



# ITU / BDT Regional Network Planning Workshop with Tool Case Studies for the Arab Region

Cairo - Egypt, 16– 27 July 2006

## Network Planning Tools

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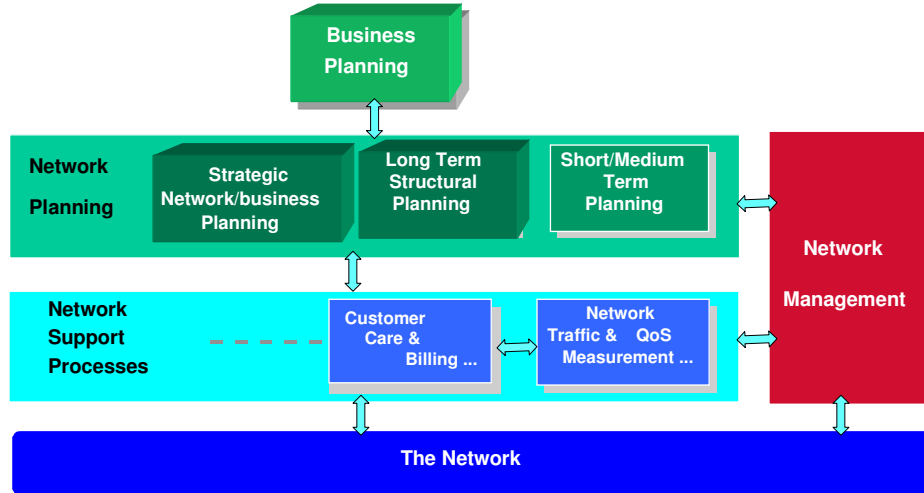


## Network Planning Tools Content

- **Network planning process and domains**
- **Objectives and classification for the different tool types**
  - Overall techno-economical evaluation
  - Network design and optimization
  - Detailed design and configuration
  - Network evaluation and simulation



## Network Planning Tools Network Planning: Related Processes



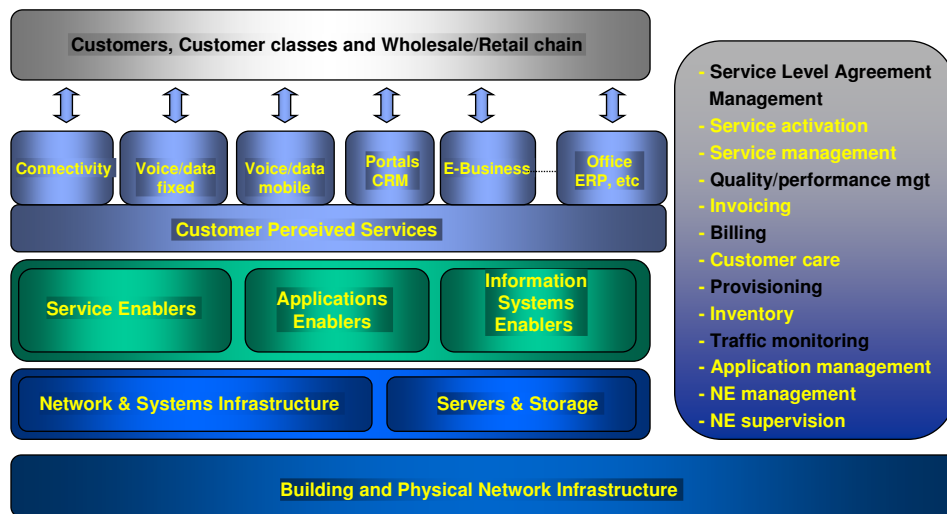
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## Network Planning Tools Towards Converged Platforms and Services



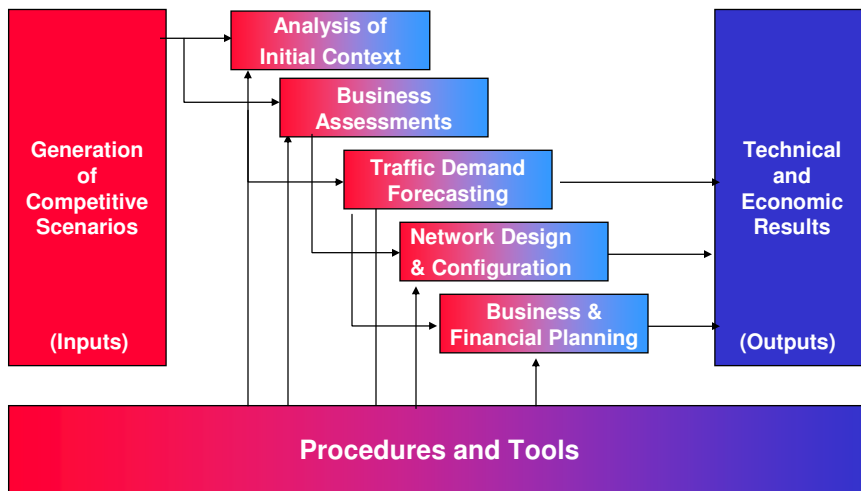
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## Network Planning Tools Integrated Iterative Planning Process



