

David Vanheeswijck

Principal Engineer

david@vanheeswijck.com • <https://david.vanheeswijck.com>

From pioneering the early web to engineering the future of enterprise AI.



ABOUT ME

As a Principal Engineer and veteran technologist, I architect and build future-proof systems that drive enterprise-scale innovation. My career has progressed from pioneering early web platforms to leading the development of sophisticated IaC, cloud, and AI solutions. At Nike, I pioneer the use of agentic AI and serverless architectures to transform global trade and customs operations. I excel at translating complex business strategy into production-ready systems and mentoring teams to deliver with excellence.

CONTACT

- +32 484 39 80 52
- david@vanheeswijck.com
- Bremstraat 2, 3530 Houthalen, Belgium

SKILLS

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| <ul style="list-style-type: none">AI / Agentic Workflow ArchitectureSystem & Cloud ArchitectureDatabricks & MLOpsInfrastructure as Code (IaC)Kubernetes & ContainerizationFull-Stack Modern WebCI/CD & DevOps StrategyData Modeling & Databases | <ul style="list-style-type: none">API Design (REST & GraphQL)Programming (Python, TypeScript, Java)Mobile ArchitectureLegacy System ModernizationTechnical Leadership & MentoringSecurity & AuthenticationSemantic Web Technologies |
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Education

Provinciale Hogeschool Limburg — A1 Analyste / Programmeur EHOKT

1997

Hasselt, Belgium

IUT de Nantes — L'année Post Premier Cycle Informatique

1995 – 1996

Nantes, France

ECIP — Certificate de European Community - Intensive Programme Erasmus

1996

Porto, Portugal

Work Experience

Nike — Principal Engineer, Global Customs & Trade

2024 – Present

Laakdal, Belgium

- Led the Principal Engineering strategy and delivery for critical global customs and trade capabilities across multiple international teams.
- Provided key AI guidance to business and engineering partners.
- Led an international tiger team on a critical Customs Compliance project.
- Designed technical architecture for compliance project using LangGraph.
- Initiated governance for SDLC across four global Customs and Trade teams.
- Laid foundation for the Trade Content and Classification project.
- Advocated for AI adoption within the organization.
- Created an expandable AI Orchestration Agent within Databricks.
- Designed a proof-of-concept agentic workflow to extract data from customs pre-entry documents with human-in-the-loop validation, integrated into the AI Hub frontend.

ExAd CommV — Founder & Principal Consultant

2022 – Present

Houthalen, Belgium

- Expert consultancy for short-term projects
- Specialization in web, mobile (iOS/Android), and 3D printing technologies
- Design of SDLC flows
- Migration projects
- Infrastructure as Code (IaC) implementation
- Cloud architecture design
- AI agentic workflow development

Work Experience

Nike — Principal Engineer, Transportation and Trade EMEA

2022 – 2024

Laakdal, Belgium

- Owned and delivered software solution design for 5 critical EMEA transportation teams, integrating core TMS systems.
 - Collaborated closely with business partners and engineering peers.
 - Helped establish standards for event-driven design.
 - Integrated TMS solutions from BlueYonder and Manhattan into the Nike landscape.
 - Assisted engineering teams in partnership integrations.
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Euricom — Architect

2018 – 2022

Mechelen, Belgium

- Provided expert architectural guidance to diverse clientele
 - Leveraged extensive senior development experience to inform strategic decisions
 - Facilitated knowledge transfer and skill development within client teams
 - Contributed to the successful delivery of complex software solutions
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Wolters Kluwer Belgium — Solution and System Architect

2012 – 2018

Mechelen, Belgium

- Designed and architected multiple core business applications still in use.
 - Contributed to the foundation of Wolters Kluwer Belgium's core business operations.
 - Developed expertise in folio and digital publishing systems.
 - Implemented advanced semantic content management systems.
 - Created sophisticated classification software solutions.
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4uWare NV/SA — Senior Developer and IT Architect

2007 – 2012

Mechelen, Belgium

- Consulted as a Senior Developer and IT Architect for various companies.
 - Developed a custom XML/XSLT-based WebCMS system.
 - Extended the WebCMS system to a fully functional CRM.
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Spirit Tek (Limited Company) — Senior Software Engineer

2000 – 2007

Nantes, France

- Spearheaded numerous software development projects as a consultant for Wolters Kluwer.
 - Achieved expert-level proficiency in web development technologies.
 - Became a specialist in XSLT/XML for complex data transformation challenges.
 - Contributed significantly to the technical success of various client initiatives over a seven-year period.
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AROL Informatique — Senior Developer

1999 – 2000

Carquefou, France

- Developed software for Credit Mutuel Anjou.
 - Contributed to a loan simulation project.
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Médiane Informatique (Groupe Sigma) — Senior Software Engineer

1997 – 1998

Ste Luce/Loire, France

- Developed CRM software solutions.
 - Became an Oracle expert, specializing in performance diagnostics.
 - Improved system performance through targeted interventions.
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3D Xmakina Infologies — Architect and Lead Developer

1996 – 1997

Nantes, France

- Independently designed and developed a hospital intranet application.
 - Gained foundational web architecture experience early in career.
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Philips Interactive Media Centre — Tester Digital Content

1994 – 1995

Hasselt, Belgium

- Gained early exposure to digital media assessment and quality assurance processes.
 - Developed an understanding of software ergonomics and user experience principles.
 - Contributed to the pre-release evaluation of interactive digital products.
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Projects

AI Agentic Trade Framework & OriginMate UI

2025-06-01

- Architected a production-oriented, multi-agent AI framework on Databricks for trade compliance.
- Designed the 'OriginMate' UI for human-in-the-loop validation of AI-extracted trade documents.

