ASQII

HEALTHTECH STARTUP

PFE BOOK 2026

Join the Future of Cancer Treatment !

ABOUT ASQII

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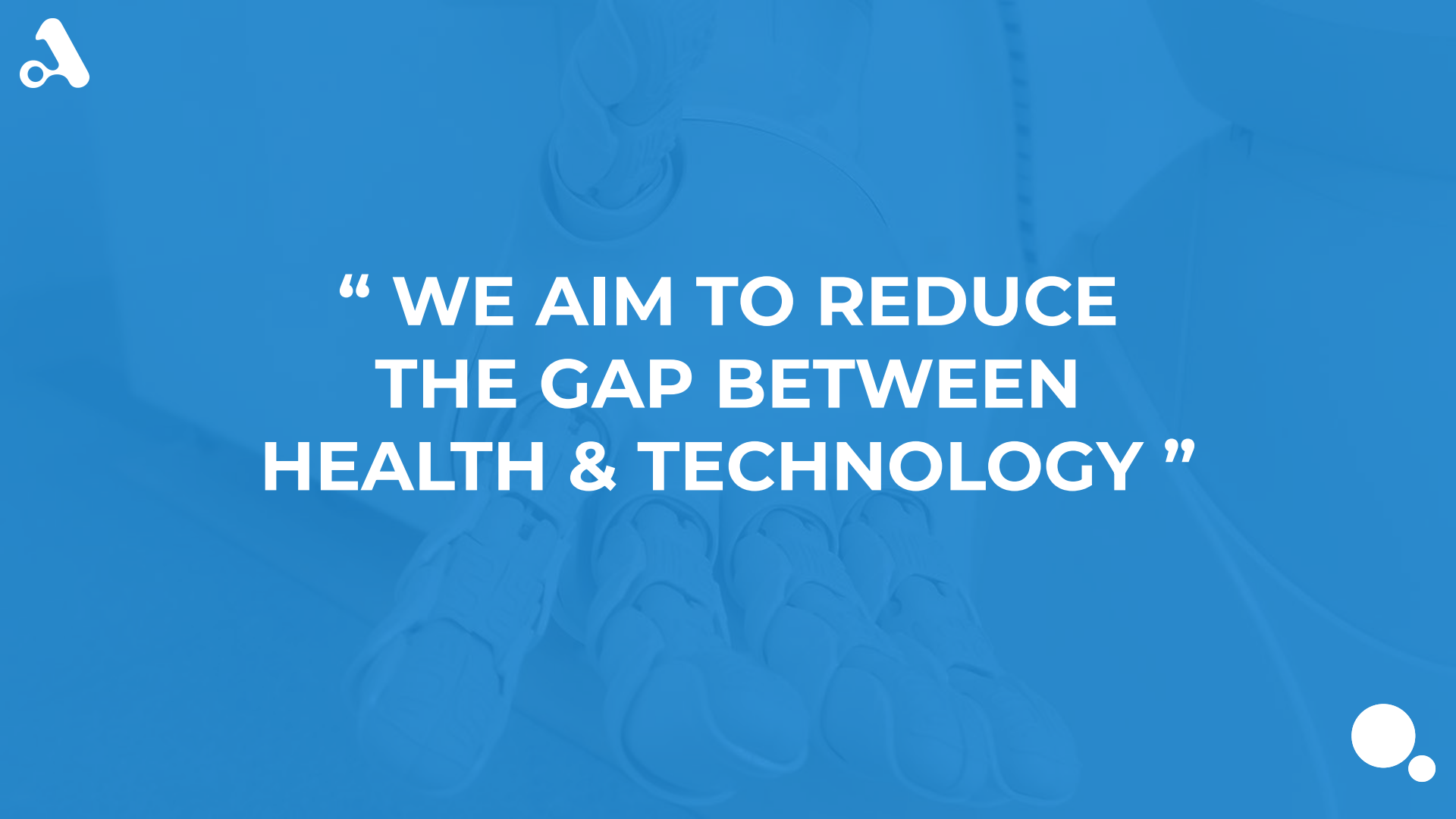
HEALTHTECH STARTUP

ASQII is a Healthtech startup dedicated to leveraging digitalization, data analysis, and process automation to enhance cancer care. Our mission is to empower patients with an optimal health experience through the use of cutting-edge technologies.

