AI-Powered Compliance Monitoring for Retail Staff

Project Plan

Group 4

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DOCUMENT CHANGE CONTROL

Version	Date	Authors	Summary of Changes
1	30/5/2024	Vuong Khang Minh	Initialized the project plan
2	05/6/2024	Nguyen Dang Duc Anh	Added requirement analysis section
3	10/6/2024	Nguyen Ha Huy Hoang	Revised project scope and objectives
4	15/6/2024	Nguyen Dang Khanh Toan	Updated quality assurance procedures
5	20/6/2024	Nguyen Cuong Nhat	Enhanced AI specialist section
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8	05/7/2024	Nguyen Dang Khanh Toan	Added detailed software specifications
9	10/7/2024	Vuong Khang Minh	Conducted final quality review

DOCUMENT SIGN OFF

Name	Position	Signature	Date
Vuong Khang Minh	Document Researcher, Document Organizer, AI Specialist		10/7/2024
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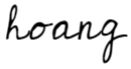
Nguyen Ha Huy Hoang	Team leader/Project Manager		10/7/2024
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CLIENT SIGN OFF

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CONTENTS

INTRODUCTION

The purpose of this document is to outline the comprehensive project plan for developing an AI system that utilizes CCTV footage to monitor staff compliance within retail settings. This document is intended for all individuals involved in the project, including the project supervisor Dr. Le Anh Ngoc, Team G4 members, and the client, Mr. Khang. It is essential for all project stakeholders to read this document to understand the project's goals, structure, and commitments, ensuring everyone is aligned and aware of their roles and responsibilities.

Intended Audience

The document should be read by:

- **Project Supervisor:** Dr. Le Anh Ngoc, to oversee the project's direction and ensure it meets academic and professional standards.
- **Team G4 Members:** All team members to understand their specific roles, tasks, and deadlines.
- **Client:** Mr. Khang, to ensure the project meets his expectations and requirements.

1.1. BACKGROUND

This project was initiated to improve compliance monitoring in retail environments through the application of advanced AI technologies, specifically in the fields of computer vision, human action recognition, and object detection. The main players in this project include the project team, led by Team G4, and the project supervisor, Dr. Le Anh Ngoc. The primary motivation behind this initiative is to leverage AI to automate the monitoring process, thereby enhancing efficiency and accuracy in ensuring staff adherence to compliance protocols. This project responds to the growing need for more sophisticated monitoring solutions in the retail sector, aiming to integrate state-of-the-art AI capabilities with existing CCTV infrastructure to deliver a robust compliance monitoring system.

1.2. KEY PROJECT PERSONNEL

The key personnel involve in this project are as follows:

1.2.1. CLIENT

Mr. Vo Thanh Khang Nguyen, an AI Researcher at PFT Quy Nhon AI, serves as the Project Mentor for this initiative. With expertise in Explainable AI and Reinforcement Learning, Mr. Khang oversees the project's direction and ensures that all compliance requirements are met. His verified experience and knowledge in the field are invaluable to guiding the project towards achieving its objectives effectively and efficiently.

1.2.2. OTHER STAKE HOLDERS (ASSUMPTION)

In addition to the project client, several other stakeholders are crucial to the success and operational deployment of the AI compliance monitoring system. Below is a list of these stakeholders, their roles, and why their involvement is pivotal to the project.

Retail Store Manager:

- Role: Ensures the AI system aligns with store operations and addresses specific compliance issues in the retail environment.

- Relevance: The manager's insights are vital to tailor the system to the store's unique needs, ensuring practical and effective implementation.

Data Protection Officer (DPO):

- Role: Ensures that the AI system complies with data protection laws and that the privacy of individuals recorded by CCTV is respected.

- Relevance: The DPO's involvement is crucial to maintain legal compliance and protect customer and staff privacy, avoiding potential legal issues.

Compliance Officer:

- Role: Monitors the effectiveness of the AI system in enforcing company policies and legal standards.

- Relevance: This role is key to validating the system's performance and ensuring it meets regulatory and policy requirements.

Technical Support Team:

- Role: Provides ongoing maintenance and troubleshooting after the system deployment to ensure operational stability.

- Relevance: Their expertise ensures the system remains functional and any technical issues are promptly resolved, ensuring minimal disruption to operations.

Each of these roles is critical for the successful implementation and operation of the AI monitoring system. Their insights and cooperation will ensure that the system is effective, compliant with laws and regulations, and integrated seamlessly with existing business operations. For now, these roles are defined in a general sense, but identifying specific individuals within these roles will be a next step for the project's advancement.

1.2.3. PROJECT SUPERVISOR, TEAM LEADER AND KEY PROJECT MEMBERS

Project Supervisor

- Dr. Le Anh Ngoc - As the project supervisor, Dr. Le Anh Ngoc oversees the project's overall direction, ensuring it meets academic standards and aligns with professional requirements. Dr. Ngoc provides guidance and support throughout the project lifecycle.

Team Leader

- Nguyen Ha Huy Hoang - Serving as the Team Leader and Project Manager, Nguyen Ha Huy Hoang is responsible for coordinating the team's efforts, managing project timelines, and ensuring that all deliverables meet the specified requirements. Hoang also acts as the primary point of contact between the team and the stakeholders.

