

Francesco Bullini

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Senior Software Architect - Java J2EE & AI

16 years of professional experience in the Java ecosystem, in R&D departments of software companies, designing, developing, and delivering distributed systems and SaaS platforms.

Expert in Agentic AI, Multi-Agent Systems, and Generative AI.

Proficient with AI-assisted (vibe coding) development tools.

12 years of international experience in culturally diverse workplaces.

12 years participating in agile teams.

3 languages spoken fluently: **French, English** and Italian.

6 years as independent consultant.

10+ application domains covered throughout my career.

Profile

Intellectually curious, quick learner, with a strong focus on AI and security.

From early hands-on work with agentic and multi-agent AI systems in university labs, I progressed from backend engineer to software architect, then to CTO for small and mid-sized companies, and finally to independent consultant, developing strong expertise in innovation, cybersecurity and advanced AI technologies.

Key Competencies

Software Architecture:

Microservice architectural style, Domain Driven Design, Agentic and Multi-Agent systems, API Management, Service-Oriented Architecture (SOA), Enterprise Integration Patterns (EIP), and Event-Driven Architectures.

Agentic and Multi-Agent Systems:

Design and implementation of custom RAG (Retrieval-Augmented Generation) pipelines, vector databases, embedding models, Semantic Cache, Semantic Routing, Model Context Protocol (MCP), Agent-to-Agent Protocol (A2A), AG-UI Protocol, WebSockets, Docker-MCP, and proprietary protocols for contextual reasoning and orchestration.

Cloud Providers:

Google Cloud (GCE, Cloud Storage, Cloud SQL, Firewall, Cloud Run, Google Functions, GKE), AWS (S3, EC2), Netlify, Vercel, Microsoft Azure, Heroku.

AI Inference Providers:

Vertex AI, RunPod, Hugging Face, Anthropic API, OpenAI API, OpenRouter, AnyScale, Mistral AI API, AWS Bedrock.

Security and Privacy:

OAuth 2.0, OpenID Connect (OIDC), JWT, Spring Security, implementation of OWASP recommendations.

Identity providers:

Google Identity and Access Management (IAM), Azure AD, Azure AD B2C, Single Sign On (SSO); Firebase.

Core Technologies:

Java 17+, Spring Boot 3.x, Tomcat, PostgreSQL, Spring Data JPA, Quartz, Redis, RabbitMQ.

Development Practices:

Design Patterns, Software quality assurance, software craftsmanship.

Testing:

TDD, BDD, TestContainers, JBehave, JUnit 5.

Containerization & Orchestration:

Docker, Docker Compose, and Kubernetes (Google Kubernetes Engine).

CI/CD:

Competent in Continuous Integration and Continuous Delivery practices: Github actions, Jenkins, SonarQube, Nexus Repository, Google Artifact Registry, Google Cloud Build. DORA Metrics.

Observability:

Google Monitoring, Google Logging.

Key Professional Experience

Jan 2024 – Present **CTO / AI Architect** - Agenticity.ai (Paris, France)

Agenticity provides consultancy services in AI and IT.

► Designed and developed an agent-first AI-native distributed software infrastructure for contextual reasoning and programmable orchestration of teams of domain-specific AI Assistants.

► Designed and developed three MVPs for **AI assistants (B2B) based on custom RAG pipelines**, in the fields of civil construction, coaching of SME executives and longevity research.

► Designed and developed a tool to optimize the **cost-quality trade-off** in the usage of Large Language Models (LLMs).

► Designed and developed a **custom ingestion component** for unstructured data including videos.

► Designed and developed a tool to report on the cost of Google Cloud projects and products.

► Implemented a tool to forecast the ROI of agentic AI applications.

► Managed domain names and domain name servers configuration.

Technical Environment:

Languages:

Java SE 17, 21.

Backend Framework:

Spring Boot 3.2.

LLM libraries:

LangChain4J, Ollama4J, vLLM, RouteLLM, Lark, LiteLLM.

LLM Providers and API:

Google Vertex AI, OpenAI, AWS Bedrock, Anthropic, Mistral AI, Hugging Face, Whisper API.

