

Osama Arshad

osamaarshad222@gmail.com
+923202566885

Summary:

Experienced Software Engineer & Technical Lead

Skilled and adaptable full-stack engineer with extensive experience in **backend development**, **AI integration**, and **scalable system architecture**. Proven ability to design and implement robust software solutions, lead cross-functional teams, and drive innovation across the stack.

Technical Expertise:

- **Backend:** Python (Django, Flask, FastAPI, DRF), **Node.js** – building high-performance, scalable APIs using REST, GraphQL, and gRPC
- **Frontend:** Proficient in React.js, Angular, Vue.js, and Next.js – creating responsive, dynamic, and intuitive user interfaces, with server-side rendering (SSR) and static site generation (SSG) capabilities
- **Systems & Infrastructure:** Asynchronous programming, WebSockets, microservices, monolith optimization
- **Databases:** PostgreSQL, MySQL, MongoDB, Redis, Vector Databases – optimized for performance and scalability
- **Cloud & DevOps:** AWS (Lambda, S3, SQS, SNS, API Gateway, CloudWatch), Docker, Kubernetes, CI/CD pipelines

AI & Automation:

- Hands-on experience with **LLMs**, **RAG pipelines**, **Generative AI**, and **agentic AI**
- Integrated **LangChain**, **OpenAI**, and automation agents into enterprise-grade applications
- Developed robust tools for **web scraping** (Scrapy, Selenium, proxies), and interactive dashboards using **Streamlit** and **Tableau**

Leadership & Collaboration:

- Led development teams in fast-paced environments, driving clean code practices and scalable architecture
- Strong advocate for innovation, collaboration, and building secure, maintainable systems

Work Experience:

Lead Software Engineer

InvoZone - April 2022 to Present

At Invozone, I build scalable backend systems using Django, Flask, FastAPI, and DRF across monolithic and microservices architectures. Skilled in APIs (REST, GraphQL, gRPC, WebSockets) and system optimization. Experienced in LLMs, RAG, Generative AI, and agentic AI with LangChain and OpenAI. Also contributed to EHR/Practice Management systems, ensuring secure workflows, patient engagement, and HIPAA compliance. Managed AWS, Docker, Kubernetes, and CI/CD pipelines for reliable cloud deployments.

Key Contributions:

- ▮ **Backend & Server Development** – Built high-performance systems using Django, Flask, FastAPI, and Node.js, with Celery and Celery Flower for task scheduling and background jobs.
- ▮ **Frontend & UI** – Experience working with React.js, Angular, and Vue.js to create responsive, dynamic, and intuitive user interfaces.
- ▮ **Microservices & WebSockets** – Developed asynchronous APIs, real-time services, and proxy servers using WebSockets, with strong focus on scalability and performance.
- ▮ **Data Management & Caching** – Optimized databases using PostgreSQL, MySQL, MongoDB, Redis (for caching), and vector databases for advanced retrieval tasks.
- ▮ **Automation & AI** – Developed robust business automation tools using Scrapy, Selenium, and proxies; built and integrated RAG pipelines, Generative AI models, and agentic workflows.
- ▮ **CI/CD & Cloud Services** – Implemented CI/CD pipelines using Jenkins and GitHub Actions; deployed cloud-native applications using AWS (Lambda, S3, SQS, SNS, CloudWatch, API Gateway), Docker, and Kubernetes.
- ▮ **Healthcare Systems (EHR/EMR)** – Worked on Electronic Health Record (EHR) and Practice Management Systems, ensuring secure data handling, interoperability with HL7/FHIR standards, and regulatory compliance (HIPAA/GDPR).
- ▮ **Patient Engagement Solutions** – Developed patient portals, appointment scheduling, and secure messaging modules to improve user experience.
- ▮ **Data-Driven Healthcare Insights** – Implemented analytics pipelines for real-time reporting and clinical decision support.
- ▮ **Integration Expertise** – Built API integrations with labs, pharmacies, and third-party healthcare providers to streamline clinical workflows.
- ▮ **Scalability & Performance in Healthcare** – Optimized large-scale medical data systems, ensuring reliability, speed, and accuracy across thousands of patient records.

