Smarter Networks

Unlocking the Potential of the Network

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Pulse2012

Meet the Experts. Optimise your infrastructure.

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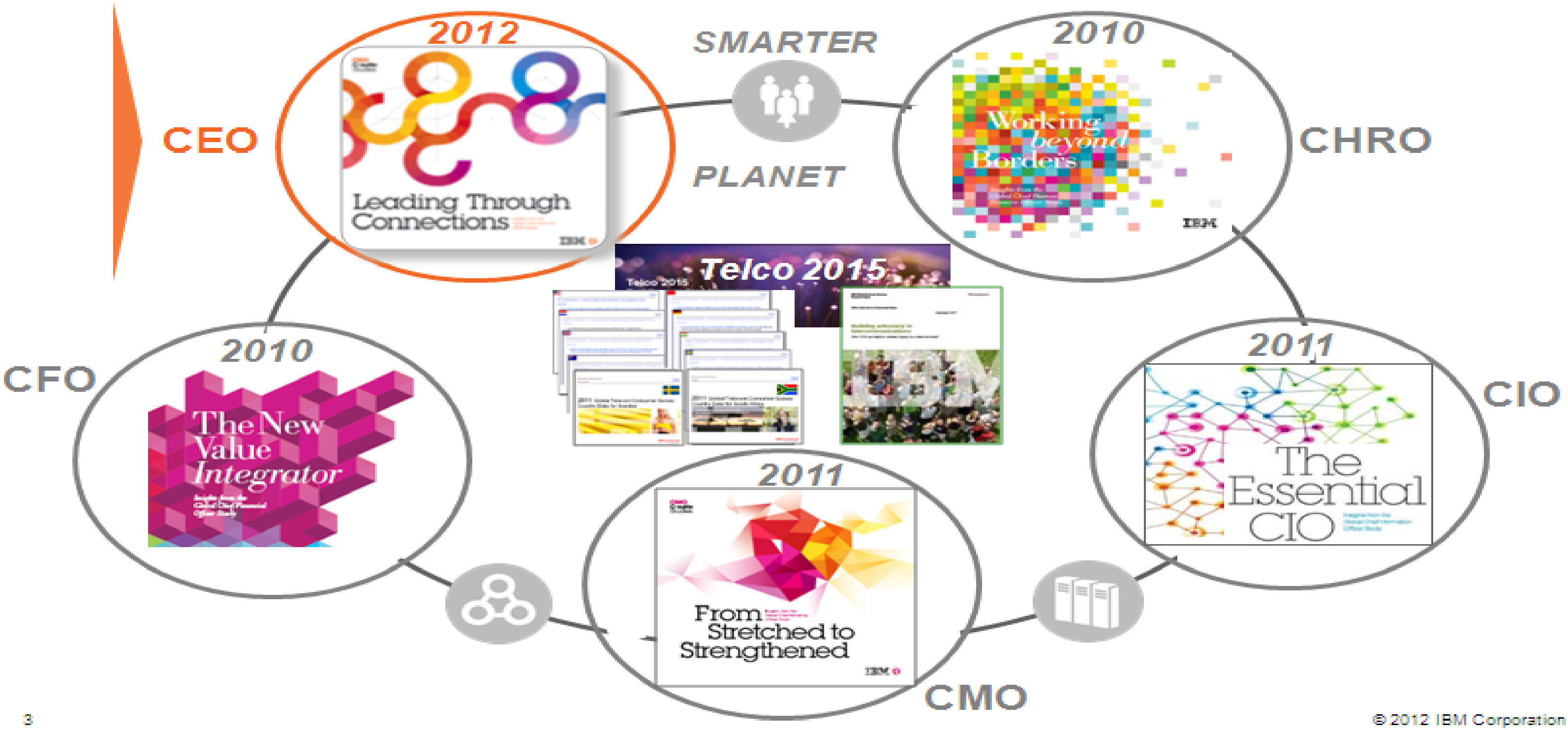
Agenda

- IBM CEO Study 2012, CSP Perspectives
- Global Trends in Network Transformation
- IBM’s Point of View - Smarter Networks
  – Intelligent Operations
  – Intelligent Infrastructure
- Summary

The IBM's CxO studies are a set of reports, identifying the challenges



The telecommunications landscape is being rapidly changed.