Protocols:

Model Context Protocol (MCP), agent-to-agent protocol (A2A), AG-UI protocol, WebSockets, Docker-MCP, Proprietary Protocol for contextual reasoning and orchestration.

Cloud:

Google Cloud Platform, GCE, Cloud Storage, gcloud CLI, RunPod, Hugging Face, Anyscale, Netlify, Docker, Docker Compose, Firebase.

Middleware and Databases:

RabbitMQ, Nginx, ChromaDB, Firebase, H2, PostgreSQL, **Redis**.

Security:

JWT, Spring Security.

May 2022 – Nov 2023 **Consultant CPO/CTO** - EU project (Paris, France)

“D-Reskill at Universities” is a project funded by the European Commission to envision and design a software platform for reskilling workers using an explicit skill-based approach and the [ESCO](#) ontology.

- ▶ Co-authored a grant proposal that was successfully awarded funding for an EU project.
- ▶ Led technical meetings among European partners (15 professionals).
- ▶ Designed products and solutions to meet requirements.
- ▶ Maintained a coherent vision of the product synthesizing different points of views and proposals.
- ▶ Conducted feasibility studies exploring different ontologies and approaches to apply skill intelligence to education and for reskilling the workforce.
- ▶ Ensured compatibility to technical standards and ontologies (ESCO, ISCO, ISCED, EQF, NACE, ISCED).
- ▶ Supervised mockup implementation, UX design and user needs assessment survey.
- ▶ Co-authored EU technical reports.
- ▶ Presented in international education (edTech) conferences.

Technical Environment:

Languages:

Java SE 17.

Databases:

Neo4J.

Semantic Web/Ontologies:

Resource Description Framework ([RDF](#)), Simple Knowledge Organization System ([SKOS](#)).

UX/UI:

Supervision of work in: Figma, Figma Flow.

Jun 2023 – Sep 2023 **Consultant CPO/CTO** - Open University of Catalonia (Barcelona, Spain)

UOC is one of the first European universities fully digital and provides courses to international students for more than 20 years.

- ▶ Designed a software product in the field of education and career development.
- ▶ Led ideation workshops to explore product directions.
- ▶ Conducted a feasibility study for integrating the product into the university's IT ecosystem.
- ▶ Managed a team of 2 professionals in the development of a prototype.

Technical environment:

No-Code:

Bubble.io

Cloud:

Azure AD, Power BI, Adobe Cloud, Google Cloud Run.

Other:

Whimsical.

Jul 2019 – Jul 2022 **Chief Technology Officer / Data Protection Officer** - Pixis (Paris, France)

Pixis provides white-label SaaS solutions in the career advice and coaching sector using ontologies for skills, Sustainable Development Goals and a chatbot that guides the user in interacting with the application.

- ▶ Elicited requirements and designed the software architecture and the roadmap.
- ▶ Supported pre-sales and key accounts.
- ▶ Managed concurrently up to 5 IT projects.
- ▶ Trained and onboarded junior and new employees.
- ▶ Designed new functionalities and products.
- ▶ Enforced GDPR and security constraints to the software product.
- ▶ Developed technical proof of concepts and key elements of new SaaS products.
- ▶ Led the team as SCRUM master and coach.
- ▶ Managed a group of 5 data scientists in a machine learning project to exploit available data.
- ▶ Designed and led implementation of a cross-cloud, white-label SaaS, based on microservices.
- ▶ Developed technical proofs of concept which then became the key elements of new SaaS products.
- ▶ Managed concurrently up to 5 complex projects based on microservices.
- ▶ Designed authorization flows with Identity Provider (Azure AD B2C).
- ▶ Designed and developed a tool to map ESCO ontology to ROME database.

Technical Environment:

Languages:

Java SE 17, Spring Boot, Angular 10, Python, Jupyter Notebook, Google Colab.

Middleware and Databases:

MySQL, Neo4J, MongoDB, REST API, OpenAPI, proprietary API Gateway.

Authentication:

OAuth 2.0, JWT, MS Authentication Libraries (MSAL), Azure AD, Single Sign-On, Azure AD B2C.

Cloud:

Google Cloud Platform, Azure, Docker, Docker Compose, Microservices, Terraform.

CI/CD:

Github Actions, Maven repository.