This role has strengthened my expertise in server development, intelligent automation, and cloud-native solutions, enabling delivery of efficient, scalable, and AI-powered applications.

Skills: Python (Programming Language) · Flask · FastAPI · Django REST Framework · Node.js · REST APIs · GraphQL · gRPC · Proxy Server · Microservices · WebSocket · Celery · React.js · Next.js · Angular · Vue.js · PostgreSQL · MySQL · MongoDB · Redis · Vector Databases · Jenkins ·

Docker · Kubernetes · Terraform · OpenAI API · LangChain · Agentic AI · RAG · Generative AI · Scrapy · Selenium · Tableau · Streamlit · pytest · unittest · EHR · HL7

Senior Software Engineer

Crown Bioscience - Remote(California, United States) June 2022 to Jan 2024

As a Full-Stack Engineer, I develop and optimize scalable web applications, transforming wireframes and user requirements into responsive, dynamic interfaces using React.js. I collaborate closely with design and product teams to integrate RESTful, GraphQL, and gRPC APIs, while leveraging AWS Serverless and containerized architectures for backend solutions. My work emphasizes performance, maintainability, and AI-powered capabilities.

Key Contributions:

- ▮ Developed responsive frontend applications using React.js, with experience across Angular and Vue.js for diverse UI requirements.
- ▮ Built and optimized AWS Serverless backend solutions using Lambda, API Gateway, and SQS, ensuring high scalability and performance.
- ▮ Ensured efficient data storage and retrieval using AWS DynamoDB and integrated Redis for caching.
- ▮ Implemented secure, scalable authentication flows with AWS Cognito and fine-grained access control.
- ▮ Enabled real-time capabilities using AWS AppSync and WebSockets for live updates and streaming features.
- ▮ Optimized analytics workflows using AWS Athena and integrated interactive dashboards via Streamlit and Tableau.
- ▮ Contributed to automation, debugging, and system performance enhancements across the full stack.

Focused on building secure, scalable, and high-performance applications, while incorporating AI-driven workflows and cloud-native solutions to deliver seamless user experiences.

Skills: React.js · React Hooks · Context API · Angular · Vue.js · AWS Lambda · API Gateway · SQS · RESTful APIs · GraphQL · gRPC · Amazon Cognito · DynamoDB · Redis · AWS AppSync · Amazon Athena · Streamlit · Tableau · Jira

Senior Software Engineer

NewEffect - Remote(London Area, United Kingdom) Feb 2021 to Aug 2022

Worked on a fintech product, implementing advanced ML/AI algorithms and developing full-stack systems using Django for the backend and React.js for the frontend. Focused on predictive analytics using SARIMA/ARIMA models, along with modern AI techniques, to enhance forecasting accuracy and drive business intelligence.

Key Contributions:

- ▮ Developed and integrated ML/AI algorithms, including SARIMA, ARIMA, and LLM-powered models for predictive analytics and decision-making.
- ▮ Built scalable, high-performance backend systems using Django, Django REST Framework, and WebSockets for real-time event handling.
- ▮ Created responsive, interactive user interfaces using React.js, ensuring smooth and intuitive user experiences.
- ▮ Integrated third-party APIs and services to extend functionality and data enrichment across financial modules.
- ▮ Optimized both the performance and accuracy of forecasting models, improving reliability and insight generation.
- ▮ Leveraged PostgreSQL for structured data storage and Redis for performance-focused caching.

Contributed to building a robust, AI-driven fintech product with enhanced forecasting, user experience, and system scalability.

