



**COMARCH**

## **How to improve customer experience with a self-organizing network**

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## Agenda

- Introduction
- Self-Organizing Network and Customer Experience
- What are the challenges?
- Cell Outage Compensation example
- Architecture
- How to employ „Plug & Play” for improving CE
- Leveraging „Self-Optimizing” SON function
- How to employ self-healing
- How to gain trust in automation
- Conclusions

## Customer Experience

- According to Yankee Group's report „Delivering a World-Class Customer Experience” there are **4 dimensions of customer experience**:
  - Company and brand
  - Products and services
  - Channel
  - Delivery and operations
    - Does the product work anywhere, anytime?



## Customer Experience - Self-Organizing Network

- **A congested network leads to poor customer experience**
- LTE is a „better network” - an anticipated remedy in mobile networks
- LTE – huge investments – a need to „kill two birds with one stone” – OPEX reduction
- **OPEX reduction by shifting from network management towards a Self-Organizing Network**
  - Automation is key
- **Self-Organizing Network goals:**
  - A direct goal – **cost reduction** by leveraging automation, reducing costs related to human work
  - **Customer Experience** – can this be the ultimate goal?

## What are the challenges?

- Translating „better network” to „better customer experience”
- **Self-Organizing Network needs** a „good driver” – **proper metrics**
  - **Improving technical parameters IS NOT a goal in itself**
  - **Improving Customer Experience IS**
- SON – means „autonomy for network management”
- How to control SON so that it is in line with the business goal?
- Gaining trust in automation, tuning ability
- **Step-by step implementation**
- Multi-vendor, multi-domain support

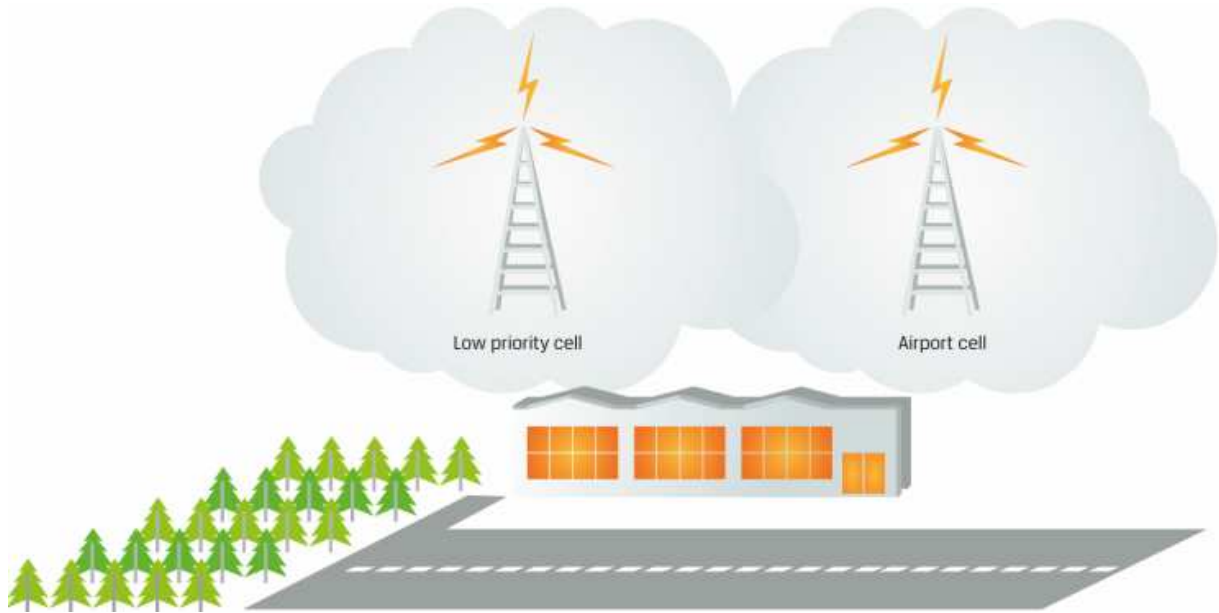


## Using the right criteria - example

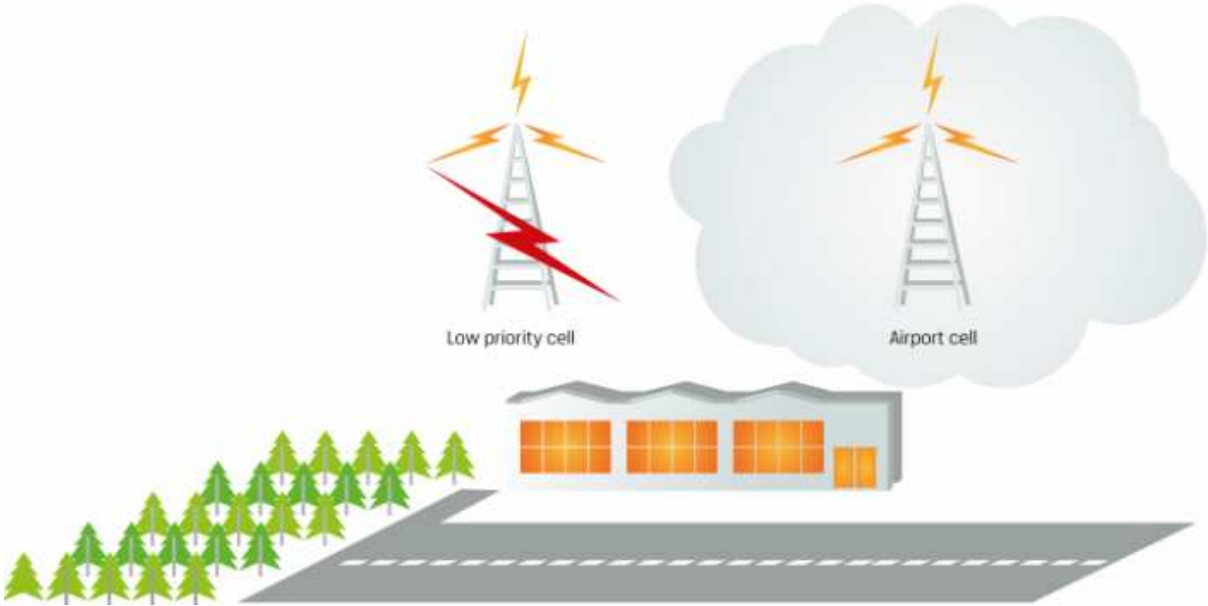
- „Better network” vs. „better customer experience”
- Technical parameter optimization may not be the right criterion
- The right approach is **optimization based on the final goal** (not intermediary ones) Let's see the obtained results based on different criteria
  - **Cell Outage Compensation – SON function – an example scenario**

