Challenges of Migration Towards Full IP Converged Network

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Agenda

1. The need for IP Transformation
2. IP Transformation
3. Challenges
4. IP Transformation methodology
5. Summary – Key Take ways

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1 Key Customer Issues

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High-level Key Customer Issues

Increase/Accelerate Revenues

- Reduce subscriber churn
- Grow subscriber base
- Stimulate ARPU

Optimize Costs & Improve margin

- Modernize aging network
- Cope with changing traffic volume
- Limit network complexity

Build Agility and competitive advantage

- Cope with changing technology
- Cope with changing business

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Increase and Accelerate Revenues

Addressing the battle for subscribers and revenues

Reduce churn

Grow Subs base

Stimulate ARPU

How to compensate commoditization and counter ISP-based VoIP players with stickiness and added value?

- Deliver superior & consistent quality of experience
- Limit substitution and leverage convergence
- Add value to content delivery
- Offer more value to business communication

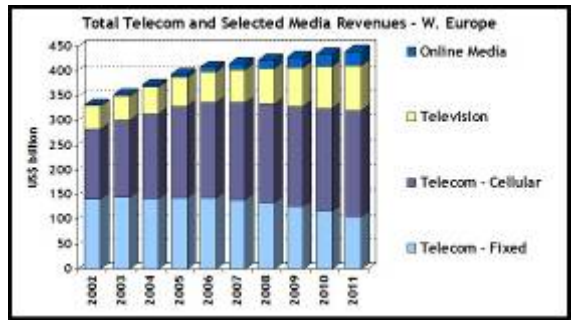
How to meet end-user expectation not yet addressed, with innovative services?

- Capture demand for new media & entertainment
- Capture demand for simplicity & convenience
- Offer advanced interactions for enterprise/vertical
- Offer innovative payment schemes

How to speed time to market for revenue generating services to customers quickly?

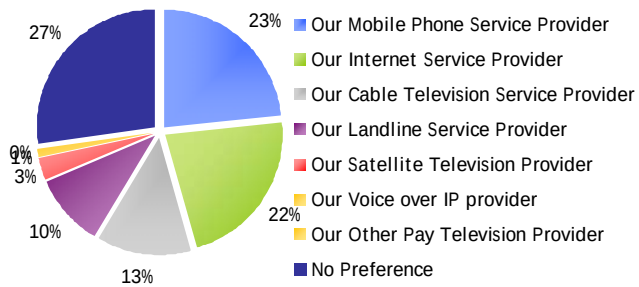
- Facilitate service creation over multiple domains
- Enhance content and do cross-selling
- Deliver personalized & blended services

Telecom Market at Crossroad



Source: Strategic Analytics, Sept '07

Preferred Service Provider for Blended Services



Source: ALU Market Research, Apr '07

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Optimize Costs & Improve margin

Addressing the urge for cost competitiveness

Aging network

More traffic

Complexity

How to address obsolescence and need for transition from legacy to next generation?

- Upgrade to next generation and rationalize
- Streamline OPEX for cost-efficient traditional services
- Transition to packet world with minimum disruption
- Move to IMS straight

How to rapidly scale to capture traffic increase in very competitive & high growth markets?

- Capture 2G/3G growth and increase market share with high voice/data quality
- Evolve to full inter domain peering between PSTN, NGN and IMS domains

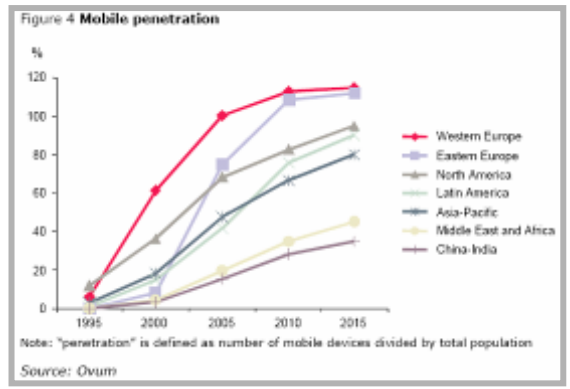
How to reduce complexity in heterogeneous & disparate environment?

- Multiple service delivery platforms and provisioning
- Evolving to IP but co-exist with large legacy networks
- Consolidate all networks to single packet transport
- Ensure satisfactory end-2-end service delivery
- Interworking in multi-vendor IMS environment
- Optimize the deployment cycle

"Service Providers Must Commit To Radical Cost Structure Reengineering or Die."

Source: Gartner

Mobile Penetration WW



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Build Agility and Competitive Advantage

Addressing the uncertainty resulting from changing technology and business forces

Changing Technology

How to de-risk the investment strategy towards the all-IP evolution?

- Which transformation scenario and timeline
- How to mitigate the risk in network evolution

How to address new requirements for combining telecom services with new web service capabilities?

- Leverage social networking opportunity
- Leverage user generated content opportunity

Changing Business

How to anticipate new players, regulation, and social trends and need for evolving business models?

- Face growing importance of internet players
- Address UGC, social networking and communities
- Offer outsourced models to enterprises/verticals
- Monetize the network with profiling, advertising & commerce and adjust to changing buying behaviour
- Manage risk and develop attractive business cases with new business models

myspace.com a place for friends

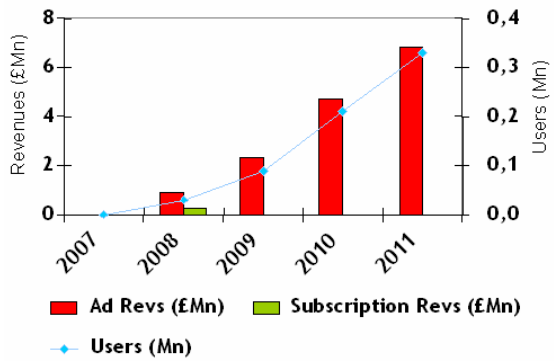
'Myspace' grew 200% yoy

YouTube™

'YouTube' reaching 70M users in less than 2 years

Vodafone UK/ MySpace Partnership Projections

Business Model based around Upselling data plans, Subscription and Advertising revenues



Source: Strategic Analytics, Sept '07

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Why Service Providers are Transforming their Business - Summary

Infrastructure evolution

- Single IP infrastructure
- Getting rid of stovepipes in network and systems

Top-line increase

- ARPU and customer retention
- Portfolio rationalization and new service revenues

Bottom line increase

- Cost of operations
- Time to market
- Processes and organization

Overall company value

- Competitive position
- Shareholder return
- Enhanced user experience
- Alternative partnerships

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2 IP Transformation Overview

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IP Transformation:

Large-scale **IP transformation** is complex, and requires a broad set of inter-related activities to address:

- Business Transformation - Developing the transformation business case
- Network Transformation - Designing and implementing flexible IP networks
- Service Transformation - Enabling rapid service creation
- Program Management - Managing interdependencies to meet timeline and costs constraints
- Stakeholder Engagement - Managing internal and external relationships