Skills: Python (Programming Language) · JavaScript · Django · Django REST Framework · REST APIs · WebSockets · Webhooks · Third-Party API Integrations · SARIMA · ARIMA · LLMs · React.js · Next.js · PostgreSQL · Redis

Senior Software Engineer

CureMD - Dec 2020 to April 2022

At CureMD, I contributed to building and enhancing healthcare technology solutions, particularly focused on Electronic Health Records (EHR), practice management, and patient engagement systems. My work involved developing secure, scalable backend services and collaborating with cross-functional teams to deliver solutions that improved healthcare workflows and compliance.

Key Contributions:

- ▮ **EHR Systems Development** – Contributed to the design and implementation of scalable backend services for electronic health record systems, ensuring compliance with HIPAA and healthcare data standards.
- ▮ **Backend Development** – Built and optimized RESTful APIs using Django and Django REST Framework, integrating complex data models for patient records, scheduling, and medical workflows.
- ▮ **Frontend Integration** – Supported frontend teams by developing API-driven solutions consumed by Angular and React.js applications for enhanced patient and provider experiences.
- ▮ **Interoperability** – Integrated third-party healthcare APIs (HL7, FHIR) to improve interoperability and data exchange across healthcare systems.
- ▮ **Database Management** – Managed PostgreSQL and MySQL databases, ensuring data consistency, schema optimization, and high performance for critical healthcare operations.
- ▮ **Cloud & DevOps** – Deployed applications on AWS cloud infrastructure and implemented CI/CD pipelines to ensure smooth releases and system reliability.

▮ **Security & Compliance** – Implemented secure authentication and access controls, ensuring patient data protection aligned with healthcare security standards.

▮ **Agile Practices** – Actively participated in sprint planning, daily stand-ups, and retrospectives to ensure timely delivery and continuous improvement.

Skills: Python (Programming Language) · Django · Django REST Framework · GraphQL · gRPC · Microservices · OAuth · Single Sign-On (SSO) · Redis · PostgreSQL · Cache Management · Jenkins · docker · Continuous Integration and Continuous Delivery (CI/CD) · Unit Testing · EHR Systems · HL7 · FHIR · React.js · Angular

Software Engineer

Arbisoft - July 2020 to Dec 2020

At Arbisoft, I worked extensively with Django, Django REST Framework, and React.js, contributing to the development of scalable, high-performance applications in both e-learning and distributed systems. My role focused on backend and full-stack development, database optimization, and AWS cloud integration within an Agile/SCRUM environment.

Key Contributions:

▮ **Backend & API Development** – Developed and optimized high-scale Django REST Framework applications, handling complex ORM logic, multi-database configurations, and asynchronous operations.

▮ **Learning Management Systems & Distributed Systems** – Contributed to enterprise-grade LMS platforms and scalable distributed systems, utilizing microservices architecture and real-time communication where needed.

▮ **Frontend Development** – Built responsive, dynamic UIs using React.js with Redux and React Hooks, ensuring seamless interaction with backend services.

▮ **Database Management** – Designed and optimized relational and NoSQL databases using MySQL and MongoDB, with Redis integration for caching and performance improvements.

▮ **Open edX** – Gained in-depth experience enhancing Open edX-based e-learning platforms, improving modularity, performance, and feature integration.

▮ **Cloud & DevOps** – Integrated AWS services (e.g., S3, Lambda, EC2) for scalable cloud deployments and collaborated on DevOps practices using Docker and CI/CD workflows.

▮ **Authentication & Security** – Implemented secure authentication mechanisms including OAuth2.0 and SSO for user management across services.

▮ **Agile Development** – Practiced SCRUM methodologies, actively participating in sprint cycles, using Git for version control and Jira for issue tracking and delivery planning.

This role deepened my expertise in scalable backend architecture, microservices, cloud-native development, and high-impact e-learning solutions.

Skills: Python (Programming Language) · Django REST Framework · React.js · React Hooks · Redux.js · Next.js · Open edX · Microservices · REST APIs · MongoDB · MySQL · Redis · AWS · OAuth2.0 · Single Sign-On (SSO) · Docker · Unit Testing · Jira

Associate Software Engineer

Convergence Business Systems - Sep 2019 to June 2020

As an Associate Software Engineer, I worked extensively with Python and frameworks like Web2Py, Web4Py, and Django REST Framework, focusing on backend development for telecom industry clients including Afghan Wireless, Telenor, and Zain (Saudi Arabia). I also contributed to a logistics product, delivering scalable backend systems and working with Linux environments for deployment and system reliability.