NLP / ML:

spaCy, Stanford NLP; scikit-learn, numpy, pandas.

Semantic Web:

Resource Description Framework (RDF), Apache Jena.

UX/UI:

Supervision of work in : Zeplin, Sketch.

Mar 2021 – Feb 2022 **Scrum Master and Agile Coach** - Cosys (Paris, France) - Freelance

The Flexup project proposes a SaaS product to implement a financial model for building and managing companies based on shared risk between participants.

- ▶ Provided agile coaching sessions to align strategic vision and technical developments.
- ▶ Introduced an agile process based on Kanban.
- ▶ Led Sprint meetings as Scrum Master.
- ▶ Created and maintained the company's knowledge base.
- ▶ Created and maintained the Roadmap.
- ▶ Facilitated the creation of specifications.

Technical Environment:

Vue.js, Storybook, Keycloak, Traefik, JSON-server, Droplets, Pulumi, Confluence, Vagrant.

Oct 2018 – Mar 2019 **CTO / Software Architect** - Stealth mode (Paris, France) - Freelance

Participated in the early-stage conception of a fintech startup specializing in loan syndication.

► Elicited requirements, designed the architecture and implemented a PoC of the solution.

Technical Environment:

Google Kubernetes Engine, Minikube, **Java**, **Spring Boot**, Docker.

Jan 2016 – June 2018 **Senior Software Engineer** - Eptica (Boulogne Billancourt, France)

Eptica provides AI-powered solutions, implemented in Java, for multichannel call centers exploiting proprietary natural language processing (NLP) technologies and collaborative intelligence.

► Improved and maintained, within a Scrum team, a suite of interacting applications, that constitutes about 80% of the enterprise revenue.

► Designed architecture, user stories and proof of concept for the introduction of linguistic-aware features on a CRM, like the Semantic Routing of messages.

► Led a cross-department project to improve security of applications, aligning them with OWASP recommendations and GDPR.

► Designed the architecture and developed a PoC of a user's actions tracking system for security auditing.

► Designed and implemented behaviour, integration and performance/load tests.

► Added security and code quality analysis within the continuous delivery pipeline.

► Designed and implemented an automated data migration process between major versions of a CRM.

► Performed penetration testing for security auditing of a CRM.

Technical Environment:

Languages:

Java SE 8.

Frameworks and Application Servers:

Spring, Spring Boot, Struts.

Middleware and databases:

PostgreSQL, MS SQL Server, Oracle DBMS PL/SQL, Elasticsearch.

Testing:

Behavior Testing: JBehave, Selenium WebDriver, Gherkin Notation; Integration Testing: **Testcontainers**,

Mock Testing: Mockito, Load Testing: Gatling, Unit Test: **JUnit**, Squash TM.

CI/CD:

Git, Jenkins, SonarQube, Sonar Quality Gates, automatic static analysis on local IDE, custom DORA-like metrics tracking, Metrics pack for SonarQube.

Security:

Dependency check sonar plugin, Security Assessment for SonarQube, OWASP ZAP, Wireshark, proprietary Auditing tool.

Cloud:

Docker, (Mesos, Marathon).

Other:

JIRA, Confluence.

NLP:

Usage of proprietary NLP engine and ElasticSearch.

Sep 2014 – Sep 2015 **Business Analyst / Software Architect** - 2Collaborate (Geneva CH)
2Collaborate works in complex socio-cultural contexts such as United Nations projects on global themes, promoting an innovative methodology called “Action Intelligence”.

► Designed and developed proofs of concept to implement the “Action Intelligence” methodology.

Technical Environment:

Language:

Java SE 7

Cloud:

Heroku

NLP:

IBM Watson NLU.

Other:

World Wind, Apache POI, graph libraries (Jung, Gephi, Ubigraph, sigma.js),

Mar 2013 – Aug 2014 **R&D Software Lead** - Terabee (St. Genis Pouilly, France)

Terabee collaborates with CERN in the market of drones and advanced sensors.

► Led a 4-member team in a project that involved smartphones and drones in the golf sector.

► Implemented a set of photogrammetry services (like 3D reconstructions and orthomosaics) which enabled the company to explore new business opportunities related to aerial inspection, in the field of biodiversity, cultural heritage and virtual tours.