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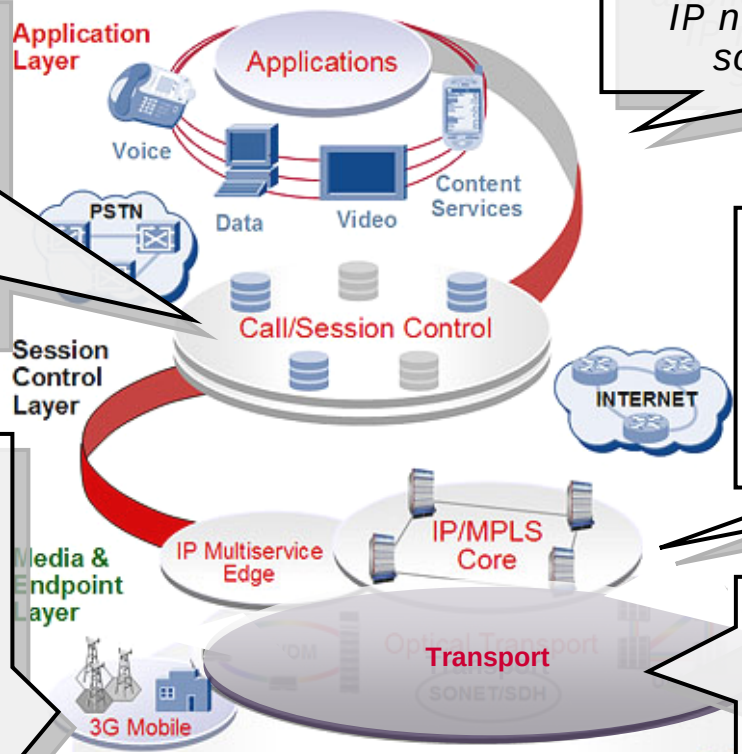
IP Transformation for Wireless Carriers: A Network View

IMS & SDE
New services and applications enabled by the IP network to drive new sources of revenue

Mobile IP Core Transformation
Transformation of call control and media gateway functions to a distributed architecture to reduce opex



IP/MPLS
Transition to a consolidated IP/MPLS backbone to provide a single, converged core network

High-Speed Access
Evolution to high-speed access technologies to enable enhanced end-user experience

(WiFi, WiMax, 3G/4G)

IP Backhaul
Utilization of Ethernet and IP for transport and backhaul to reduce transport costs and increase capacity

IP Transformation occurs at multiple layers of the wireless network

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IP Transformation for Wireline Carriers: A Network View

IMS, SDE, IPTV
New services and applications enabled by the IP network to drive new sources of revenue

Voice Services & Legacy Data Services Transformation

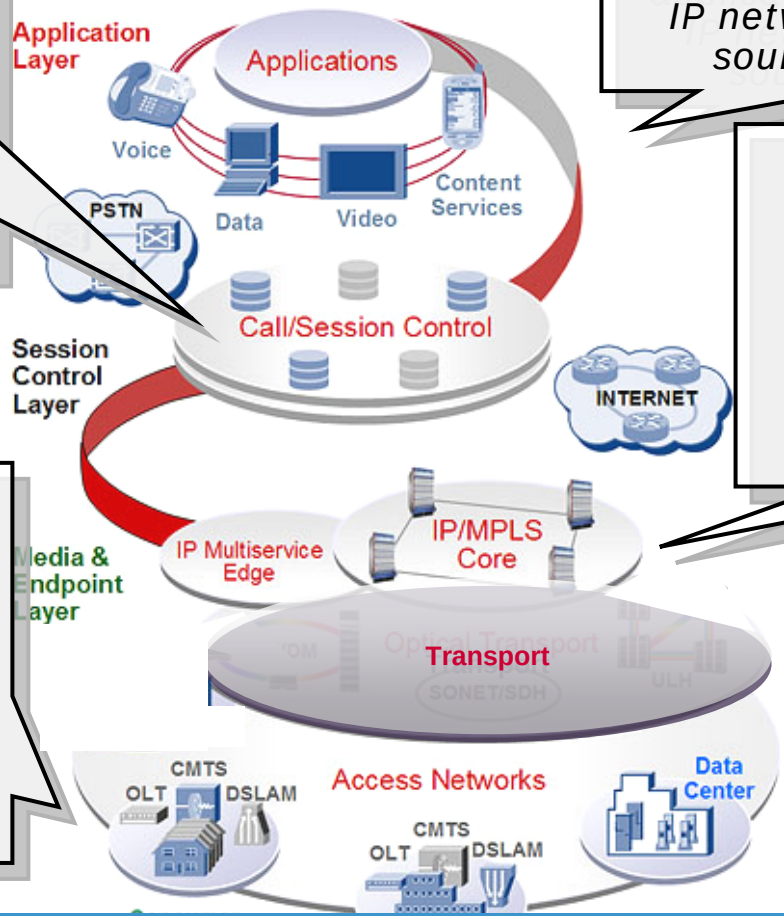
Transformation Class 4/5 Services to a distributed architecture

IP/MPLS
Transition to a consolidated IP/MPLS backbone to provide a single, converged core network

High-Speed Access

Evolution to high-speed access technologies to enable enhanced end-user experience

(xDSL, FTTN)



IP Transformation occurs at multiple layers of the wireline network

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Technology change in the network is central to transformation, but successful programs encompass much more…

Program Management & Holistic management of interdependencies

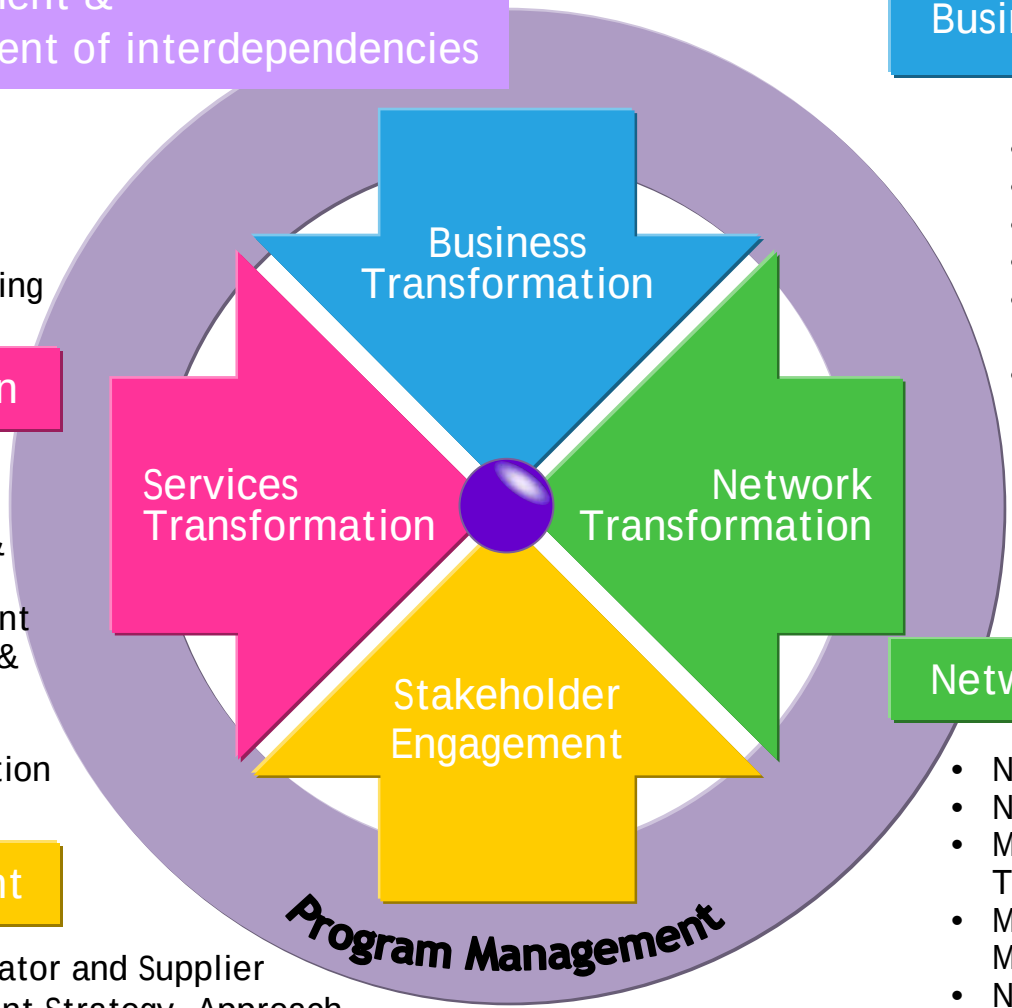
- Program Setup
- Financial Management
- Schedule Management
- 3rd Party Coordination
- Resource Fulfillment Planning

