Bell Labs Consulting

From NOC to SOC to AI-supported ops

Ronald Hasenberger

16. Sep. 2025

Agenda

1 **BLC Introduction**

Who is Bell Labs Consulting

2 Operating Model evolution

NOC to SOC to Autonomous Networks

3 Autonomous Networks

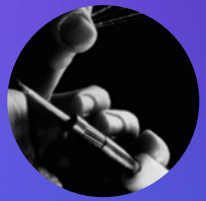
Incorporating AI into the Operating Model to achieve autonomy

An unrivalled track record of driving innovation that changes the way we live, work and communicate

Transistors

Information Theory

Solar cells



Laser/fiber optics

Satellite communications

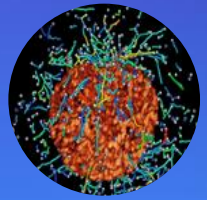
Charge-coupled devices

Unix/C/C++

Coherent optics

Cellular communications

Neural networks



Super-resolution microscopy

Multi-antenna systems

Global recognition for ground-breaking discoveries

1 Nobel Prizes

5 Turing Awards

5 Draper Prizes

1 US National Medals of Science

0

12 US National Medals of Technology & Innovation

3 Japan Prizes

3 Technology Emmy® Awards

2 Grammy Awards

1 Oscar

4

Bell Labs Consulting enables bold technology strategy decisions, shaping the future of industries that help the world act together

Networks and operations strategy

- Future-proof network architecture
- Network operation and organization strategies
- Cloudification and automation foresight and impact

Techno-economic & business modelling

- Cost improvement maximization
- Monetization analysis
- New business models creation

Business transformation

- Detailed transition plans
- Strategic partnership models
- Merge and infrastructure split analysis

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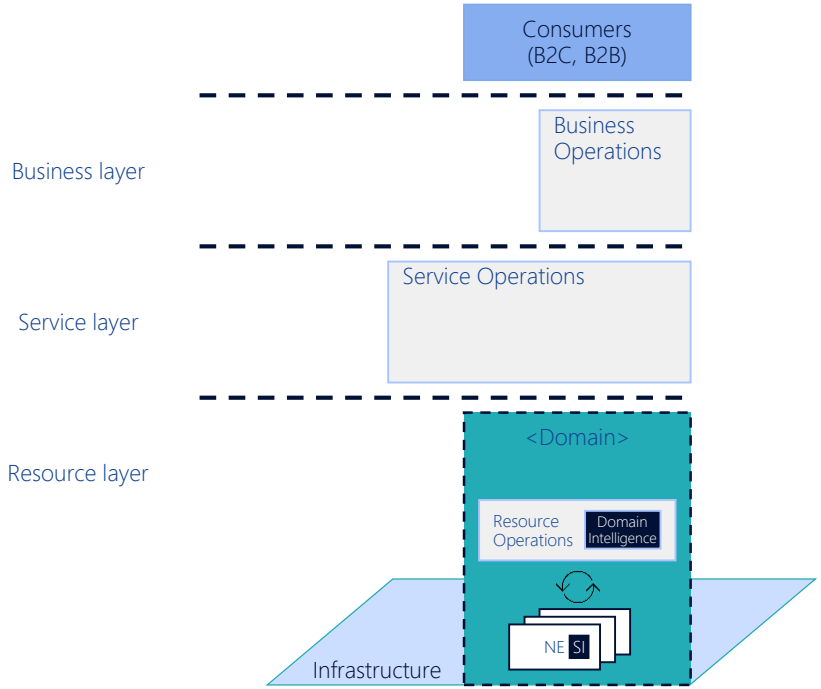
Structuring the operating model



