

PROFESSIONAL PORTFOLIO REPORT

Process Excellence, Quality and Automation

Ayoub Mahdoudou

Industrial Engineer combining Lean thinking with IT and data

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Abstract: This portfolio presents an industrial engineer who connects process excellence, quality discipline and IT-enabled automation. The progression begins with shop-floor observation and SIPOC analysis at MARISA, advances to sales-process standardization and performance management at MFI Maroc, and culminates in a Heliconia Group project integrating aviation MRO–CAMO and Supply Chain data. The flagship work follows a DMAIC logic: diagnose fragmented processes, define requirements and KPIs, build governed data flows and applications, then validate calculations and user outcomes. Deliverables include a Python/Flask Fleet Digital Twin, two Power BI decision systems and a Node.js/SSE real-time fleet monitor. Evidence includes 12 AW139 aircraft monitored, 49 validated DAX measures, one-click LHD reporting and a PBH calculation checked to within \$0.03.

Index Terms: Lean, Process Excellence, Quality, Automation, Industrial Engineering, Power BI, Supply Chain, MRO–CAMO, Python, Digital Twin.

1 Professional Profile

I improve operations by connecting Lean process thinking with quality controls, data and automation. My method begins with the real process, including its customer, actors, flow, information, waste, risks and control points, before moving into standards, KPIs, data models and digital tools.

1.1 Value Proposition

I can carry an operational problem from Gemba observation and process mapping through root-cause analysis, requirements, architecture, development, calculation validation, user acceptance testing and delivery. The objective is not digitalization for its own sake: it is safer, more reliable and more efficient process performance.

1.2 Capability Map

Process	SIPOC, process mapping, DMAIC, flow analysis, standardization
Quality	KPI definitions, control rules, validation, UAT, traceability
Data	Power BI, Power Query, DAX, ETL, star schema, Excel/VBA
Automation	Python, Flask, pandas, Node.js, REST APIs, SSE, n8n
Operations	Supply Chain, MRO–CAMO, sales administration, production
Visual	Executive BI, maps, Three.js, Gantt, CAD/SolidWorks

2 Engineering Trajectory

2.1 MARISA · 2023–2024

Initiation internship in textile manufacturing: enterprise mapping, SIPOC analysis and documentation of a winter-coat production process.

2.2 MFI Maroc · 2024–2025

Application internship combining Sales Administration process design, structured Excel/VBA capture and Power BI performance management.

2.3 Heliconia Group · 2025–2026

Four-month final-year project designing and deploying an integrated digital-operations portfolio for AW139 fleet, CAMO and Supply Chain activities.

2.4 Independent Development

Self-directed projects extend this operational foundation through BI cases, workflow automation, visual analytics and advanced CAD.

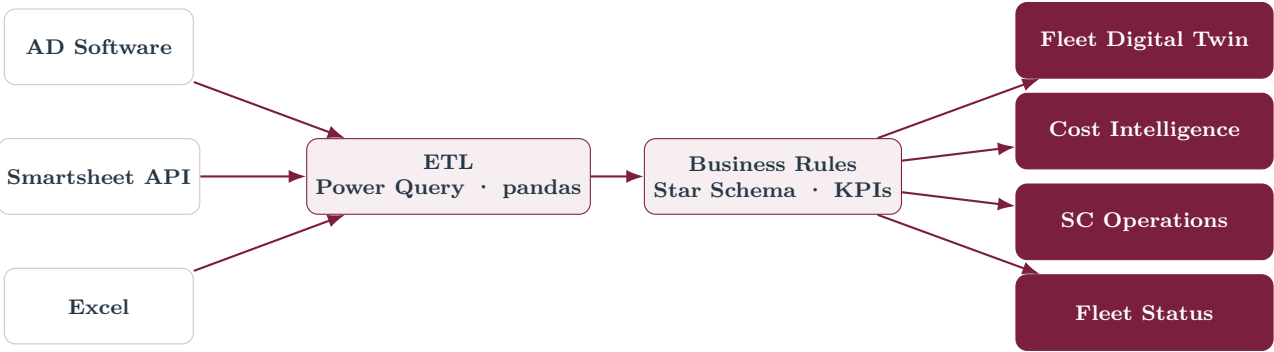


Figure 1. Flagship solution architecture: enterprise sources, transformation and decision products.