**EXAMPLE**

# Cell Outage Compensation - example



# Cell Outage Compensation - example





# Cell Outage Compensation - example



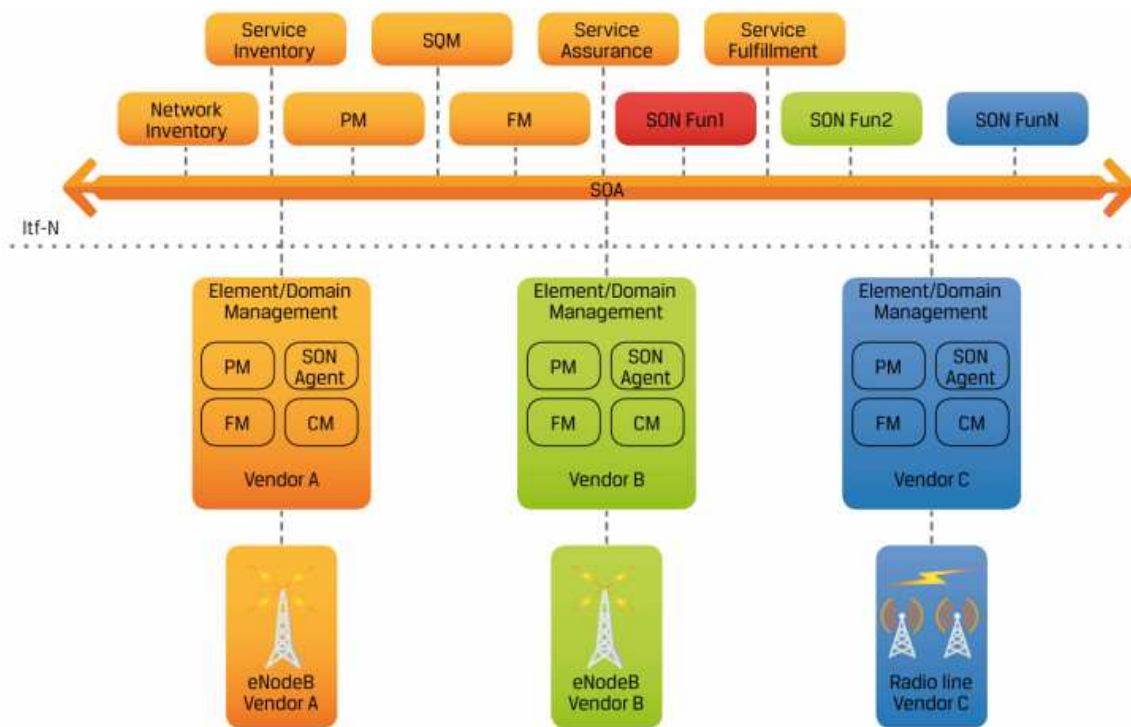
## Cell Outage Compensation - example

- Compensation is based on the „borrowing resources” effect
- Network-centric implementation may cause the high priority cell (airport cell) service level to be degraded by the compensation mechanism
- A need for business goal control
- **What is the true goal of Cell Outage Compensation:**
  - NO – bringing the coverage back
  - YES – a **maximum service level which can be provided using limited resources**
- **Criteria:** summary service level after compensation must be „>” than the one just after an outage
- If not – the compensation scenario should be discarded

## Lessons learned

- **SON must be driven by customer service criteria and metrics**
- Technical parameter optimization itself can't be a SON goal
- A holistic view of the network is needed to avoid a „local optimization” problem
- **A holistic view means**
  - both service and network (resource) view of the network
    - To translate service criteria onto network requirements
    - To calculate the impact of network optimization on services
  - horizontally the end-to-end view means a multi-domain, multi-vendor view of the network
    - To have a summary effect of network reconfiguration

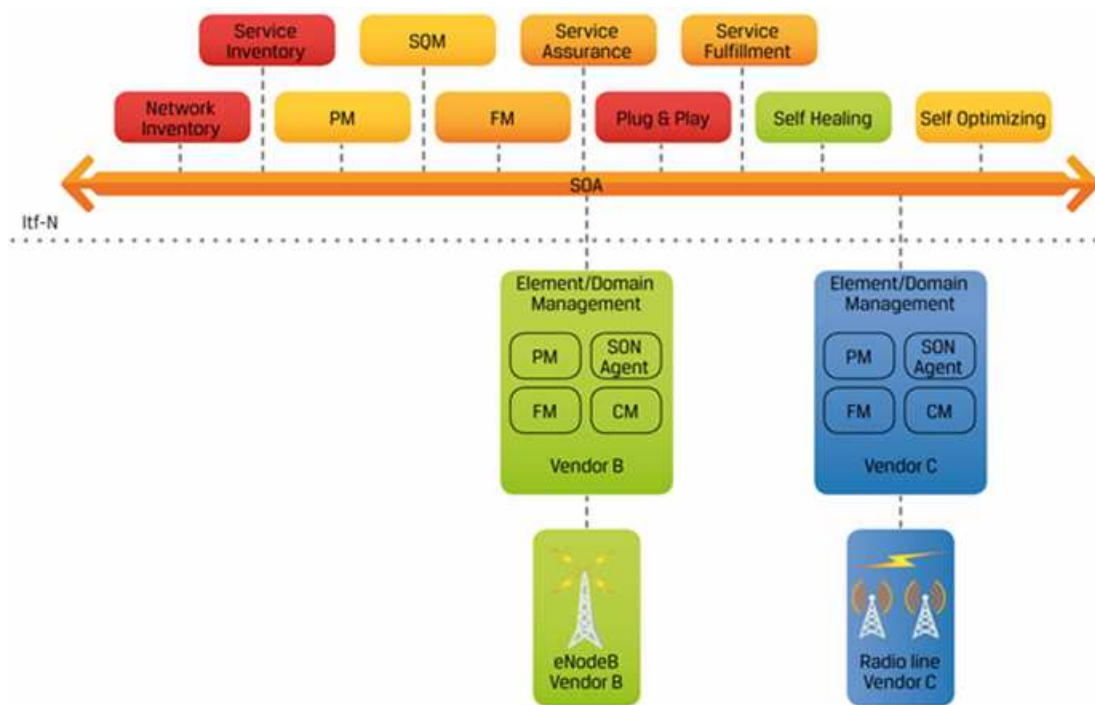
# Self-Organizing Network – the architecture



## Plug & Play and Customer Experience

- **Plug & Play – direct goals:**
  - new NEs should self-configure and self-optimize and be operational directly after being „plugged-in”
  - cost reduction
  - speeding up the process of network extension
- **Plug & Play – Customer Experience**
  - improving network support for customer services
  - quicker network extension – faster reaction to changing customer demands

