# ITXTREE

TECH SOLUTIONS DEVELOPMENT

Evolving, Futuristic, Intelligent

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# PFE Book 2026

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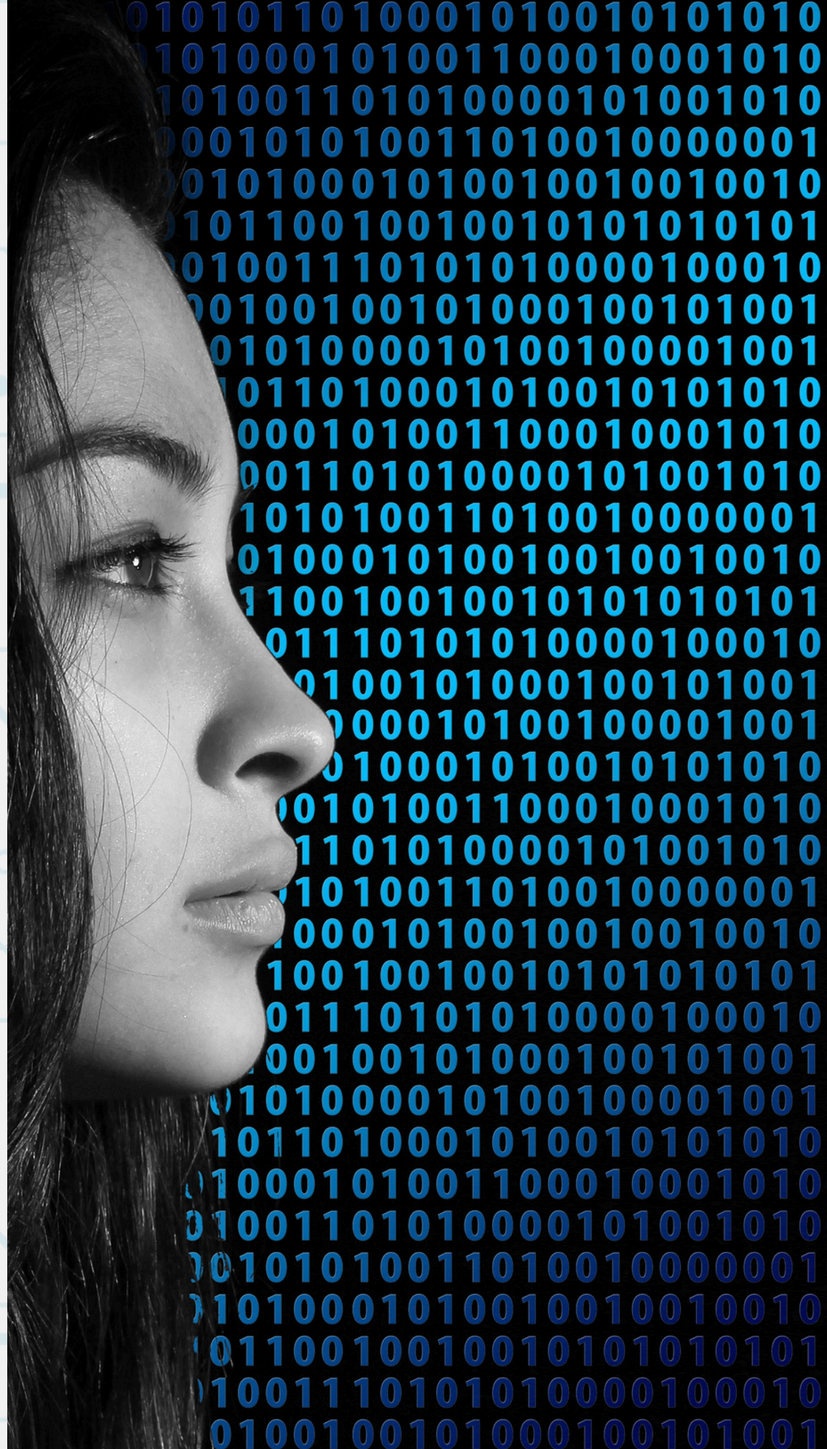