Services Transformation

- Operations Transformation consulting
- Service operations design & integration
- Service Delivery Environment (SDE) Consulting, Planning & Integration
- Applications Consulting, Planning, Security, Integration & Custom development

Stakeholder Engagement

- Customer, Regulator, Operator and Supplier Communications Engagement Strategy, Approach and Management



Business Transformation

- Business Readiness
- Portfolio Management
- Business Case
- Benefits Management
- NGN support & operations
- Hosted services

Network Transformation

- Network Readiness
- Network Design
- Multivendor Integration & Testing
- Migration Planning and Management
- Network build
- Security services

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3 Challenges in Transformation

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Challenges:

- **The stakes are high**
  - Competitors are entering previously uncontested markets
  - Transformation program failure can easily = corporate failure
  - Pressure to transform rapidly and profitably is increasing
- **The costs are high**
  - Transforming services, business, networks and operations is expensive whether or not you do it right
- **The programs are more complex than anything it was done before**
  - Managing across “smokestacks” is a major challenge, as is the scale of the programs, right skill mix across packet/circuit is not in place (esp in ops)

Customers undergoing a network transformation do not want to impact their existing customer base. This base is essential to make a smooth transition over to the new infrastructure in order to sell expanded services.

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Convergence of multiple services and access creates challenges.

Challenges for Subscriber Data Management

Inertia of Traditional Subscriber Profile Management

- Multiple network components with several data/models/interfaces
- Multiple points of provisioning
  - Databases are managed separately
  - Databases have old and duplicated data (dirty data)
- Database performance limitations
  - Data needed in real time with high availability

Speed of Deploying New Services

- Multiple services accessing data from multiple components and domains
  - Data migration issues
- Personalization of services is complex if profile data not easily accessible
  - Databases cannot support consolidation of data

Cost of Operation, Maintenance and Support

- Support of multiple and fragmented nodes increases operation and maintenance costs

Business impact

- Limited "re-use" hinders possible CapEx savings
- Existing Data not properly leveraged to enhance customer experience in support and new services

- Revenue is delayed or missed due to longer implementation cycle
- Testing and configuration of a new application is more difficult and costly when multiple sources are needed

- Maintenance (troubleshooting & upgrades) of multiple implementations is difficult and not cost effective

Estimated Impacts*:

- Annual broadband costs are set to soar by as much as 900%, from 1.3 billion in 2005 to 12 billion in 2010;
- Dirty data will cost U.S./ European operators $6.3 billion per year by 2010;
- Up to 50% of existing access network records have some level of inaccuracy
- Up to 50% of access network faults related to inaccurate data records;

* Factiva News and Business Information Service, John Mellis – July, 2006

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Requires a Trusted Partner to Deliver the End Game

Capture Business Benefits

- Optimize investments and realize savings
- Improve flexibility and service delivery

Control Risk and Costs

- Manage interdependencies
- Leverage proven methodologies and tools

Speed-up Transformation

- Share best practices
- Improve time to market and reduce technical risk with transformation lab facilities, thorough testing and validation of pre-integrated and custom solutions

Transformation Is Not Business as Usual
Make Transformation Predictable

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Challenge: Making the Transformation “Predictable”

Transformation risks and associated costs

- Shareholder-proof business case
- Scalable all-IP architecture
- Market-proof service roadmap
- The right skills and experience
- End-to-end integration
- Streamlined business processes
- Overall project management
- Cost-effective OSS/BSS

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4 IP Transformation Methodologies

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Unique Expertise and Assets: Bell Labs Methodologies and Algorithms

Bell Lab Innovation:

- Multi-Service, Multi-Layer Network Design
- Business Modeling
- Decision Support Methods for Data Migration Planning
- Comprehensive Methodology Addressing 20 Major Functional Areas

Comprehensive Processes and Algorithms Support Unique Capabilities to Enable Predictable Transformation for Our Customers

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Investing in Predictability to Differentiate Our Solution:

Repeatable methods, proven processes and best practices support predictable transformation

Unique Ingredients	Value Proposition
IP Transformation Methodology	Carrier-proven workflow and E2E process to de-risk IP transformation and migration, and streamline planning
Data Migration Planning	Identify optimal (costs/benefits) for complex data migration & transformation activities
Application-Driven Network Design Methodology	Provides design optimized for NGN performance and reliability, and the ability to manage and compare multiple design scenarios.
IP Transformation Centers	Centers of excellence for integration and migration

Repeatable methodologies mitigate risk and reduce your investment

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What Problems Can the IP Transformation Methodology Help Solve?

- What are the key decisions that we need to make to determine our transformation strategy?
- Do we have a framework that defines all the planning, preparation, and execution tasks need to implement the strategy?
- Which of these tasks are in scope of the contract / work program we are trying to define?
- Are our migration requirements clearly defined?

- What are the implications of those requirements on capital expenses, support systems development, and schedules/resources?
- How much data validation and cleansing do we need to undertake, and when?
- How can we dynamically model our resource needs, as the migration schedule changes?