3

Flagship Project: Heliconia

— FINAL-YEAR ENGINEERING PROJECT

Digitalization of MRO–CAMO and Supply Chain Performance

Heliconia Group · 2025–2026 · Four months

Heliconia Group operates 15 helicopters, including 12 AW139 aircraft deployed in Senegal, Ghana and Nigeria. The project scope covered the AW139 fleet. Operational information lived across AD Software, Smartsheet and Excel with no shared integration layer. Events were entered twice, Supply Chain KPIs were not standardized, and fleet surveillance was performed manually.

3.1

Mission and Ownership

The mission was to build a shared digital decision layer without replacing the existing operational systems. My ownership included diagnosis, requirements, KPI defini-

tion, data modeling, architecture, development, UAT, calculation validation, RLS, LAN deployment and documentation.

ENGINEERING RESULT. Four operational deliverables were deployed through five agile sprints; an additional integrated planning platform was developed as a prototype extension.

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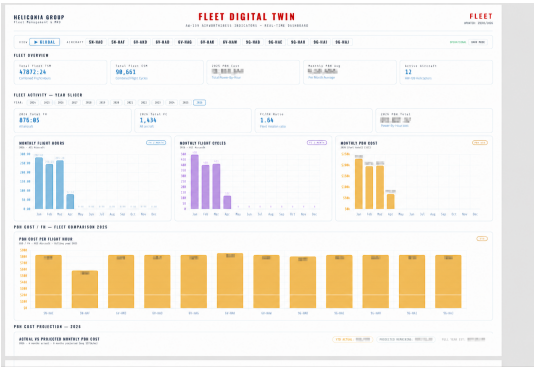
Fleet Digital Twin

— DELIVERABLE 1

CAMO Cost and Airworthiness Intelligence

Python · Flask · pandas · Chart.js

The internal Flask application consolidates fleet and aircraft-level information, applies PBH business rules, visualizes flight-hour and cycle histories, and generates the monthly Landing Hour Detail report.



Fleet-level PBH and operational overview



Aircraft deep dive: flight history, rolling average and threshold

Figure 2. Fleet Digital Twin: complementary fleet overview and aircraft-level analysis in the Flask application.

4.1

Technical Contribution

The application separates extraction, business calculation and presentation logic. This makes regulated calculations testable and allows the internal tool to operate over the company LAN without requiring a new cloud platform.

ENGINEERING RESULT. The PBH calculation was validated to within \$0.03. A monthly LHD preparation process previously reported as approximately three hours became a one-click workflow.

5 Supply Chain Cost Intelligence

— DELIVERABLE 2
Consolidated Cost Dashboard

Power BI · Power Query · DAX

Four coordinated report pages provide a common view

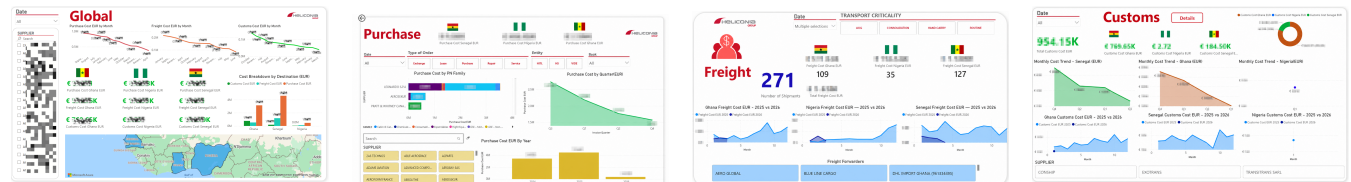


Figure 3. Cost intelligence report family: global, purchasing, freight and customs views.

ENGINEERING RESULT. Management gained its first consolidated view across the three major Supply Chain cost families, with consistent filters and business definitions.