Key Project Members

- Vuong Khang Minh - Document Researcher, Document Organizer, and AI Specialist. Vuong is responsible for gathering and organizing relevant documentation, conducting research, and contributing to the development of AI models.

- Nguyen Dang Duc Anh - Software Specialist and Requirement Analyst. Nguyen focuses on software development and ensuring that the project requirements are thoroughly analyzed and met.

- Nguyen Dang Khanh Toan - Quality Assurance Domain Expert and Software Specialist. Nguyen ensures the project's quality through rigorous testing and validation processes.

- Nguyen Cuong Nhat - AI Specialist and Requirement Analyst. Nguyen works on developing AI models and ensuring that the project's requirements are accurately captured and addressed.

2. TERMS OF REFERENCE

The primary goal of the project is to enhance the monitoring and enforcement of compliance within retail environments using AI-driven technology. The client envisions a system that can automatically analyze CCTV footage to identify and report compliance-related events, thereby reducing the need for manual monitoring and increasing overall adherence to corporate and safety standards. The intended user group includes retail managers, compliance officers, and IT support teams who will interact with the system to maintain operational standards and ensure staff follow prescribed protocols.

2.1. OBJECTIVES

1. Develop an AI model capable of detecting specific compliance metrics such as uniform wearing and safety protocol adherence.
2. Integrate the AI system with existing CCTV infrastructure to monitor compliance and reporting of compliance.
3. Ensure the AI system complies with all relevant ethical standards and privacy regulations, safeguarding user data and privacy.

2.2. SCOPE

The project will focus on the development of a software solution that leverages AI to analyze video streams from existing CCTV systems for compliance monitoring in retail environments. The scope includes:

What the Project Will Accomplish:

1. Development of AI Models: Create AI models capable of detecting specific compliance metrics, such as uniform adherence, safety protocol adherence, and other relevant compliance indicators.

2. Integration with CCTV Infrastructure: Develop and deploy the software to work seamlessly with existing CCTV systems in the retail environment.

3. User Interface and Reporting: Design and implement an intuitive user interface for retail managers, compliance officers, and IT support teams to interact with the system and access compliance reports.

4. Compliance with Privacy and Ethical Standards: Ensure that the AI system adheres to privacy laws and ethical standards regarding the use of surveillance footage.

5. Testing and Validation: Perform rigorous testing to validate the accuracy and reliability of the AI models in real-world conditions.

What the Project Will Not Cover:

1. Hardware Installation: The project will not include the installation of CCTV cameras or any related hardware setup.

2. Hardware Maintenance: Ongoing maintenance or troubleshooting of CCTV hardware will not be covered by this project.

3. Non-Compliance Related Features: Any features or functionalities not directly related to compliance monitoring will be excluded.

4. Long-Term Technical Support: The project will not provide long-term technical support beyond the initial deployment and training phase.

Timeline:

- Earliest Start Date: June 1, 2024

- Latest Finish Date: December 31, 2024

This defined scope ensures that the project team can focus on delivering a robust and effective software solution within the specified timeframe, meeting the client's requirements for compliance monitoring in retail environments.

2.3. CRITICAL SUCCESS FACTORS

Identifying critical success factors (CSFs) helps ensure the project meets its objectives effectively. These factors are essential for the successful completion of the project and are derived from the project's objectives. Here are the critical success factors for this project:

1. Accuracy of AI Models

- Measurement: The AI models should achieve a high accuracy rate (above 90%) in detecting compliance metrics such as uniform wearing and safety protocol adherence.

- Importance: Accurate detection is crucial to ensure the system reliably identifies non-compliance events, thereby fulfilling its primary purpose.

2. Integration with Existing CCTV Infrastructure

- Measurement: Seamless integration without disrupting the existing CCTV system's operations.

- Importance: Ensures that the software can utilize current hardware efficiently, minimizing additional costs and deployment time.

3. Compliance with Privacy and Ethical Standards

- Measurement: Adherence to relevant data protection laws and internal privacy policies.

- Importance: Protects the privacy of individuals and maintains the ethical standards of surveillance, which is vital for legal and social acceptance.

4. User-Friendly Interface

- Measurement: User satisfaction scores from retail managers, compliance officers, and IT support teams during usability testing should be high (above 80%).

- Importance: A user-friendly interface ensures that stakeholders can easily interact with the system, access reports, and take necessary actions based on the analysis.

5. Reliability and Performance

- Measurement: System uptime and performance metrics, ensuring the software runs smoothly with minimal downtime.

- Importance: Reliable performance is essential for continuous compliance monitoring and timely reporting of non-compliance events.

6. Effective Training and Support

- Measurement: Positive feedback from initial training sessions and support queries resolution time.

- Importance: Ensures that the end-users are well-equipped to use the system effectively and any issues are resolved quickly, contributing to overall satisfaction and system adoption.

Each of these critical success factors is vital for the project's success. If any of these factors are absent or not adequately addressed, it could lead to the project's failure, resulting in unmet objectives, dissatisfaction among stakeholders, and potential legal or operational issues.