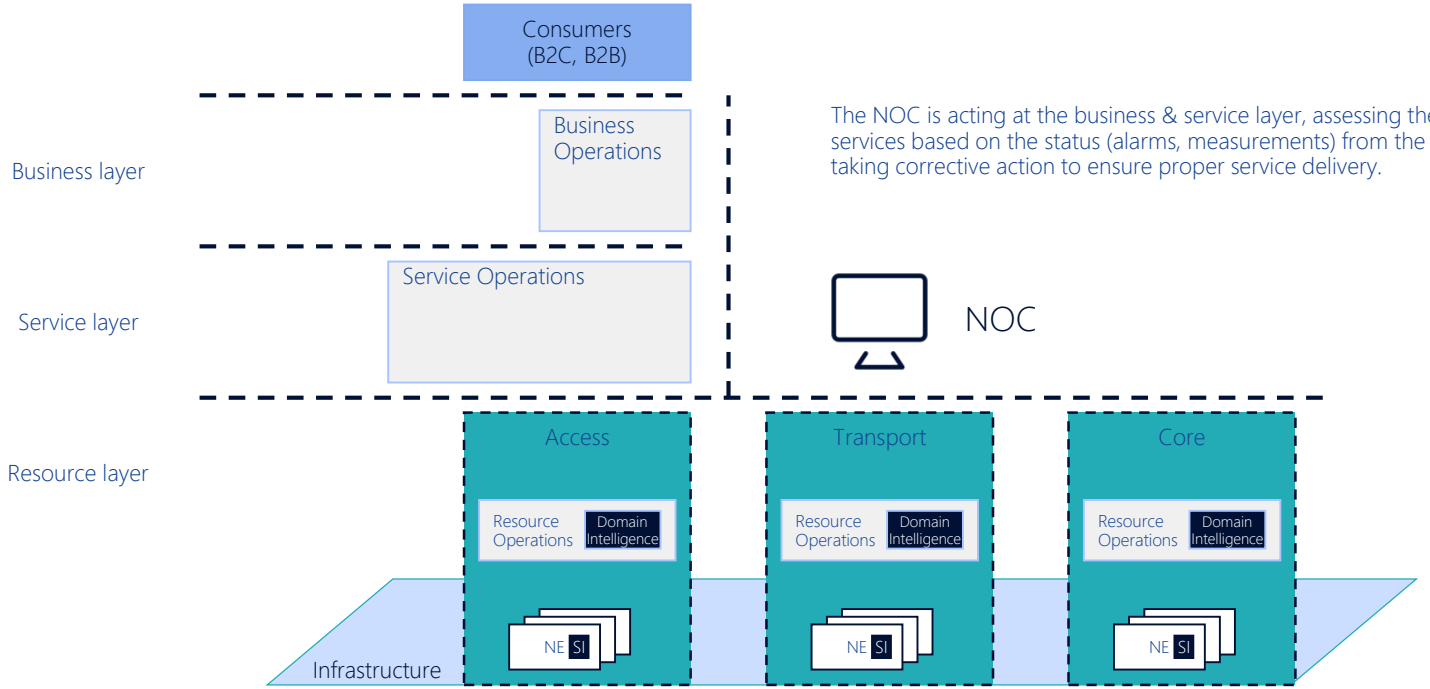
Derived from IG1251 - Autonomous Networks Reference Architecture - July 2022

Business layer
The business layer provides the interface towards the end customer, defining application attributes and translating these in services and corresponding attributes.

Service layer
The service layer defines the decomposition of end-to-end services into resources required to provide these services.
The service layer also orchestrates the service lifecycle implementation on the resource layer.

Resource layer
The resource layer contains the actual (physical, virtual, cloud) resources and the management thereof.