6 Supply Chain Operations

— DELIVERABLE 3
Operational Control Tower

Power BI · Lead-Time Analytics · DAX

The control tower supports daily exception management and performance review. KPIs include phase-level lead time, ETA respect rate, order priority (AOG, Critical, Rush, Routine), buyer performance and workload.

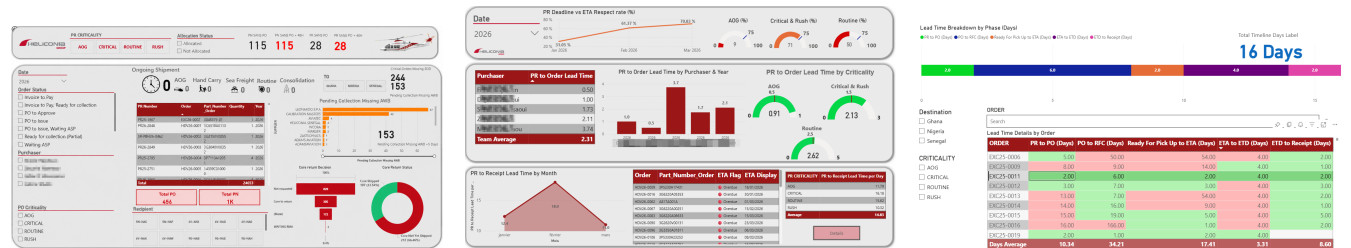


Figure 4. Operational, management and timeline perspectives of the Supply Chain control tower.

ENGINEERING RESULT. Shared definitions and a common operating picture replaced department-specific interpretations of Supply Chain performance.

7 Real-Time Fleet Status

DELIVERABLE 4 AW139 Monitoring System

Node.js · SSE · Smartsheet REST API

The monitoring service retrieves and normalizes oper-

ational status through the Smartsheet API, then pushes updates to browser clients through Server-Sent Events. A complementary Power BI view supports management analysis.

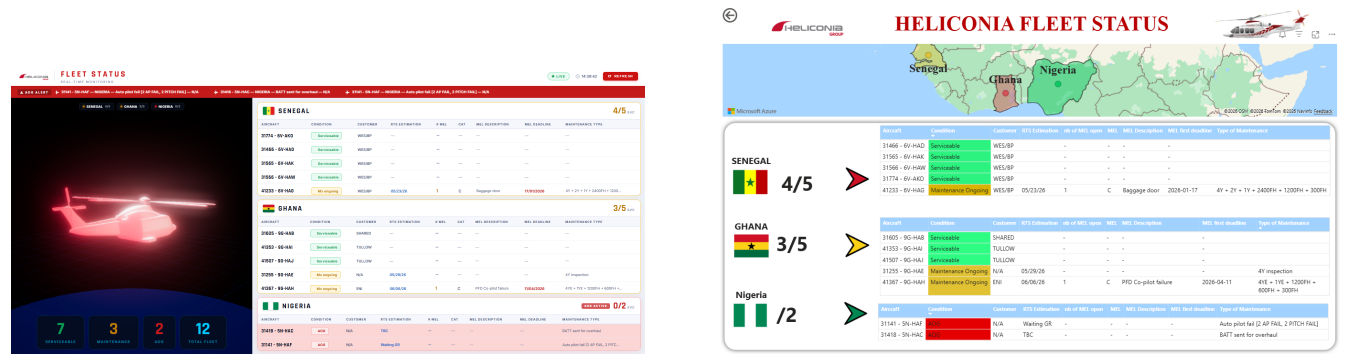


Figure 5. Correctly separated Fleet Status interfaces: real-time web operations and Power BI management reporting.