2.4. ACCEPTANCE CRITERIA

The acceptance criteria outline the conditions under which the client will consider the project deliverables to be satisfactory. These criteria are derived from the project's scope and critical success factors and will guide the acceptance testing process.

Acceptance Criteria:

1. Accuracy of AI Models:

- Criteria: The AI models must demonstrate at least 95% accuracy in detecting compliance metrics such as uniform adherence and safety protocol compliance in real-world conditions.

- Testing Method: Conduct a series of validation tests using recorded CCTV footage to measure the detection accuracy and compare the results against ground truth annotations.

2. Seamless Integration with Existing Systems:

- Criteria: The software must integrate smoothly with at least 90% of the client's existing CCTV infrastructure without requiring significant modifications.

- Testing Method: Perform integration tests in a controlled environment using a sample of the client's CCTV systems to ensure compatibility and functionality.

3. User-Friendly Interface:

- Criteria: The system interface must be intuitive and easy to use, achieving at least an 85% user satisfaction score in usability tests.

- Testing Method: Conduct usability testing sessions with a representative group of end-users, including retail managers, compliance officers, and IT support teams. Collect feedback through surveys and direct observations.

4. Compliance with Privacy and Ethical Standards:

- Criteria: The system must comply fully with GDPR and other relevant privacy regulations, ensuring the ethical use of surveillance footage.

- Testing Method: Review the system against a compliance checklist and conduct a privacy impact assessment to verify adherence to legal and ethical standards.

5. Timely Delivery:

- Criteria: The project must be completed within the agreed timeline, with no more than a 10% delay in any project phase.

- Testing Method: Review the project timeline and progress reports to ensure all milestones and deliverables are met within the specified timeframe.

6. Effective Training and Support:

- Criteria: Comprehensive training must be provided to ensure users can operate the system efficiently, with at least 90% positive feedback from participants.

- Testing Method: Conduct training sessions and collect feedback through surveys and interviews to assess the effectiveness of the training program.

Acceptance Testing Process:

1. Preparation: Define detailed test cases based on the acceptance criteria and prepare the necessary testing environment, including sample CCTV footage and user groups.

2. Execution: Conduct the tests as per the defined methods, involving all relevant stakeholders and documenting the results.

3. Review: Analyze the test results and compare them against the acceptance criteria. Identify any discrepancies or areas requiring improvement.

4. Feedback: Present the findings to the client for review and gather their feedback.

5. Approval: Obtain formal sign-off from the client, indicating their acceptance of the project deliverables based on the satisfactory fulfillment of the acceptance criteria.

By adhering to these acceptance criteria and conducting thorough acceptance testing, the project team can ensure that the final deliverables meet the client's expectations and requirements.

3. ESTABLISHMENT

3.1. PROCESSES, PROCEDURES AND STANDARDS

This section outlines the methodology, processes, and standards that will be adopted throughout the project to ensure effective development, collaboration, and quality assurance.

Software Development Methodology:

Agile Methodology:

- Reason for Selection: The Agile methodology has been chosen for this project due to its iterative and flexible nature, which allows for continuous feedback and improvements (ProjectManager 2024). This approach is well-suited for complex projects like AI-based compliance monitoring systems, where requirements may evolve based on client feedback and testing outcomes.

- Key Features:

+ Iterative Development: The project will be divided into multiple sprints, each delivering a functional increment of the software.

+ Continuous Feedback: Regular meetings with stakeholders to gather feedback and adjust the development process accordingly.

+ Flexibility: Ability to adapt to changes in requirements or priorities throughout the project lifecycle.

Processes to be Adopted:

Versioning System:

- Tool: Git

- Description: Git will be used for version control to manage changes in the project codebase. It allows for tracking revisions, collaborating with team members, and maintaining a history of changes.

- Practices:

+ Branching and Merging: Use feature branches for new functionalities and merge them into the main branch after review.

+ Commit Messages: Follow a standard format for commit messages to ensure clarity and traceability.

User-Centered Design Process:

- Description: A user-centered design process will be employed to ensure that the software meets the needs and expectations of its end-users.

- Stages:

+ User Research: Conduct interviews and surveys with retail managers, compliance officers, and IT support teams to understand their requirements and pain points.

+ Prototyping: Develop wireframes and prototypes based on user research findings.

+ Usability Testing: Conduct usability tests with representative users to gather feedback and iterate on the design.

Program Coding Standards:

Coding Standards:

- Language: Python (for AI model development), JavaScript/TypeScript (for frontend development)

- Standards:

- Python:

- Follow PEP 8 guidelines for writing clean and readable code.

- Use type hints and docstrings for better code documentation and readability.

- Implement unit tests using frameworks pytest.

- JavaScript/TypeScript:

- Follow Airbnb JavaScript Style Guide for consistent code formatting.

- Use TypeScript for type safety and better maintainability.

Documentation Standards:

- Description: Comprehensive documentation will be maintained throughout the project to ensure clarity and facilitate future maintenance.

- Practices:

- Inline Comments: Use inline comments to explain complex code logic.

- API Documentation: Document all APIs using tools Postman.

- User Manuals: Create user manuals and guides for end-users to facilitate easy adoption and usage of the system.

By adhering to these processes, procedures, and standards, the project team aims to ensure high-quality deliverables, effective collaboration, and successful project outcomes.