As the architect for this proof-of-concept, I designed a comprehensive solution to modernize Nike's trade compliance operations using agentic AI. The project consists of two core components.

The first is the **Trade AI Agent Framework**, a production-oriented, multi-agent system built on the **Databricks Mosaic AI Agent Framework**. I designed this framework to orchestrate complex workflows for legal research and document processing using **LangGraph**, with **Azure OpenAI** as the core LLM and **Unity Catalog** for data governance.

The second component is **OriginMate**, a user-facing web application that I designed in parallel. OriginMate serves as the "human-in-the-loop" interface for the AI framework, allowing trade compliance analysts to upload documents (like Certificates of Origin), review AI-extracted data, correct any low-confidence fields, and manage the approval workflow.

My role was to architect this entire ecosystem, ensuring the backend AI agents could seamlessly power a user-centric front-end, creating a powerful, scalable, and auditable solution for trade compliance.

databricks • langgraph • mlflow • azure-openai • python • unity-catalog • ai-ml • system-architecture • bff • rest-api • okta

Nike ARTA Trade Content Integration (Bi-Temporal PoC)

2025-05-01

- Designed an event-driven, bi-temporal data model to integrate trade content, preserving historical truth.
- Delivered a PoC laying the foundation for future RAG-based HS classification systems on AWS.

As the Principal Engineer and architect for this proof-of-concept, my objective was to design a future-proof solution for integrating critical ARTA trade content that was being missed by existing systems, which degraded data quality. The core architectural challenge was to handle data with both a business validity window and a transaction history.

I designed a **bi-temporal** data model to solve this, ensuring we could preserve historical truth while managing how data is seen at different points in time. I then built an event-driven ingestion pipeline using **Python** and **AWS Lambda** that performed idempotent upserts into Amazon **OpenSearch**, providing full auditability.

This PoC not only solved the immediate data quality problem but also established a scalable foundation for future **RAG**-based HS classification systems by creating a compliant, searchable, and vector-ready data store. It de-risked future AI enhancements and provided the team with a clear path forward.

python • aws-lambda • opensearch • event-driven-architecture • bi-temporal-modeling • rag-architecture • system-architecture

Customs Compliance Hub (CCH)

2025-06-01

- Architected a greenfield, future-ready platform for Nike's global trade and customs compliance.
- Pioneered the use of LangGraph to create an adaptable, agentic business workflow, moving away from hard-coded logic.

As the Principal Solution Architect for the Customs Compliance Hub (CCH), I was tasked with solving a core business challenge: Nike's trade processes were rigid and slow to adapt to a constantly changing global landscape. My role was to architect a new greenfield platform from the ground up. I led a "Trade Tiger team" to deliver the first production version, designing the complete technical architecture.

The most strategic decision I made was to use **LangGraph** as the core of an agentic workflow. This fundamentally decoupled the business logic, which is now defined in declarative **YAML** files, from the serverless execution engine on **AWS**. This architecture treats trade flows as configurable processes, not rigid code. **LangGraph's** graph-based structure and native state management were perfect for modeling complex, long-running customs procedures and paving the way for future AI capabilities like anomaly detection and predictive analytics.

I also established the technical standards for the project, authoring the messaging and error model guides, and owning the architectural repository. The platform includes a **Next.js** and **GraphQL**-based UI, creating a truly modern, scalable, and cost-efficient solution for global trade.

langgraph • aws-serverless • yaml • nextjs • graphql • ai-ml • system-architecture

PolyTech Immo Platform

2025-02-01

- Delivered a unified web + mobile platform for construction ops with robust auth, syncing, and reporting.
- Built offline-capable mobile workflows and automated PDF reporting, cutting field-to-office latency.

PolyTech Immo is a unified platform for construction and real-estate operations that centralizes project setup, building inventories, client management, resource catalogs, and on-site progress tracking across web and mobile.

The business need was to replace fragmented spreadsheets, photo silos, and inconsistent progress reporting that caused delays and billing inaccuracies. As Lead Full-Stack Engineer and Architect at ExAd, building for the client PolyTec (Feb 2025–May 2025), I owned system design, data modeling, and delivery across a Next.js web app, an Expo/React Native iOS app, and a Python-based reporting service.