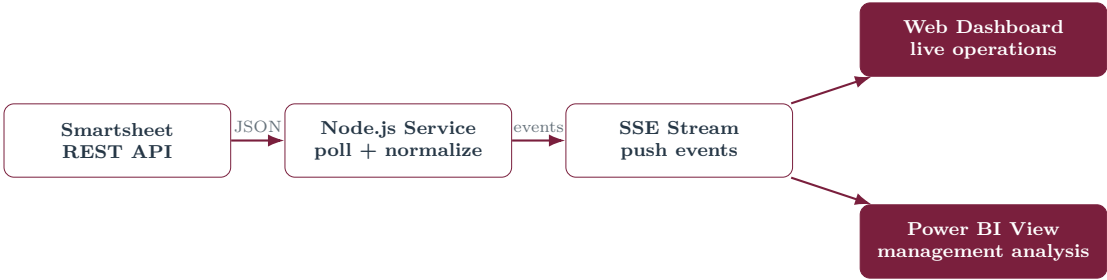


Figure 6. Real-time fleet monitoring architecture.

ENGINEERING RESULT. Automated browser-based surveillance covers all 12 aircraft in project scope and reduces dependence on recurring manual status checks.

8 West Africa Platform
— PROTOTYPE EXTENSION
Integrated Helicopter Fleet Planning

3D Interface · Gantt · Predictive Limits · AI Assistant

This project is distinct from the Fleet Status deliv-

erable. Its black 3D interface is the main shell for a wider operational product combining availability analysis by customer and country, predictive maintenance limits, a 12-month Gantt plan with PDF export, and a natural-language assistant.

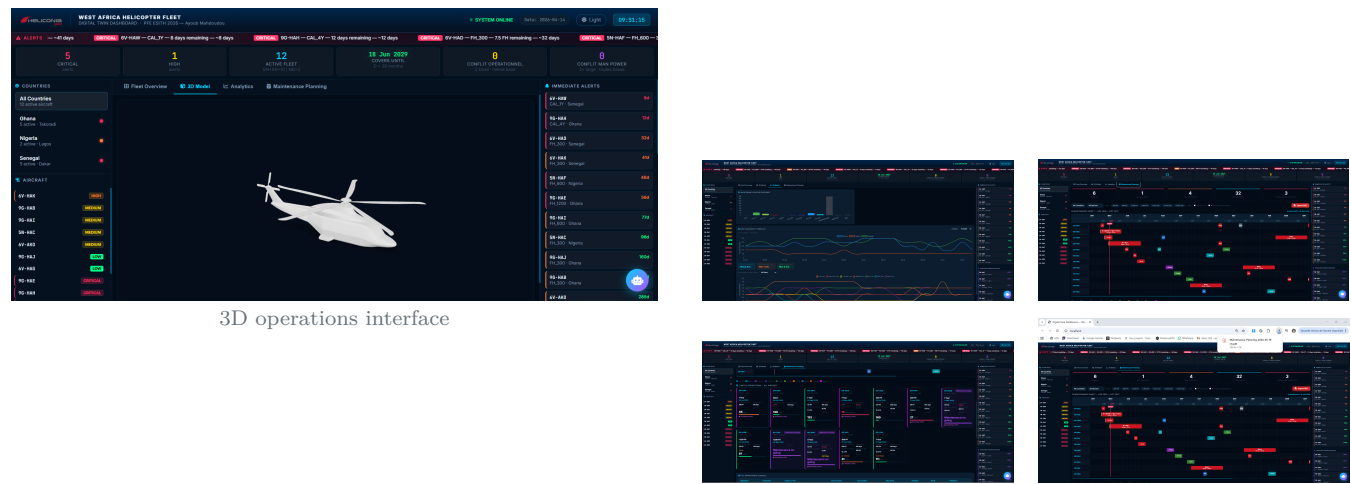


Figure 7. West Africa Helicopter Fleet platform and its analytical/planning modules.

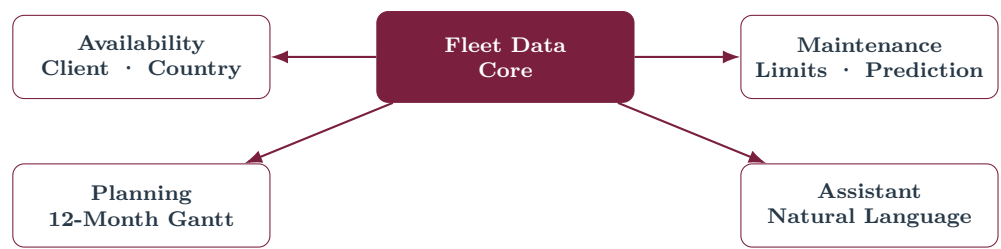


Figure 8. TikZ product architecture for the integrated planning prototype.