What are the key challenges CEOs are confronted with?

Within today's transforming telecommunications landscape, four major trends are apparent

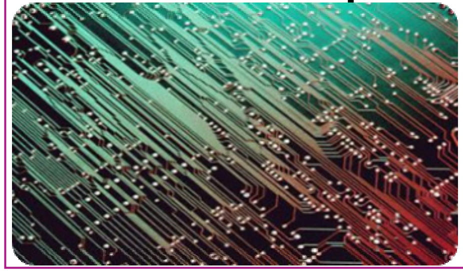
Consolidation continues

The process of telecom operators expanding outside their home markets continues, with new giants emerging

OTT providers thrive

OTT providers continue to build a dominant position in the telecommunications landscape

Mobile data explodes



People increasingly use the mobile internet. Video is the fastest growing application.

Consumers are seizing control

People increasingly connect with each other to exchange information and influence CSPs

OTT providers thrive – but Value concentrates

Combined Market Value

Top 25
drivers of
Internet traffic

Top 4 = 70% of total of top 25

= ~1/2

Combined Market Value

Top 150
CSPs

Apple	Premium priced devices, customer eco-system, pay for product (apps, iTunes, iCloud)
Google	Search and advertising value capture, customer data monetization
amazon.com	Extensive retail portfolio, retail portal infrastructure, recommendation engine, advertising value capture
Facebook	Dominant market position, advertising value capture, self-content creation business design

OTT providers – in particular the top 4 – will continue to build and expand their dominant position in both mature and emerging markets

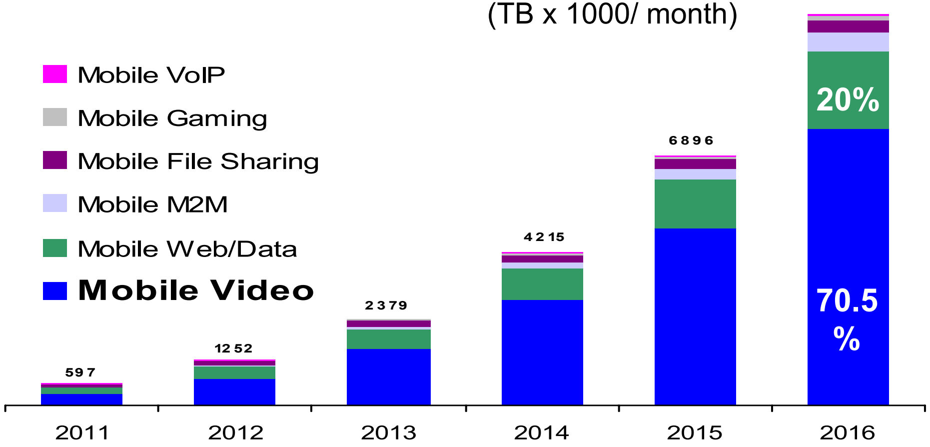
Consequence for CSP

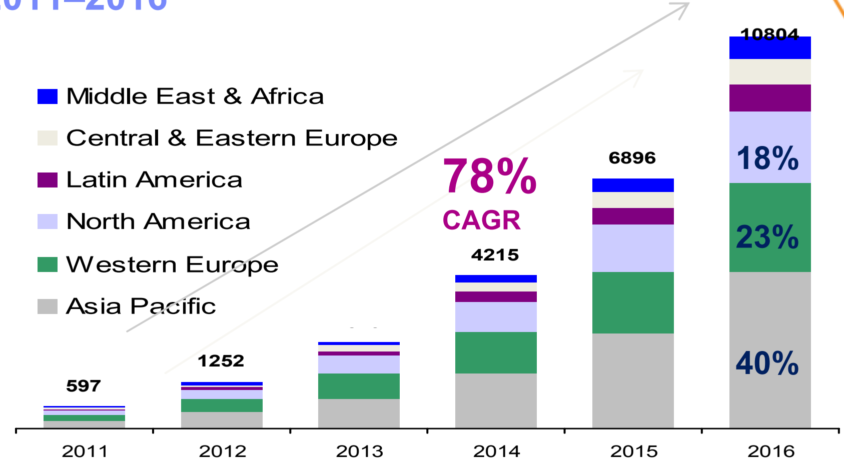
- The massive shift in value continues towards the OTTs as capital markets value the direct customer relationship and value provided by OTTs, reducing the CSP valuation **back to utility status**

