# CHRISTOPH BURNICKI

Senior Software Architect, Engineer & Consultant

**Email**
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**Website & Portfolio**
www.christoph.burnicki.net

**Social**
LinkedIn profile

## Skills & Expertise

- AI Engineering & Consulting
- Backend Engineering
- Frontend Engineering
- Software Architecture

**Large Language Model (LLM) integration, Agentic AI, Model Context Protocol (MCP),** Python, NodeJS, TypeScript, Java/SpringBoot, HTML, CSS, React, Angular, Ionic & Capacitor, SQL & RDBS, Kafka, Docker, AWS, Cloud Services,...

## Education

**Theoretical Physics**
2016 - 2017
Masters Program, discontinued
Freie Universität Berlin

**Physics, B. Sc.**
2012 - 2016
Johannes Gutenberg-Univ. Mainz

**Economics, B. Sc.**
2010 - 2012
Johannes Gutenberg-Univ. Mainz

**Political Science**
2008 - 2010
Bachelors Program, discontinued
Johannes Gutenberg-Univ. Mainz

## Publications

How To Design Software Architecture For Startups

Micro Frontends With Ionic And Capacitor

Simplifying Service-to-Service Communication

Large Language Models And Commodity AI

An Introduction to TypeScript for Backend Development

*...more publications*

## Certificates

ISAQB Foundation Level Software Architecture

## Languages

English
German

## Experience

**Freelance Engineer & Consultant**
from 2024
based in Berlin

- 2025 - Design and development of an agentic AI coachbot for an education startup
- 2024/2025 - I consulted a leading global airline group on a more modern software architecture for some of their core services. This included the setup of a multi-tenant Angular application and an extensive redesign of part of their Spring backend services as well as their move to a new OpenShift cluster.

**Senior Consultant**
2018 - 2024
INNOQ Deutschland GmbH, Berlin

- Design and implement software architectures (monolithic, microservices and self-contained systems) for various clients
- Solve challenging engineering tasks
- Understand my clients business interests and find the best technical solution while keeping costs and resources in mind

*Java, Kotlin, Typescript, NodeJS, React, VueJS, Ionic, Python, Capacitor, MongoDB, PostgreSQL, Kafka, Redis, Cloud Services,...*

**Founder**
2019 - 2023
of the happs.app

- Developed an app and founded a startup together with my brother and a friend
- App development from a first user workshop to the successful launch in the app stores
- Took on many tasks from product design, feature planning, engineering, product launch and analyzing user retention
- The app eventually failed but learned more than on any other project
- We have since applied this knowledge for numerous clients

*Ionic/Angular, NodeJS/TypeScript, Flask/Python, MongoDB, Redis, RabbitMQ, Protease*

**Software Engineer**
2016 - 2018
Integral Learning GmbH, Berlin

- E-learning platform for mathematics
- Mostly backend and some frontend development
- Modernization of the company's monolithic codebase towards a container based microservice architecture
- First consulting experience with external clients.

*Java, Docker, PostgreSQL, MongoDB, NodeJS, TypeScript, Python,...*

**Software Engineer, Testmanager**
2011 - 2016
Textbroker EU, Mainz, part-time

- International operating content marketing platform
- Feature development (backend and frontend)
- Participated in the rewrite of the whole platform
- Testmanagement

*PHP, MySQL, HTML, JavaScript, CSS*

# PROJECT PORTFOLIO

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## Featured Projects

### AI-Powered Receipt and Invoice Processing Pipeline

2025 to 2026    Team: 3

Cloud

Design and implementation of a data processing pipeline that utilizes AI tools like embedding models and AI agents to automatically process large numbers of receipts and invoices with minimal human oversight. The system automatically extracts data from documents in various formats, performs data validation and cleaning, and uses AI-driven matching against large product databases. The system is built as an event-driven, Kafka-based, distributed architecture deployed in the cloud.

Responsibilities:

- System design and software architecture
- Event-driven architecture design using Apache Kafka
- AI agent integration for document processing
- Overall product design consultation

Apache Kafka    NodeJS    Kotlin    PostgreSQL    LLMs    AI

### Design and implementation of an agentic AI coachbot for an education startup

2025    Team: 4

Web

The task was to design and implement an agentic AI coachbot for an education startup. The coachbot will auto-adjust to the user's needs and select the best possible coaching path.

Responsibilities:

- Consultation on the product design.
- Consultation on the AI system design.
- Prototype implementation of the AI system.

AI    Python    NextJS    AWS    AWS Bedrock

## Systems Modernization for a Leading Global Airline Group

2024 to 2025    Team: 3

Web

The task is to modernize and redesign several core backend systems and to implement a multi-tenant Angular application. This also includes the move to a new OpenShift cluster.

Responsibilities:

- Modernization and redesign of several core backend systems
- Concept and implementation of a multi-tenant Angular application
- Move to a new OpenShift cluster

Angular    Spring    OpenShift

## Implementation of a Micro-Frontend Architecture using Ionic

2023 to 2024    Team: 6

Android    iOS

Our task is to roll out an existing internal application as a mobile app. In order to give the individual teams maximum independence in terms of development speed, choice of technology and deployment, an Android app consisting of micro front ends will be built first.

