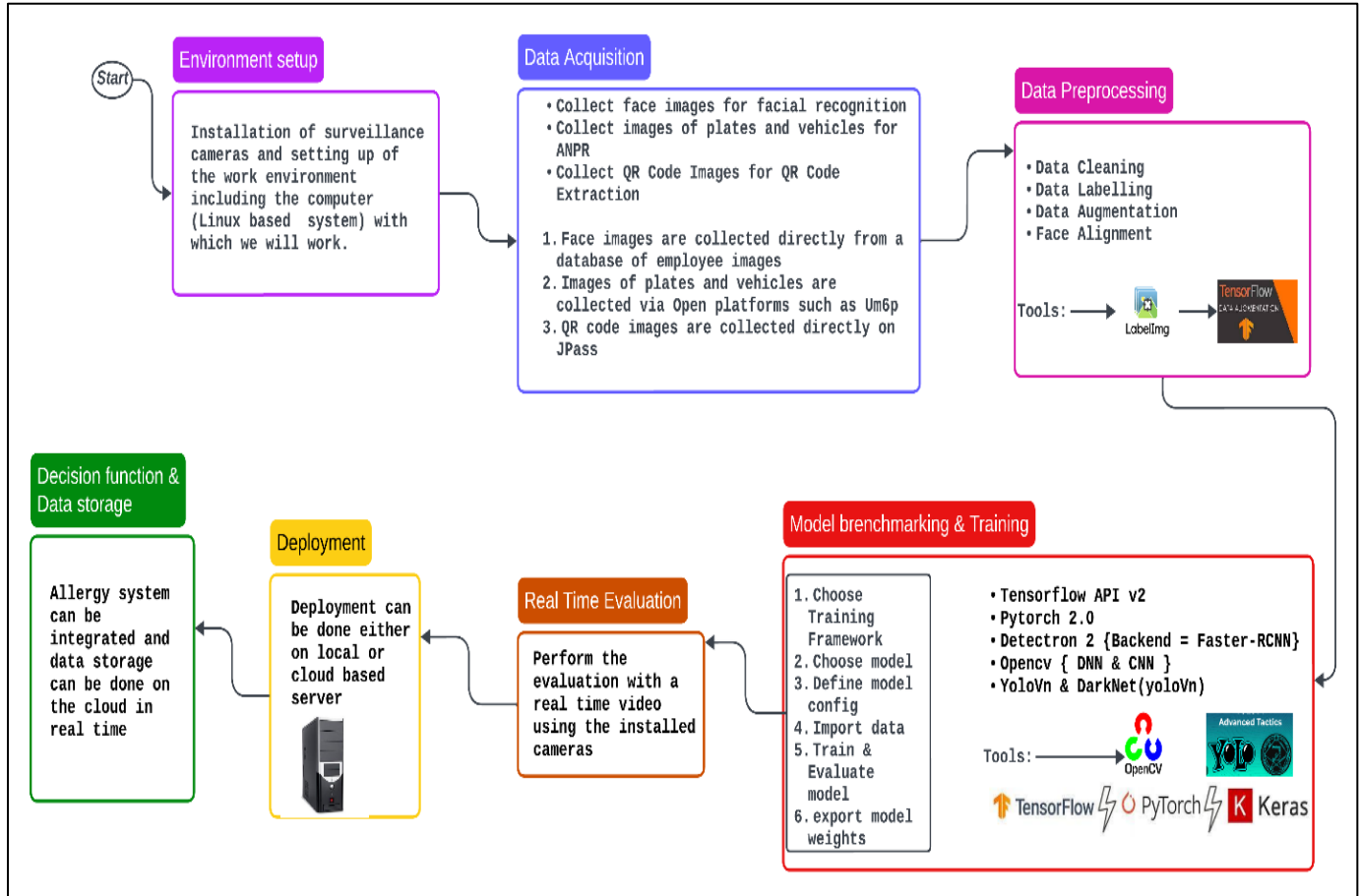
Owners:

- **Project delivery department:** Benkiran Ridouane (head of Digital Transformation), Benzakour Anouar (Data Hub & Automation Manager)
- **Assurance Department:** HSE Director, HR Director

Transformation process:

- **Security & access control analysis:** images data from installation cameras
- **Reporting and decision making:** make decision based on AI real time analysis

Project Implementation RoadMap



Project Value Added Evaluation

Detection and monitoring of employees authorized to access sensitive areas of the site. This can help prevent unauthorized access to confidential data or equipment, as well as prevent employees from stealing or misusing their personal belongings.

- ✓ For example, the facial recognition system could be used to monitor the entry and exit points of the manufacturing or construction plant. When an employee enters the establishment, the system can scan their face and compare them to a database of authorized employees. If the system detects that the employee is not in the database, it can automatically trigger an alarm and alert the security team to investigate the situation. **This can help prevent unauthorized access to the facility and protect the company's reputation.**
- ✓ In addition, the AI-powered facial recognition system could also be used to monitor employees who carry confidential data or equipment. The system can identify employees and check their permissions and if a problem is identified it can automatically trigger an alarm and alert the security team to investigate the situation. **This can help prevent theft or misuse of confidential data or equipment.**
- ✓ The system can also help identify employees who do not comply with safety measures by identifying people who do not wear protective equipment, **this can help to remind some employees of their duty to comply with company safety standards.**
- ✓ The system can also be used for employee attendance, for example instead of using a paper timecard and registration system at the entrance of buildings, **facial recognition could be used to replace and automate this process.**

Automatic license plate recognition can have important added value in the company through these aspects:

- ✓ Inventory management: An ANPR system can be used to detect the license plates of goods in construction markets. **This can help track current inventory and identify products that need to be sold or replenished.**
- ✓ Transportation Management: An ANPR system can be used to detect truck license plates on construction roads. This can help keep up with ongoing work.

The QR code detection and decoding system could be used to improve decision-making with synchronization of FR and ANPR. It can also be used in other needs in the same context.