Manage the risk and complexity of planning and migration using proven methods

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IPTM increases the predictability of transformation …

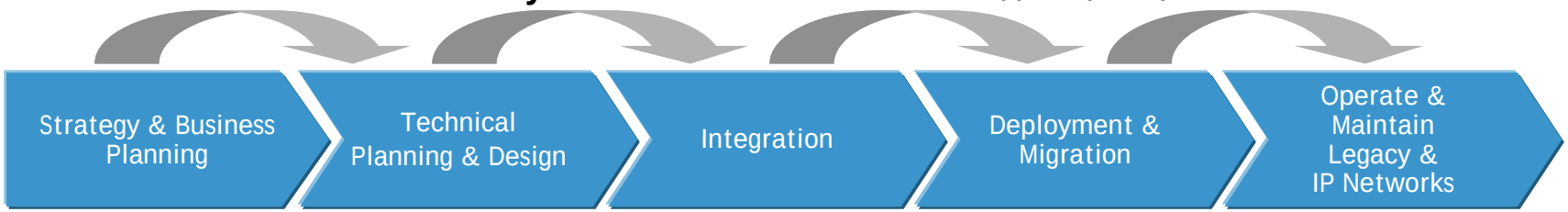
… by managing inherent complexity and operational risk

IP Transformation Methodology is a framework for

·Planning ·Preparing ·Executing

Customer Transformation Lifecycle

Typically 2-3 years



1 **Transformation Planning**

IPTM has four phases that align with …

2 **Migration Preparation**

3 **Migration Execution**

4 **Close out**

A well-planned and executed IP transformation is required to realize long-term financial objectives

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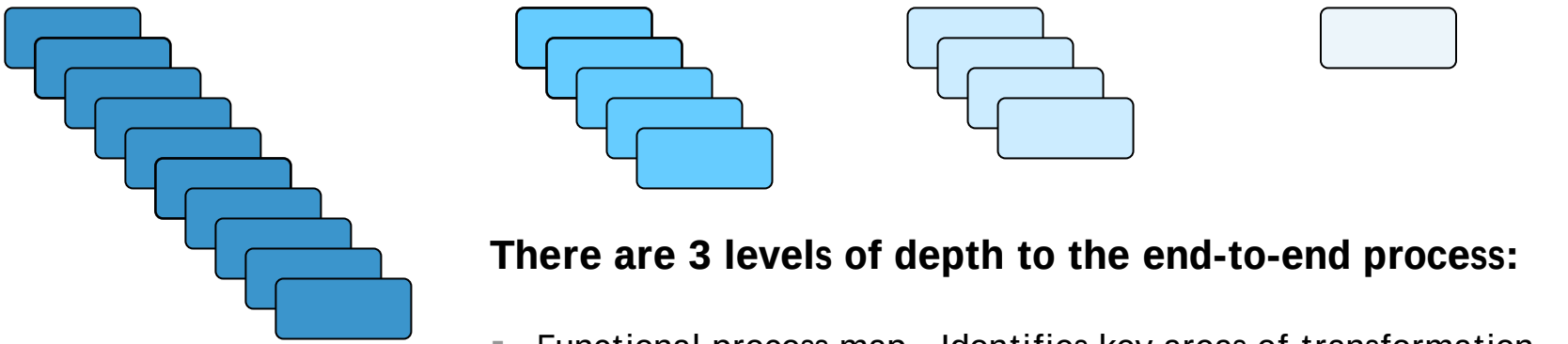
The methodology defines the *process* of transformation and …

Addresses 20 major functional areas inclusive of the following:

- Architecture, design, operations systems, operations, migration requirements, data management, lab trials, field trials …
- Overarching business requirements

Transformation Planning | **Migration Preparation** | **Migration Execution** | **Close out**



There are 3 levels of depth to the end-to-end process:

- Functional process map – Identifies key areas of transformation
- Detailed process flows – Show relationships among area tasks
- Activity templates – Specify inputs, tasks and outputs

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… and cover the following transformation activities:

Transformation Planning

1. Business Requirements and Priorities
2. High-level Planning
3. Discovery and Inventory
4. Hybrid Architecture
5. Hybrid Network Design
6. Hybrid OSS/BSS Design
7. Hybrid Operations Design
8. Migration Requirements
9. Detailed Migration Planning

Network Migration Preparation

10. NGN Network & Systems Deployment
11. Network Preparation
12. Migration Software & Tool Preparation
13. Software & Process Validation
14. Data Validation & Clean-up

Network Migration Execution

15. NGN Mgmt for Migrating Services
16. Network & Subscriber Database Migrations
17. Physical Network & Subscriber Service Migration
18. Validation/Operational on NGN

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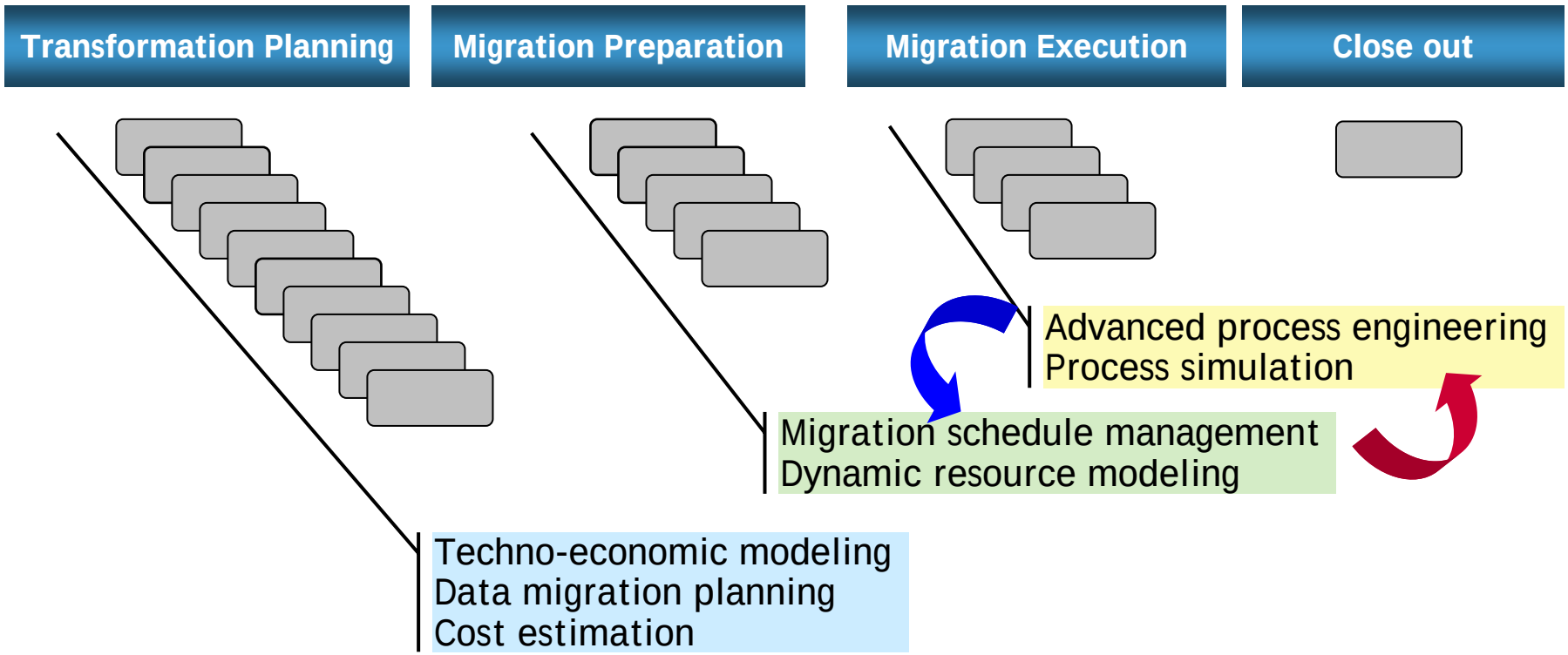
… provides *decision support tools* for mitigating risks in the process