Key Contributions:

- ▮ **Telecom & VoIP Solutions** – Developed telecom-specific applications, integrating Asterisk PBX for advanced call management, VoIP capabilities, and telecom billing logic.
- ▮ **Dashboard Development** – Built interactive dashboards using Web2Py and Web4Py, providing real-time analytics and telecom KPI visualization.
- ▮ **API Development & Integrations** – Designed RESTful APIs and implemented third-party API integrations to enhance feature interoperability across distributed systems.
- ▮ **Agile Development** – Worked in Agile teams, actively participating in sprint planning, stand-ups, and retrospectives while delivering iterative progress.
- ▮ **Testing & Quality Assurance** – Developed unit and integration tests using `unittest` and `pytest`, ensuring backend reliability and regression safety.
- ▮ **Cloud & Deployment** – Deployed applications in Linux environments and cloud platforms, utilizing AWS services (S3, SQS), and configured CI/CD pipelines using Jenkins.
- ▮ **Database Management** – Managed PostgreSQL and MySQL databases with focus on schema efficiency, query optimization, and data consistency at scale.
- ▮ **Version Control & Project Management** – Used GitHub for version control and Jira for task tracking, promoting collaboration and traceability across the team.
- ▮ **Logistics Platform Development** – Built scalable, high-performance backend services using Django REST Framework and PostgreSQL, addressing logistics workflows and business automation.

This role laid a strong foundation in backend development, cloud integration, and system-level engineering for both telecom and logistics domains.

Skills: Python (Programming Language) · Django REST Framework · Web2Py · Web4Py · Asterisk PBX · REST APIs · PostgreSQL · MySQL · AWS (S3, SQS) · Jenkins · CI/CD · VoIP · Dashboarding · Linux · GitHub · Jira · Unittest · Pytest

Projects:

Crown Bioscience

<https://www.crownbio.com/>

- Initiated and spearheaded a AWS Serverless and React.js-based project, translating wireframes and user requirements into responsive and engaging web applications as a front-end engineer.
- Collaborated seamlessly with design and product teams to integrate visual elements with application functionality, ensuring a cohesive user experience.
- Engaged extensively with Python on the backend, particularly within AWS Lambdas in the AWS Serverless architecture, optimizing backend logic execution and eliminating the need for traditional server management.
- Integrated RESTful APIs and employed AWS DynamoDB for efficient data retrieval and storage in the AWS Serverless environment, contributing to streamlined data handling.
- Implemented secure user authentication using AWS Cognito, ensuring the highest level of privacy and compliance in the application.
- Enabled real-time capabilities in web applications through AWS AppSync, facilitating efficient data synchronization between front-end and backend data sources.
- Incorporated AWS Lambda functions for backend logic execution in the serverless paradigm, enhancing efficiency and reducing operational complexities.
- Contributed significantly to backend development by leveraging Python in AWS Lambdas, optimizing data analysis through AWS Athena queries.
- Played a key role in troubleshooting efforts, ensuring the seamless operation of both front-end and back-end components for a robust user experience.
- Committed to enhancing development processes by staying updated on industry best practices, incorporating feedback, and optimizing workflows for continuous improvement. Continuous commitment to development process optimization ensures that the end products not only meet but exceed user expectations.

NewEffect

- Spearheaded the development of a fintech-based Financial Forecasting and Integration Platform, with a focus on backend development.
- Leveraged Django Rest Framework to ensure a secure and efficient foundation for seamless integration with financial tools like XERO.
- Facilitated the effortless import and centralization of financial data from diverse tools on the platform.
- Applied sophisticated financial models, including the SIRIMA model, for projecting future profit and loss sheets.
- Implemented machine learning models and manual formula calculations on the backend, creating a hybrid system for optimal data-driven insights and user-defined parameters.