Mobile data (really video) explodes

Global Mobile Data Traffic, 2011–2016

(TB x 1000/ month)





Source: Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2011–2016.

2011

- **Global mobile data grew 2.3-fold**
- **Mobile video traffic exceeded 50%**
- **Average smartphone usage tripled**

2016

- **Mobile data traffic will increase 18-fold**
- **2/3 of mobile data traffic will be video**

Mobile data – in particular OTT video – will dramatically increase

Consequence for CSP

❑Data growth is causing significant **capex and opex pressures** on CSPs, further accelerating **margin decline**. CSPs have to rethink billing

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Business imperatives for Network Transformation

"What carriers need are innovative ways to increase data revenue while finding smart solutions to manage a growing demand in data…

Ultimately, it will be the consumer who chooses the content he or she wants to use, and carriers need to ensure the quality of experience is good... "

Gartner, August 2011

In 2011, EBITDA (profit) of three major carriers in Korea fell from 25.3% in 2010 down to 23.5%...

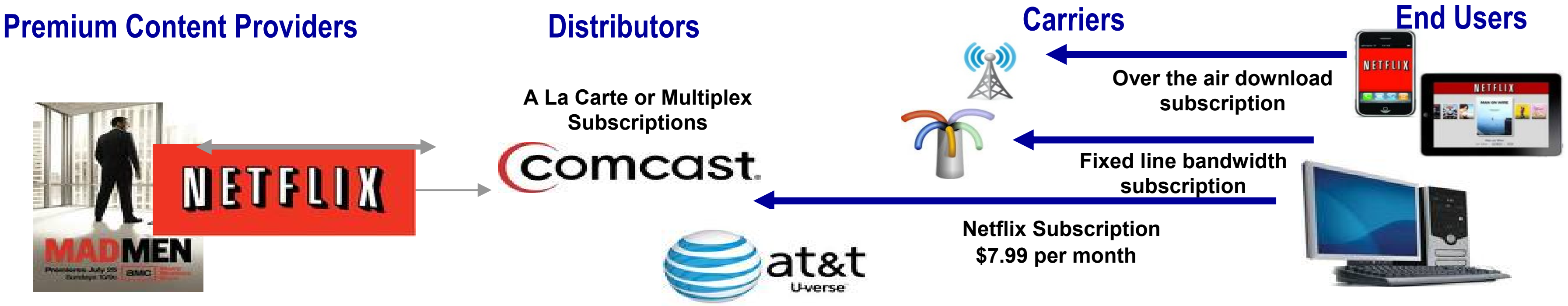
… even though Telco provides infrastructure for 'smart revolution', they still *remain to be dumb pipe without harvesting profit from their infrastructure*… decoupling between revenue and data growth…

… on the other side, internet *content providers like NHN, Daum have been enjoying strong growth* both in revenue and profit… NHN revenue and profit jumped by 19%, 29%, Daum by 23%, 32% in 2012…

2012 Telecom Market Report (Korea Telecom)

Current ecosystem, value chain and regulatory environment created unprecedented challenge to CSPs

- Increased streaming activities are **occurring at 'peak hour'** eating bandwidth capacity
- Operators cannot block streaming to protect network capacity (net neutrality laws)
- Carrier Operators must obtain **carrier fees** for delivering 'premium' content for Over-the-Air viewing



