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AP Angst+Pfister

Bringing machine learning to the shopfloor

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David Bader
Head of Architecture | Aveniq

Aveniq Business Summit | 2. September 2024

Your speakers today

We are pleased to welcome you here

Quentin Bauden
Chief Information Officer
Angst+Pfister Group

David Bader
Head of Architecture
Aveniq

Agenda

- **Who is Angst+Pfister**

- Angst+Pfister and Aveniq

- Our challenge

- Our solution approach

- Key take-aways

We are Angst+Pfister

The innovation development partner for elastomeric materials and industrial components
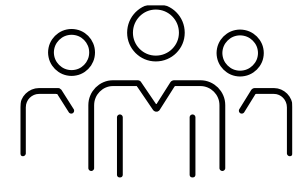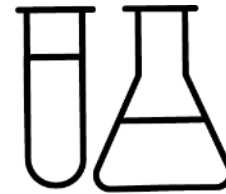
Founded in 1920

Over 1500 employees

Global team in over 24 sites in Europe, the US and Asia

3 dedicated R&D centers and over 200 engineers in the field

7 logistic centers on 3 continents

Thousands of engineering solutions developed every year

We built deep application expertise centered around elastomeric materials …
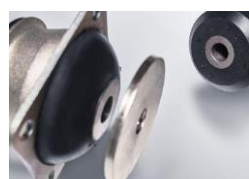
Engineering Plastics Parts

O-rings & Moulded Parts

Rotary & Linear Sealing

Fluid Handling Solutions

Mechanical Drive Solutions

Antivibration Solutions
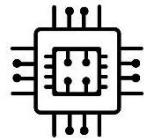
Elastomeric Compounds

Sensors & Power Solutions

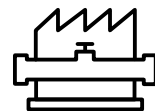# … and offer our expertise to players in the major industries:
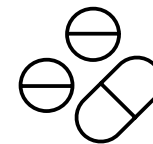
Agriculture & Construction Machinery

Railway

Semiconductors

Automotive & E-Mobility

Food & Beverage

Pharma & Medtech

Oil & Gas

Process Industry

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Angst+Pfister and Aveniq

A sustainable, strong partnership

The Roadmap

2009
- 1st gen outsourcing
- 1st external customer of Aveniq

2014
- Contract renewal
- Infrastructure renewal
- Global MPLS Network
- WAN Optimisation
- Fat Client and VDI
- Onsite Support

2019
- Contract renewal
- Migrate to Aveniq Swiss Cloud
- Cloud Managed Workplace
- Global Security Zoning
- MDR, NGF
- IAM and Automation

2024
- Contract renewal
- Migrate to Next Gen Aveniq Cloud
- Security enhancements, NAC
- Optimised footprint
- Cloud integration
- IoT / IoT Security

- Global Digital Services
- Multi-Cloud integration
- Decentralisation
- More M&A's

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The Vision

Bring Machine Learning to the shopfloor

- **Collect** data along manufacturing process
- **Analyse** collected data using Machine Learning (AI)
- **Send** real-time insights to engineers and operators
- **Increase** quality and efficiency of Angst+Pfister production

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11

The Journey

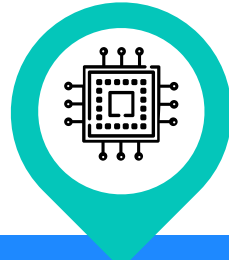**Discovery**
Feb. 23 – Oct. 23
- What data can we get from production?
- How do we set up a connection to retrieve data?
- How can we use the data?

MVP 0 – Turkey
Oct. 23 – Nov. 23
- Collecting data from 2 machines using OPC-UA, Telegraf & InfluxDB
- First data analysis and real-time visualisation
- POC on real-time downtime notifications

MVP 1 – Italy
Dec. 23 – Apr. 24
- IIoT Device installation in Italy integrated in corporate network (RevPi)
- Concrete data analysis: identify shots, isolate outliers, deviations, errors etc.

MVP 2 – Cloud
May 24 – Aug. 24
- Move to AWS (S3, SiteWise, Lambda)
- First attempt with ML for real-time analysis and notifications
- Replace IIoT with Onlogic ML510G-50

MVP 3 – ???
Sep. 24 – Dec. 24
Definition of MVP 3 will depend on the success of MVP 2 (connect more machines, factories...)