Indicates critical decision points and provides algorithms and models to enable optimal decision making before migration begins and during 'hybrid network' state



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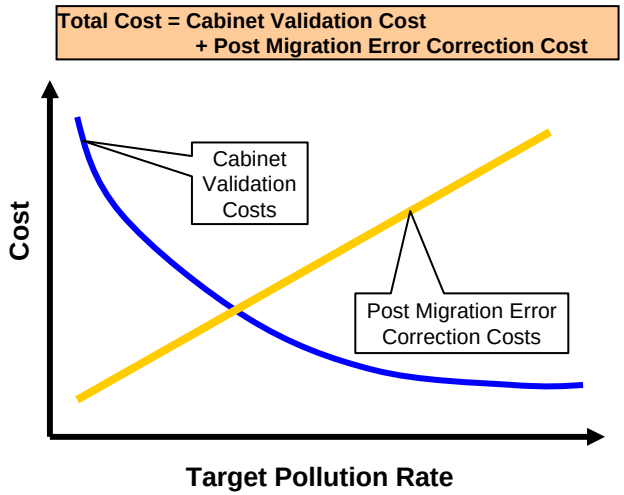
Data Migration Planning

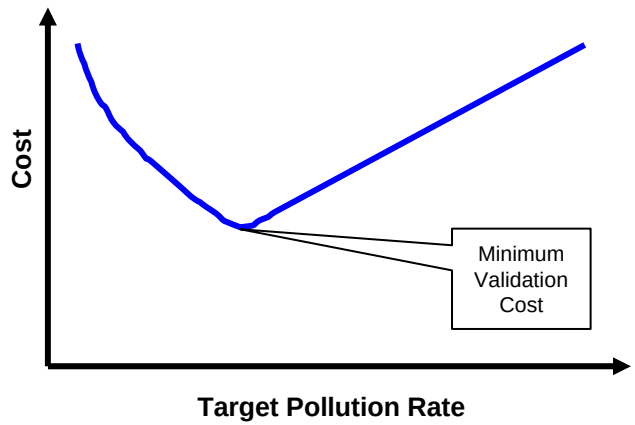
Evaluate the Impact of Data Quality Early – (concurrent with network readiness)

- Example IP Transformation Program – 5M Subscribers with 3 year migration window
  - Assume 5% Error Rate = 370 Migration Errors / Day
  - Assume 30 mins effort to correct = 25 AfterCare Headcount
- Best In Class Accuracy for Physical Network Administration data is 85%
- Post Migration Error Correction is twenty times more expensive than data validation



Best Practices

- Perform initial audit of data quality in all potential systems that are data sources for the migration program
- Develop migration processes that will take advantage of highly accurate data streams
- Use sophisticated modeling tools to minimize the cost of data validation and error correction



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“Datagrid”:

Simplifies the challenges for Subscriber Data Management

Overcomes the inertia of Traditional Subscriber Profile Management

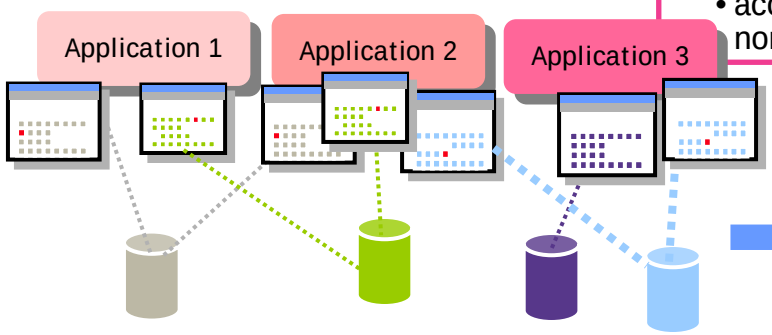
- A Universal View of data
  - Data Consolidation
  - abstraction of data from network elements
  - a unique view of any data to each application
  - Provide efficient, uniform data management
- Telco performance
  - Fast
  - Scalable
  - Economic IT platform with telco grade reliability

Speeds up Deployment of New Services

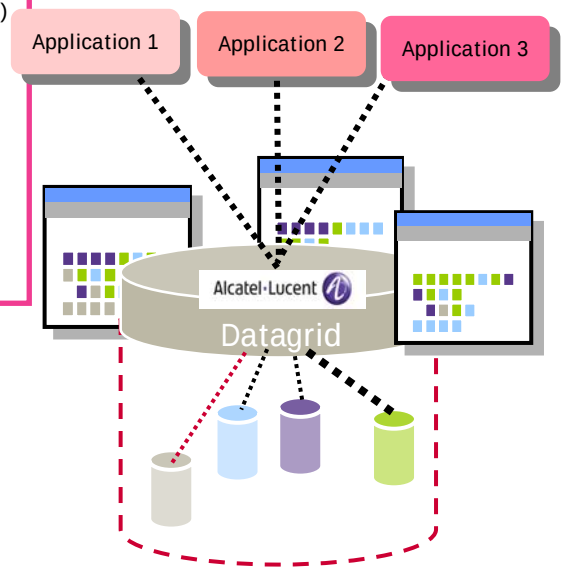
- Single point of access
  - protocol adaptation (LDAP, Sh, SOAP/XML/SQL)
- Use existing subscriber data without migration risks
  - Simultaneous support for a many data models
    - Store data externally
    - Store or copy data locally
    - Trigger on network data events (future)
- Leverage 3rd parties
  - Data Federation
    - Allow easy and secure access to third party data and applications
  - access security functions for trusted and non trusted (Liberty alliance) parties