I standardized data with Prisma on managed Postgres (Vercel Neon) to gain reliability and low operational overhead, deploying the web on Vercel for fast CI/CD. The mobile app used offline-first patterns with background sync to keep field teams productive without connectivity. This architecture delivered consistent APIs, predictable auth flows, and a modular domain structure for maintainability. The result was a measurable reduction in reconciliation errors and faster stakeholder visibility via automated PDF summaries—improving decision speed and client satisfaction.

nextjs • react • typescript • tailwind-css • prisma • postgresql • vercel • react-native • expo • python • system-architecture • data-modeling • devops

Resume Agent

2025-09-20

- Prebuilds and compresses a full resume PDF from markdown content and serves it via public assets.
- Chat agent generates a tailored resume and letter-of-motivation PDF with clear messaging.

As the architect and sole engineer for this personal branding project, my goal was to automate and scale my professional outreach. The business problem was simple: manually tailoring resumes and writing motivation letters is inefficient. I wanted to build a "digital twin" that could handle this on my behalf.

I designed a markdown-first content layer for all my professional data, ensuring it was portable and AI-ready. A key architectural decision was to create a CI/CD pipeline that uses **Puppeteer** and **pdf-lib** to pre-build and compress a master resume PDF during the static site build. This ensures instant delivery of my standard resume.

The core of the system is the AI agent, which I built with **LangGraph**. It uses my structured content as its knowledge base to generate fully tailored resumes and personalized motivation letters on the fly, directly responding to a recruiter's needs. This project is a practical demonstration of my skills in full-stack development, serverless automation, and the pragmatic application of agentic AI.

nextjs • react • typescript • tailwind-css • puppeteer-core • pdf-lib • langgraph • openrouter

GLXY Infrastructure Modernization

2024-07-01

- Automated shared Kubernetes infrastructure (Ingress, RBAC, NetworkPolicies, PVCs) with safe, idempotent playbooks.
- Delivered safe, automated EBS volume and Rancher upgrade procedures with rollback guidance.

The GLXY platform suffered from manual, error-prone operations for shared **Kubernetes** infrastructure and critical platform upgrades (**Rancher**, storage), creating risk and operational drag ahead of a planned divestiture. As the Infrastructure Architect and Lead Engineer, I designed and implemented a safety-first Infrastructure-as-Code (**IaC**) system centered on **Ansible** to solve this.

My key contribution was to introduce a modular, auditable, and repeatable process for managing the platform. I created idempotent **Ansible** playbooks that used dynamic inventory to manage shared Kubernetes resources like Ingress, RBAC, and Network Policies across all environments. A significant achievement was building an end-to-end automated workflow for **EBS** volume upgrades, which included pre-emptive snapshots, modification, and verification, complete with clear runbooks.

I also engineered a secure process for **Rancher** upgrades with pre-upgrade backups and defined rollback paths. The choice of **Ansible** was deliberate for its idempotency and agentless architecture, ensuring that every operation was safe and predictable. The result was a dramatic reduction in manual effort and risk, which standardized operations and significantly improved the reliability and predictability of the GLXY platform.

ansible • terraform • aws-ec2 • aws-ebs • aws-elb • rancher • kubernetes • jinja2 • yaml • bash • aws-cli • git • ci/cd • iac

Lyra

2017-01-01

- Led architectural design for a global classification software platform.
- Coached developers on modern frontend and backend best practices.

vuejs • vuex • nodejs • microservices • rabbitmq • marklogic • xquery • sparql • xslt • docker • ci/cd

Apollo

2016-01-01

- Led the migration of a key semantic publishing platform from on-premise to AWS.
- Designed the cloud-native architecture and planned all migration requirements.

aws • ec2 • s3 • docker • rancher • java • camel • marklogic • xquery • xslt

Connect

2015-01-01

- Architected and led development of a dynamic semantic publishing platform from the ground up.
- Implemented a cutting-edge stack including ReactJS, Redux, and a hypermedia REST API.

reactjs • redux • nodejs • marklogic • sparql • rdfa • xslt • rest-api

Content Selection Tool

2014-01-01

- Led the business analysis, architecture, and development of a user-facing tool for content selection.
- Built a rich client-side application that consumed the newly created Data API.

angularjs • bootstrap • jquery • nodejs

Data API

2014-01-01

- Designed a centralized metadata store using a microservice architecture.
- Integrated data from three disparate CMS systems into a single, queryable API.

mongodb • nodejs • rabbitmq • nginx • microservices • rest-api

Health Insurance Client Zone

2012-01-01

- Architected and implemented a centralized client zone website for a health insurance company.
- Integrated disparate data sources (SQL, Oracle, email) into a unified datastore.

drupal • mongodb • nodejs • expressjs

OXS - Online XML Store

2011-01-01

- Designed and developed a custom, reusable platform for rapidly creating and deploying web applications.
- The platform was XML/XSLT-based, a powerful paradigm for data-driven applications.

dotnet • sql-server • xml • xslt • extjs • jquery

Patient Management System

1997-01-01

- Designed and developed a pioneering intranet application for a hospital's Thoracic Transplantation Unit.
- Recognized as the first of its kind in France and featured in a magazine article.

delphi • oracle • pl/sql • isapi • activex • javascript