9 MFI Maroc Internship
— APPLICATION INTERNSHIP
Sales Process and Performance Management

Excel/VBA · Power BI · Power Query · DAX

Sales tracking relied on distributed files, while Sales

Administration workflows needed clearer structure and traceability. I analyzed the commercial and ADV processes and formalized flows for new contracts, amendments, delivery/installation, demo/test machines and waiting status.

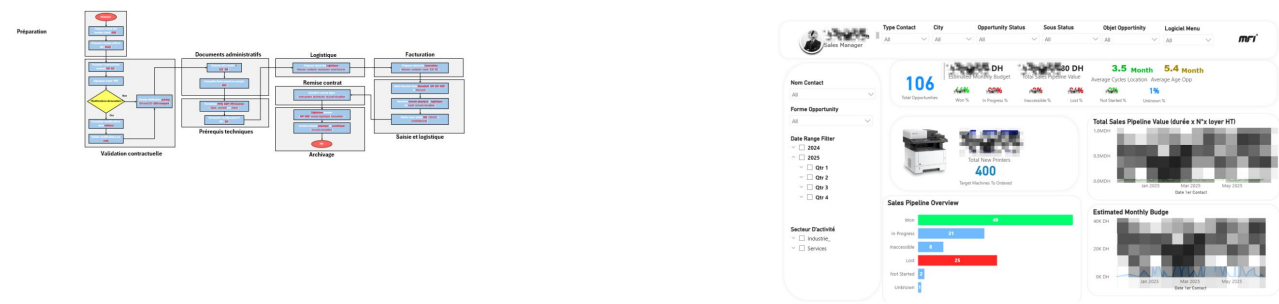


Figure 9. MFI Maroc: process formalization and the resulting management dashboard.

The solution combined structured Excel/VBA capture, Power Query transformation and a Power BI decision

layer. Measures addressed opportunities, pipeline value, conversion, monthly targets versus actuals, sales trends and prospect response time.

ENGINEERING RESULT. The project proves an end-to-end logic: map the business process, improve capture, transform the data and expose role-specific decision information.

10 MARISA Internship

— INITIATION INTERNSHIP

Textile Manufacturing Process Analysis

Shop-Floor Observation · SIPOC · SWOT

The internship mapped an integrated garment-manufacturing environment and analyzed the production process of a BALIBARIS winter coat. The study covered development, material preparation, spreading, cutting, sorting/bundling, fusing, assembly, finishing and quality control.

SIPOC models clarified interfaces across development, the fabric/accessory store, the cutting area and sewing chains. The work also reviewed layout, machines, maintenance, training and the organization of production.

ENGINEERING RESULT. This first industrial experience established the process literacy behind later digital work: operational data is useful only when its source, transformation and customer are understood.

11 Lean + IT Operating Model

1. **Observe the process:** Gemba, SIPOC and stakeholder voice.
2. **Diagnose performance:** waste, delays, variation, risk and root causes.
3. **Define quality:** standards, KPIs, controls and traceability.
4. **Automate selectively:** remove duplicate entry and repetitive handling.
5. **Validate and sustain:** calculation checks, UAT, access rules and documentation.

ENGINEERING RESULT. The target is a controlled process with better flow and faster decisions. Digital tools are enablers of the improvement system.

12 Evidence Matrix

Diagnosis

MARISA process study; MFI ADV mapping; Heliconia data-silo analysis

BI Design

Sales, HR, cost, operations and fleet dashboards

Modeling

Power Query, star schema, 49 validated DAX measures

Software

Flink digital twin and Node.js/SSE monitoring

Integration

AD Software, Smartsheet REST API and Excel

Assurance

PBH validation, UAT, traceability and RLS

13 Engineering Synthesis

My contribution is the combination of Lean reasoning and IT execution: observe the operation, map the flow, identify waste and risk, define quality controls, structure the data, automate the right tasks and validate the outcome. Technology is selected only after the process and its quality requirements are understood.