In addition to the usual challenges, such as avoiding cross-team version dependencies, special challenges arise with a mobile app compared to a web app, since only one app bundle is deployed.

Responsibilities:

- Design of a distributed frontend architecture
- Team coordination
- Frontend Development
- Cloud Service Consultation (Push Notifications)

Ionic    Capacitor    WebComponents    Micro-Frontends

## Design, Development and Rollout of a Social Networking App (häpps)

2019 to 2023    Team: 3

Android    iOS

The app is a social network that allows you to create and share events (happenings). The mobile app was developed cross-platform with Ionic for Android and IOS and rolled out, and includes a multitude of features such as wizards, friends lists, profile pages, searches, event creation, push notifications and chatrooms. The system is a complex distributed system interconnected by HTTP interfaces and message brokers.

Responsibilities:

- Planning and design of the app and its features
- Architecture design, backend and frontend
- Backend and frontend development
- Deployment and rollout of the app to the stores
- Monitoring and test management

Ionic/Angular    NodeJS/TypeScript    Flask/Python    MongoDB    Redis    RabbitMQ

### Concept, Development and Rollout of an Event App

2015 to 2018     Team: 3

Android          iOS          Web

The app shows a live map with various events in selected cities. The development of the Android/IOS apps was done cross-platform with Ionic. Various backend services have searched the Internet for events and extracted, categorized and prepared information using machine learning to centrally display it in the app.

Responsibilities:

- Planning of the app and its features
- Planning of the backend architecture
- Design, further development and tuning of the ML features
- Backend development
- Planning of the frontend architecture
- Frontend development
- Deployment and rollout of the app to the stores

Ionic/Angular     NodeJS/TypeScript     Java     Python     Machine Learning

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### Optimization and Further Development of a Telemedicine App

2020     Team: 6

Web

Assistance in the development of a telemedicine app for a startup. The app enabled doctors to communicate remotely and with emergency personnel on site, to record patient data and to prescribe medication. Challenges included the high requirements for data security, connection stability, and logging and traceability of internal processes.

Responsibilities:

- Backend development

NodeJS/Typescript     RabbitMQ     Redis     MongoDB

## Other Projects

### Concept, Development and Rollout of an Invitation App

2018     Team: 4

Web

Development of a web app that allows sending electronic invitations to private and commercial events. The web app allowed guests to respond to invitations and organizers to keep track of events and the responses of various guests.

Responsibilities:

- Feature planning
- Design of frontend and backend architectures
- Frontend and backend development

VueJS     NodeJS/TypeScript     Flask/Python     MongoDB

## Performance Optimization of Internal Systems for a Festival Organizer

May 2021    Team: 3

Web

The internal platform manages approximately 30k staff at the Fusion Festival. Just before the start of the festival, it became clear that the platform was not scaling with the enormous amounts of encrypted data and the large number of users. A special challenge was an unusual, sluggish architecture, which however was to ensure the high standards of data security for all participants. A series of workshops analyzed the problems and then made architectural and performance improvements until the platform scaled smoothly.

Responsibilities:
- Architecture analysis
- Performance optimization
- Database optimization

NodeJS    Redis    PostgreSQL

## Further Development of a Product Information Management System

2021    Team: 6

Web

The aim of the project was to replace the outdated Product Information Management System (PIM) as part of the redevelopment of the online store of a large fashion house. As part of the PIM team, we made further developments, adjustments and optimizations to ensure smooth operation.

Responsibilities:
- Backend development
- Frontend development

Spring/Kotlin    PostgreSQL    Apache Kafka

## Architecture Planning and Development of Internal Market Platforms for a Large Food Retailer

2018 to 2020    Team: 5 to 20

Web

Planning of an SCS landscape for the distributed architecture of an employee portal and a marketplace. Backend and frontend development in the individual SCS. Design of a distributed search engine.

Responsibilities:
- Development (BE & FE)
- Architecture planning

Spring/Java    NodeJS/TypeScript    ElasticSearch    MongoDB    PostgreSQL

### Transfer of an Existing E-Learning Platform to a Distributed Architecture

08.2016 to 09.2018   Team: 7

Web

To ensure the maintainability and further developability of a large e-learning platform, the monolith was broken down into several (containerized) subsystems, some of which were transferred to new technologies.

Responsibilities:

- Design and transfer of the system architecture
- Backend development
- Refactoring

Apache    Java, TypeScript    Docker    PostgreSQL, MongoDB

### Development of a LateX Web-IDE

03.2018 to 07.2018   Team: 3

Web

An existing desktop IDE for the creation, management, versioning and deployment of courses of an e-learning platform was redeveloped as a web-based IDE.

Responsibilities:

- Improvement of the system architecture
- Backend development
- Refactoring

Java    Docker    Angular    MongoDB

### Development of a New B2C Division Portal for an Online Retailer

03.2017 to 03.2018   Team: 4

Web

A prototype of a new B2C division platform was developed for a large, international auction platform.

Responsibilities:

- Design of the system architecture
- Backend development

NodeJS    MongoDB

**Further Development and Modernization of a Large Content Marketplace**

12.2011 to 06.2016     Team: 5 to 10

Web

Further development and modernization of a large, international content marketplace.

Responsibilities:
- Development (BE & FE)
- Feature planning
- Test management

Apache     PHP     HTML/JS/CSS     MySQL