TV Streaming Value Chain

Carrier Fees → | Carrier Fees → | ← Monthly/On Demand Bandwidth Subscriptions

OTT ⟷ **Distributors** ⟷ **Carriers** ⟷ **End Users**

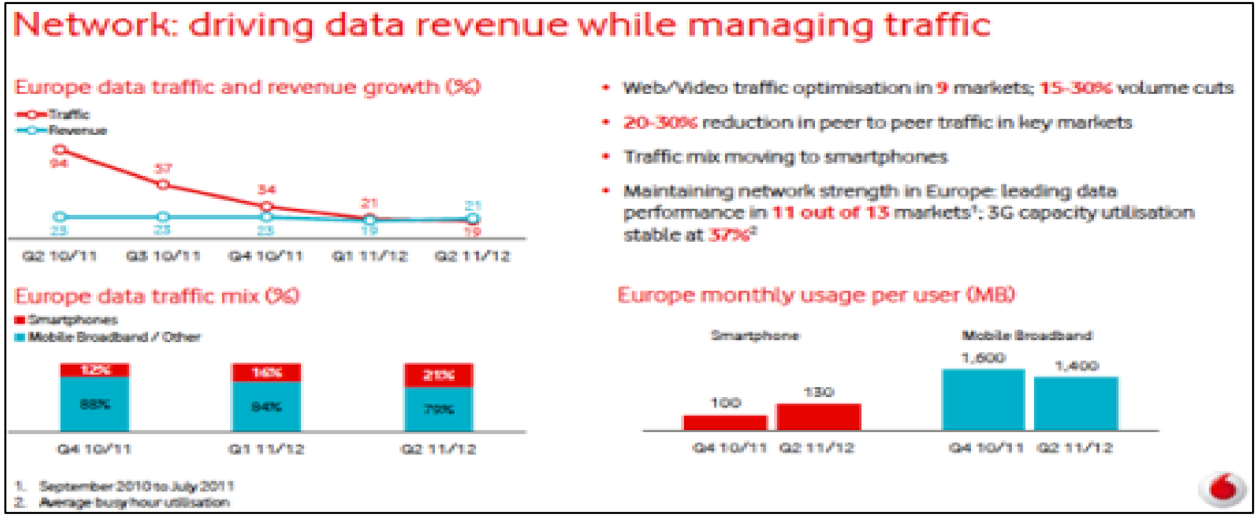
← Customer Content Subscriptions | ← Monthly/On Demand Content Subscriptions

Efforts to drive data revenue aligned with data growth – Vodafone case

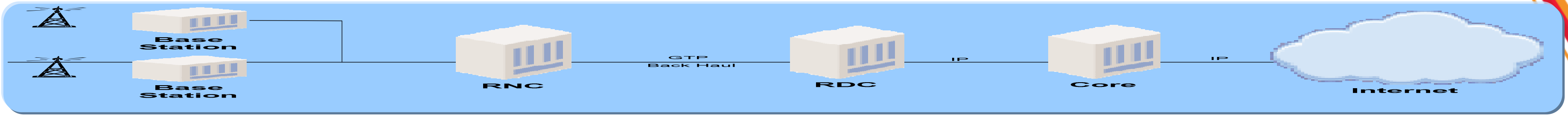
Vodafone Group CEO Vittorio Colao, Vodafone 2011 Half-Year Report

"… *Data traffic growth is aligning with revenue growth at around 20%. This is happening because we are proactively managing traffic...*"

Source: http://www.vodafone.com/content/index/investors/reports/financial_results/halfyear_300911/webcast.html



Holistic approach is required in network transformation in order to maximize return on investment



3rd Parties Devices

On-boarding Eco system

- Partner Portal
- Subscriber Portal
- Integration Services
- Analytics/Reportin g

DPI / PEP
PCEF

- 2-way
- Content Type
- Up / Download
- Device Type
- Time of Day
- Partner site (hulu, espn.com)
- Ip/subnet/port

OCS / Profile Mgmt

- Convergent Charging
- Balance Manager
- Profile Manager
- Network Edge Rating
- Dynamic Context Router