The digital products that will make Angst+Pfister factories more efficient and increase revenue

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Engineer, build and integrate

How it started (Aveniq view)

The tire swing cartoon… you all know it

1st touchpoint with Aveniq – a special C-Level project (Feb 2023)

Meeting with data analyst and computer scientist

1st view on planned solution (collect machine data and analyse in Cloud) / (Cloudera)

Proposed a solution approach (Aveniq and Angst+Pfister P CISO)

Project went under radar

Autumn 2023 - project resurfaced with different team
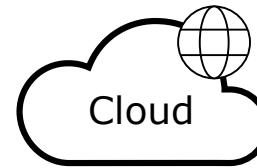
Different views
Data analyst's view

The data analyst

- Machine sends data to the Cloud
- Data is analysed in the Cloud
- Data is visualised in the Cloud
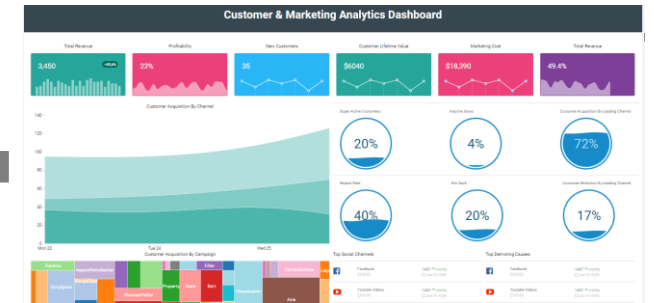- Site manager consumes visualised data

How the customer explained it

Get infos from dashboard

Cloud

Data analysis

Send data to Cloud

Production site

Different views
Developer's view

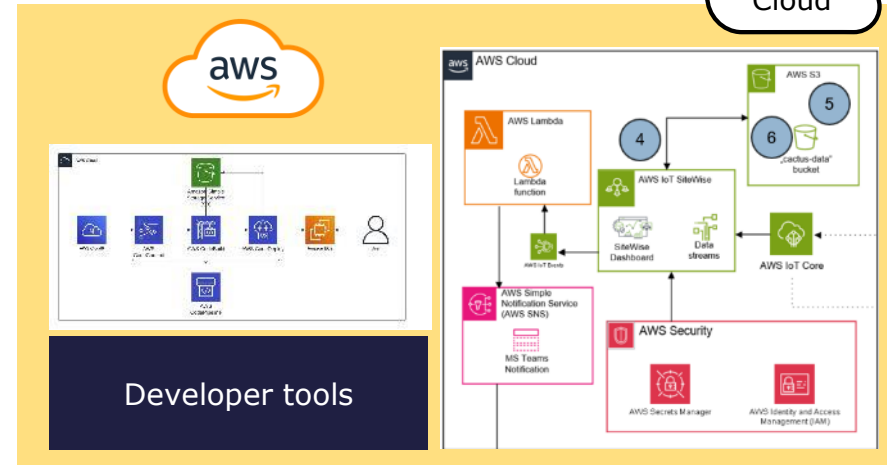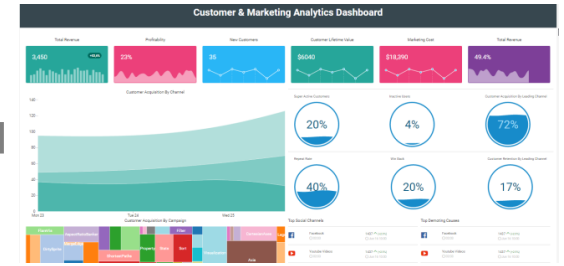How the project leader understood it

The developer

- Data sent to the Cloud
- Portfolio of AWS/Azure available to build logic
- Use my development stack/tool and pipeline