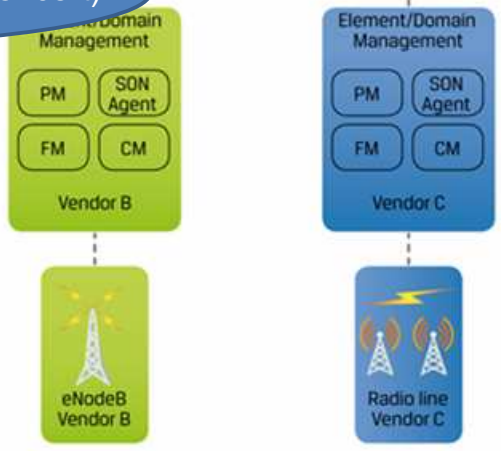
# Plug & Play and Customer Experience



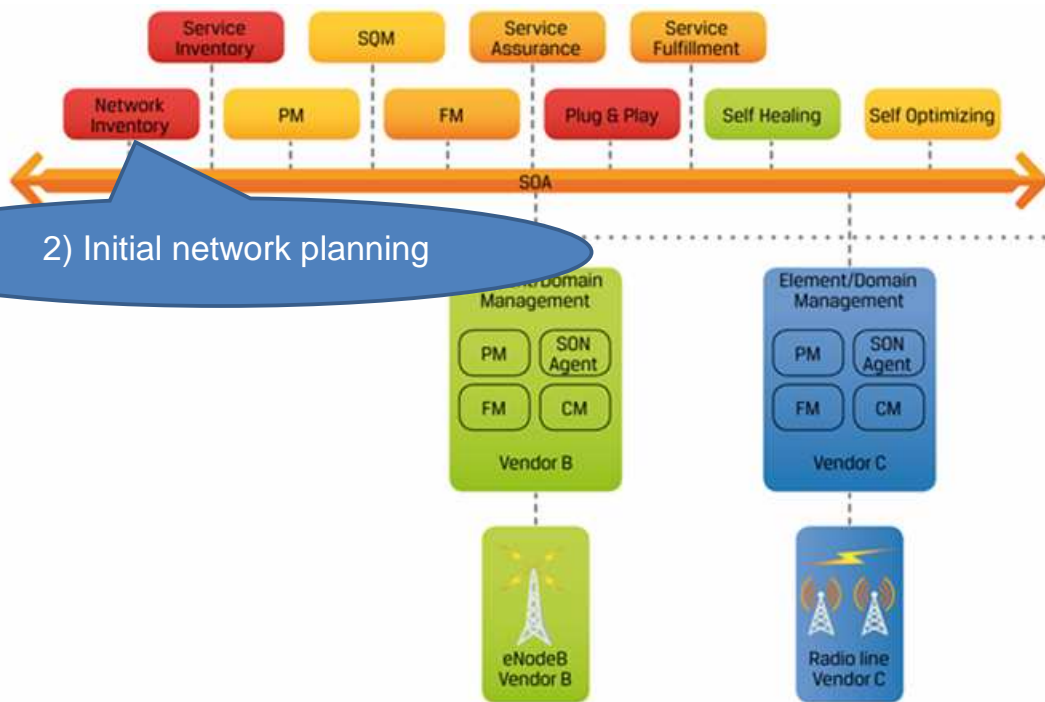
# Plug & Play and Customer Experience



1) Define service criteria (a rock concert)