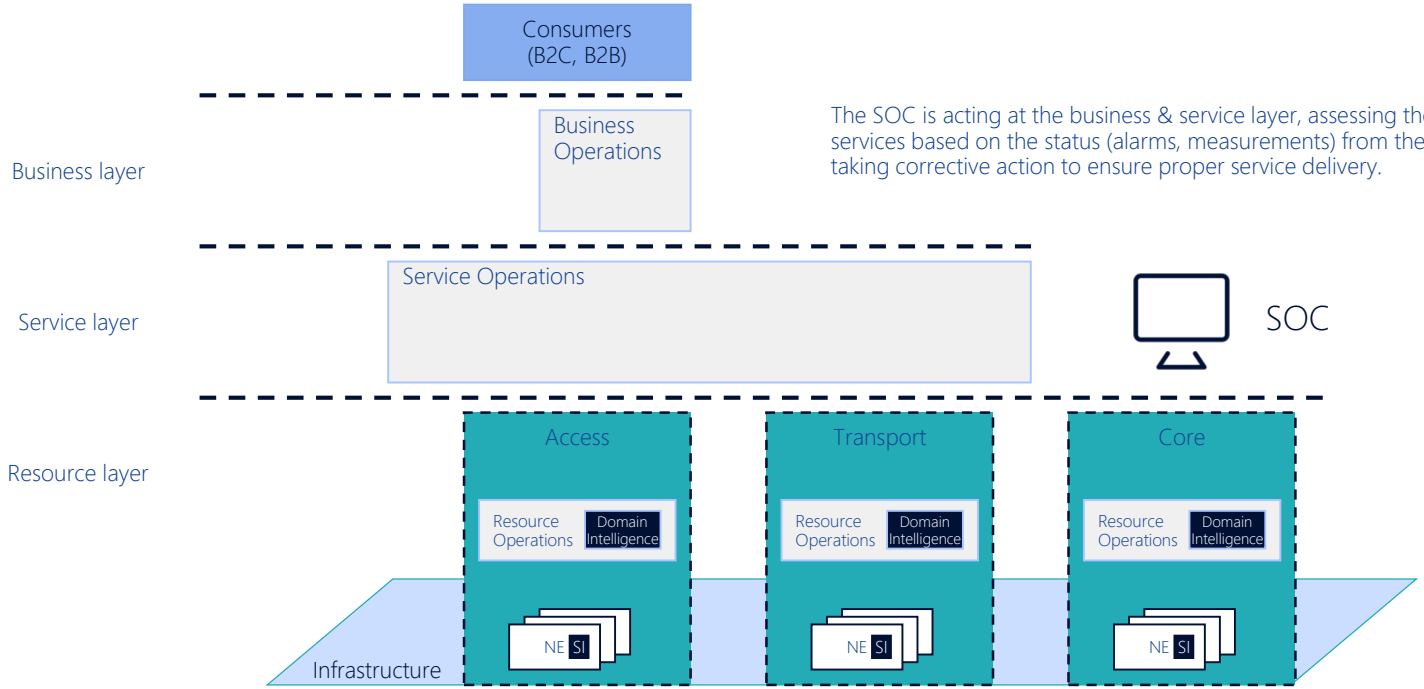
NOC based operation



The NOC is acting at the business & service layer, assessing the status of the services based on the status (alarms, measurements) from the resource layer and taking corrective action to ensure proper service delivery.