# OVERVIEW

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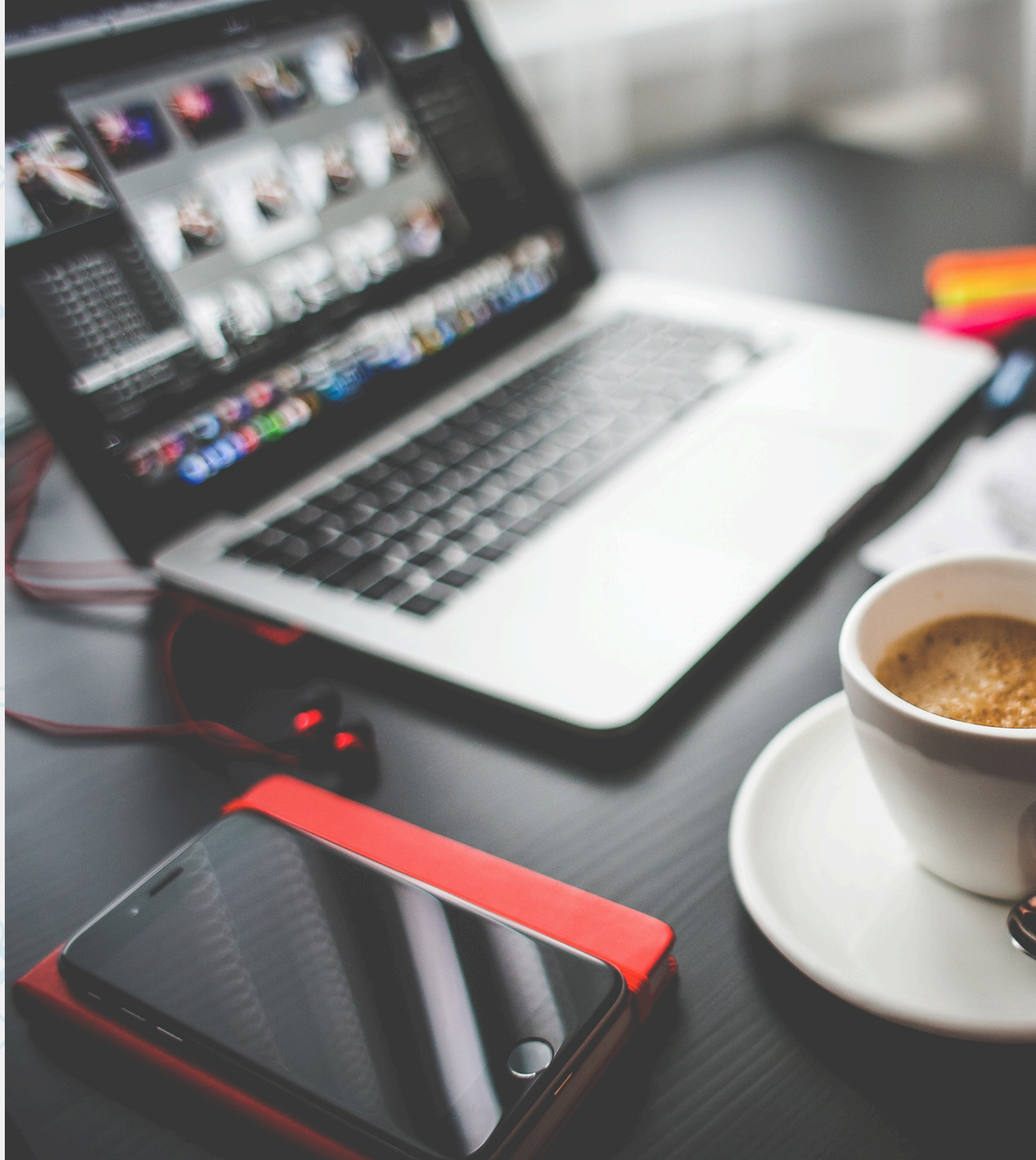

# About Us

1. ITXTree is an early-stage technology startup focused on building a solid foundation for future digital solutions.

2. Although we have not launched any projects yet, we are actively exploring ideas and shaping our first internal concepts.

3. With a small team, ITXTree is progressing step by step, preparing for larger-scale development in the future.

# Our Values

### Integrity
We stay honest and transparent in every decision.

### Curiosity
We explore, learn, and push ourselves to understand deeper.

### Quality
We prefer thoughtful development over rushing.

### Adaptability
We evolve quickly as we discover new challenges.

These values guide our culture as we build the identity of our growing company.