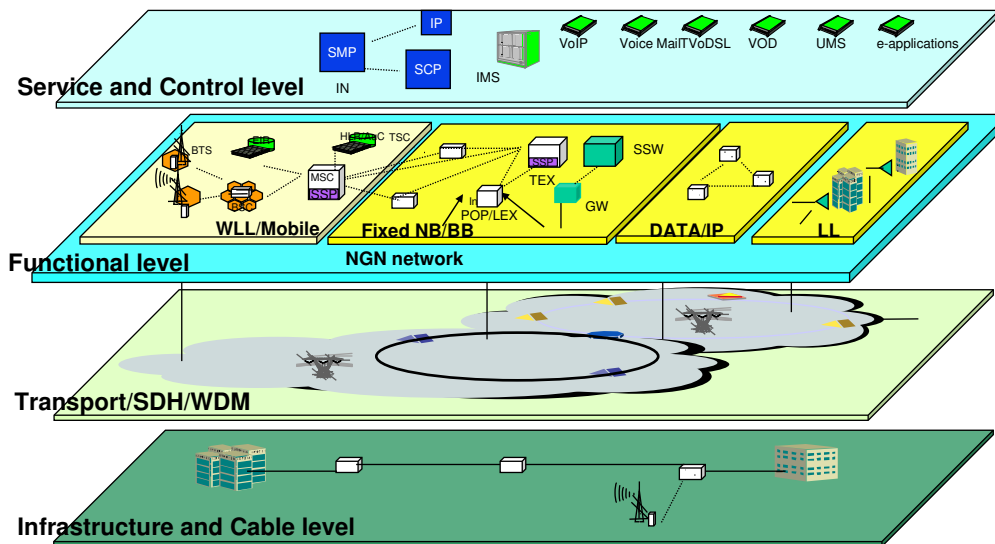
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## Network Planning Tools Strategic view: Network Layer Modeling



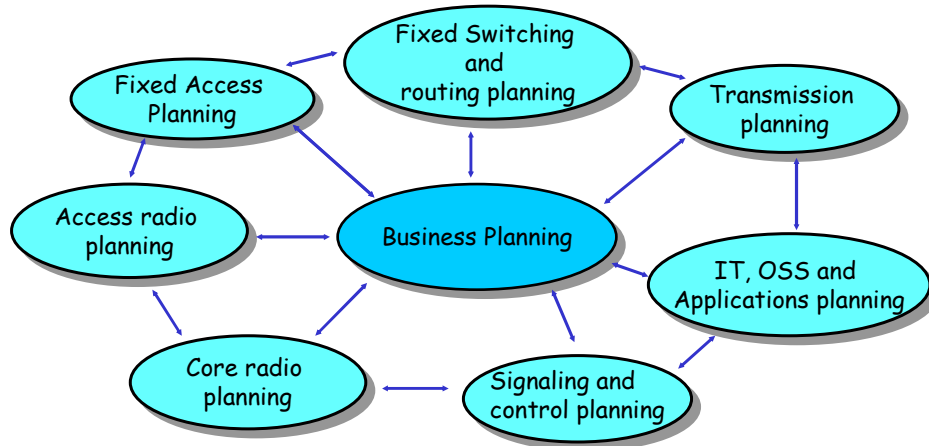
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## Network Planning Tools Planning domains



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## Network Planning Tools Support tools: Business

- **Required functionality for Business tools**

- Service Demand Projection
- Dynamic modeling for technology **substitution and migration rates**
- Dimensioning **multiple flows** (circuit and packet modes)
- Evaluation of network resources and associated investment (CAPEX)
- Evaluation of revenues for given tariffs and installation rate
- Modeling **multiple resource lifetimes**
- Modeling of demand elasticity to tariffs
- Interrelation between network growth and operational cost (OPEX)
- **Cost assignment** as a function of utilization rates
- Generation of standard financial results like Cash Flow, Profit & Loss, Balance Sheet, NPV, IRR, etc.