Contact

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14 Independent Learning



Plant Co. · Business Intelligence

Power BI analysis of quantity, gross profit and sales across 2022–2024 by country, account, product and channel. Waterfall, trend and correlation views support growth decisions.



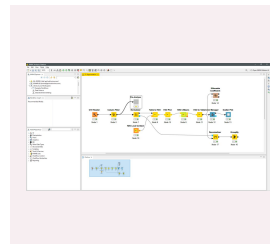
CIB · People Analytics

HR dashboard covering absence periods, trial-period analytics, attendance and time tracking. This demonstrates the transfer of BI modeling to workforce decisions.



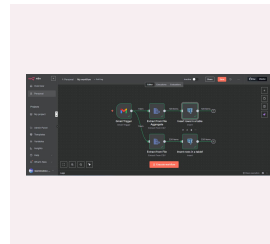
SolidWorks · Jet Engine

A 3D jet-engine model built with advanced sketches, surfaces and feature-based solids to strengthen geometric reasoning and disciplined CAD construction.



KNIME · Visual Analytics

Node-based experiments in modular, inspectable preparation and analytical workflows. The visual pipeline makes data transformations explicit and reusable.



n8n · Workflow Automation

Experiments connecting triggers, routing, transformations and actions into repeatable workflows. Presented as capability-building work rather than production deployment.

15 Certifications & Continuous Learning

These credentials reinforce the portfolio’s central theme: an industrial engineer combining process improvement, quality, analytics and automation. Titles are reproduced from the confirmed LinkedIn certification list.

15.1 Data, BI & Digital Foundations

BUSINESS INTELLIGENCE
Microsoft Power BI Data Analyst Specialization
BUSINESS PRODUCTIVITY
Excel Skills for Business Specialization
DATA ANALYTICS
Data Analyst Associate
PYTHON & DATA
Python Data Fundamentals
DATABASES
Introduction to Databases for Back-End Development

Engineering Relevance

Analyze	Power BI, Excel, Python and database foundations support reliable decision models.
Improve	Lean waste identification connects operational diagnosis to measurable action.
Digitalize	Digital manufacturing and SAP MM connect improvement work to industrial systems.
Communicate	Negotiation and Business English strengthen adoption across functions.

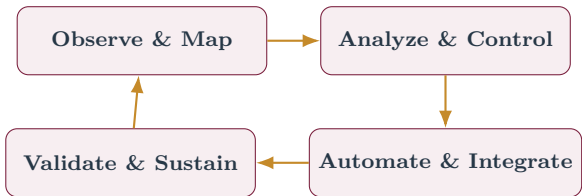
Lean, Manufacturing & Business

QUALITY IMPROVEMENT
Six Sigma Green Belt Specialization
LEAN PROCESS IMPROVEMENT
The 8 Wastes of Lean
INDUSTRY 4.0
Digital Manufacturing & Design
ENTERPRISE SYSTEMS
SAP MM End User

Communication & Applied AI

GENERATIVE AI
Prompt Engineering: Generative AI for Marketing & Advertising
PROFESSIONAL SKILLS
Negotiation Training
BUSINESS COMMUNICATION
Business English: Meetings

Capability Chain

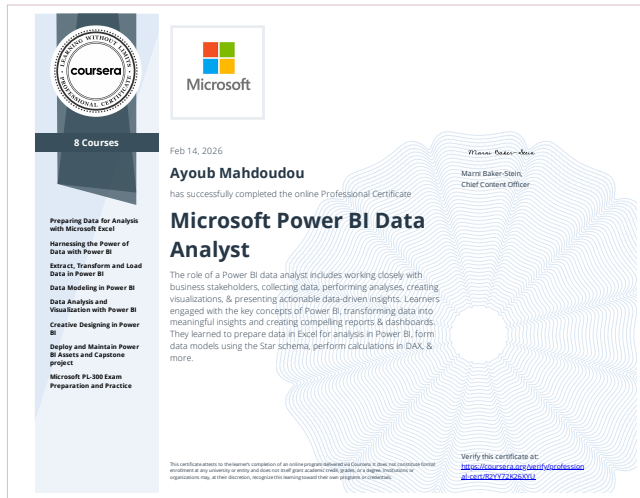


The certification portfolio is intentionally cross-functional. It supports a complete improvement cycle, from understanding waste and process requirements to building analytical solutions, integrating enterprise data and communicating change.