► Designed experiments and developed a software tool in order to evaluate the accuracy of 3D reconstruction methodologies.

► Developed an application to configure an on-screen display for remote controlling drones.

► Developed an internal tool to manipulate point-clouds and meshes.

► Developed an internal tool to get online statistics from data received from a time-of-flight sensor.

Technical Environment:

Java SE 7, Python, Photoscan/Metashape, Pix4D, Meshlab, ArcGIS, QGIS, drone mission planners.

Sep 2010 – Nov 2012 **Software Architect / Project Manager** - italianaSoftware (Imola, Italy)

ItalianaSoftware created the first language for microservices [JOLIE](#), implemented in Java, in collaboration with centers of excellence ([INRIA](#), [SDU](#)) and an [international community](#).

► Led a team of 4 professionals in a 5-month project to replace a B2B platform for the management of suppliers and their aggregated product catalogs in the industrial metal components sector, migrating from an Oracle-based system to an open-source microservice solution.

► Accomplished an external consultancy as QA engineer in the mobile carrier industry, in a system with more than 500 services using Oracle Service Bus.

► Led the mission for the integration of jolie-lang microservices with an existing CMS from a partner.

► Designed and implemented a fail-safe, real-time data synchronizer between Microsoft SQL Server instances and Microsoft Dynamics for a multi-site office supplies eCommerce platform.

► Designed and implemented an application to convert the JOLIE type system into WSDL.

► Designed and implemented a tool to generate tests and documentation from the jolie-lang.

► Discovered, analyzed and fixed a memory leak in the early version of the jolie-lang language.

► Designed and developed microservice-oriented components for logging, scheduling/triggering of events and document elaboration, reusable in distributed cloud-oriented applications.

► Designed and developed custom Maven plugins for jolie-langauge.

► Developed the initial core of a web application for managing the accounting (timesheets) of consultants for a SAP partner company.

► Implemented two microservices compliant with EDI standards in a project involving ESB.

Technical Environment:

Languages:

Java SE 6-7, jolie-lang.

Middleware and Databases:

Web Services, SOAP, WSDL, Oracle Service Bus, Aqualogic, MS SQL Server, Tomcat, **PostgreSQL**.

Testing:

JUnit, SoapUI, proprietary tools for jolie-lang languages.

Front:

GWT, jQuery, Swing.

Others:

MS Dynamics, EDI/EDIFact standards, SAP iDOC.

Jun 2011 – Jun 2012 **Consultant / Resource Trainer** - GemBB (San Marino) - Freelance

GemBB is active in the sector of workplace safety, integrating legacy systems.

► Supervised the construction of 3 Extract-Transform-Load applications involving legacy systems.

► Mentored a developer by delivering targeted lessons and conducting pair programming sessions.

Technical Environment:

Java SE 6, Java libraries to connect with legacy technologies like: AS400, MS COM.

Oct 2009 – Aug 2010 **Analyst / Developer** - Gheotech (Cattolica, Italy)

Gheotech operates in the field of public utility distribution (water, optical fiber, gas), leveraging its proprietary Geographic Information System (GIS) and video surveillance server.

► Led up to 6 projects, coordinating 3 professionals and interacting with stakeholders.

► Doubled the performance of a video surveillance server in terms of real-time streams handling and supported camera types, leading to the acquisition of more client contracts.

Technical Environment:

Languages:

Java SE 6.

Application Layer:

Spring, JBoss, J2EE/EJB2, EJB3, JAX-RS, jBPM, Drools.

Middleware and databases:

Proprietary GIS, **PostgreSQL**, PostGIS,

Front / Presentation:

GWT, Ext.js, jQuery, JavaServer Faces (JSF).

Cloud providers:

Rackspace, VMware.

Libraries and protocols for video streaming

VLC, Red5, ffmpeg, Real Time Protocol, Real Time Control Protocol.

Others:

C++, BIRT (Business Intelligence Reporting Tool), VirtualBox.

Education & Qualifications

Professionally qualified as a Chartered Engineer in Italy.

Master's Degree in Computer Engineering, Bologna University, Italy.

Specialization: Systems and Applications.

Master's Thesis on Spring and OSGi.