Policy Mgmt
PCRF

- Network Quality-of-Service
- Platinum / Silver / Bronze video plans
- Dynamic Controls
- Flexibility
- Flow Gating
- Restriction to Services

Back Office Support

OSS

- Prov
- EMS
- FM
- TM
- Inv Mgmt

BSS

- Mediation
- Re-Rating
- Family Plan
- Billing

CARE

- Customer Care
- IVR
- Web
- Mobile

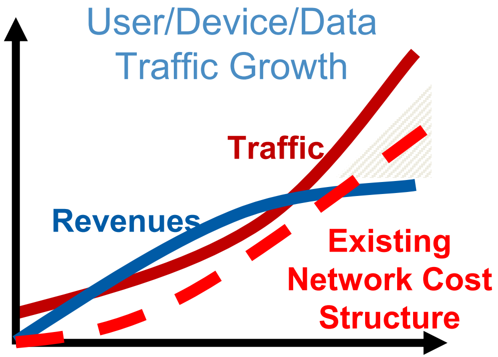
OTT Revenue

	Air & Radio Access Network	Mobile Access Network	Access/Core Network/Peering
Smarter Network	▪ Spectrum Efficiency ▪ Signaling Efficiency ▪ Intelligent Cache and CDN ▪ Traffic Shaping ▪ Software Defined Radio/Vision ▪ Video Compression ▪ *Policy Enforcement Point* ▪ *Mobile / Edge Analytics* ▪ Smart Tower Operations	▪ RAN Cloud & General Purpose Computing ▪ Intelligent Cache & CDN ▪ Traffic Shaping ▪ DPI and Policy Enforcement ▪ Mobile / Edge Analytics ▪ Video Compression ▪ Self-Organizing Networks ▪ Network Analytics	▪ DPI and Deep Analytics ▪ Core Cloud (managed infrastructure) ▪ Contextual Driven (openet & volubill) ▪ CDN/Cache (bytemobile & flash networks) ▪ DPI & Analytics ▪ Policy Provisioning and Management ▪ Usage based billing models
Value	▪ % RAN Reduction ▪ %Subscriber Quality of Experience	▪ % Backhaul Reduction ▪ % Roaming/Access Reduction ▪ Subscriber Quality of Experience	▪ % Transport Reduction ▪ % Peering Costs ▪ Subscriber Quality of Experience

Cost per GB by Content Type Optimization

Successful network transformation is to build sustainable competitive edge for improved profitability

P (Profit)	=	R (Revenue)	-	C (Cost)
Improve Margin		**Create New Revenue Streams**		**Reduce OPEX/CAPEX**



Build new business model to monetize OTT contents

Increase ARPU with differentiated Premium Services

Intelligence w/ Analytics

Reduce OPEX for radio interface, backhaul and core network traffic

Deferred CAPEX by increasing carrier's network capacity

Optimized Network

Intelligent & Optimized Network for Sustainable Competitive Edge in the Market…

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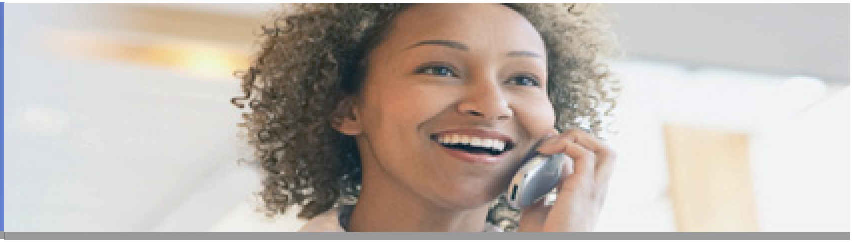
IBM's Point of View: Smarter Networks unlock the potential of the network by integrating network and IT with analytics

