Answers for infrastructure and cities.

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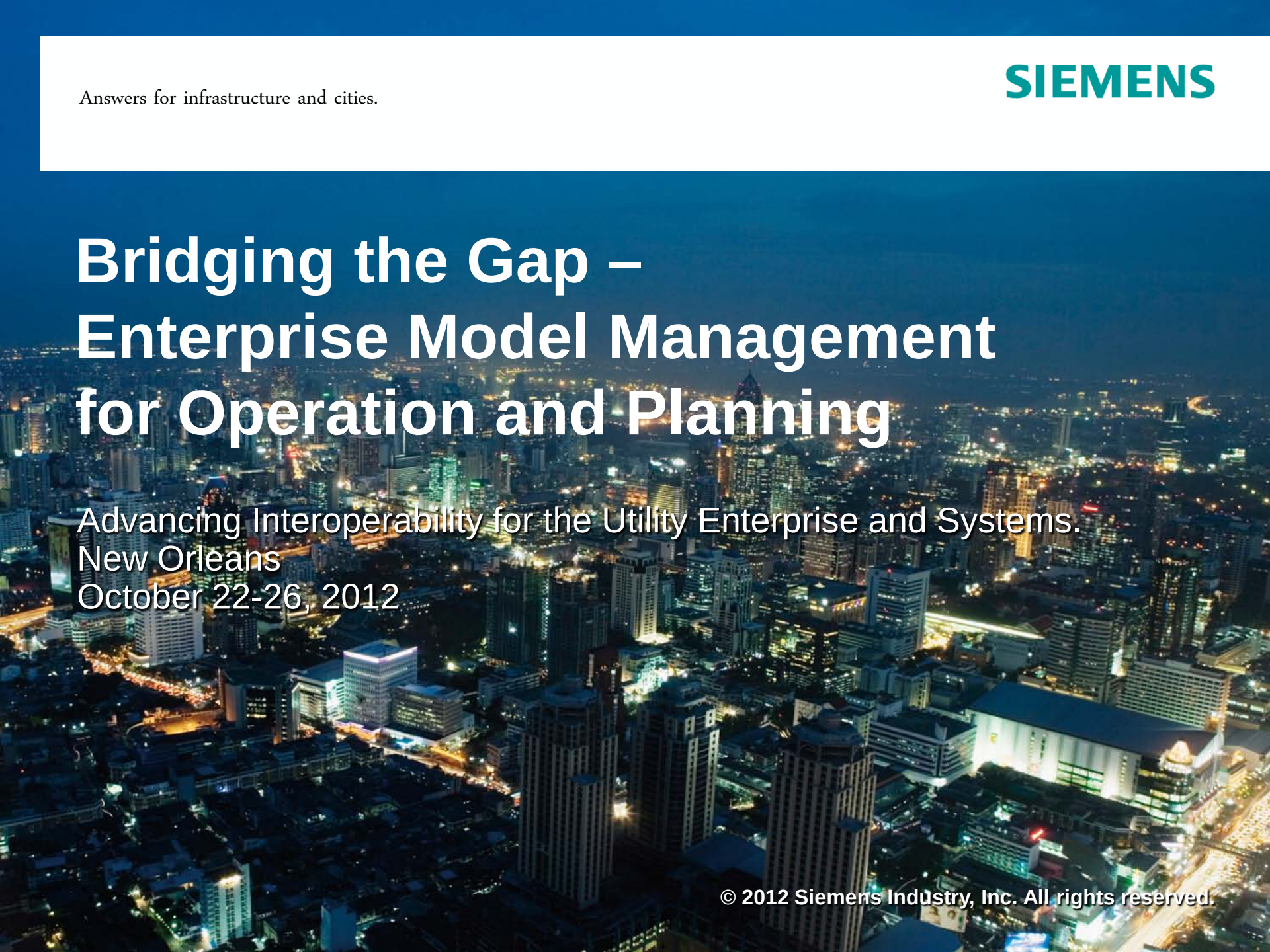
Bridging the Gap – Enterprise Model Management for Operation and Planning

Advancing Interoperability for the Utility Enterprise and Systems.
New Orleans
October 22-26, 2012