3.2. PROJECT ENVIRONMENT

The successful development and deployment of the AI compliance monitoring system require distinct environments tailored for software development and software deployment. Each environment includes specific workplaces, hardware, software resources, and essential tools.

3.2.1. Software Development Environment

1. Workplaces

- Office Setup: The development team will work at Swinburne Vietnam.

- Remote Workstations: Home setups for remote team members with access to necessary tools and resources.

2. Computers

- GG Colab: Used for training purposes.

3. User Accounts

- Version Control: GitHub accounts for managing code versions.

- Collaboration Tools: Jira for project management.

- Communication: Discord for team communication.

4. Server Accounts

- Development Server: Access to FPT Cloud Server for hosting development environment, version control systems, and testing instances.

5. DBMS (Database Management System)

- Development Database: FPT Database (PostgreSQL) for storing and manipulating sample data for testing.

6. Software Development Tools

- IDE: Visual Studio Code, primarily for JavaScript/TypeScript development.

- Version Control System: Git repositories hosted on GitHub.

- AI Development Tools: Frameworks like TensorFlow, PyTorch, and OpenCV for AI model development.

3.2.2. Software Deployment Environment

Workplaces

- Deployment Site: Physical location where the final system will be deployed, typically at the client's retail stores.

Computers

- Deployment Machines: Computers with configurations similar to the deployment environment to ensure compatibility and performance during testing phases.

User Accounts

- Deployment Accounts: Accounts for accessing the production environment, with strict access controls to ensure security and data integrity.

Server Accounts

- Deployment Server: Accounts for accessing the production server where the final system will be deployed, typically hosted on FPT Cloud or an equivalent service.

DBMS (Database Management System)

- Production Database: Accounts and access to the production database, ensuring secure access and data protection measures are in place.

Stationery

- Training Materials: Manuals, guides, and printed materials for training sessions with end-users.

Testing Tools

- End-to-End Testing: Manual tests and Cypress for end-to-end testing of the deployed web application to ensure all functionalities work as expected in the production environment.

By ensuring these components are in place for both the software development and software deployment environments, the project team can create an effective and efficient setup for developing and deploying the AI compliance monitoring system.

3.3. PROJECT TEAM SKILL DEVELOPMENT REQUIREMENTS

To ensure the success of the AI compliance monitoring system project, it is essential to identify and address any skill gaps within the project team. The following training programs are recommended to equip team members with the necessary knowledge and skills:

AI and Machine Learning

- Deep Learning Frameworks: Training on frameworks such as TensorFlow and PyTorch for developing and deploying AI models.

- Computer Vision: Specialized courses on computer vision techniques and applications, focusing on retail compliance monitoring.

- Model Training and Optimization: Workshops on training AI models, including techniques for optimizing performance and accuracy.

Software Development and Engineering

- Agile Methodology: Training sessions on Agile practices to ensure effective project management and iterative development.

- Version Control Systems: Courses on using Git for version control, including advanced topics like branching strategies and conflict resolution.

- Code Quality and Testing: Workshops on writing clean code, unit testing with Pytest, and integration testing with Postman.

Database Management

- Database Design and Management: Training on designing, implementing, and managing databases using PostgreSQL.

- Data Security and Privacy: Courses on ensuring data protection, focusing on compliance with relevant regulations and best practices.

Web Development

- Front-End Development: Training on modern front-end technologies, including HTML, CSS, JavaScript, and frameworks like React or Angular.

- Back-End Development: Courses on server-side development using Node.js, Python (Django/Flask), or other relevant technologies.

- API Development and Testing: Workshops on developing RESTful APIs and testing them using tools Postman.

Software Testing

- Automated Testing: Training on using Selenium for functional testing and Cypress for end-to-end testing of web applications.

- Performance Testing: Courses on using Gatling for load and performance testing of web applications.

Security and Compliance

- Security Best Practices: Workshops on implementing security best practices in software development and deployment.

- Compliance Standards: Training on relevant compliance standards and regulations, particularly those related to data privacy in the retail sector.

User Experience (UX) and User Interface (UI) Design

- UX/UI Design Principles: Training on the principles of user-centered design, focusing on creating intuitive and effective user interfaces.

- Design Tools: Courses on using design tools such as Adobe XD, Figma, and other relevant software.

Project Management and Collaboration

- Project Management Tools: Training on using project management tools like Jira to facilitate effective team collaboration and project tracking.

- Communication Skills: Workshops on enhancing communication skills, both within the team and with external stakeholders.

By providing these training programs, the project team will be well-equipped with the necessary skills and knowledge to successfully develop and deploy the AI compliance monitoring system.

4. DELIVERABLES, ACTIVITIES AND CAPITAL RESOURCES

4.1. DELIVERABLES

The project deliverables are categorized based on the recipients: the client and the project supervisor. Each deliverable is designed to ensure the successful development, implementation, and assessment of the AI compliance monitoring system project.

Client Deliverables

These deliverables are intended to provide the client with a functional, deployable system along with necessary documentation and support materials.

1. AI Compliance Monitoring Software

- A fully functional AI system capable of detecting and reporting compliance issues in the retail environment.
- Includes modules for human detection, action recognition, and compliance rule checking.