START UP ACT

SMU

PARIS-SACLAY CANCER CLUSTER
FRANCE INNOVATION CANCER


“ WE AIM TO REDUCE
THE GAP BETWEEN
HEALTH & TECHNOLOGY ”

OUR MAIN FIELDS OF INTEREST

- **Medical Devices and Robotics :** Develop and improve medical devices and robotics solutions that enhance the precision and efficiency of cancer treatment.

- **Development Solutions for Oncology :** Create web, mobile, and desktop solutions that support healthcare professionals in providing the best treatment experience for cancer patients.

- **Data Science and Computer Vision :** Unlock the power of data to develop and implement solutions that improve cancer treatment and journey.

JOIN US FOR YOUR END OF STUDY PROJECT

WHY TO JOIN ASQII?

Prototyping Lab

We're constantly exploring and refining groundbreaking ideas for cancer treatment. You will be working on innovative projects that address real needs, with a strong focus on implementation.

Enthusiastic And Multidisciplinary Team

You'll be part of a young team of dedicated individuals from diverse backgrounds, driven by a shared passion for healthcare and technology.

Innovative Tech Solutions

We actively design innovative solutions that harness technology to improve the patient journey, ensuring that cancer treatments are more effective and less invasive.

PROJECTS

PROJECT 1 : Data Management and Business Intelligence

Ref : PFE26-01

Objective : Manage and visualize data collected from various projects.

- **Data Integration :** Identify and import datasets from internal projects.
- **Dashboard Creation :** Develop interactive dashboards that provide insights and track key metrics.
- **Data Governance :** Implement data cleaning, validation, and secure storage protocols.
- **Analysis and Reporting :** Use BI's analytical tools to generate regular reports and monitor KPIs.

PROJECT 2: AI-Powered Medical Decision Support System

Ref : PFE26-02

Objective: Develop an intelligent assistant integrated into medical record systems to support clinical decision-making for doctors and provide personalized health insights for patients.

- **AI Integration:** Implement machine learning models for symptom analysis, treatment suggestions, and patient risk stratification.
- **Dual Interface:** Create separate dashboards for doctors (clinical insights) and patients (health monitoring & recommendations).
- **Technical Stack:** Python (FastAPI/Flask), React with TypeScript, TensorFlow/PyTorch, PostgreSQL for structured medical data.
- **Compliance & Ethics:** Ensure HIPAA/GDPR compliance, transparency in AI decisions, and secure handling of sensitive health data.

PROJECT 3 : AI & Automation for Oncology Patient Pathway

Ref : PFE26-03

Objective : Design an automated and intelligent workflow system to streamline the oncology patient journey, from prescription to follow-up, enhancing coordination, data quality, and clinical decision support.

- **Process Automation :** Automate key steps of the patient pathway, including treatment prescription workflows, administrative validations, appointment scheduling, follow-up reminders, and toxicity monitoring notifications.

- **Clinical Data Integration :** Connect and synchronize data from electronic medical records, treatment protocols, laboratory results, imaging reports, and patient-reported outcomes to ensure a unified and reliable information flow.

- **AI-Driven Decision Support :** Integrate intelligent modules to assist clinicians, such as toxicity risk prediction, anomaly detection in follow-up data, recommendation of next monitoring steps, and prioritization of critical alerts.

PROJECT 4: Mobile Application for Patient-Doctor Monitoring in Oncology

Ref : PFE26-04

Objective: Develop a mobile application for patients and doctors to ensure continuous and personalized monitoring of the care journey, particularly for cancer patients.

- **Shared Monitoring:** Enable doctors to monitor progress in real-time.
- **Facilitated Communication:** Integrate a secure messaging system for exchanges between patients and caregivers.
- **Technical Stack:** Cross-platform development using React Native or Flutter for a native experience on iOS and Android.
- **Data Security:** Compliance with health regulations (e.g., GDPR, HIPAA) for the protection of sensitive medical data.