# Our Goals

## Short-term:

- Strengthen our technical capabilities
- Develop and refine our first internal projects
- Gradually expand our team

## Long-term:

- Deliver impactful digital products for a large public
- Become a trusted provider of simple, reliable, and innovative solutions

# How to Apply ?

To submit your application, please follow these steps:

1. Send an email to the recruitment address provided.
2. Include the **topic title of the PFE** you are applying for in the **email subject** line.
3. Attach your **CV (PDF recommended, in English or French)**
4. You may apply for a **maximum of two topics**. If you choose two, list both topic titles clearly in the email.

Make sure your documents are well-organized and named correctly to help us process your application quickly.

# Why Join Us?

Accelerate your growth
Gain hands-on experience in a real startup environment where learning is fast and meaningful

Work directly with the lead engineer
Receive guidance, mentorship, and technical exposure that supports your academic and professional development

Contribute to real projects
Your ideas matter and can influence the direction of our early-stage initiatives

Develop practical skills Strengthen your technical, problem-solving, and teamwork abilities in a modern and evolving tech setting

Be part of a young, ambitious company
Join a team that values innovation, responsibility, and student potential

# Topic proposals

# Topic 1 — AI-Powered Job & Internship Matching Web App

**Technologies:** AI/ML • Spring Boot • Angular • SQL

**Description:**
Design and develop an intelligent matching platform that connects candidates and recruiters through automated analysis. The system reads and classifies CVs, evaluates skills, and provides smart recommendations to both parties.
A key feature of the platform is an AI-driven testing module that assigns skill-based assessments to candidates applying for a job or internship. The results of these tests become the main engine behind the recommendation system, ensuring that recruiters receive the most skilled and relevant profiles.

**Objectives:**

- Develop a web interface for candidates and recruiters (Angular)
- Build backend services and data pipelines (Spring Boot)
- Implement CV parsing and skill classification using AI models
- Integrate AI-generated skill assessment tests for applicants
- Create algorithms to suggest appropriate jobs to candidates
- Develop a scoring-based recommendation engine to suggest qualified profiles to recruiters
- Set up a structured database for users, job offers, tests, and scoring results (SQL)
- Ensure accuracy, scalability, security, and a seamless user experience

# Topic 2 — Social Commerce Platform for Tunisian Artisans

**Technologies:** React • React Native • Spring Boot • SQL • Cloud Services • Video Streaming APIs

**Description:**
Develop a social commerce platform tailored for Tunisian artisans, allowing them to showcase, promote, and sell products through short videos, live streaming, and interactive content. The platform combines e-commerce with social media features, creating an engaging experience for both artisans and consumers.

**Objectives:**

- Build a responsive web and mobile application using React and React Native.
- Integrate video and live streaming features for product demonstrations and interactive sessions.
- Implement secure e-commerce functionalities, including product listings, shopping cart, payments, and order tracking.
- Develop social interaction features: likes, comments, shares, and user profiles.
- Create an admin dashboard to manage users, products, and transactions efficiently.
- Implement AI-powered analytics and recommendation engine to suggest trending products and personalized content.
- Deploy the platform on cloud services for scalability, reliability, and smooth video streaming performance.

# Topic 3 — Cross-Platform Event Planning & Reservation Application

**Technologies:** React • React Native • Spring Boot • SQL • Cloud Services

**Description:**
Develop a cross-platform application that simplifies event planning and reservation for users and service providers. The project includes a modern web interface built with React and a mobile application developed with React Native, both connected to a unified Spring Boot backend.
The platform allows users to create and manage events, book venues and services, organize guest lists, and coordinate event details efficiently. It aims to deliver real-time updates, smart filtering, calendar integration, and a seamless experience across devices.

**Objectives:**

- Build a responsive web application using React
- Develop a cross-platform mobile app using React Native
- Implement backend APIs for users, events, reservations, and service providers (Spring Boot)
- Design and manage SQL database structures for events, bookings, users, and service listings
- Integrate notifications, reminders, and calendar synchronization
- Enable service providers to publish offers with availability, pricing, and booking options
- Deploy components using cloud services for scalability and reliability
- Ensure a secure, consistent, and high-performance experience on web and mobile

# Topic 4 — AI Tutor for National Exams (BAC / 9ème / Concours)

**Technologies:** AI/ML • NLP • React • React Native (optional) • Spring Boot • SQL • Cloud Services

**Description:**
Develop an intelligent learning platform that acts as a personalized AI tutor for students preparing for national exams such as the Baccalauréat, 9ème, or competitive exams.
This system uses artificial intelligence to analyze student performance, detect strengths and weaknesses, and generate tailored exercises with detailed explanations.
The platform adapts to the student's level, simulates real exam sessions, and provides continuous guidance to improve learning efficiency.