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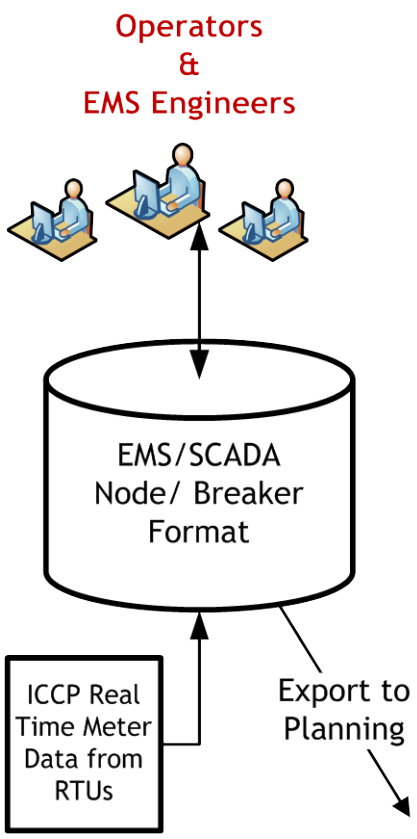
Operations Models

Transmission Operations Model

- For real-time system monitoring & equipment control
- Control area models
- Detailed node-breaker
- Single-phase
- Neighboring areas only represented as power source/sink

Challenges

- Coordination with the planning models
- Neighboring areas only represented as power source/sink



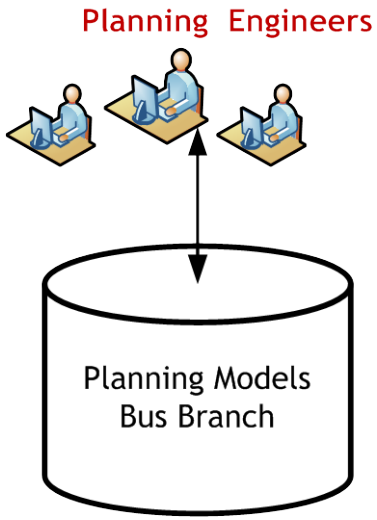
Transmission Planning Models

Transmission Planning Model

- Bus-branch representation
- Large cases to include all interconnected areas
- Typically in offline mode for long term analysis such as interconnection and expansion studies
- Detailed generator models for dynamic system response

Challenges

- Typically not coordinated with Real-time Model
- Consistency with the real time network condition needs to be validated
- Neighboring areas could be very extensive



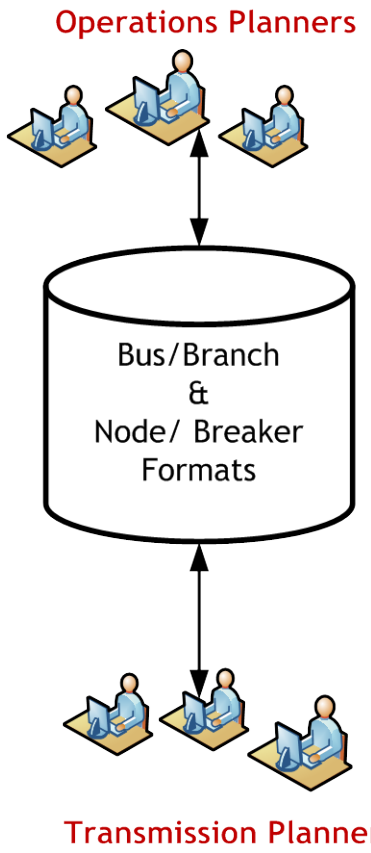
Unified Planning Models

Unified Planning Model

- Bus-branch and Node Breaker representation
- Includes all interconnected areas
- In offline mode
  - for long term analysis
  - for real time what if analysis
  - for system outage planning
- Detailed generator models for dynamic system response

Advantages

- Consistency with the real time network conditions
- Detailed future enhancements representation
- The same base models for planning and operations