PROJECT 5: Medication Database - Microservice

Ref : PFE26-05

Objective: Create a web application that centralizes all medication references and makes them accessible via a robust and scalable API.

- **Centralized References:** Comprehensive database of medications with their characteristics (dosage, interactions, etc.).
- **Microservices Architecture:** Development of an independent service, connected to the company's gateway for seamless integration.
- **Technical Stack:** NestJS (backend), React with TypeScript (frontend), and MongoDB (document) and PostgreSQL (relational) databases.
- **Data Management:** Ensure the consistency, availability, and security of medication information.

PROJECT 6: Biology Analysis Matching Platform

Ref : PFE26-06

Objective: Develop a web application to catalog biological analyses needed and connect them with laboratories that have the appropriate equipment.

- **Analysis Catalog:** Reference types of analyses and specific requirements.
- **Laboratory Network:** Map out laboratories and their technical capabilities (machines, expertise).
- **Technical Stack:** Identical to the medication project: NestJS / React / TypeScript / MongoDB / PostgreSQL.
- **Resource Optimization:** Facilitate the search and booking of analysis slots with partner laboratories.

PROJECT 7: Enhanced System & Project Security Framework

Ref : PFE26-07

Objective: Design and implement a comprehensive security framework to protect the company's VPS infrastructure and project deployments.

- **Infrastructure Hardening:** Secure VPS configurations, firewall policies, and intrusion detection systems.
- **Project-Level Security:** Integrate SAST/DAST tools, secret management, and vulnerability scanning into CI/CD pipelines.
- **Monitoring & Response:** Set up real-time security monitoring, logging, and incident response protocols.
- **Tools:** Terraform, Docker, Kubernetes, Wazuh, OWASP ZAP, Trivy, Grafana.

PROJECT 8: QA & Automated Testing Pipeline

Ref : PFE26-08

Objective: Establish a robust quality assurance framework with automated testing and continuous integration to ensure project reliability and performance.

- **Test Strategy:** Design unit, integration, and end-to-end testing plans for frontend and backend services.
- **Pipeline Integration:** Implement CI/CD pipelines with automated test execution, code coverage, and reporting.
- **Tools & Frameworks:** Jest, Cypress, Selenium, GitLab CI/GitHub Actions, SonarQube, Postman/Newman.
- **Documentation:** Maintain test cases, bug tracking, and QA reports for audit.

PROJECT 9: Compliance & Certification Implementation

Ref : PFE26-09

Objective: Achieve and maintain compliance with industry standards such as ISO 27001 and HL7 for healthcare interoperability.

- **ISO 27001:** Develop ISMS (Information Security Management System), conduct risk assessments, and implement security controls.
- **HL7 FHIR Integration:** Ensure medical data exchange complies with HL7 standards for interoperability.
- **Audit & Documentation:** Prepare compliance documentation, conduct internal audits, and facilitate certification processes.
- **Team Training:** Organize workshops on compliance requirements and best practices.

PROJECT 10: Multilingual Translation System

Ref : PFE26-10

Objective: Build a scalable translation service to support multilingual content across company platforms and patient-facing applications.

- **Translation Engine:** Integrate both API-based (Google Translate, DeepL) and custom ML models for domain-specific terminology.
- **User Interface:** Provide a simple UI for content managers to submit, review, and publish translations.
- **Caching & Performance:** Implement caching strategies to reduce latency and costs for frequent translation requests.

PROJECT 11: DevOps & Infrastructure Automation

Ref : PFE26-11

Objective: Design and implement a fully automated DevOps pipeline to streamline deployment, monitoring, and infrastructure management.

- **Infrastructure as Code:** Use Terraform and Ansible to provision and manage cloud resources.
- **CI/CD Automation:** Build pipelines for automated testing, containerization, and deployment to staging/production.
- **Monitoring & Logging:** Set up Prometheus, Grafana, ELK stack for observability.
- **Disaster Recovery:** Implement backup strategies and high-availability configurations.

PROJECT 12: Marketing & Communicati...
Strategy Development

Ref : PFE26-12

Objective: Strengthen the company's visibility, brand positioning, and engagement through a structured marketing and communication strategy.