2. User Manuals

- Detailed documentation guiding end-users on how to operate the AI system.
- Instructions on system setup, configuration, and troubleshooting.

3. Technical Documentation

- Comprehensive technical documentation detailing system architecture, data flow, and integration points.
- Includes API documentation, database schema, and system design diagrams.

4. Training Materials

- Manuals, guides, and video tutorials for training staff on system usage and maintenance.
- Conduct on-site or virtual training sessions for key stakeholders.

5. Deployment Guide

- Step-by-step instructions for deploying the AI system in the client's retail environment.
- Includes hardware and software requirements, installation procedures, and configuration settings.

6. System Performance Report

- A detailed report on system performance based on field testing.

- Includes metrics on detection accuracy, processing speed, and compliance reporting effectiveness.

Project Supervisor Deliverables

These deliverables are intended to provide the project supervisor with comprehensive insights into the project process, progress, and outcomes for assessment purposes.

1. Project Plan and SQAP (Software Quality Assurance Plan)

- Detailed project plan including timelines, milestones, and resource allocation.

- Software Quality Assurance Plan outlining the quality standards and procedures to be followed.

2. System Requirements Specification (SRS)

- Document specifying the functional and non-functional requirements of the AI compliance monitoring system.

- Includes detailed descriptions of system features, user interactions, and performance criteria.

3. System Architecture Design and Research Report

- Documentation of the system's architecture design, including component diagrams and data flow models.

- Research report on state-of-the-art techniques in human action recognition, object detection, and compliance monitoring.

4. Detailed System Design and Implementation Report

- In-depth report on system design, including module specifications, interface descriptions, and data processing workflows.

- Detailed account of the implementation process, highlighting key development challenges and solutions.

5. Meeting Minutes

- Records of all project meetings, documenting decisions, action items, and progress updates.

- Includes minutes from meetings with the client, project team, and supervisor.

6. Version-Controlled Repository

- Access to the project's version-controlled repository, showcasing code commits, branches, and version history.

- Demonstrates the use of best practices in code management and collaboration.

7. Final Presentation

- A comprehensive presentation summarizing the project's objectives, methodologies, outcomes, and future work.

- Includes a demonstration of the AI system, performance metrics, and user feedback.

8. Individual Task Contribution Records

- Detailed records of each team member's contributions, including work logs, peer reviews, and contribution statements.

- Used to assess individual participation and contribution to the project.

By delivering these items, the project team ensures both the client and the project supervisor are provided with the necessary resources and insights to evaluate the success and functionality of the AI compliance monitoring system.

4.2. ACTIVITIES

Phase 1: Planning and Requirements Gathering

Activity 1.1: Project Planning

- Task 1.1.1: Define project scope and objectives.

- Task 1.1.2: Develop a detailed project plan, including timelines, milestones, and resource allocation.

- Task 1.1.3: Create the Software Quality Assurance Plan (SQAP).

Activity 1.2: Requirements Gathering

- Task 1.2.1: Conduct stakeholder interviews to gather requirements.

- Task 1.2.2: Document functional and non-functional requirements.

- Task 1.2.3: Review and validate requirements with stakeholders.

Phase 2: System Design

Activity 2.1: System Architecture Design

- Task 2.1.1: Design system architecture, including component and data flow diagrams.
- Task 2.1.2: Document the system architecture design.
- Task 2.1.3: Review and validate the architecture design with the project team and stakeholders.

Activity 2.2: Detailed System Design

- Task 2.2.1: Develop detailed design specifications for each system component.
- Task 2.2.2: Create interface designs and data processing workflows.
- Task 2.2.3: Document the detailed system design.
- Task 2.2.4: Review and validate the detailed design with the project team and stakeholders.

Phase 3: Implementation

Activity 3.1: System Development

- Task 3.1.1: Set up development environment and tools.
- Task 3.1.2: Develop system modules based on design specifications.
- Task 3.1.3: Integrate modules and perform initial testing.
- Task 3.1.4: Conduct code reviews and quality assurance checks.

Activity 3.2: Testing and Validation

- Task 3.2.1: Develop test plans and test cases.
- Task 3.2.2: Perform unit testing using Pytest.
- Task 3.2.3: Conduct integration testing with Postman.
- Task 3.2.4: Execute functional testing with Selenium.
- Task 3.2.5: Perform end-to-end testing with Cypress.
- Task 3.2.6: Conduct performance testing using Gatling.

Phase 4: Deployment

Activity 4.1: Preparation for Deployment

- Task 4.1.1: Prepare deployment guide and related documentation.
- Task 4.1.2: Set up production environment on FPT Cloud Server.
- Task 4.1.3: Configure database on FPT Database for PostgreSQL.

Activity 4.2: System Deployment

- Task 4.2.1: Deploy system components to production environment.
- Task 4.2.2: Perform system configuration and initial setup.
- Task 4.2.3: Conduct final system validation and acceptance testing.

Phase 5: Training and Support

Activity 5.1: User Training

- Task 5.1.1: Develop training materials, including manuals and video tutorials.
- Task 5.1.2: Conduct on-site or virtual training sessions for end-users.
- Task 5.1.3: Provide ongoing support during the initial usage period.