- Utilized Django Rest Framework to build RESTful APIs, ensuring seamless communication between the front end and the back end.
- Ensured reliability, scalability, and security of the system through extensive work on the backend. The focus on backend development ensures a reliable, scalable, and secure foundation, representing a significant stride in providing users with a sophisticated toolset for making informed business decisions.

Loyalty Management System (LMS)

- Spearheaded the development of the Loyalty Management System (LMS) as the backend lead, creating a sophisticated platform for omnichannel experiences in a Django Rest and React.js-based project.
 - Built the project on the Django Rest Framework, leveraging its robust features for efficient API development and management, ensuring seamless communication between the frontend and backend.
 - Adopted a microservices architecture for scalability, modularity, and maintainability, deploying individual services for specific functionalities, promoting a flexible and adaptable system.
 - Utilized AWS services extensively, with AWS SQS and SNS facilitating communication between microservices for real-time data exchange and message processing, enhancing the overall responsiveness of the Loyalty Management System.
 - Implemented Celery as an asynchronous task queue for handling background tasks, contributing to system responsiveness and efficiency, particularly in managing time-consuming processes.
 - Chose PostgreSQL as the primary storage solution and strategically employed Redshift for listing cache, optimizing data retrieval speed and storage efficiency.
 - Implemented Redis as a caching mechanism to enhance performance by swiftly retrieving and storing frequently accessed data, improving overall system responsiveness.
 - Supported GraphQL for flexible and efficient query execution, allowing clients to request specific data tailored to their needs, enhancing the user experience.
 - Implemented gRPC to facilitate communication between microservices, ensuring fast and reliable data exchange, promoting a cohesive and interconnected system.
 - Robustly handled authentication and authorization through OAuth, providing a standardized and secure protocol across channels and touchpoints for seamless user access.
 - Integrated seamlessly with external applications and data stores through API interfaces, promoting interoperability with cart services, mobile applications, and POS systems, ensuring a comprehensive omnichannel experience for users.
 - Leveraged AWS SQS and SNS as communication channels, message queues, and notification services for the timely delivery of important information, enhancing the overall reliability and responsiveness of the Loyalty Management System.
- The adoption of advanced technologies and a meticulously selected AWS ecosystem contribute to the system's success as a sophisticated and efficient platform.

TSP - The Service Provider

- Crafted a robust backend infrastructure for TSP, an online marketplace, using Django and Django Rest Framework.
- Developed a user-friendly job posting experience, enabling users to articulate service requirements seamlessly.
- Implemented an intuitive interface for detailing job scope, timeline, and budget, ensuring a smooth onboarding process for service seekers and providers.
- Created detailed profiles for service providers showcasing work history, reviews, and ratings.
- Implemented stringent verification mechanisms to guarantee the authenticity and credibility of service professionals.
- Developed a smart matching algorithm for precise connections between users and qualified service providers.
- Introduced real-time notifications for service providers regarding opportunities aligned with their expertise.
- Established a transparent quoting system for service providers to submit quotes or proposals, fostering clear communication and pricing transparency.
- Implemented a robust review and rating system to empower users to make informed decisions and allow service providers to showcase their expertise.
- Extended focus to the development of a powerful Admin Dashboard, providing administrators with tools to oversee and manage platform activities.

The implementation of smart algorithms, real-time notifications, and transparent systems enhances the overall experience, positioning TSP for continued success and growth in the service industry.

RAWAN Fleet Management System

- Designed and implemented the RAWAN Fleet Management System, focusing on optimizing the management of the RAWAN transportation network.
- Developed a user-friendly dashboard providing a real-time overview of the entire fleet's status, incorporating GPS integration for precise vehicle tracking.
- Implemented the driver management module, facilitating seamless onboarding, driver profile management, and a performance rating system.
- Ensured meticulous inventory tracking, automated maintenance alerts, and compliance reports through the vehicle management component.
- Utilized advanced algorithms and real-time traffic data for route optimization, reducing travel time and improving fuel efficiency.
- Integrated a robust communication module for efficient interaction between fleet managers and drivers.
- Implemented a billing and payments system for transparent financial transactions within the RAWAN Fleet Management System.
- Incorporated performance analytics to provide valuable insights for strategic decision-making.