- **Market & Audience Analysis:** Identify target segments, analyze competitors, and define key value propositions.

- **Communication Strategy:** Develop clear messaging, editorial guidelines, and multi-channel communication plans (digital, social media, events)..
- **Content Creation:** Produce impactful visual and written content to promote products, services, and company activities.
- **Digital Marketing:** Manage social media presence, monitor performance metrics, and support online campaigns to increase reach and engagement.
- **Performance Monitoring:** Track KPIs, analyze results, and propose continuous improvements for greater impact.

PROJECT 13: Design and Realization of an Adaptive X-Y Handling System with Gripper for Automated Medication Storage

Ref : PFE26-13

Core Objectives:

- Design an X-Y motion platform optimized for **speed, robustness, and compactness**.
- Develop an **adaptive, safe gripper** suitable for fragile medication boxes.
- Integrate position sensors, limit switches, presence sensors, etc.
- Validate mechanical precision and repeatability.
- Prepare the system for integration with the Computer Vision module.

Keywords:

- Linear motion systems (belt drive / lead screw / linear rails)
- Structural rigidity optimization
- Adaptive parallel-jaw / soft robotic gripper
- Force distribution & box integrity protection
- Motion kinematics & trajectory planning
- Precision & repeatability testing

PROJECT 14: Embedded Control, Sensor Integration, and Safety Electronics for an Automatic Medication Sorting and Storage Robot

Ref : PFE26-14

This PFE focuses on designing the full embedded electronic system controlling both the singularization module and the X-Y handling robot. This includes motor drivers, sensor acquisition, safety circuits, communication protocols, and firmware running on a microcontroller.

Core Objectives:

- Define the full electronic architecture for controlling the singularization module and the X-Y handling system.
- Integrate all required sensors for position, presence, and safety, and establish a synchronized acquisition workflow.
- Develop the embedded control firmware ensuring coordinated motion, error handling, and system supervision.
- Implement safety and protection systems, including fault detection and emergency stop logic.
- Design and prototype compact PCBs tailored to the mechanical constraints of the overall system.
- Ensure reliable communication between the embedded controller, the mechanical modules, and the computer-vision unit.
- Perform electrical validation and system-level testing, including load characterization and final integration.

Keywords:

- Embedded systems architecture (ESP32/RPI)
- Motor control (stepper/servo drivers)
- Sensor fusion (IR, ToF, limit switches, load cells)
- Real-time firmware (FreeRTOS)
- Power distribution & protection circuits
- PCB design & EMI/EMC considerations
- Communication protocols (UART, CAN, RS485, MQTT)

PROJECT 15: Testing, Optimization, and Integration of a Computer Vision System for Medication Identification and Expiration Date Extraction

Ref : PFE26-15

This PFE focuses on **evaluating and improving an existing prototype** designed to detect medication boxes and extract expiration dates through computer vision. The goal is to enhance accuracy, robustness, and real-time performance, and then integrate the system with the mechanical storage robot.

Core Objectives:

- Real-World Testing: Test the existing prototype under authentic pharmacy conditions.
- Detection Improvement: Enhance medication box detection accuracy across various shapes and lighting conditions.
- OCR Optimization: Improve Optical Character Recognition (OCR) performance for irregular expiration date formats and implement an efficient date code parsing strategy.
- Dataset Augmentation: Implement a comprehensive dataset expansion and augmentation strategy to improve model generalization.
- System Integration: Integrate the finalized Computer Vision system with the mechanical sorting and storage robot modules.
- Performance Validation: Validate end-to-end system performance, including real-time inference on embedded devices

Keywords:

- Object detection (YOLOv8/YOLOv10)
- OCR pipeline optimization
- Irregular date code parsing
- Dataset augmentation (lighting, rotation, deformation)
- Real-time inference on embedded devices
- Vision-based localization for robotic gripping
- Blur, glare, and shadow compensation
- Model quantization & performance tuning
- System-level integration with robotic motion

If you are interested in any of the projects, please fill the form by scanning the QR code :

https://asqii.tn/en

For further information, feel free to contact us :

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