Reduces the Cost of Operation, Maintenance and Support by

- Data Centralization
  - Centralise Management and Reporting



Server based application



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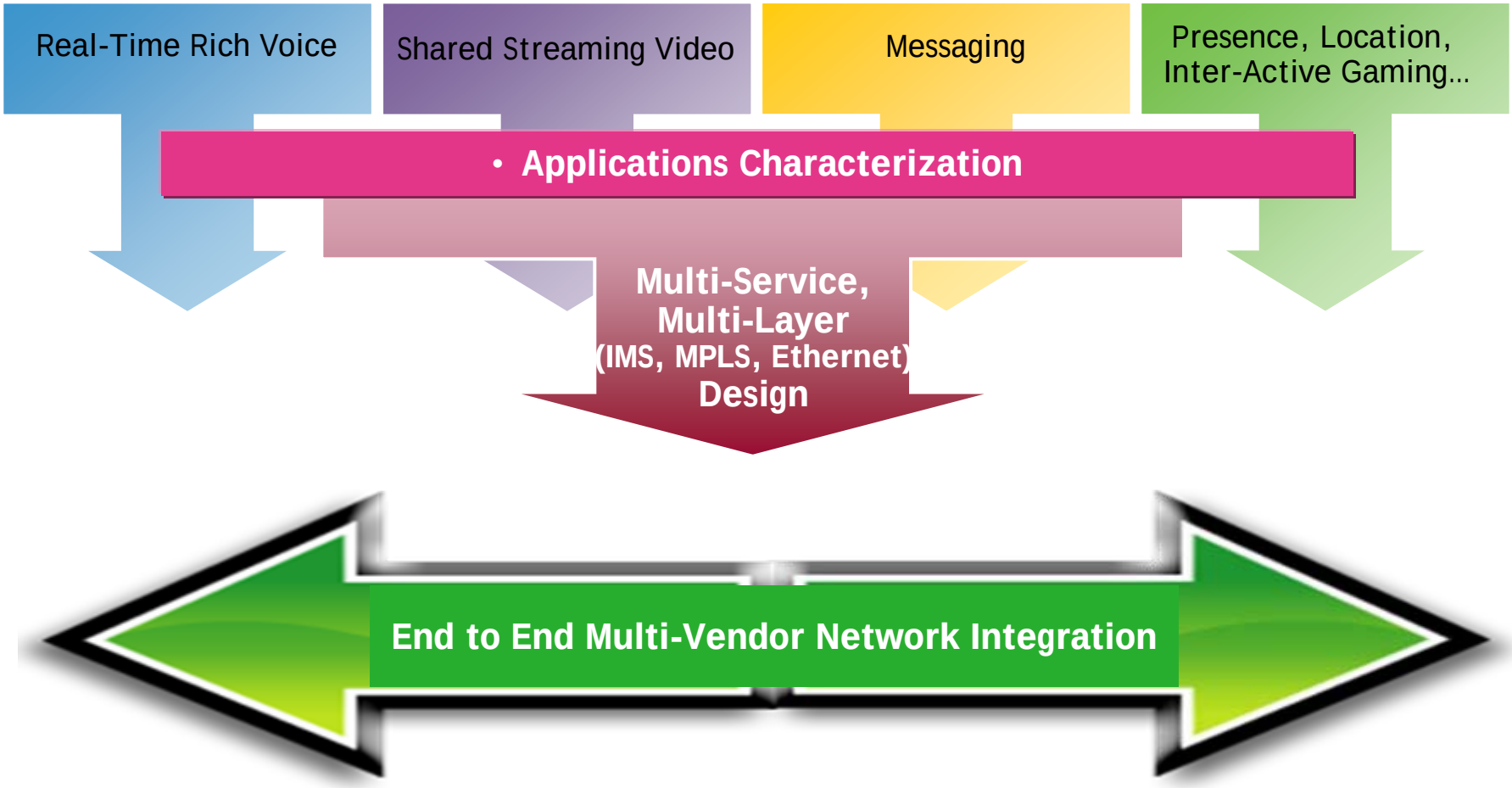
Many applications share a common infrastructure in NGN



End User Quality of Service Requires a New Approach

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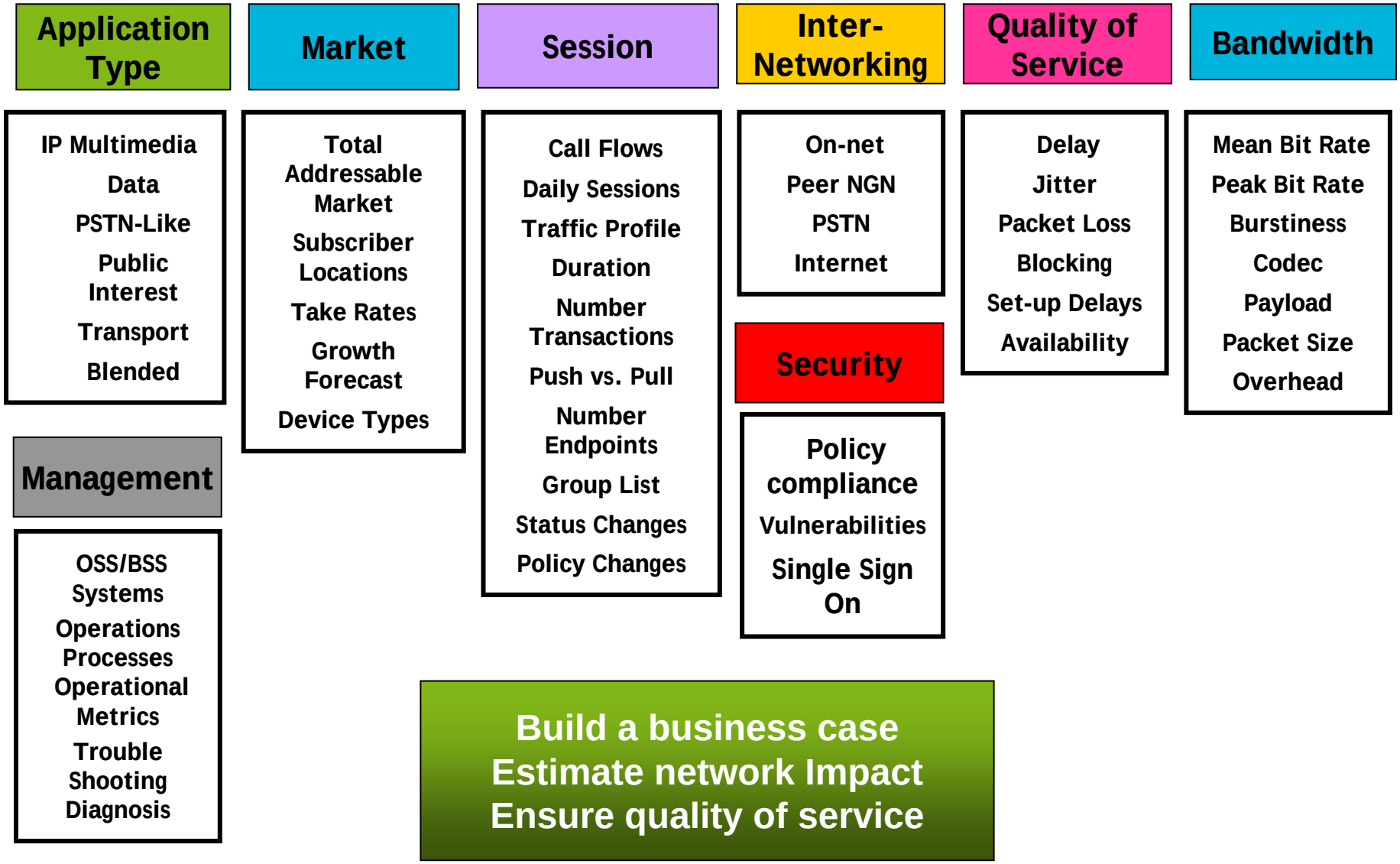
What Does it Mean to Characterize an Application?



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Design for Application-Driven Networks

Best Practices Support Network Planning and Design

Value to IP Transformation:

Speed time-to-market and optimize capital and operating expenses.

- Applications characterization to model the impact of new applications on the network.
- Network architecture and deployment options to support network planning and business case development.
- Detailed network designs for multi-service, multi-layer, multi-vendor networks.

Application Driven Network Design Features:

Integrated design process uses **detailed applications and traffic modeling** to drive advanced design optimization algorithms

Design for the **IMS, MPLS and Ethernet layers** of a **multivendor** network.