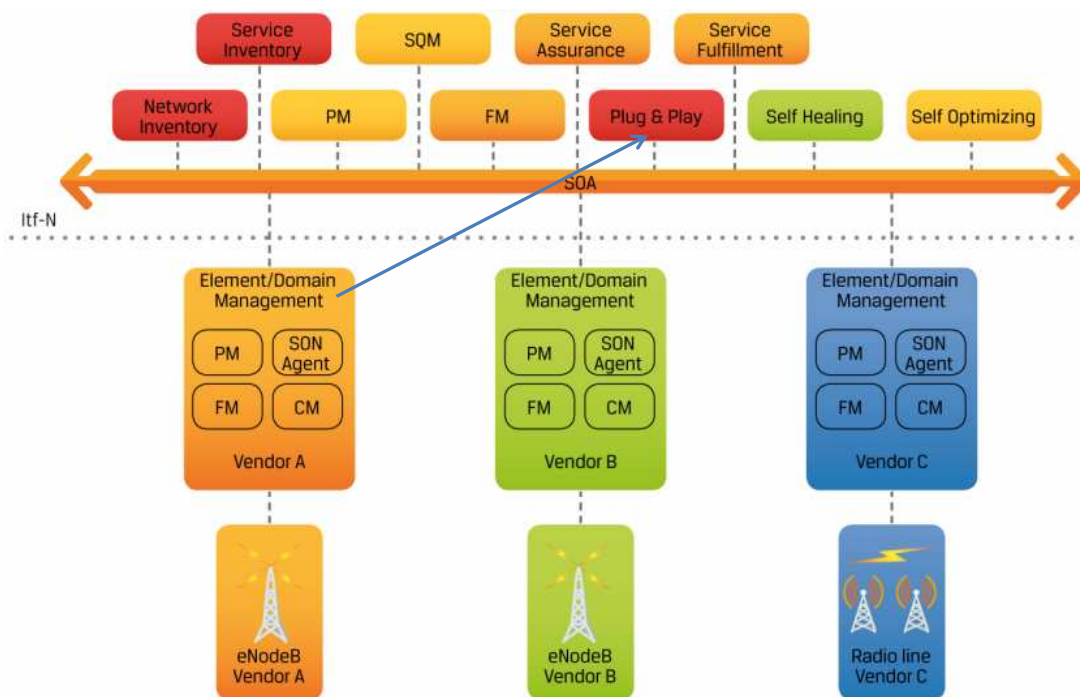


# Plug & Play and Customer Experience

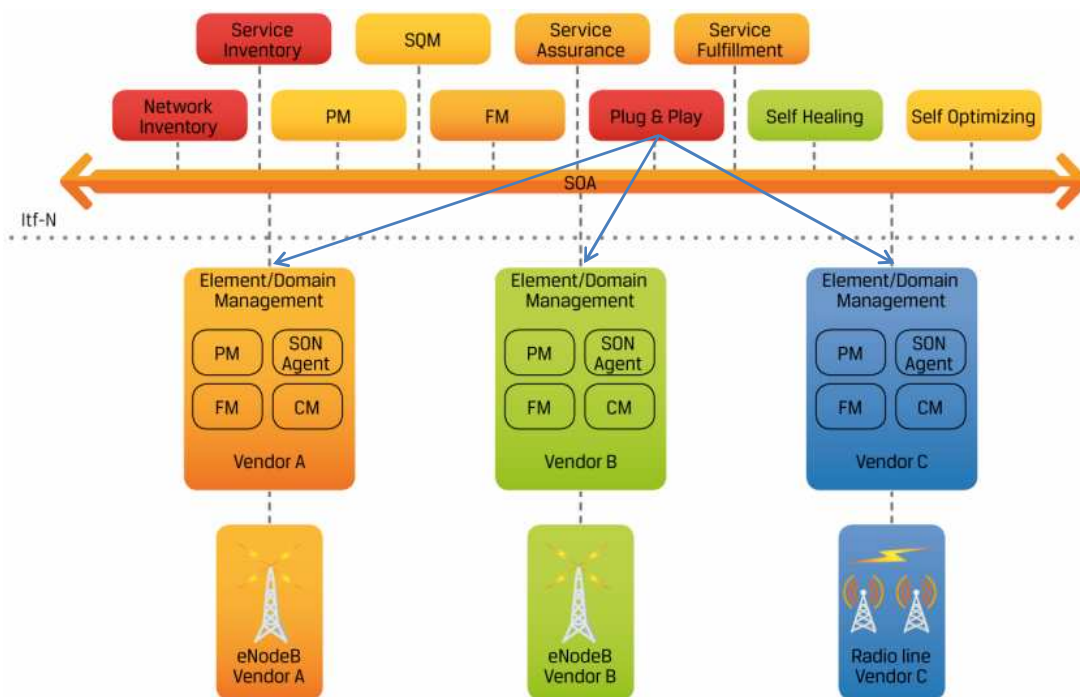




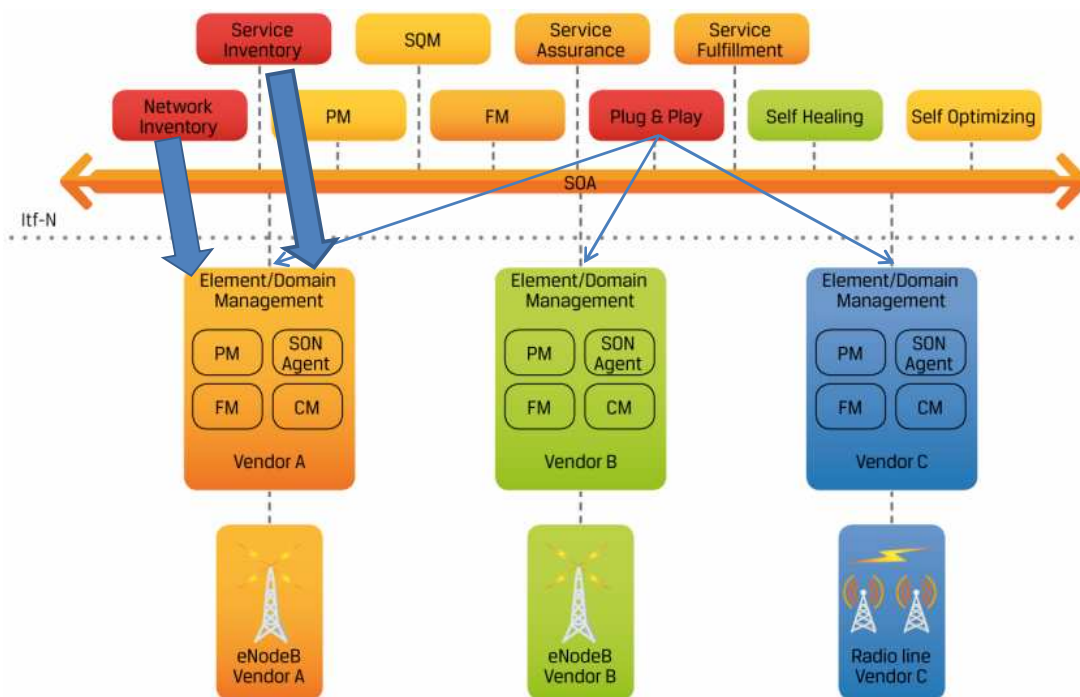
# Plug & Play and Customer Experience



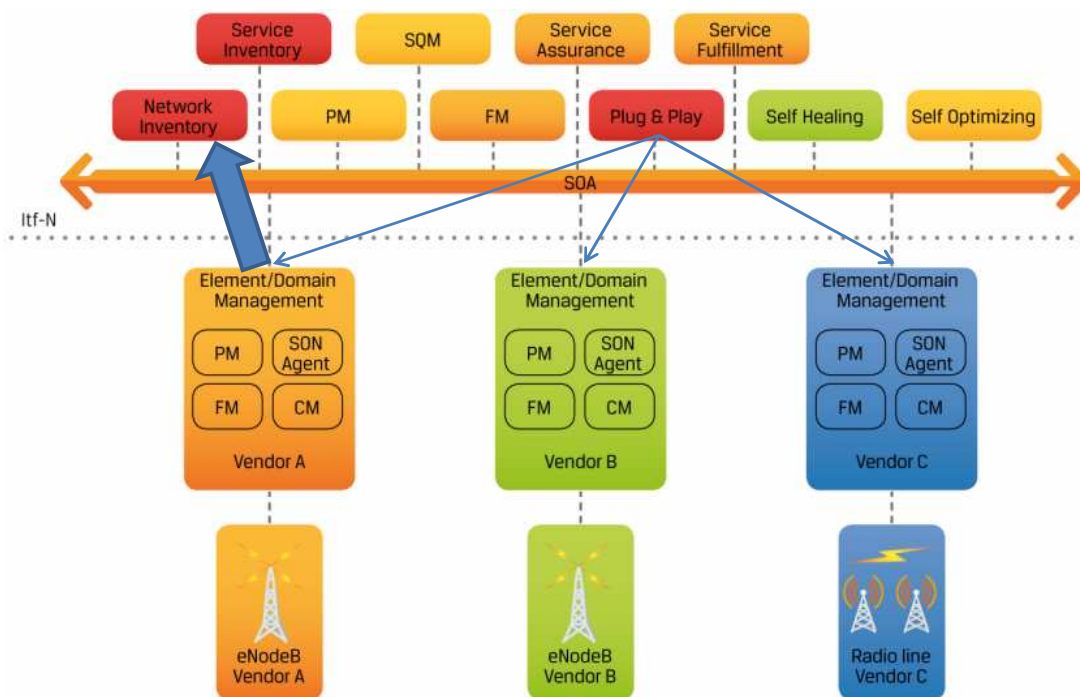
# Plug & Play and Customer Experience



# Plug & Play and Customer Experience



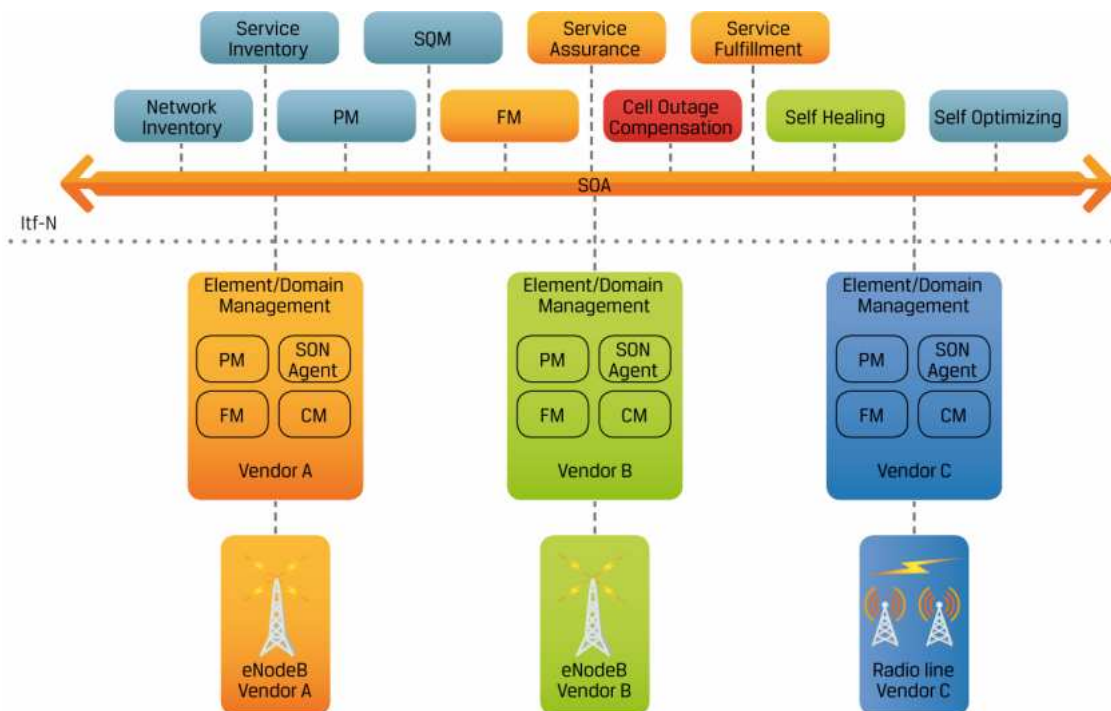
# Plug & Play and Customer Experience



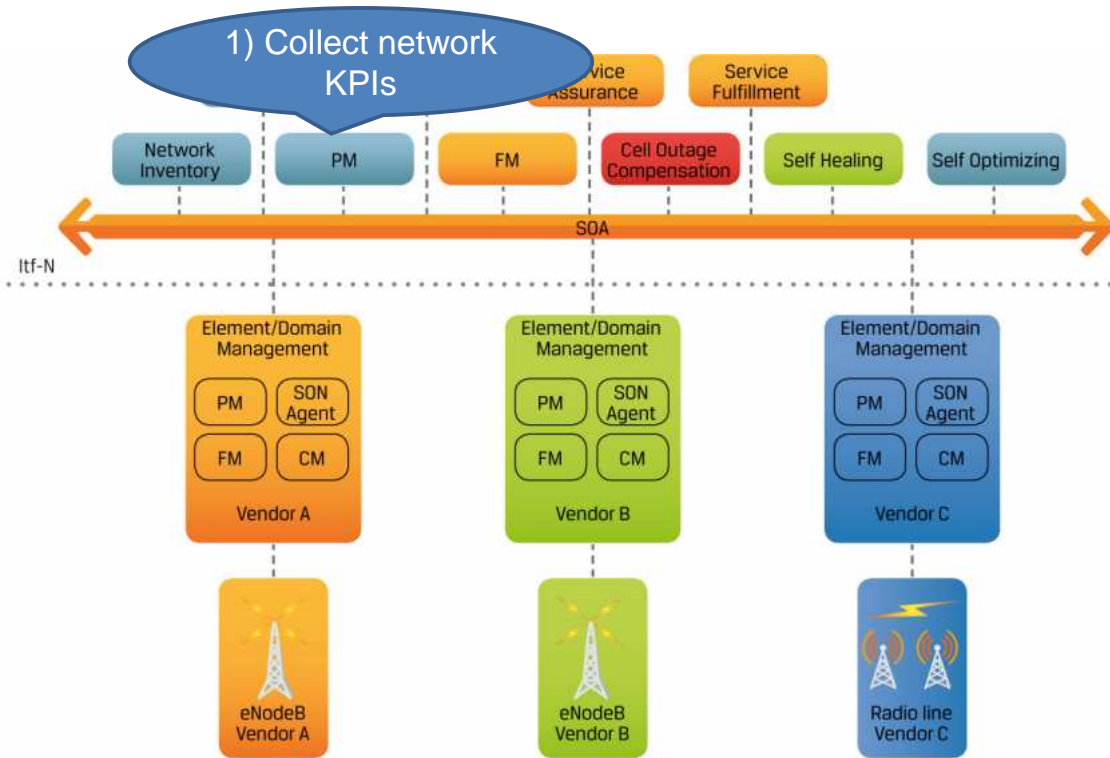
## Self-Optimizing and Customer Experience

- **Self-Optimizing – direct goals:**
  - automating network configuration tuning process
  - no need for manual changes of technical parameters
  - cost reduction
- **Self-Optimizing– Customer Experience**
  - optimizing network support for customer services
  - automated network adjustments, according to changing customer service requirements

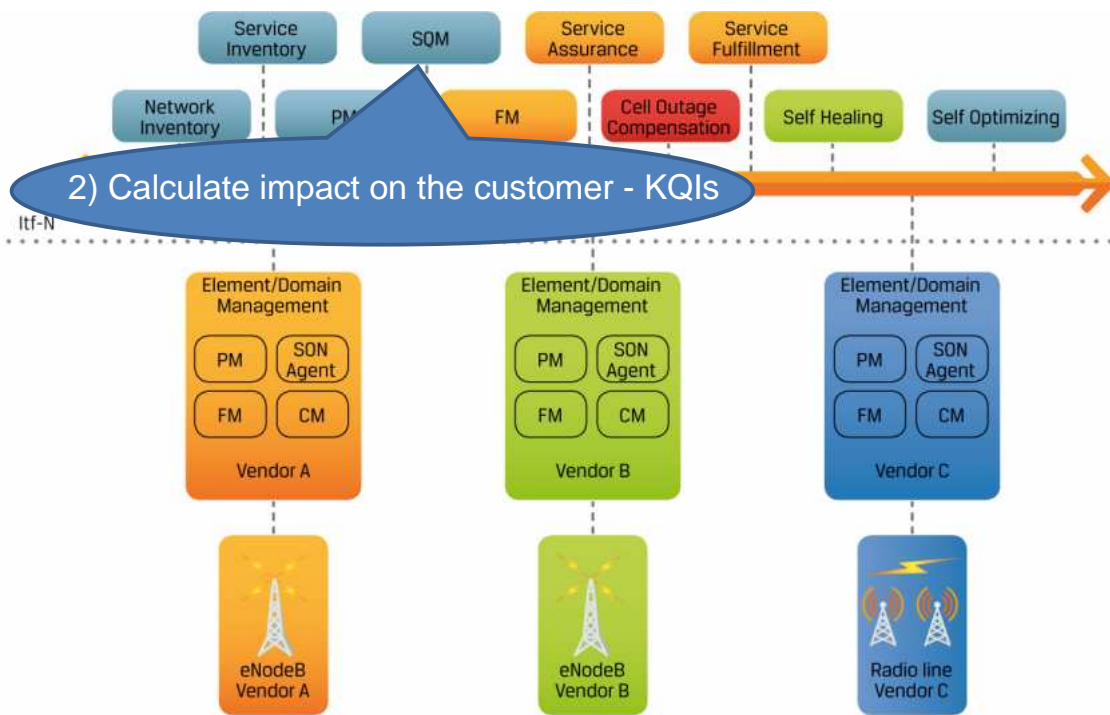
# Self-Optimizing and Customer Experience



# Self-Optimizing and Customer Experience



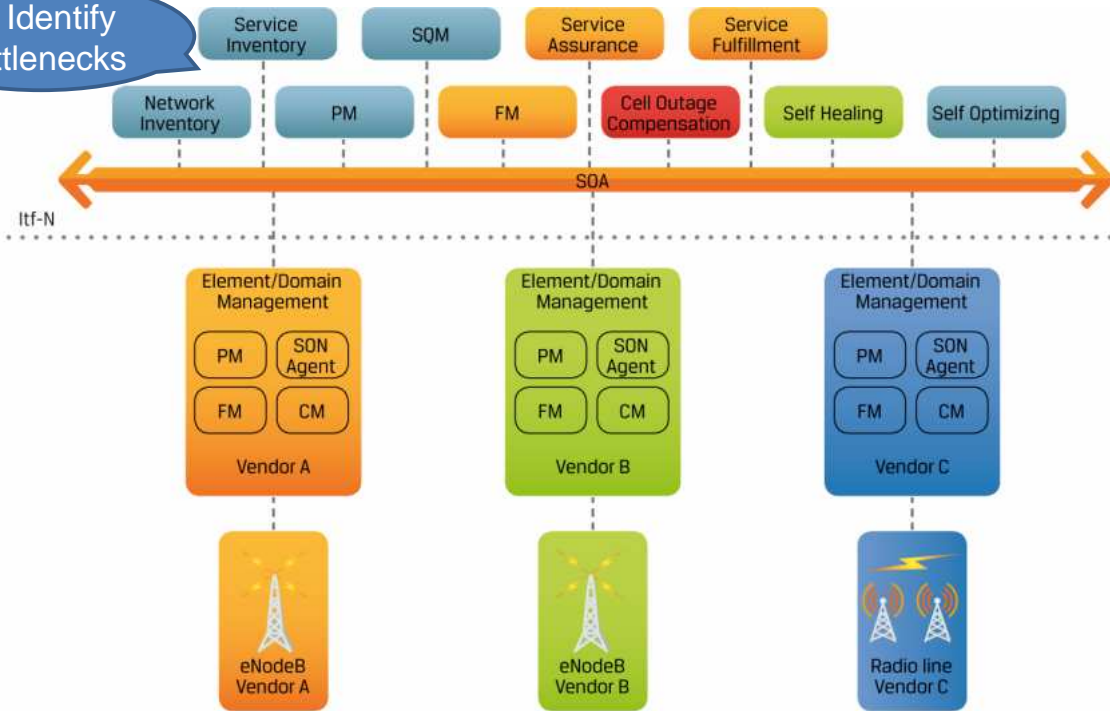
# Self-Optimizing and Customer Experience