Derived from IG1251 - Autonomous Networks Reference Architecture - July 2022

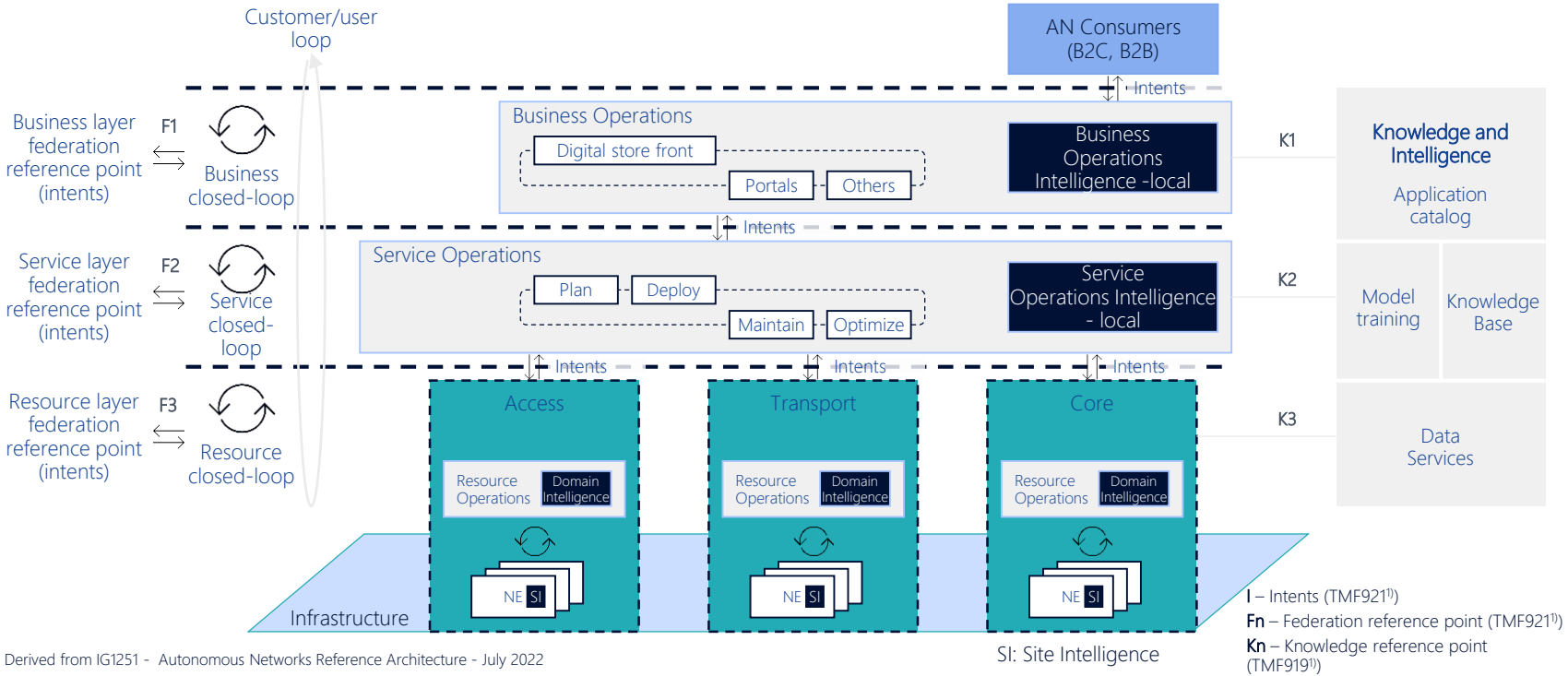
Evolve to SOC based operation



The SOC is acting at the business & service layer, assessing the status of the services based on the status (alarms, measurements) from the service layer and taking corrective action to ensure proper service delivery.

Derived from IG1251 - Autonomous Networks Reference Architecture - July 2022

Destined to run Autonomous Networks



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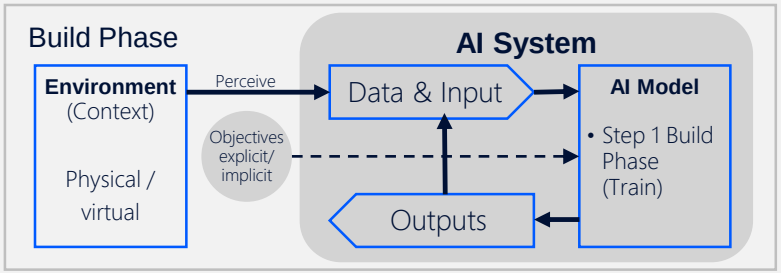
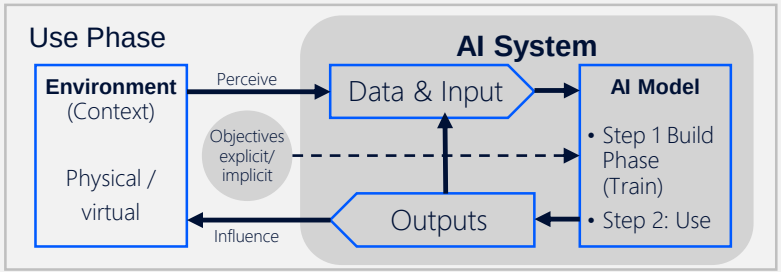
AI - What AI

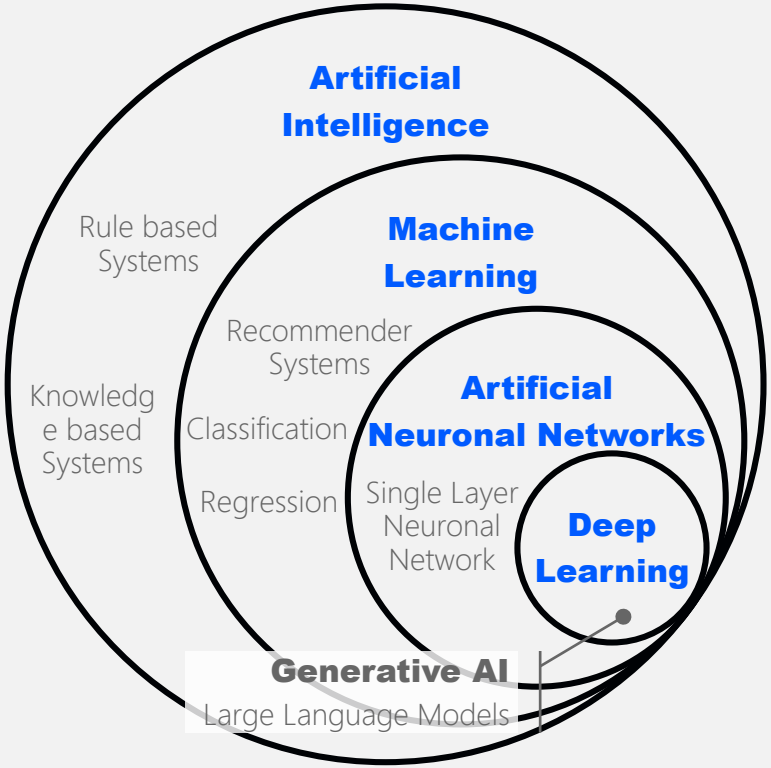
See also the blog post AI – What AI?