Automation and rapid iteration of **complex multivariate analysis using consistent data** across all layers of the design.

Innovative Network Planning and Design Support Predictable Transformation

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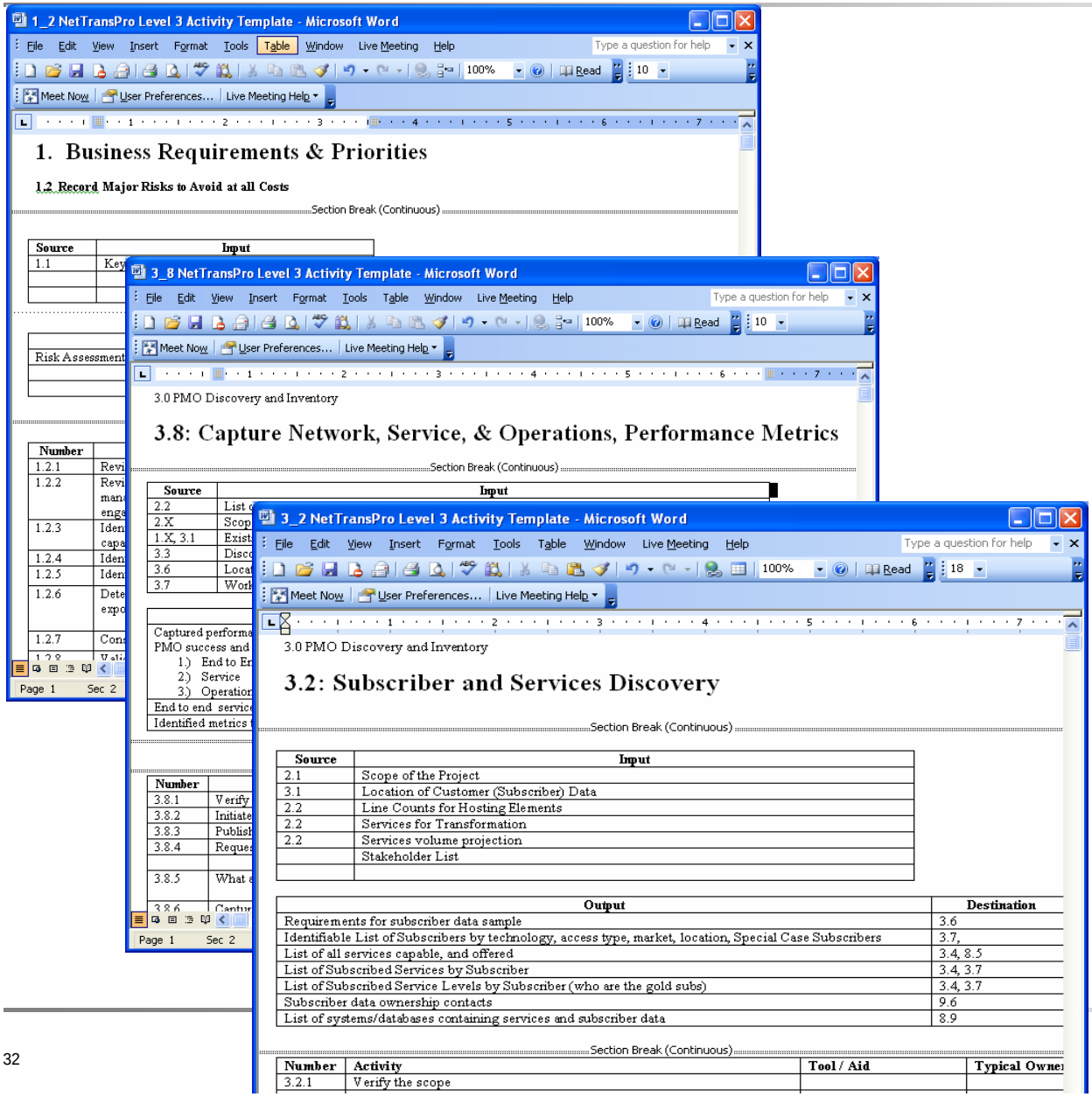
End-to-End Transformation Process – Sample Activity Templates



Activity Template Information

- Input
- Output
- Activities
- Custom Software/Tools
- Owner
- Cost & Duration Estimates & Drivers
- Risks

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5 Key Take Ways & Summary

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Key Factors to consider:

Minimize customer disruption - In formulating the migration strategy, main concern should be to ensure that the Operator's customers do not experience any degradation in service.

Maximize flexibility - Migration of network and services is not a simple process. The total process is lengthy and may also impact the Operator's existing services, systems and processes. The migration tools and processes must provide the flexibility to accommodate the Operator's changing business needs and priorities.

Maximize opportunities for new revenue generation - By deploying the new NGN network capabilities quickly, the Operator will be in a position to deliver new revenue-generating services at the earliest possible time.

Minimize ongoing operating costs - One of the key objectives in the migration process is to strive to flatten the elevated expense curve during the transition period as well as shorten the time period of the hybrid network state where expenses are elevated.

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Complexity Can Turn into Benefits with Right Partner:

Must have Extensive Experience with Complex NGN Migration Projects and Prime Contractor Competence
- Certified and Experienced Program Managers.
- Implementation of Complex Migration Projects. Technological Innovation

Available expertise in R&D as source of ideas, products and services serving the communications industry.

Proven Multi-Vendor Capability- Working knowledge of Multi-Vendor solutions.
- Knowledge of scripting techniques on multi-vendor switches.
- Deployment, integration and migration experience with Multi-Vendor Platforms.

OSS and Data Migration Skills – Experience with rapid, cost-effective, accurate migrations to new systems.

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Summary -Value Proposition through Fast, Predictable Execution

Network: reduce costs

- Strengthen IP footprint and broadband coverage
- Simplified architecture

Services: fuel growth

- Right mix of services and products
- Streamlined and redesigned end-to-end delivery process

Operations: free up cash

- Leverage cost saving programs
- Automated processes and optimized systems & tools
- Alternative partnership models