Activity 5.2: Maintenance and Updates

- Task 5.2.1: Monitor system performance and user feedback.
- Task 5.2.2: Implement necessary updates and bug fixes.
- Task 5.2.3: Conduct periodic system reviews and optimizations.

By executing these activities and tasks, the project team will be able to systematically produce the deliverables and ensure the successful development and deployment of the AI compliance monitoring system.

4.3. RESOURCES

The successful completion of the AI compliance monitoring system project requires various resources, which can be provided by the client, the university, or sourced by the project team. These resources include equipment, software, infrastructure, and personnel.

Equipment

1. Server Infrastructure

- Access to FPT Cloud Server for hosting development and production environments.

- Specifications: Sufficient processing power, memory, and storage to handle AI model deployments and data processing.

2. Network Equipment

- Reliable internet connectivity and networking equipment to ensure seamless collaboration and access to cloud resources.

- Includes routers, switches, and network cables.

Software

1. Integrated Development Environment (IDE)

- Software tools for coding and development, such as PyCharm for Python and Visual Studio Code for JavaScript/TypeScript.

2. Version Control System

- Git and GitHub platform for managing code versions and collaboration.

3. AI Development Frameworks

- TensorFlow and PyTorch for developing and deploying AI models.

- OpenCV for computer vision tasks.

4. Testing Tools

- Pytest for unit testing.

- Postman for API testing.
- Selenium for functional testing.
- Cypress for end-to-end testing.
- Gatling for performance testing.

5. Database Management System (DBMS)

- FPT Database for PostgreSQL for managing project data during development and deployment.

6. Design and Documentation Tools

- Adobe XD and Figma for UI/UX design.
- Microsoft Office Suite and Confluence for project documentation.
- Postman for API documentation.

Infrastructure

1. Development Environment

- Dedicated office space equipped with necessary infrastructure for the development team, including desks, chairs, and meeting rooms.
- Remote work infrastructure to support team members working from home.

2. Collaboration Tools

- Using Jira for project management and team communication.
- Video conferencing using Microsoft Teams for remote meetings and collaboration.

5. ORGANISATION AND STRUCTURE

The development and deployment of the AI compliance monitoring system project involves multiple groups and individuals. This section outlines all the roles involved, their interactions, and the organizational structure used during the project.

Roles and Groups Involved

1. Project Team

- Project Manager (Leader: Nguyen Ha Huy Hogna): Oversees project execution, manages timelines, and ensures deliverables are met.

- AI Developers: Responsible for developing and training AI models.

- Software Developers: Develop system modules, integrate components, and handle backend and frontend development.

- Testers: Conduct various testing activities including unit, integration, functional, end-to-end, and performance testing.

- UI/UX Designers: Design user interfaces and ensure a positive user experience.

- Technical Writers: Prepare user manuals, technical documentation, and training materials.

2. Client Stakeholder (KhangNVT1)

- Responsibilities: Act as the primary liaison between the project team and the larger company or community, providing valuable insights, ideas, and feedback throughout the project lifecycle. They ensure that project deliverables meet the specific needs and expectations of stakeholders.

- Deliverables: Collaborate closely with the project manager to provide comprehensive feedback on project milestones, ensuring alignment with broader organizational goals. They may also participate in regular progress meetings to stay informed about project developments and offer guidance as needed.

3. Supervisor (Le Anh Ngoc)

- Responsibilities: Serve as a guiding force for the project team, validating the conceptual integrity of project deliverables and verifying that they align with established requirements and standards. The supervisor plays a crucial role in maintaining project quality and ensuring that objectives are met effectively.

- Deliverables: Offer strategic insights and direction during weekly team meetings, where updates on project progress are shared. The team leader facilitates communication between the project

team and the supervisor, enabling seamless collaboration and ensuring that any questions or concerns raised by the supervisor are addressed promptly.

Organizational Structure

A matrix structure will be employed to manage the project, ensuring clear roles and responsibilities across different groups. This structure allows for efficient collaboration and accountability for each activity and deliverable.

Roles and Responsibilities Matrix

Activity	Deliverable	Groups Involved
Project Planning	Project Plan, SQAP	Project Manager, Supervisors
Requirements Gathering	System Requirements Specification (SRS)	Business Analysts, Client Stakeholders, End Users, Project Team
System Design	System Architecture Design, Detailed Design	AI Developers, Software Developers, SMEs, UI/UX Designers
System Development	AI Compliance Monitoring Software	AI Developers, Software Developers, Testers
Testing and Validation	Test Results	Testers, End Users
User Training	Training Materials, User Manuals	Technical Writers, Project Manager
System Deployment	Deployment Guide	Software Developers, Technical Support Staff, End Users
Final Presentation	Presentation Materials	Project Team, Supervisors
Documentation	Technical Documentation	Technical Writers, AI Developers, Software Developers

Table 1 Activities and Deliverables

Interaction and Communication

- Project Team Meetings: Regular meetings to discuss progress, address issues, and coordinate activities.

- Client Meetings: Scheduled sessions with client stakeholders to gather requirements, provide updates, and obtain feedback.

- Training Sessions: Conducted for end users to ensure they understand how to use the AI system effectively.