Definition of AI (OECD)





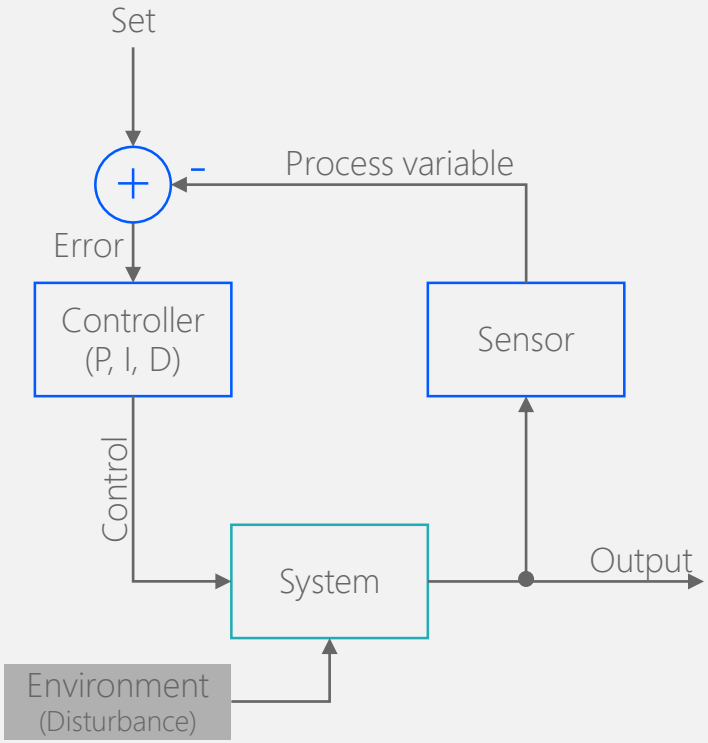
Evolution of AI



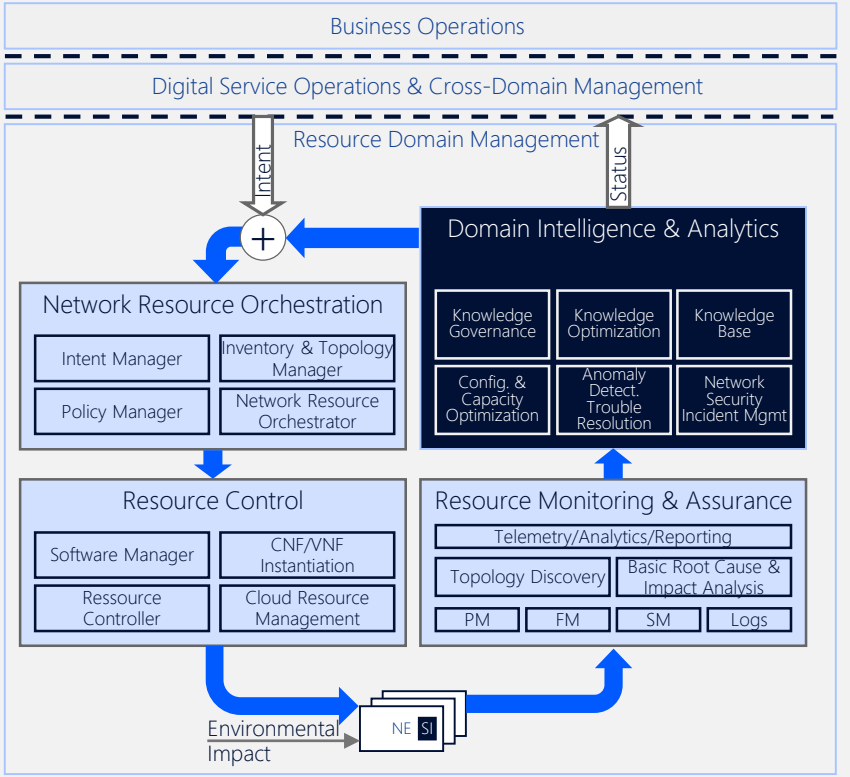
Closed loop

See also the blog post Automation and Control Theory

The concept



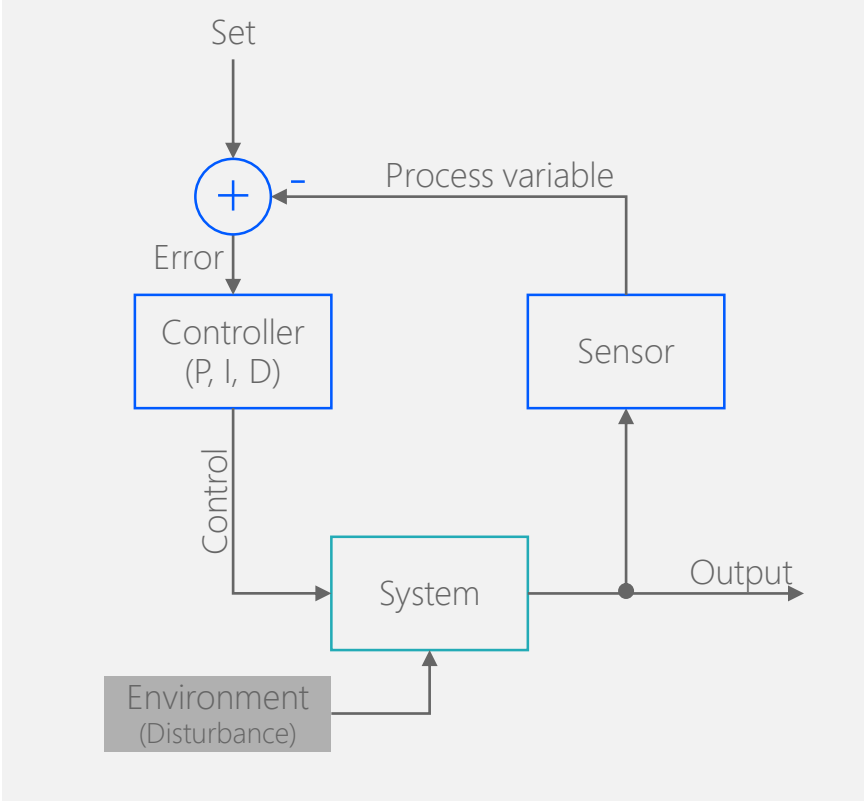
applied to a resource domain