Get infos from dashboard

Cloud

Developer tools

Data analysis

Send data to Cloud

Production site

Different views
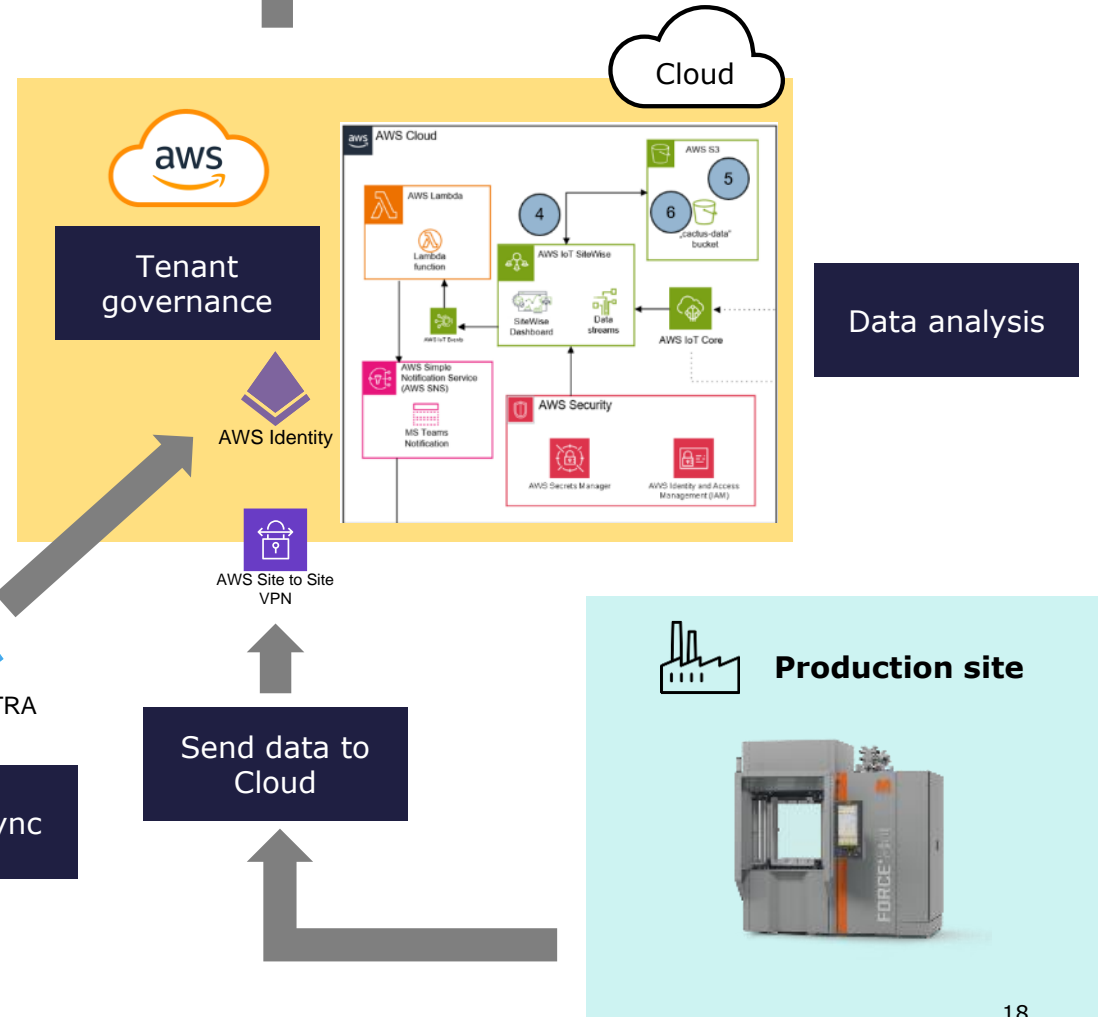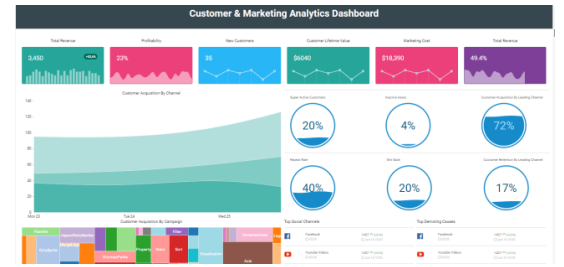## Cloud architect's view

How the analyst designed it

The cloud architect

- Connect different Clouds
- Synchronise identities
- Connect Cloud to every site
- Manage devices from Cloud

Get infos from dashboard

Cloud

aws

Tenant governance

AWS Identity

Data analysis

AWS Site to Site VPN

Azure ENTRA ID

Avenig Private Cloud (CH)