- Review Sessions: Periodic reviews with supervisors and SMEs to ensure the project aligns with academic and industry standards.

By organizing the project in this structured manner, we ensure that all roles are clearly defined, responsibilities are allocated efficiently, and communication channels are established, facilitating successful project execution.

6. RISKS

This section outlines major risks that could affect the project plan for developing an AI-powered compliance monitoring system for retail staff. These risks are crucial considerations to ensure project success and will guide the team in addressing potential issues effectively.

Risk Analysis

1. Technical Challenges in AI Model Development

- Rank: 1

- Name: AI Model Accuracy

- Description: Achieving high accuracy in AI models for detecting compliance behaviors can be challenging due to the complexity of human actions and variations in retail environments.

- Likelihood of Occurrence: High

- Severity: High

- Mitigation Strategy:

1. Conduct extensive training and testing using diverse datasets.

2. Implement iterative development cycles with frequent validation.

- Contingency: If accuracy targets are not met, consider simplifying the compliance metrics or increasing the project timeline for further model refinement.

2. Integration with Existing CCTV Systems

- Rank: 2

- Name: System Integration Issues

- Description: The AI system must integrate seamlessly with the client's existing CCTV infrastructure, which may vary in specifications and capabilities.

- Likelihood of Occurrence: Medium

- Severity: High

- Mitigation Strategy:

1. Conduct a thorough initial assessment of the existing CCTV systems.

2. Develop flexible integration protocols and perform extensive compatibility testing.

- Contingency: If integration issues persist, plan for phased deployment with targeted system upgrades.

3. Data Privacy and Security Concerns

- Rank: 3

- Name: Data Privacy Issues

- Description: Handling CCTV footage involves significant privacy and security considerations, especially regarding employee data.

- Likelihood of Occurrence: High

- Severity: Medium

- Mitigation Strategy:

1. Implement robust data encryption and access control mechanisms.

2. Ensure compliance with relevant data protection regulations.

- Contingency: If privacy concerns arise, engage with legal experts to address and rectify compliance issues.

4. Project Management and Team Coordination

- Rank: 4

- Name: Team Coordination Challenges

- Description: Effective coordination among the project team and stakeholders is critical for timely project completion.

- Likelihood of Occurrence: Medium

- Severity: Medium

- Mitigation Strategy:

1. Establish clear communication channels and regular progress meetings.

2. Use project management tools to track tasks and deadlines.

- Contingency: If coordination issues arise, consider restructuring team responsibilities and improving communication protocols.

5. Client Expectations and Requirement Changes

- Rank: 5

- Name: Requirement Volatility

- Description: Changes in client expectations or project requirements can impact project scope and timelines.

- Likelihood of Occurrence: Medium

- Severity: High

- Mitigation Strategy:

1. Maintain a detailed project scope document and obtain client sign-off on key milestones.

2. Implement a change management process to handle requirement modifications.

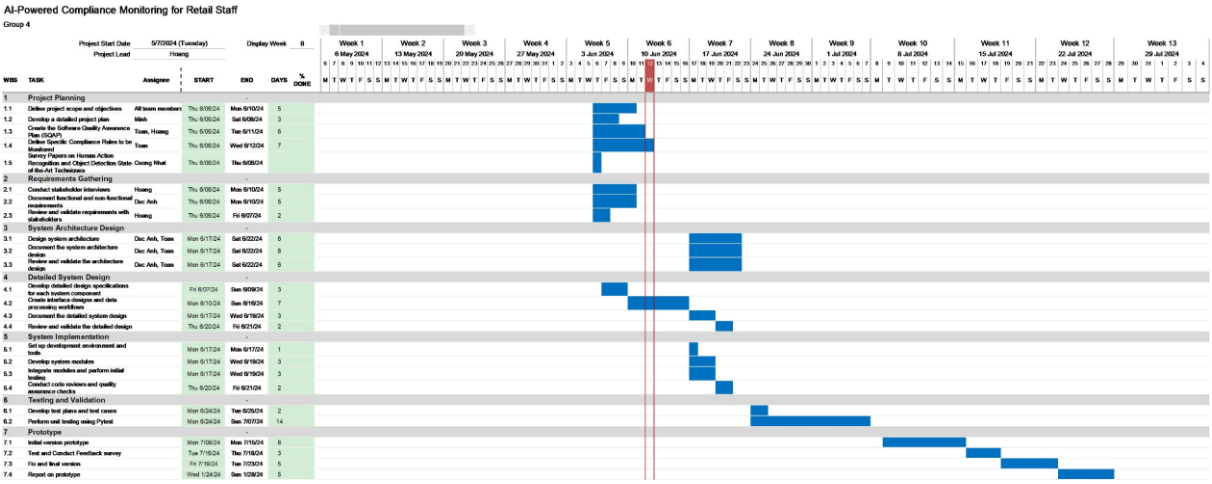
- Contingency: If significant changes are requested, renegotiate project timelines and resources with the client.