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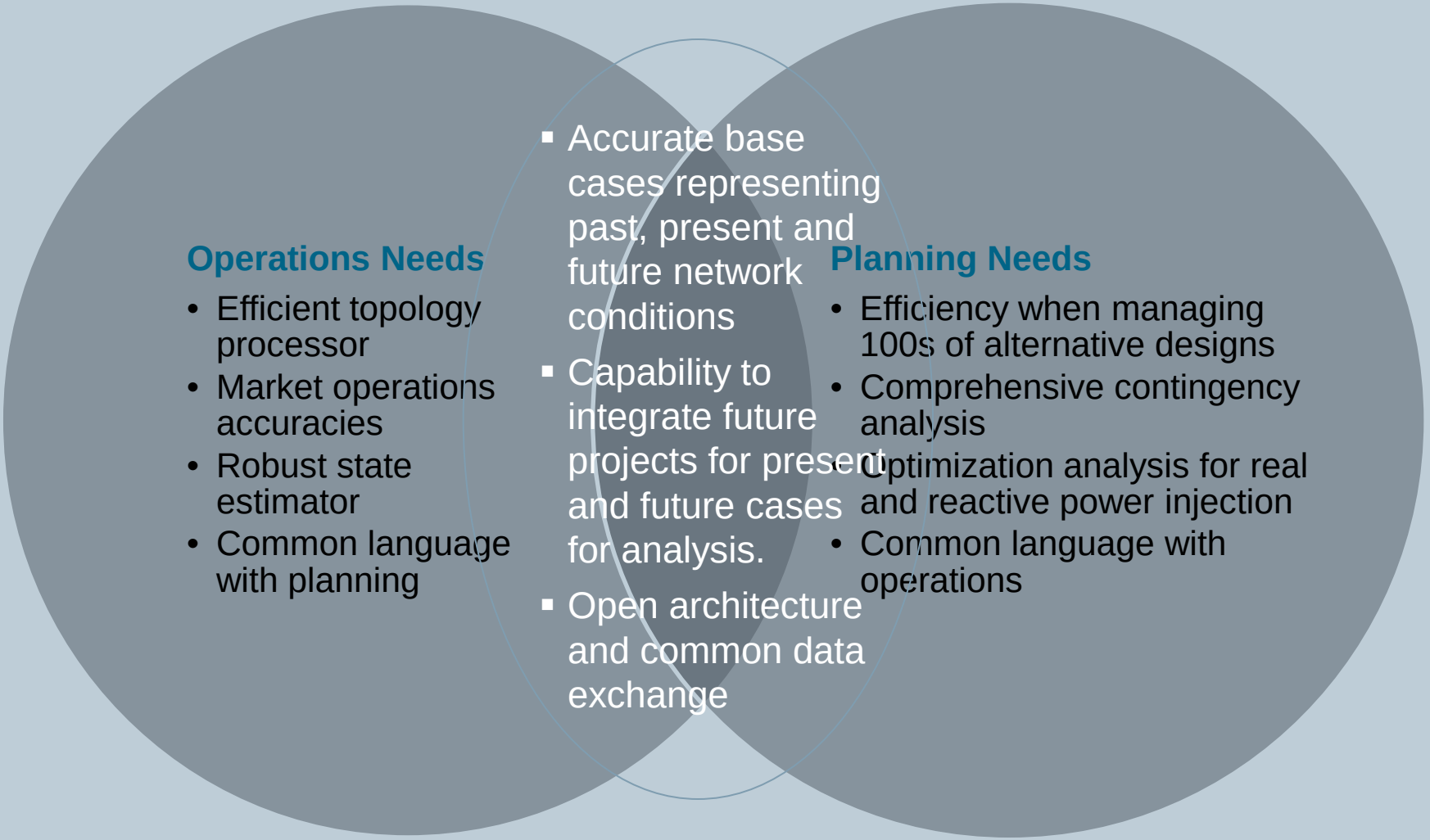