AD Domain Services

DMZ zones

Internal security zones

Business applications

Enduser Virtual desktop

Private Cloud

Identity sync

Send data to Cloud

Production site

Different views

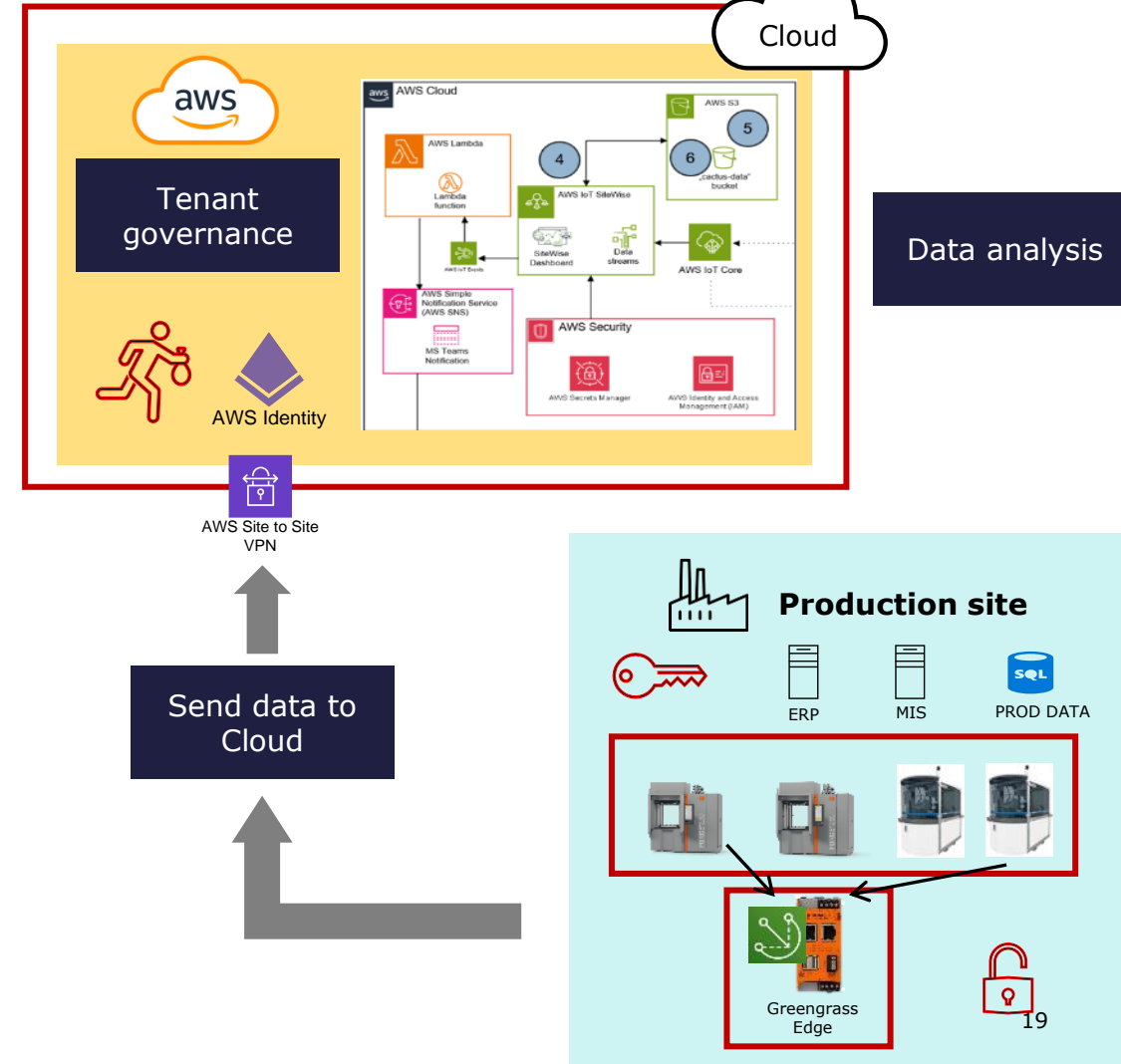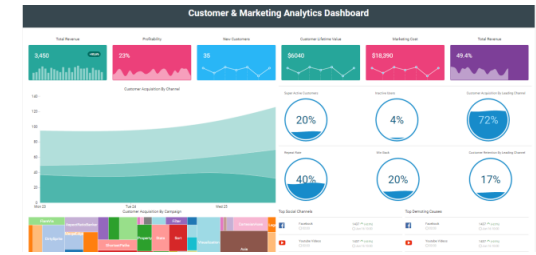## CISO's architect's view