Rank	Name / Description	Occurrence Probability (H/M/L)	Severity (H/M/L)
1	AI Model Accuracy	High	High
2	System Integration Issues	Medium	High
3	Data Privacy Issues	High	Medium
4	Team Coordination Challenges	Medium	Medium
5	Requirement Volatility	Medium	High

Table 2 Risks

7. SCHEDULE

7.1. PROJECT TIME LINE



7.2. EXTERNAL DEPENDENCIES

To ensure the project schedule is met, several critical inputs from external parties are required:

1. Client Input and Feedback:

- Timely feedback from the client is crucial, especially during the requirement gathering and validation phases. Delays in feedback can cause significant schedule disruptions.

2. Third-Party Integration:

- Integration with existing CCTV and security systems requires coordination with third-party vendors.

3. Compliance and Regulatory Approvals:

- Obtaining necessary approvals from regulatory bodies for data privacy and security standards must be factored into the schedule.

4. Non-Disclosure Agreement (NDA) Sign-off:

- All parties involved, including the client, project team, and third-party vendors, must sign a Non-Disclosure Agreement (NDA) to ensure the confidentiality of shared data and information.

7.3. ASSUMPTIONS

The following assumptions have been made in arriving at the project schedule:

1. Client Availability:

- It is assumed that the client will be available for regular meetings, feedback sessions, and approvals as per the agreed schedule.

2. Stable Requirements:

- It is assumed that the project requirements will remain stable after the initial requirement gathering phase. Any major changes or additions will be managed through a formal change control process.

3. Resource Availability:

- All project team members and key stakeholders will be available throughout the project duration, and there will be no significant attrition.

4. Third-Party Coordination:

- It is assumed that third-party vendors and regulatory bodies will cooperate and provide timely inputs and approvals as required.

8. BUDGET

Personnel Cost

Name	Role	Rate per Hour
Vuong Khang Minh	Document Researcher, Document Organizer, AI Specialist	$20
Nguyen Dang Duc Anh	Software Specialist, Requirement Analysis	$20
Nguyen Ha Huy Hoang	Team leader/Project Manager	$25
Nguyen Dang Khanh Toan	Quality Assurance, Domain Expert, Software Specialist	$25
Nguyen Cuong Nhat	AI Specialist, Requirement Analysis	$20

Table 3 Personnel Cost

Time Estimated to Complete Each Task

Activity	Task	Estimated hours needed (hrs)	Total per activity (hrs)
1.1: Project Planning	1.1.1: Define project scope and objectives.	10	
	1.1.2: Develop a detailed project plan, including timelines, milestones, and resource allocation.	15	
	1.1.3: Create the Software Quality Assurance Plan (SQAP).	20	45
1.2: Requirements Gathering	1.2.1: Conduct stakeholder interviews to gather requirements.	12	
	1.2.2: Document functional and non-functional requirements.	18	
	1.2.3: Review and validate requirements with stakeholders.	15	45
2.1: System Architecture Design	2.1.1: Design system architecture, including component and data flow diagrams.	20	
	2.1.2: Document the system architecture design.	10	
	2.1.3: Review and validate the architecture design with the project team and stakeholders.	10	40
2.2: Detailed System Design	2.2.1: Develop detailed design specifications for each system component.	25	

	2.2.2: Create interface designs and data processing workflows.	15	
	2.2.3: Document the detailed system design.	15	
	2.2.4: Review and validate the detailed design with the project team and stakeholders.	10	65
3.1: System Development	3.1.1: Set up development environment and tools.	10	
	3.1.2: Develop system modules based on design specifications.	50	
	3.1.3: Integrate modules and perform initial testing.	20	
	3.1.4: Conduct code reviews and quality assurance checks.	15	95
3.2: Testing and Validation	3.2.1: Develop test plans and test cases.	10	
	3.2.2: Perform unit testing using Pytest.	15	
	3.2.3: Conduct integration testing with Postman.	15	
	3.2.4: Execute functional testing with Selenium.	20	
	3.2.5: Perform end-to-end testing with Cypress.	20	
	3.2.6: Conduct performance testing using Gatling.	20	100
4.1: Preparation for Deployment	4.1.1: Prepare deployment guide and related documentation.	10	
	4.1.2: Set up production environment on FPT Cloud Server.	10	
	4.1.3: Configure database on FPT Database for PostgreSQL.	10	30
4.2: System Deployment	4.2.1: Deploy system components to production environment.	15	
	4.2.2: Perform system configuration and initial setup.	10	
	4.2.3: Conduct final system validation and acceptance testing.	15	40
5.1: User Training	5.1.1: Develop training materials, including manuals and video tutorials.	20	
	5.1.2: Conduct on-site or virtual training sessions for end-users.	20	
	5.1.3: Provide ongoing support during the initial usage period.	15	55
5.2: Maintenance and Updates	5.2.1: Monitor system performance and user feedback.	15	
	5.2.2: Implement necessary updates and	15	

	bug fixes.		
	5.2.3: Conduct periodic system reviews and optimizations.	15	45
Total			555

Table 4 Task time estimate

9. REFERENCES

1. Ben, L 2021, Project Planning Definition, TechTarget, viewed 20 June 2024, <https://www.techtarget.com/searchcio/definition/project-planning>.

2. ProjectManager n.d., Project Planning Guide, ProjectManager, viewed 20 June 2024, <https://www.projectmanager.com/guides/project-planning>.

10.TABLES INDEX