- Adhered to stringent security and compliance standards to ensure data integrity and user privacy.

The integration of advanced features, real-time tracking, and adherence to security standards ensures the system's effectiveness and reliability.

MiltecLMS

- Pioneered the development of MiltecLMS, a cutting-edge Learning Management System that seamlessly integrates Django Rest Framework on the backend and React.js on the front end.
- Tailored MiltecLMS to meet diverse educational needs, empowering both learners and instructors with a sophisticated and interactive online learning experience.
- Implemented an intuitive course management system within Django Rest Framework, featuring customizable modules, quizzes, and assignments for effortless course creation and organization.
- Engineered individual learner profiles to facilitate progress tracking, ensuring a secure authentication system that guarantees a personalized learning journey for each user.
- Emphasized interactive learning by supporting various multimedia formats and fostering collaboration through discussion forums, enriching the overall learning experience.
- Integrated live virtual classrooms using React.js, providing a platform for real-time interaction between instructors and learners, enhancing the dynamic nature of educational content delivery.
- Established a robust assessment and feedback mechanism leveraging Django Rest Framework, incorporating automated quizzes, grading tools, and detailed performance analytics to aid both learners and instructors.
- Streamlined the enrollment process with React.js, allowing for easy course registration. Implemented a secure payment gateway for paid content and introduced promotional features like coupons and discounts.
- Implemented a comprehensive notification system within Django Rest Framework for timely communication, utilizing both email and in-platform announcements to keep users informed about important updates and events.
- Continuously refined and optimized MiltecLMS by staying abreast of industry best practices, incorporating user feedback, and fine-tuning workflows to ensure an ever-improving learning experience.

As MiltecLMS evolves, it continues to contribute to the advancement of education for all users.

BDAutomation

- Led a significant software development initiative focused on creating a Business Development (BD) automation tool, with Python playing a pivotal role.
- Streamlined the aggregation of job postings from various online platforms, presenting them to the BD team in a structured Excel sheet.
- Overcame challenges related to managing asynchronous processes and threading, given the substantial volume of data to be scraped concurrently from multiple sources.
- Utilized threading techniques and delved into asynchronous programming for optimal

performance and resource utilization.

- Implemented a rule builder to enhance flexibility, allowing the BD team to define specific criteria for job scraping.
- Developed a parser to interpret and execute rules set by the team, creating a dynamic and user-friendly interface tailored to their unique needs.
- Gained insights into project management intricacies, emphasizing the importance of clear communication within the team to align with project goals.
- Emphasized adaptability and user-centric design during the rule builder component development.

The project stands as a testament to Python's versatility in addressing complex challenges and delivering innovative solutions in business development automation.

Team AI

Team AI is an innovative open-source Python framework designed to orchestrate autonomous AI agents, enabling them to collaborate effectively in tackling complex tasks. The project focuses on creating AI "teams" where each agent has distinct roles, goals, and tools to simulate a coordinated human-like workflow. I led the project from inception to deployment, overseeing the development of both the proof of concept (POC) and the production-ready product. The POC was built using Streamlit in Python to quickly prototype and validate core functionalities, while the actual product was developed with a robust FastAPI backend and a React.js frontend for scalability and user experience. We leveraged Large Language Models (LLMs) from OpenAI and Groq, along with tools like Coposia and LangChain, to enhance agent intelligence and collaboration. As the project leader and backend developer, I designed APIs, managed data pipelines, and ensured the seamless integration of advanced AI technologies into a production-ready system.

Education:

Master's degree, Computer Science in Computer Science

Lahore University of Management Sciences - Lahore

October 2019 to July 2021

Skills:

