Radio Access Network Design and Implementation

Network planning refers to :

the process of designing a network structure and determining network elements

Why we need to Plan Network ?

- New wireless communication technology .
- Increasing size of the radio networks .
- Increasing number of subscribers.
- User Behaviors .
- to solve optimization problems.
- New applications and services .
- Limited frequencies .

Why we need to Plan Network ?

- Reduce network defects
- Reduce maintenance operations
- Reducing waste of resources
- Equipment investments have increased.
- Minimizing interference
- Minimizing Cost
- Swapping equipment's
- Daily demands

The general demands on the networks are :

- Massive system capacity,
- Very high data rates,
- Mnimal latency,
- Extremely high reliability and availability,
- Energy-efficient and secure operation

Tips

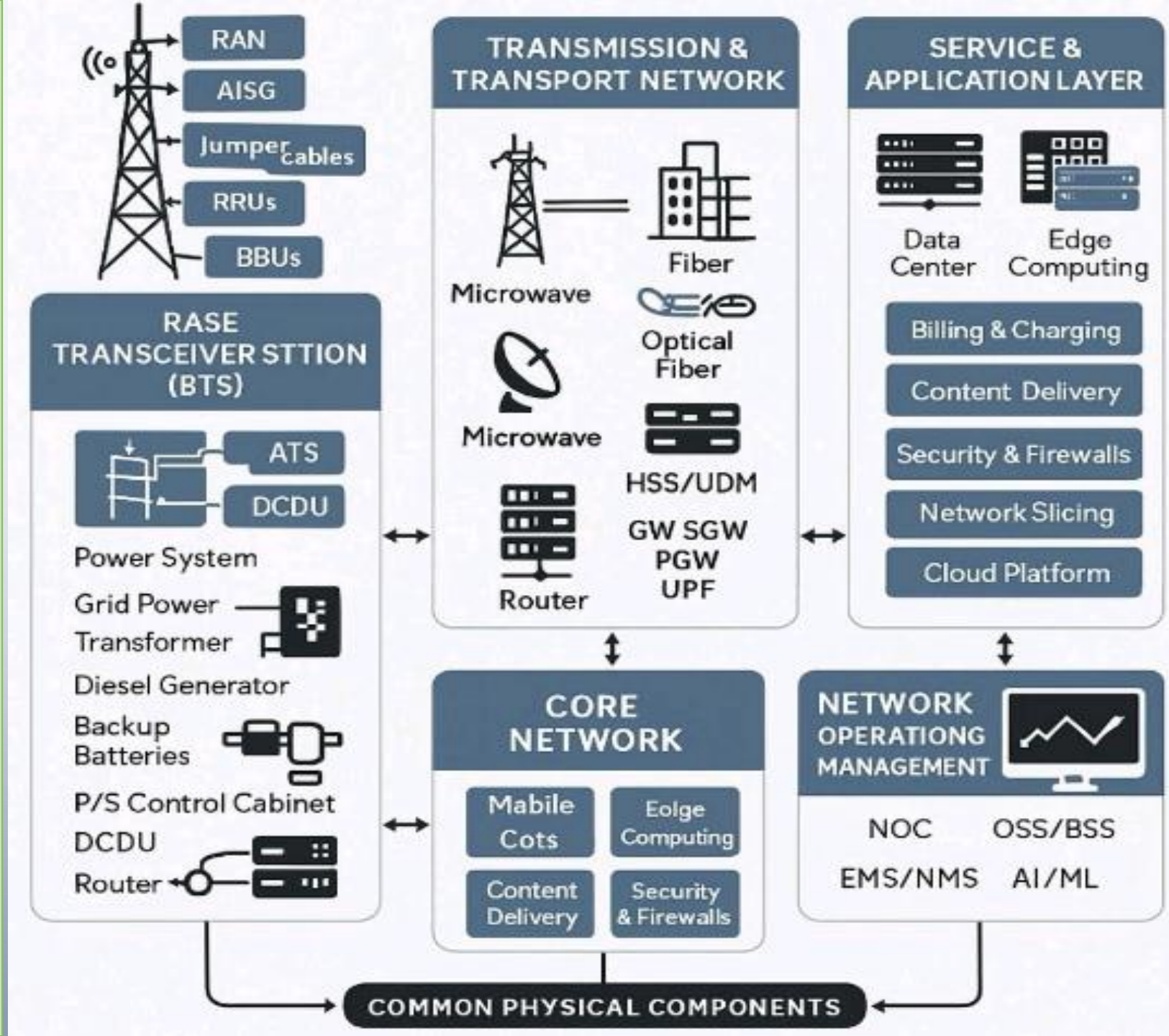
The operator is interested in the network efficiency:

- How many customers can be served ?
- How much data can be provided and how many base station sites are required ?

The end user application performance depends on :

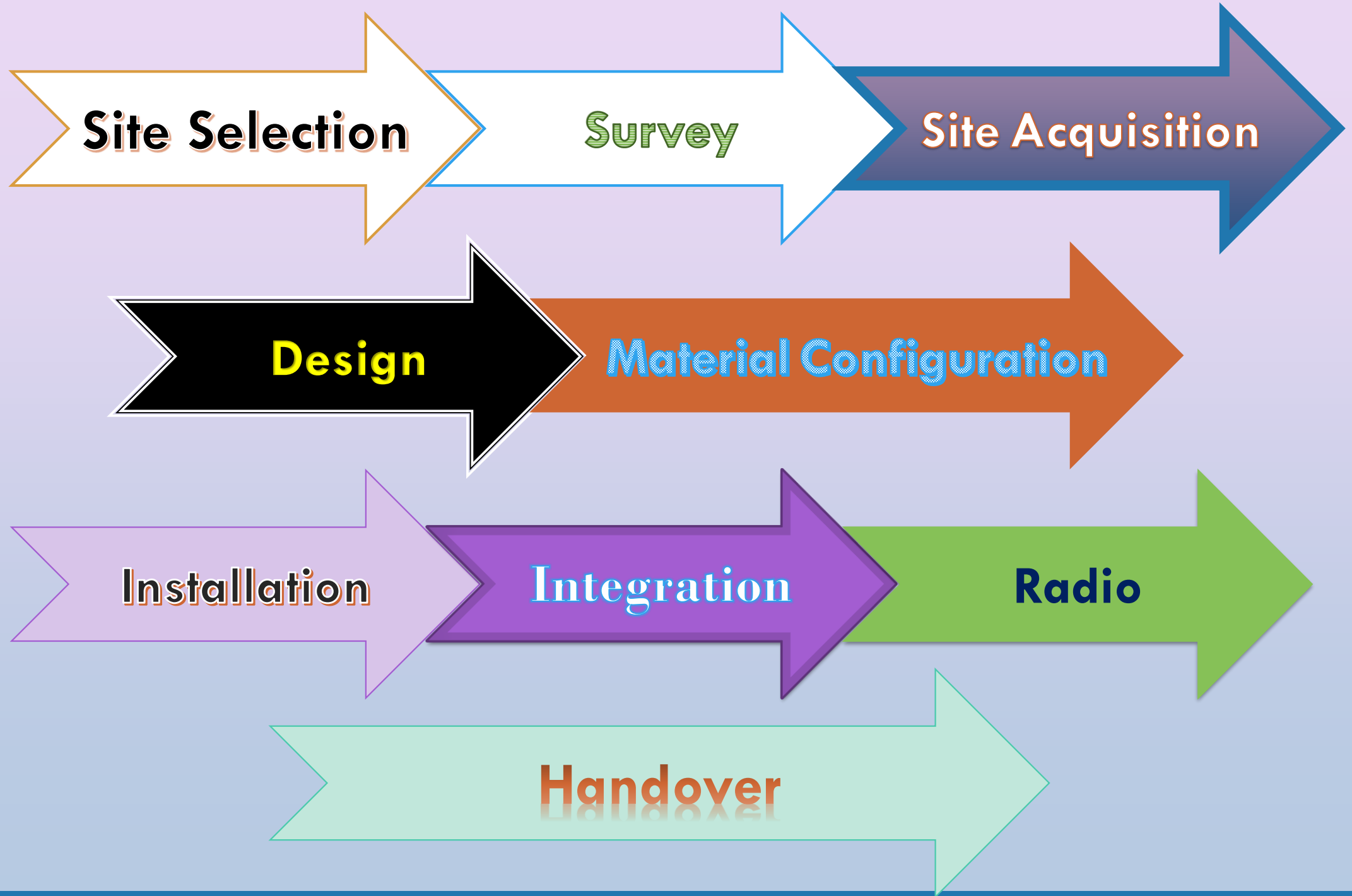
- Available bit rate,
- Latency
- Seamless mobility

Network Planning



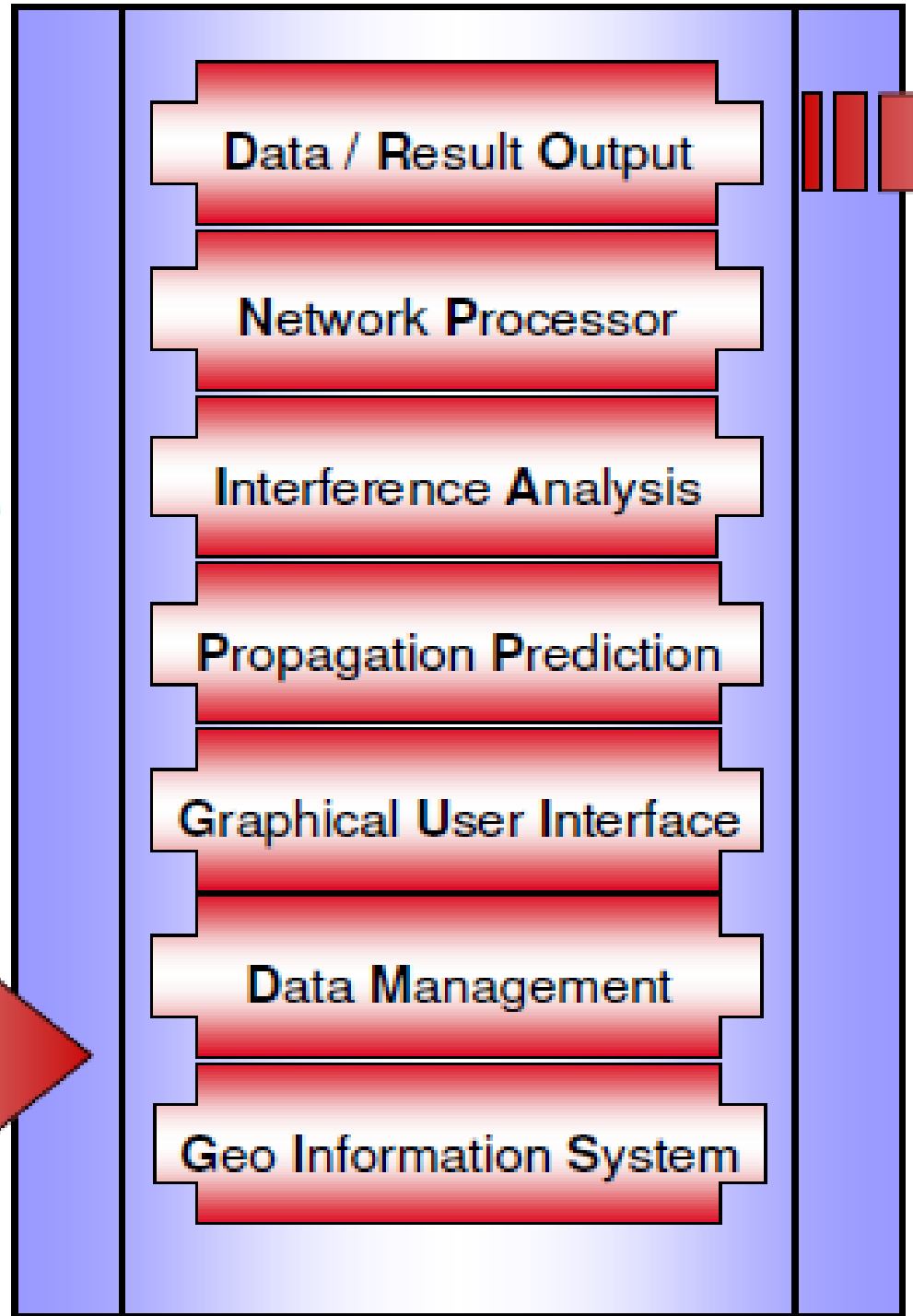
The main aim of radio network planning is :

to provide a cost-effective solution for the radio network in terms of coverage, capacity and quality


Site Selection
Survey
Site Acquisition
Design
Material Configuration
Installation
Integration
Radio
Handover