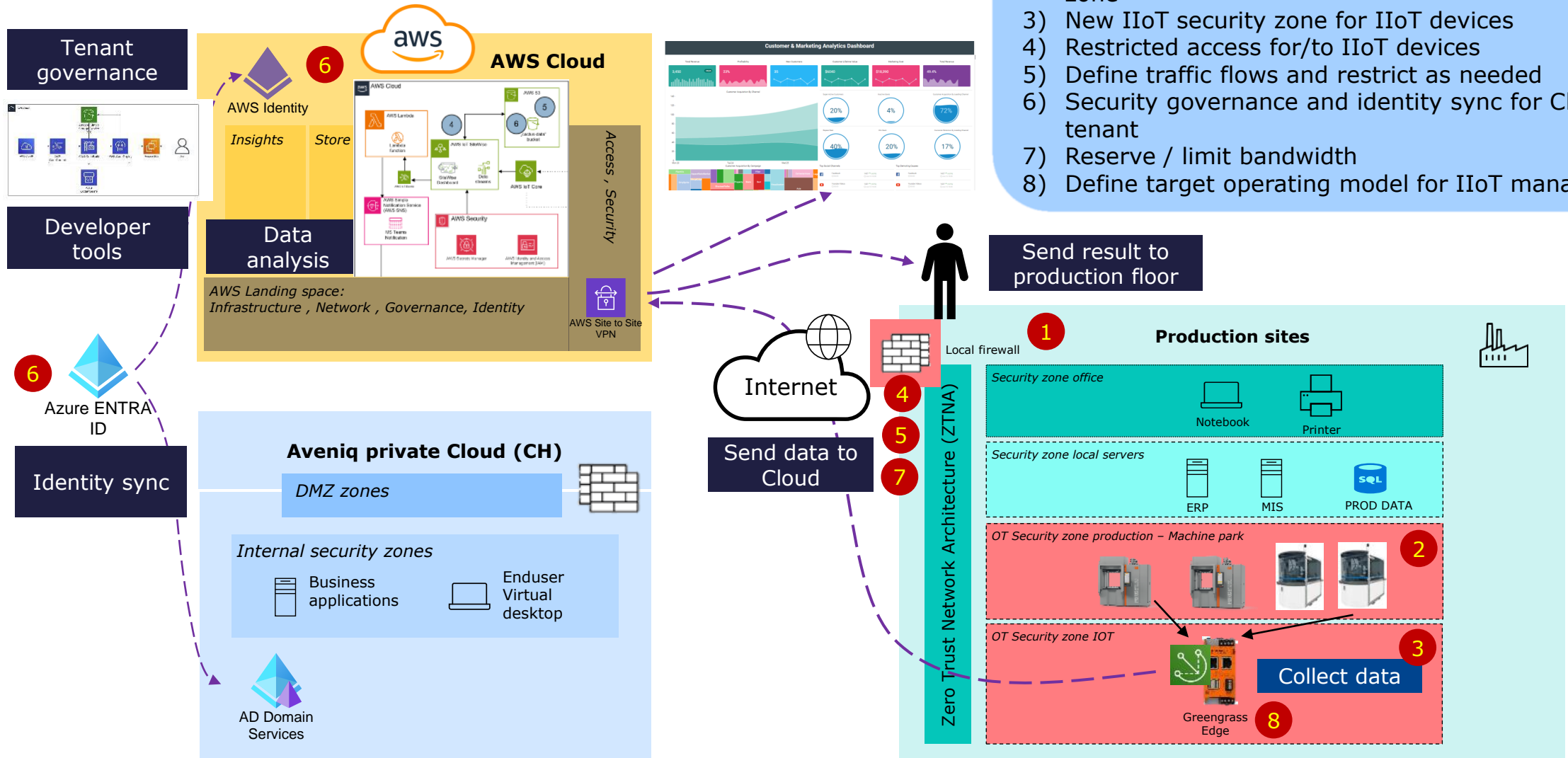How the programmer wrote it

The CISO

- Legacy machines with old OS on our production network
- New "black-box" IIoT devices in our network
- Data transferred to Cloud, what data?
- How is security maintained in the Cloud?
- Using same network and access might impact production
- Who will manage the IIoT Devices and the Cloud?

Get infos from dashboard

Cloud

Tenant governance

AWS Identity

Data analysis

AWS Site to Site VPN

Send data to Cloud

Production site

ERP   MIS   PROD DATA

Greengrass Edge

Bringing it all together

Action plan

1) Implement Network Access Control (NAC)
2) Isolate Legacy machines with old OS in production zone
3) New IIoT security zone for IIoT devices
4) Restricted access for/to IIoT devices
5) Define traffic flows and restrict as needed
6) Security governance and identity sync for Cloud tenant
7) Reserve / limit bandwidth
8) Define target operating model for IIoT management

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Key take-aways

What we learned and improved along the way

Staff your project with the right skills

- Nominate a product owner
- Recruit the skills you miss
- Ensure SME availability
- Find the right partners

Manage all stakeholders

- Align expectations early on across stakeholders
- Agree on the expected outcomes of each MVP
- Keep communication flowing

Start small, adapt, pivot, scale

- Start small to prove feasibility
- Consider scalability in design (MVP, PoC)
- Fail fast and pivot

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Haben Sie Feedback für uns?

Herzlichen Dank