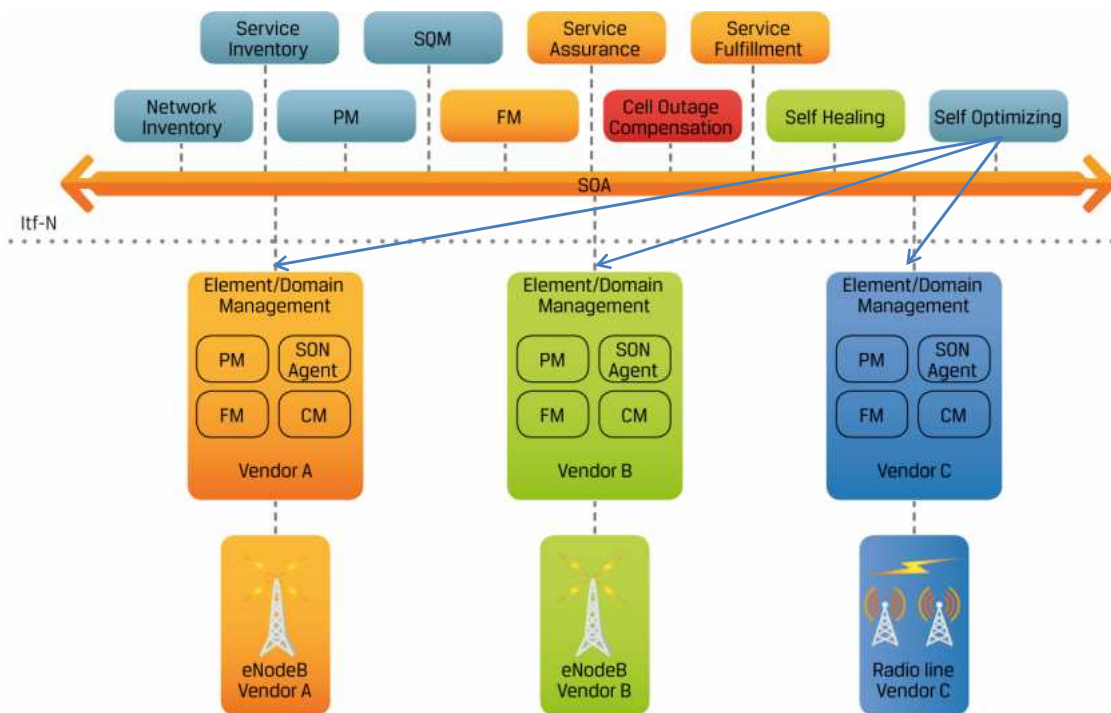


# Self-Optimizing and Customer Experience

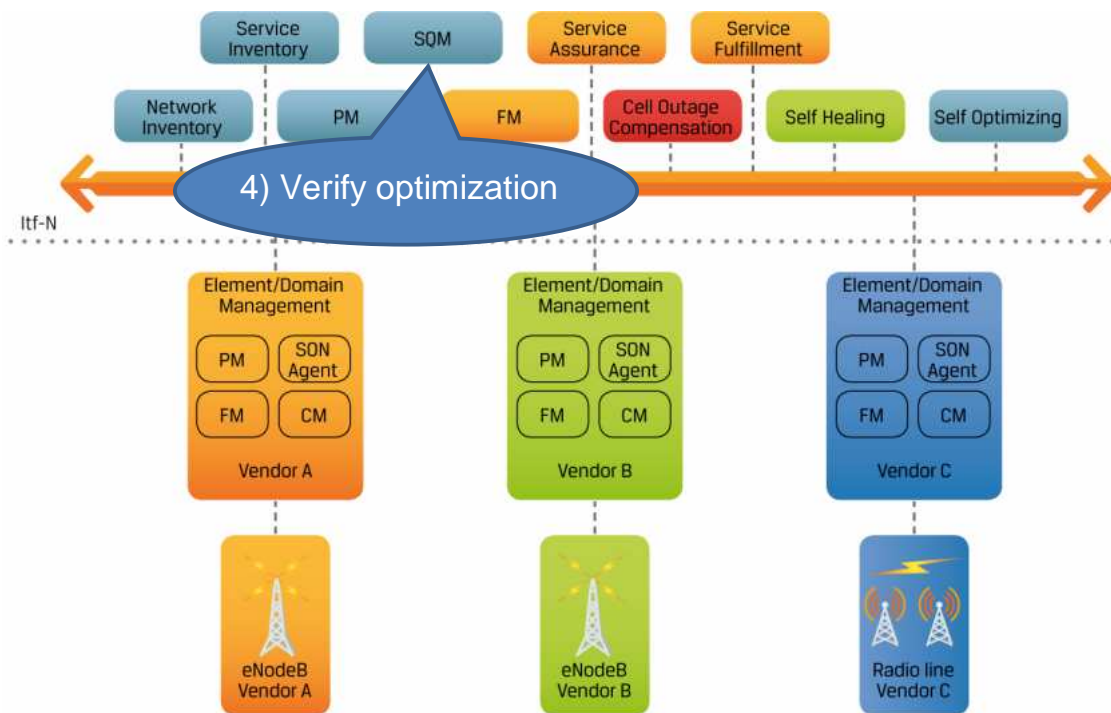
3) Identify bottlenecks



# Self-Optimizing and Customer Experience



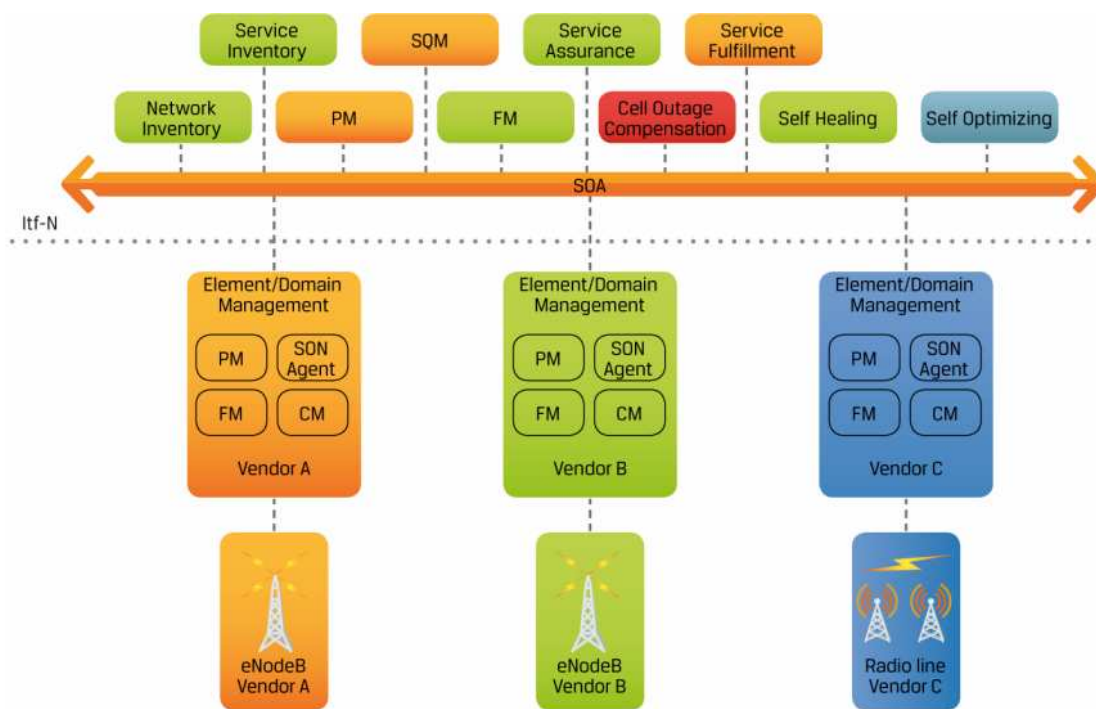
# Self-Optimizing and Customer Experience



## Self-healing and Customer Experience

- **Self-healing – direct goals:**
  - automating outage detection and problem resolution
  - no need for human intervention
  - cost reduction
- **Self-healing– Customer Experience**
  - Minimizing impact on customer services