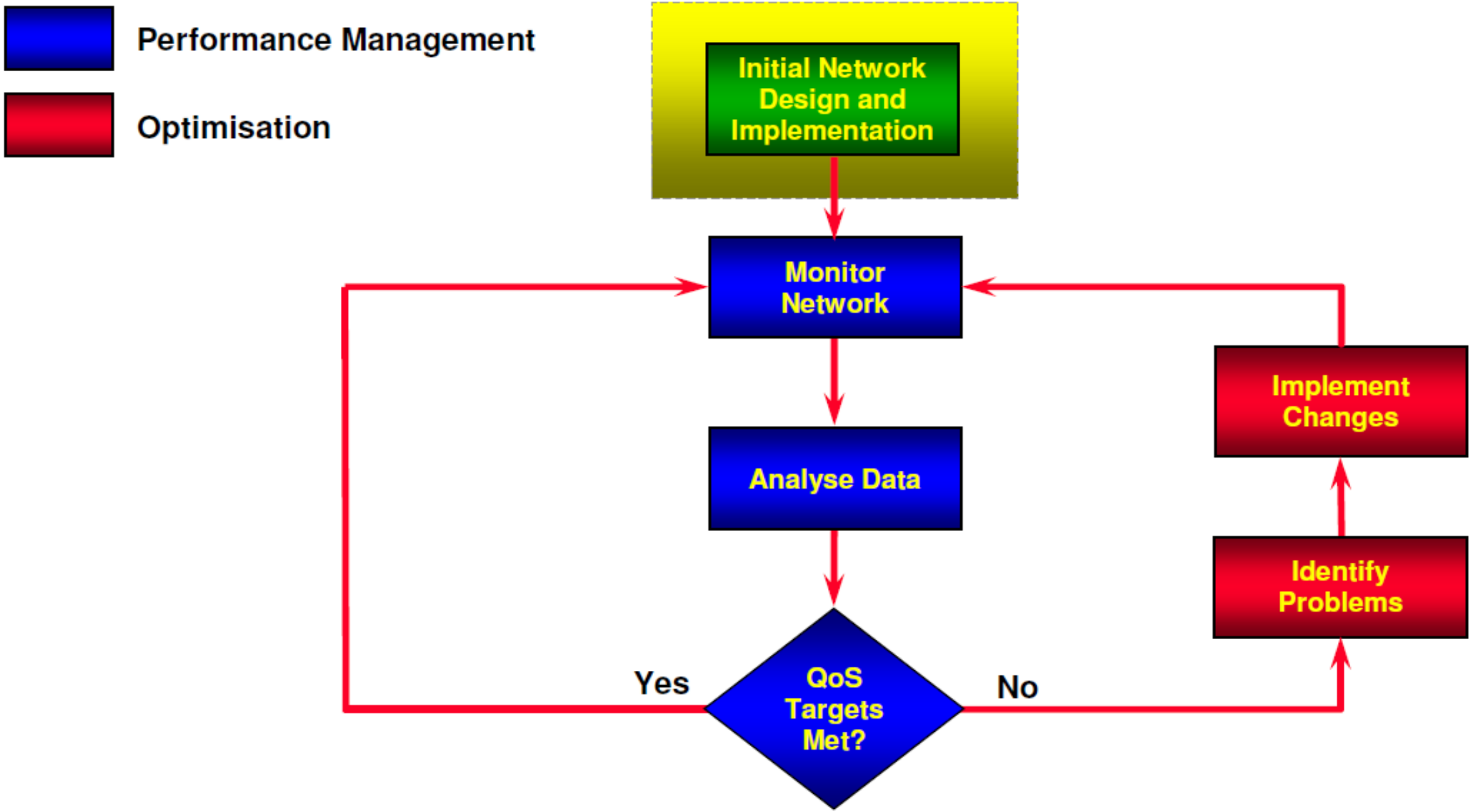
- Terrain Data
- ERP
- Antenna Pattern
- Transmitter Data Base
- Equipment Data
- Frequency Plans
- Traffic Data
- Measurement Data
- ...

In



Out

- Coverage Maps
- Interference Analysis
- Compatibility Calculations
- Coordination Calculations
- Channel/Frequency Assigments
- Frequency Plans
- Network Analysis
- Network Simulations
- Network Quality Maps
- ...


Performance Management
Optimisation
Initial Network Design and Implementation
Monitor Network
Analyse Data
QoS Targets Met?
Yes
No
Identify Problems
Implement Changes

Thanks for Listening