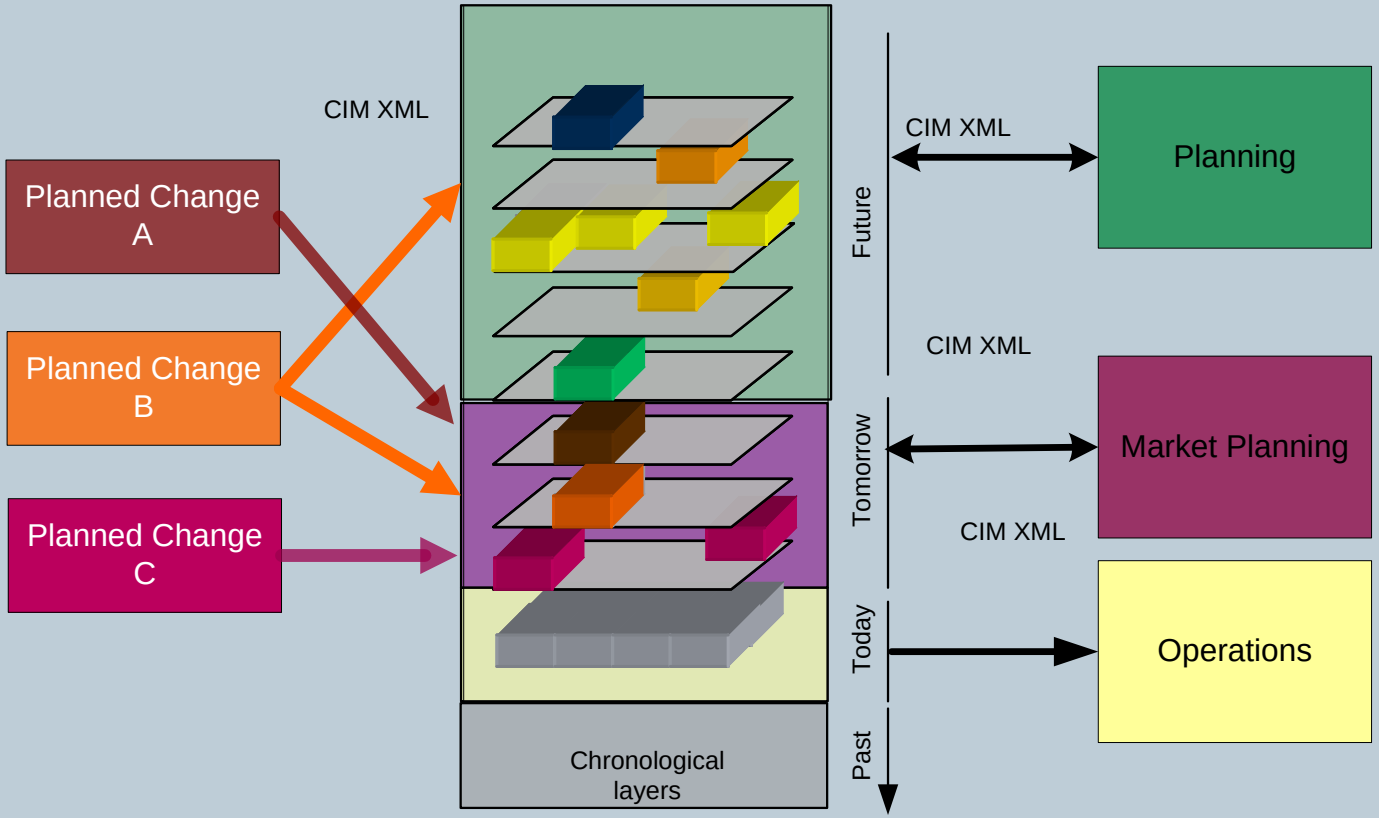
The need and the overlap