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### Support tools: Design and Optimization (I)

- **Required functionality for Technical design tools**
  - Service demands characterization and traffics for **VoIP and NGN multiservice flows**
  - Conceptual Network Design and Capacity Planning
  - Comparison of different network structures
  - Routing flows for most typical cases including **OSPF, shortest path, widest path and weighted cost** functions.
  - Optimizing locations and connections of network gateways
  - Cost, **Performance and Reliability** Analysis
  - Estimation of investment costs for the rollout and the extension of the investigated multi-service network



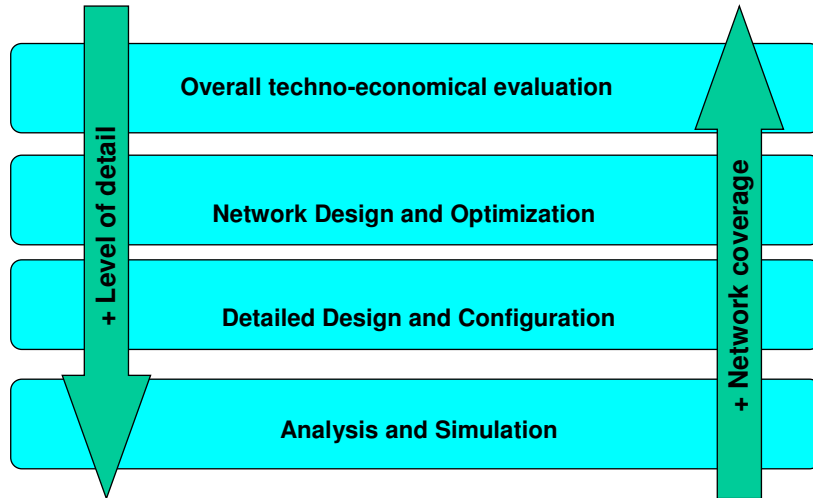
## Network Planning Tools

### Support tools: Design and Optimization (II)

- **Required functionality for Technical design tools**
  - Estimation of end-to-end delays
  - Technical Site and System Planning
  - Allocation of the IP or MPLS links
  - Formation of **virtual networks**
  - Routing over ATM links or PDH/SDH systems or tunneling via other IP links
  - **Sub-networking and addressing**
  - Configuring the network elements (IP router)



## Network Planning Tools: Tool categories by coverage and detail



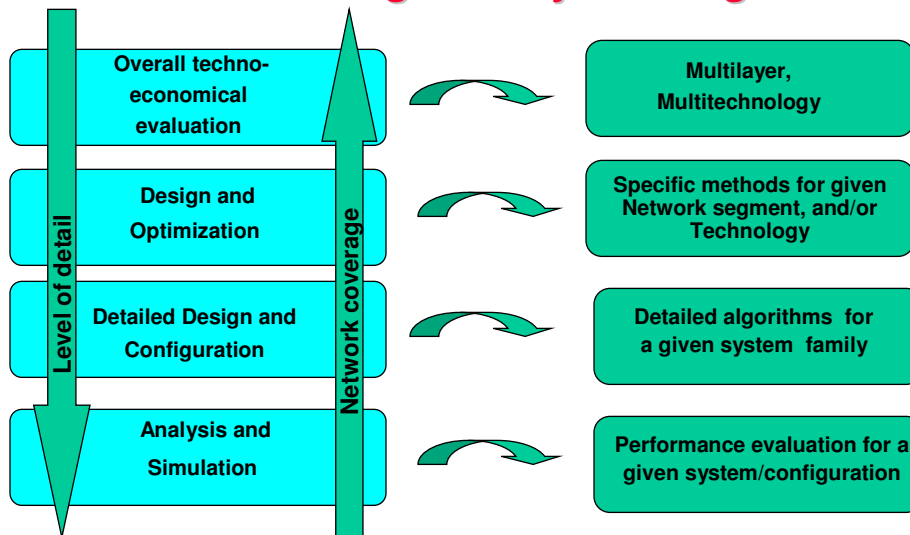
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## Network Planning Tools: Tool categories by coverage



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## Network Planning Tools: Tool examples per category