Credential profile
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16 Selected Credential Evidence

The following certificates document seven core capabilities used throughout this portfolio: business intelligence, spreadsheet engineering, data analysis, Python, digital manufacturing, structured quality improvement and enterprise systems.



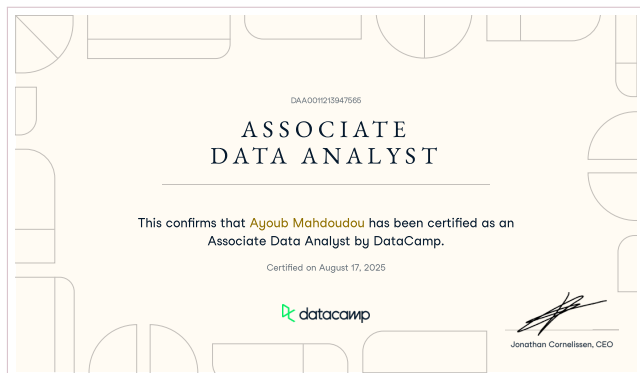
Microsoft Power BI Data Analyst

Microsoft Professional Certificate on Coursera, February 14, 2026



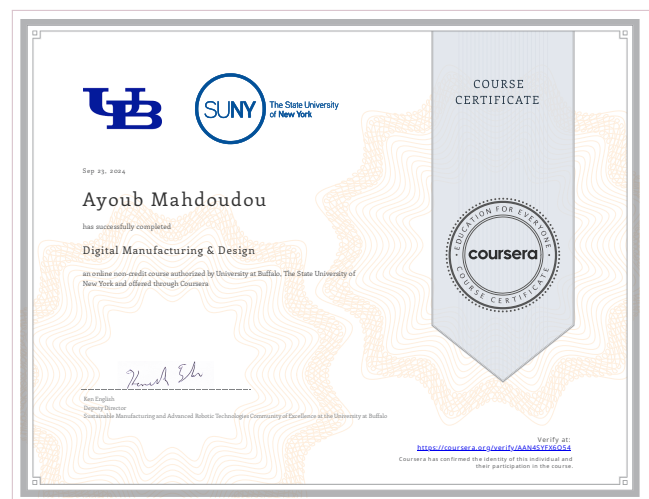
Excel Skills for Business

Macquarie University Specialization on Coursera, January 29, 2026



Associate Data Analyst

DataCamp certification, August 17, 2025



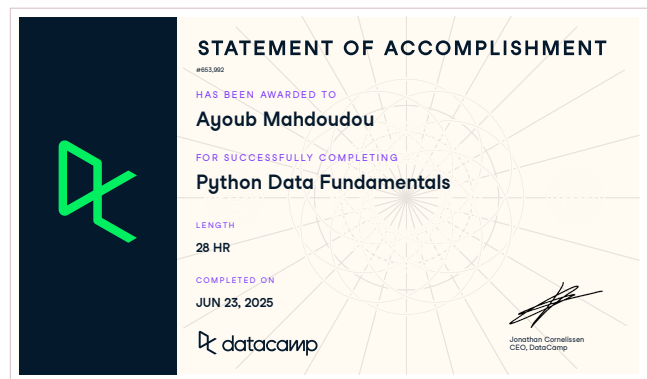
Digital Manufacturing & Design

University at Buffalo course on Coursera, September 23, 2024



Six Sigma Green Belt

Kennesaw State University Specialization on Coursera, July 28, 2026



Python Data Fundamentals

DataCamp certificate, 28 hours, June 23, 2025



SAP MM End User Training

Q'work and ESSOR Junior Enterprise participation certificate, SAP S/4HANA 1809, December 2023