Planning, Engineering and Operations Workflow



Historical Time Based Model

Base Model Plus “Projects” and “SubProjects”

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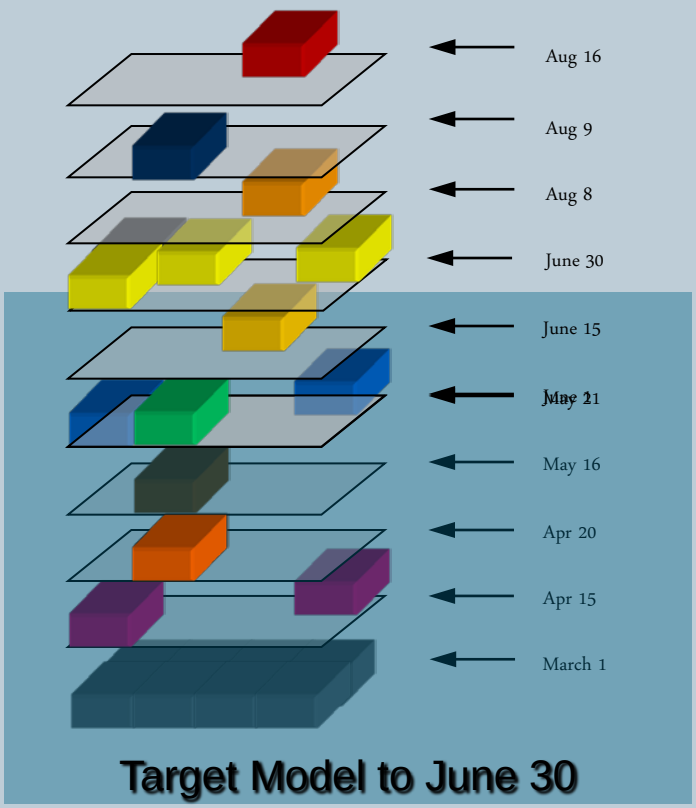
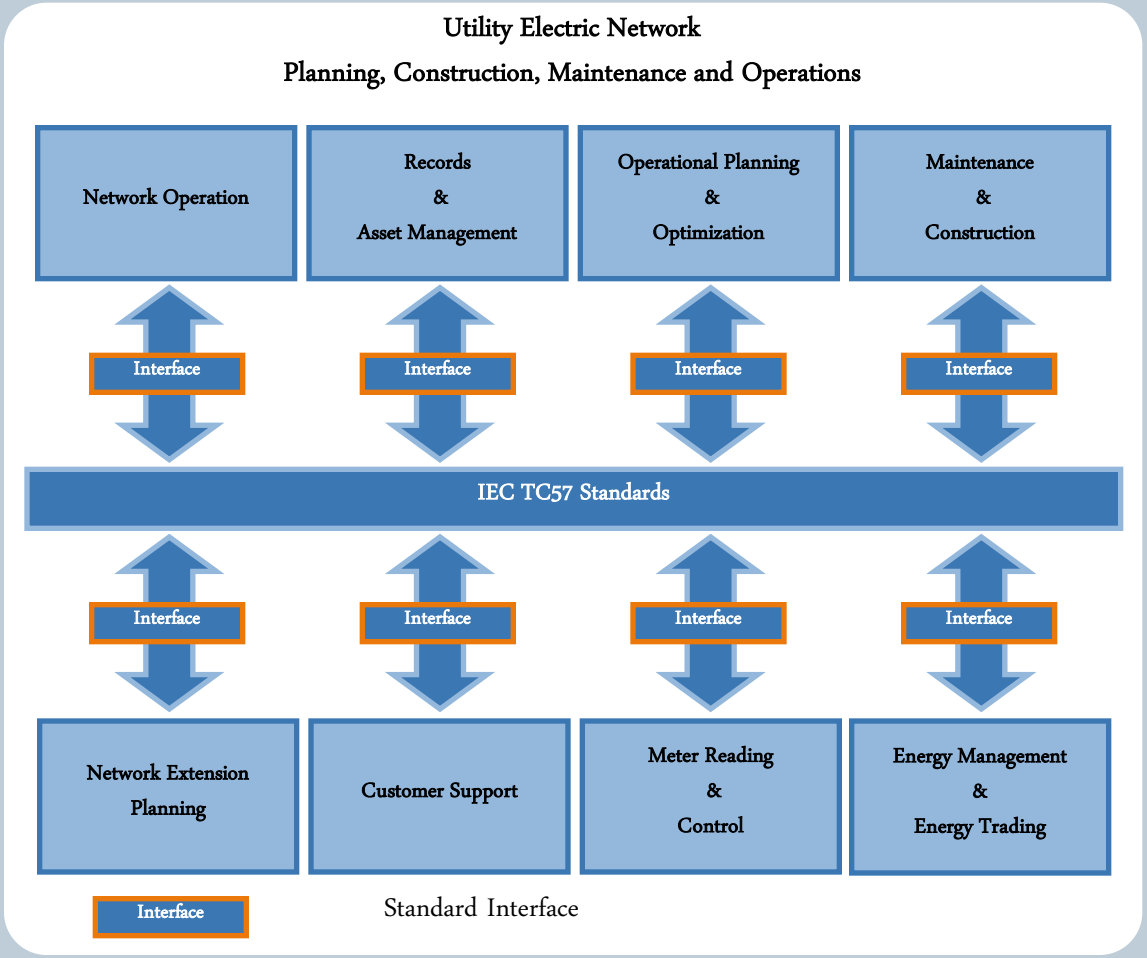