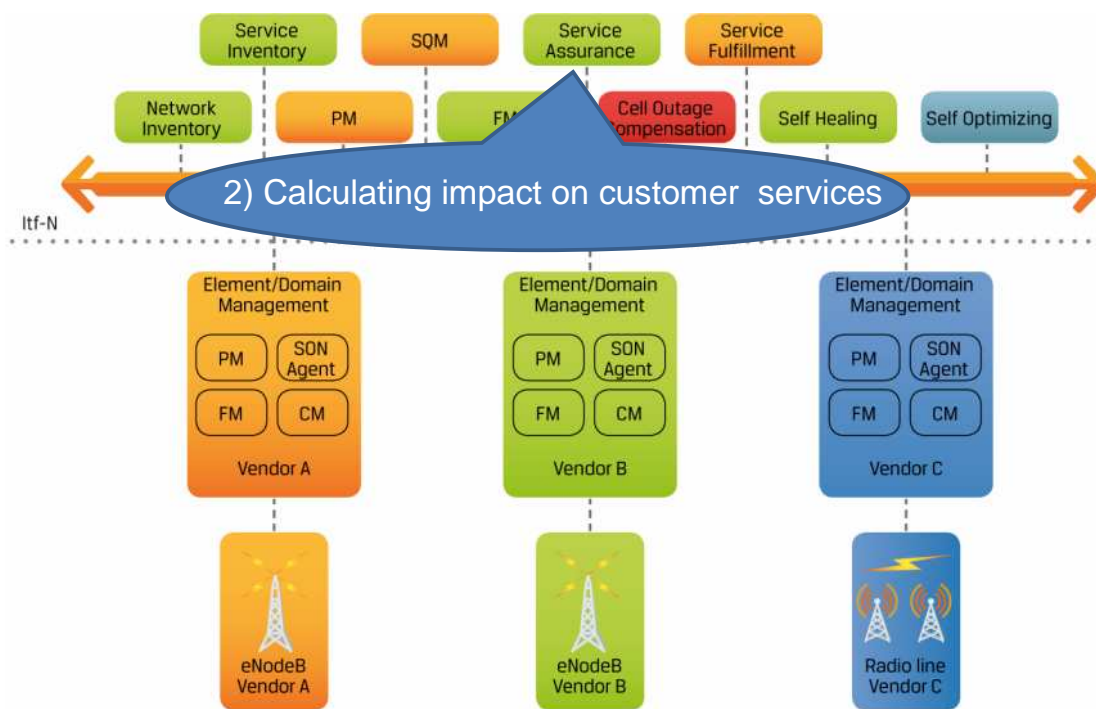
# Self-healing and Customer Experience



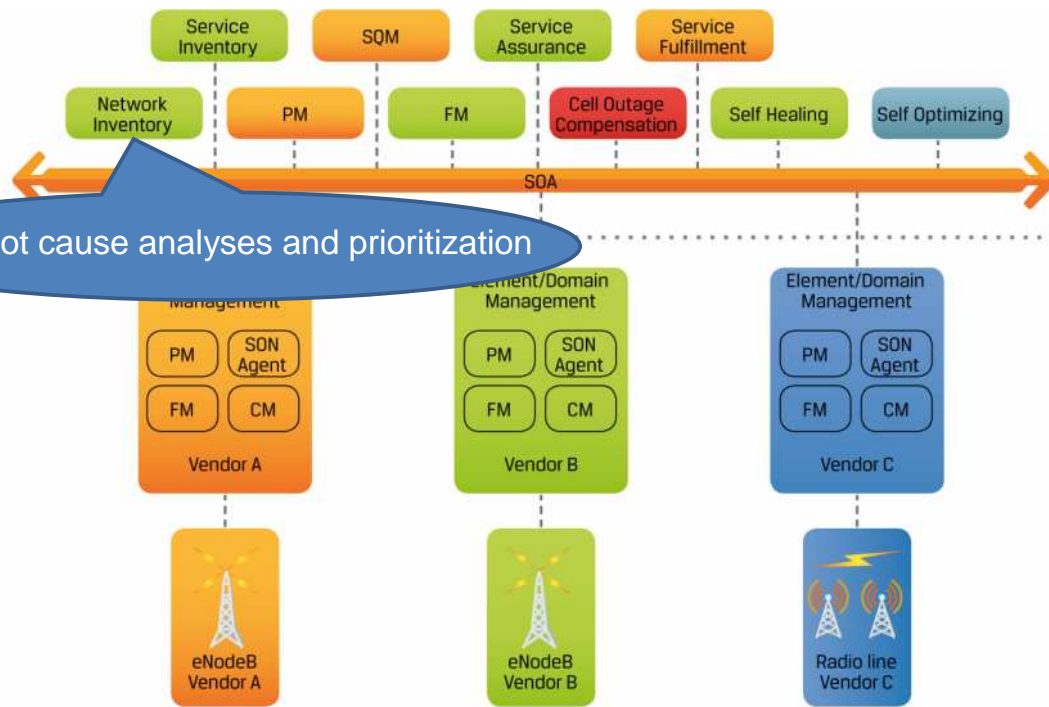
# Self-healing and Customer Experience



# Self-healing and Customer Experience

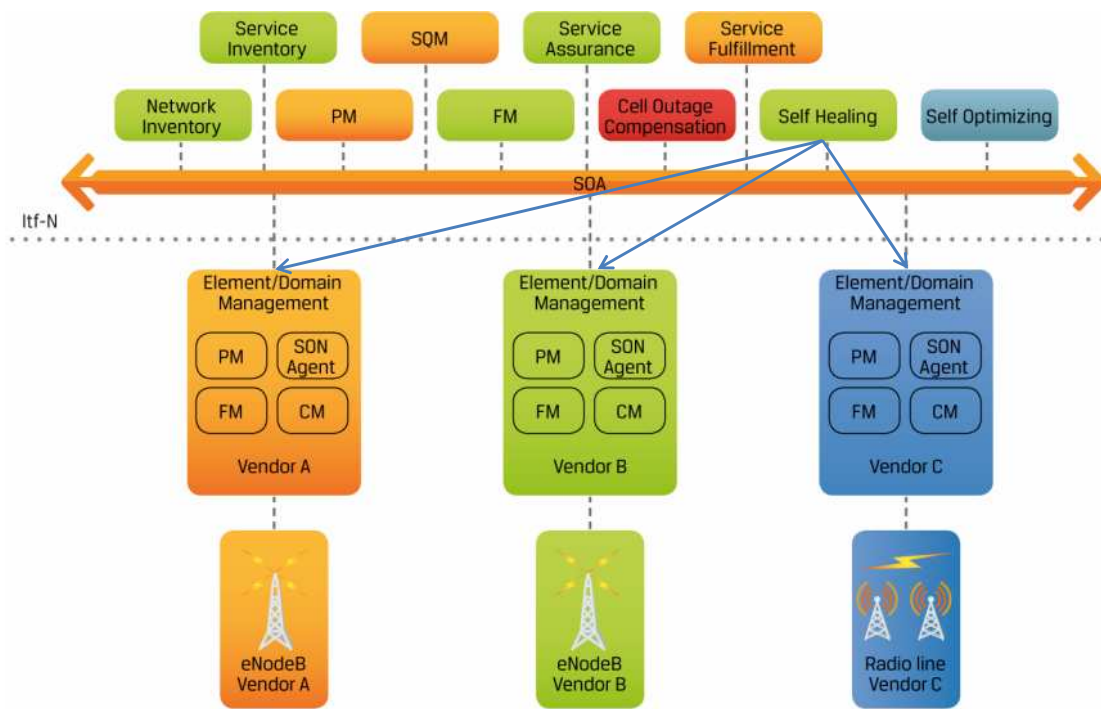


# Self-healing and Customer Experience





# Self-healing and Customer Experience



## How to gain trust in automation

- **Step-by-step implementation**
  - using the existing OSS systems in a novel way
- **Gaining trust**
  - manual, semi-automated, automated processes
  - measuring the effectiveness of automation routines
  - controlling automation via defined KPIs
  - tuning capabilities



## How to gain trust in automation

- **A simple example for self-healing (self-diagnosing):**
  - root cause analysis (FM) at the beginning – just a hint for an operator to make a final decision
  - based on KPIs, if „hints” are always correct for the defined circumstances – an automated rule can trigger a defined correction action
  - using KPIs for verification if automated routines need manual corrections -> rule tuning
  - step-by-step replacement of manual processing of tasks with automated routines

## Conclusions

- Self-Organizing Network - an **automation which can help improve customer experience**
- **Appropriate metrics and goals** for automated routines are essential
- Technical parameters vs. customer experience driven metrics
- **Comprehensive view of the network comprising both resources and services is crucial**
- **Leveraging the existing OSS ecosystem** guarantees step by step implementation and gaining trust in automation
- **Controlling and tuning automation via KPIs** is a necessity

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**Thank you**

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