**Objectives:**

- Build a responsive web application for students and teachers (React)
- Implement backend APIs for lessons, quizzes, analytics, and user profiles (Spring Boot)
- Integrate AI models to analyze student answers with NLP, identify weak areas and learning patterns, and generate personalized exercises with explanations.
- Create exam simulators for different subjects and education levels
- Design a SQL database for questions, results, study plans, and performance tracking
- Provide student dashboards with progress indicators and recommendations
- Enable teachers to upload questions, correct answers, and explanations
- Deploy on cloud services for high availability and scalability
- Ensure secure authentication, fast performance, and smooth user experience

# Topic 5 — On-Demand Local Services Platform

**Technologies:** React • React Native • Spring Boot • SQL • Cloud Services • Push Notifications

**Description:**
Develop a cross-platform application that connects users with local service providers for tasks like maintenance, cleaning, gardening, and handyman services. Users can request services, schedule appointments, and rate providers. Service providers can manage requests, track tasks, and receive real-time notifications.

**Objectives:**

- User Interface: Build responsive web and mobile apps using React and React Native.
- Service Provider Dashboard: Allow providers to manage requests, availability, and task history.
- Booking & Scheduling System: Implement a dynamic system for users to book services in real-time.
- Ratings & Reviews: Users can rate and review services; providers can track reputation.
- Backend & Database: Use Spring Boot and SQL to manage users, services, tasks, and schedules.
- Notifications: Real-time updates via email, SMS, or push notifications.
- Cloud Deployment: Ensure scalability and reliability for growing user base.

# Topic 6 — AI-Driven DevOps Automation Pipeline in Cloud Environments

**Technologies:** AI/ML • DevOps Tools (CI/CD) • Docker/Kubernetes • Cloud Services (AWS/Azure/GCP) • Monitoring & Logging Tools • Scripting (Python/Bash)

**Description:**

Design and implement an intelligent DevOps pipeline that automates and optimizes software delivery processes using artificial intelligence.

The solution enhances traditional DevOps practices by integrating AI models capable of predicting failures, optimizing build/deployment times, detecting anomalies, and automating repetitive tasks.

The system will run in a cloud environment to ensure scalability, availability, and efficient resource management.

**Objectives:**

- Pipeline Design: Build a complete CI/CD workflow integrating code building, testing, deployment, and automated quality checks.
- AI Integration:
  - Analyze logs and metrics to detect anomalies and predict failures.
  - Optimize build/deployment pipelines using ML-based decision-making.
  - Automate repetitive tasks (resource allocation, scaling, rollback triggers).
- Cloud Deployment: Host the DevOps pipeline on cloud platforms to leverage managed services, scalability, and secure storage.
- Containerization & Orchestration: Use Docker and Kubernetes to standardize deployment and ensure portability.
- Monitoring & Analytics: Implement dashboards for performance metrics, alerts, and AI-driven recommendations.
- Security Automation: Apply DevSecOps concepts for automated vulnerability detection.
- Documentation & Best Practices: Ensure clean architecture, maintainability, and adherence to modern DevOps standards

# Topic 7 — Network Intrusion Detection System  Powered by Deep Learning

**Technologies:** Python • TensorFlow / PyTorch • Spring Boot • React • SQL

**Description:**
Design and implement an intelligent intrusion detection system capable of analyzing network traffic and identifying malicious activities in real-time. The solution leverages deep learning models to detect anomalies, classify cyberattacks, and improve overall network security. A complete frontend dashboard and backend API will support monitoring, alerting, and reporting functionalities.

**Objectives:**

- Collect, preprocess, and label network traffic datasets
- Train deep learning models to classify attacks and detect anomalies
- Deploy a real-time detection engine integrated with backend services
- Build a web-based monitoring dashboard for alerts and analytics
- Provide detailed logs, visualizations, and automated security reports
- Ensure scalability, performance, and secure handling of network data