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Back up

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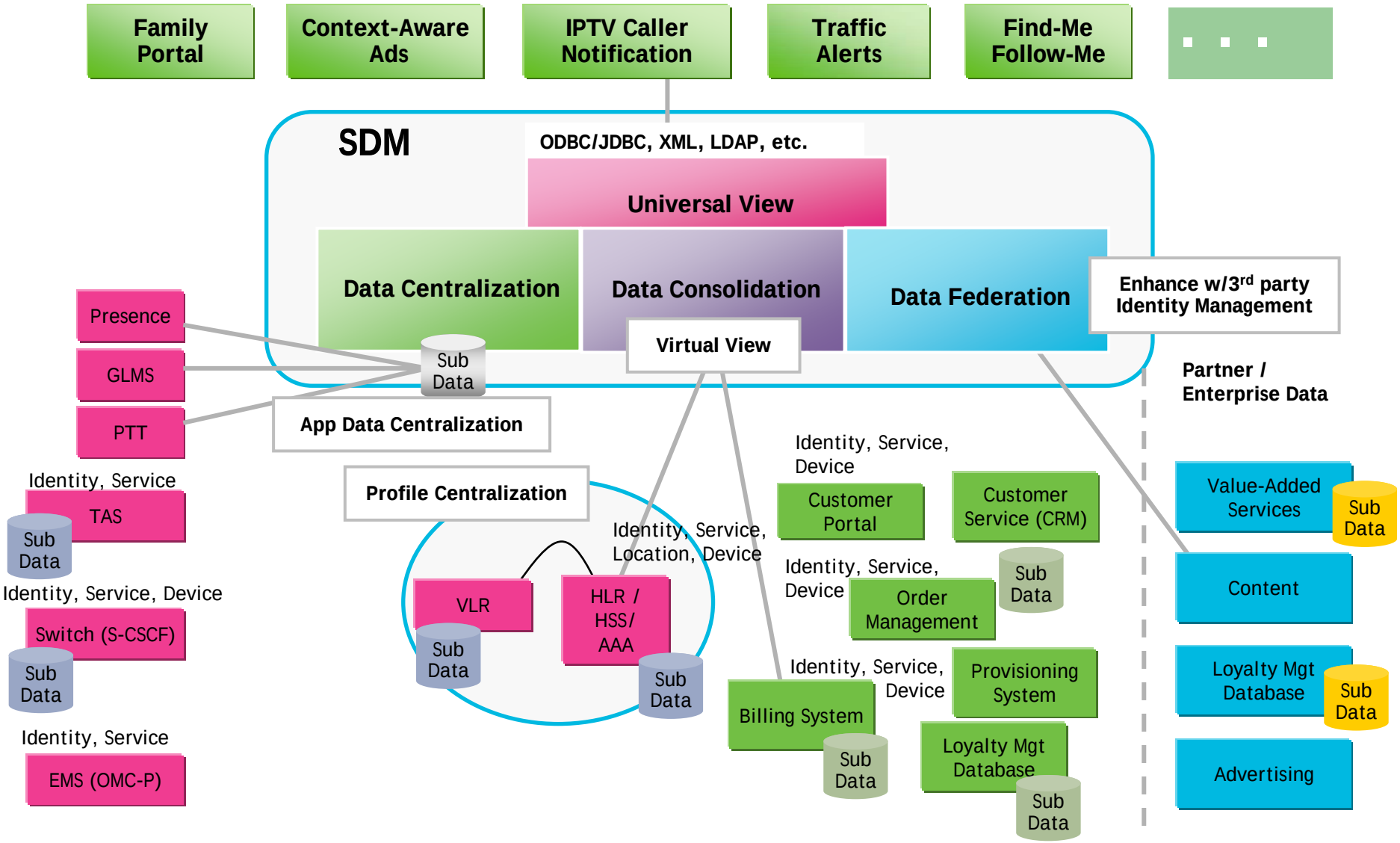
Business Transformation with Subscriber Data Management:
Flexibility in supporting Transformation Strategies



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IP Transformation Centers Partner to Manage Complexity, Speed Time to Market and Drive Predictable Results

The IPTCs provide:

- Hands-on experience with over 40 industry-leading transformation programs, repeatable methodologies and best practices to apply to your program.
- Centers of excellence for integration and migration in a global, networked, end-to-end, multivendor lab environment.
- An environment of pre-integrated solutions including networks and applications for IPTV, IMS, wireless CDMA and UMTS, cable and TDM switches to reduce investment and time to market.
- A multi-discipline network of IP Transformation domain experts.

Mitigating risk and controlling cost for IP Transformation

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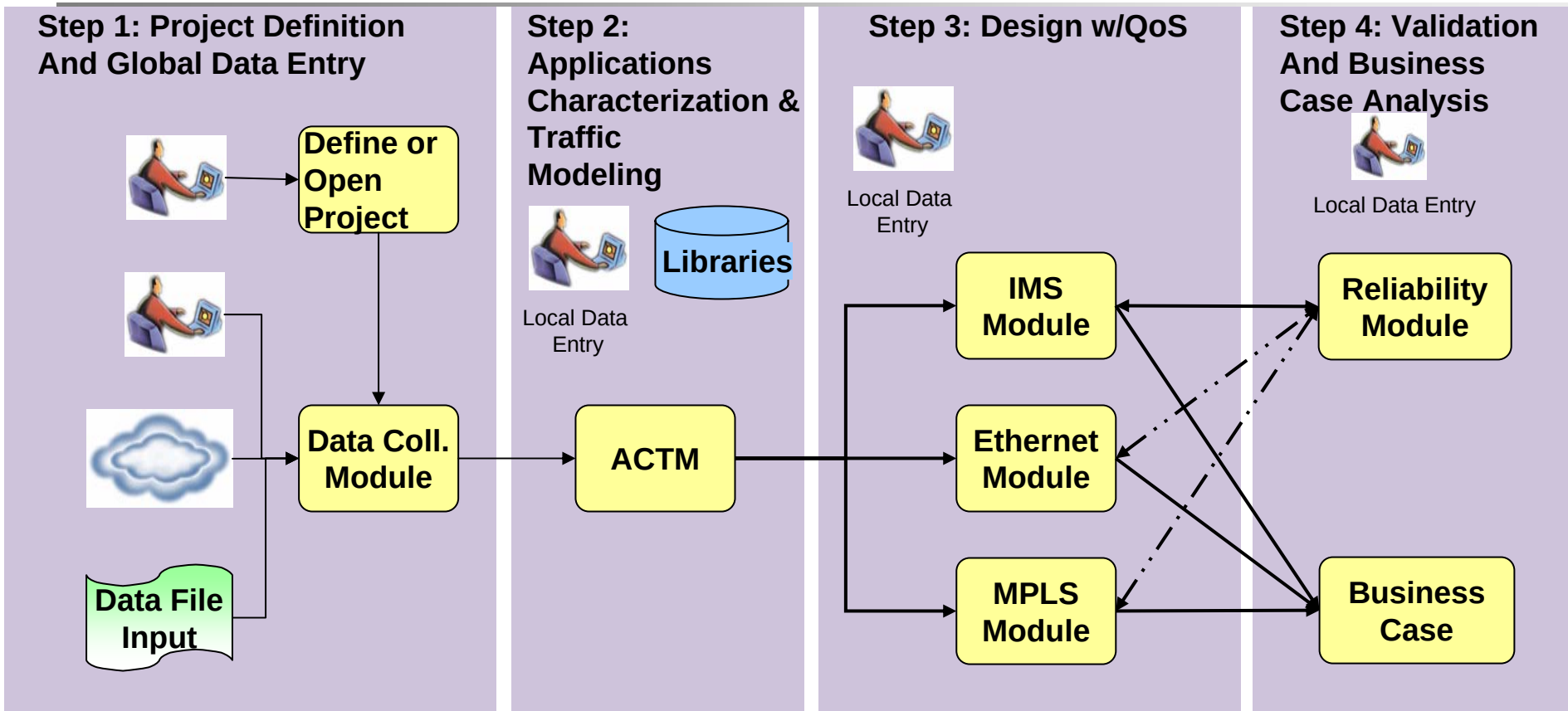
Process and Design Principles



Innovative Methods Drive Speed-to-Market, Sound Planning and Network Reliability

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