Closed loop & the application of AI

See also the white paper
Generative AI implications for telco operations

The concept



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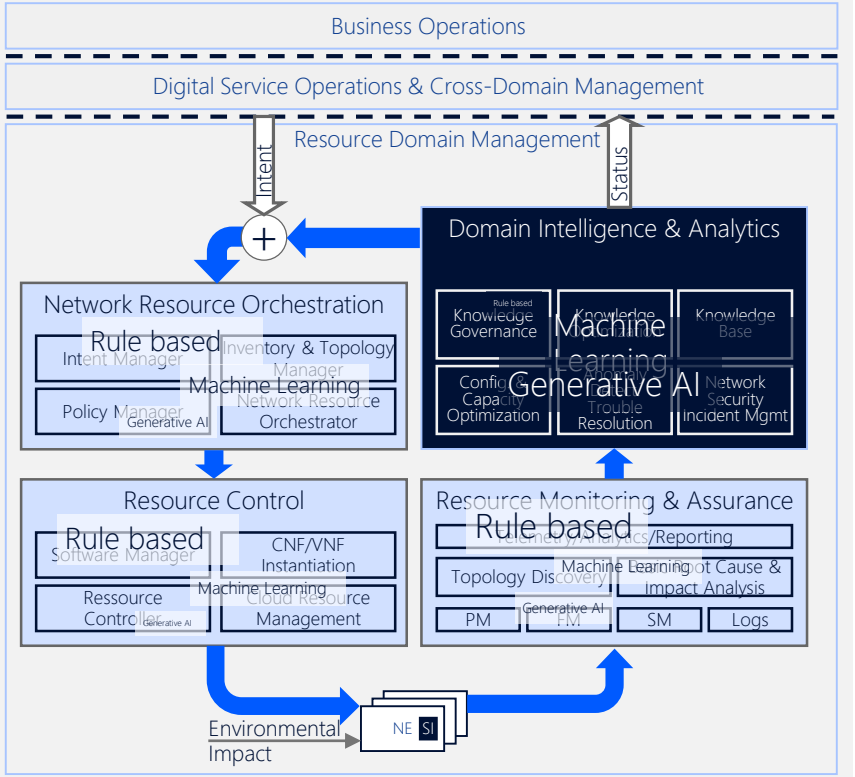

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