- Model is based on a base model plus changes (“Projects” or “Subprojects”)
- Target model at any point in time is base model plus applicable Projects/Subprojects
- Existing projects can be
  - Changed
  - De-commissioned
  - Inserted
- Time based models available for
  - Operations models
  - Planning models

The Role of the Common Information Model (CIM)

There are three **core standards** under CIM:

- IEC 61970 – EMS Application Program Interface
- IEC 61968 – System Interfaces for Distribution
- IEC 62325 – Energy Market Communications



The CIM Data Model
… a strong Base for Enterprise Integration

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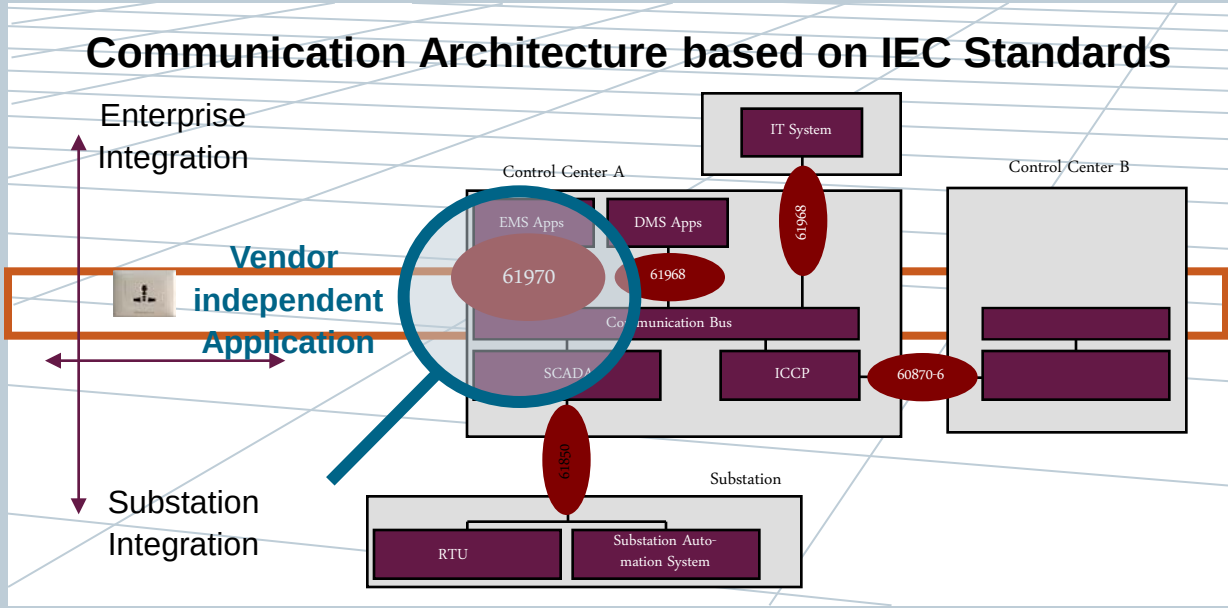
Standards

IEC

The sustainable way to the future:

- IEC 61970 / IEC 61968 / IEC 62325
- IEC 61850 / IEC 60870-6



CIM

- The CIM Standards have reached a maturity level that ensures successful usage through several interoperability tests and iterations
- Need to support the standardization effort and interoperability tests from day zero
- Market needs implemented standards to help the users to ease integration, reduce implementation costs and ensure future improvements

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