Intelligent Operations

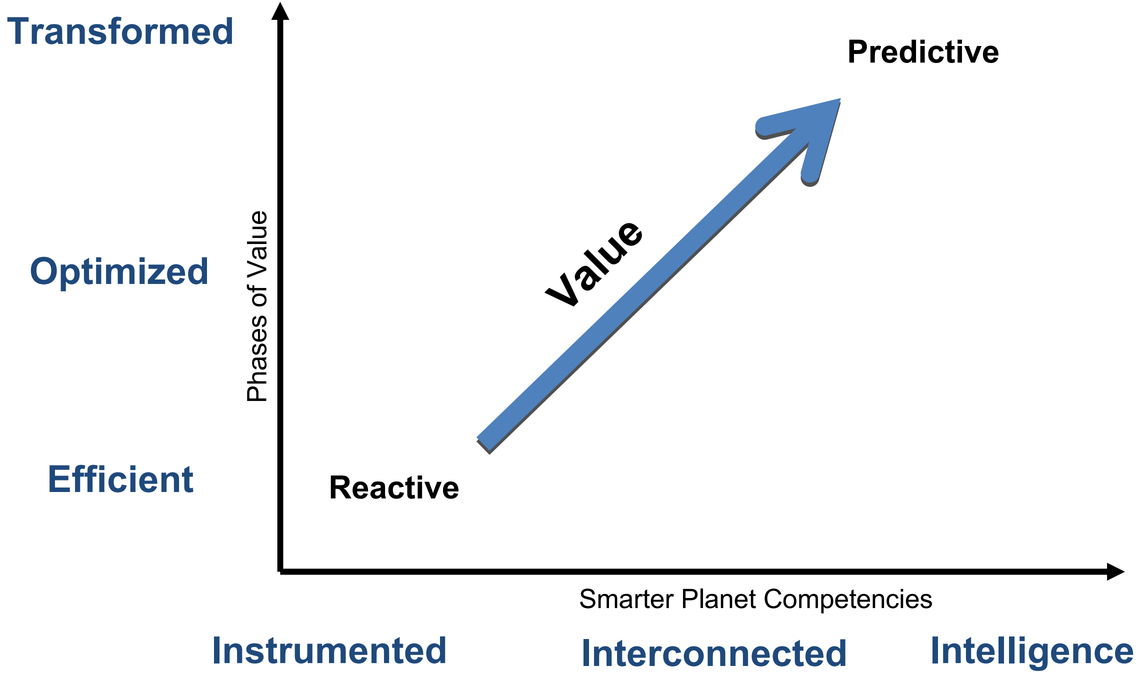
- Converts static and real-time data into actionable insights by implementing analytics for insight but also foresight.
- Breaks down silos of operations, engineering, customer care and marketing
- Applies to the active network and the passive network supporting the active network

Intelligent Infrastructure

- A converged and optimized foundation improving quality of experience
- Analytics augmenting the existing mobile network environment
- Intelligent data services to monetize the network, the user experience, and the data content



Intelligent Operations manage the smarter network with insight and foresight by moving from a reactive to a predictive environment



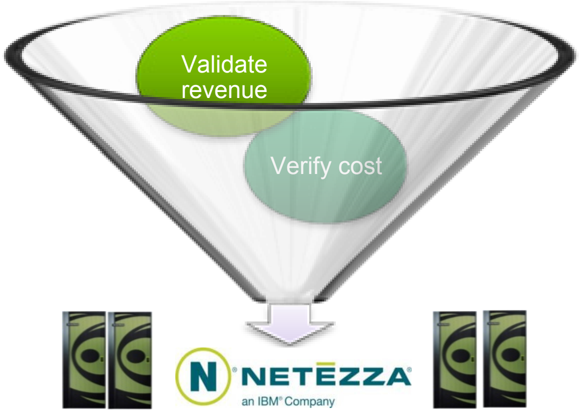
Intelligent Operations through:

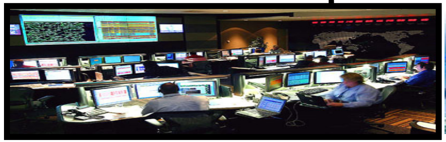
- Network Analytics
- Intelligent Site Operations (ISO)
- Self Organizing Networks (SON)

Smarter networks start with network analytics to break down silos of large amounts of information in the network

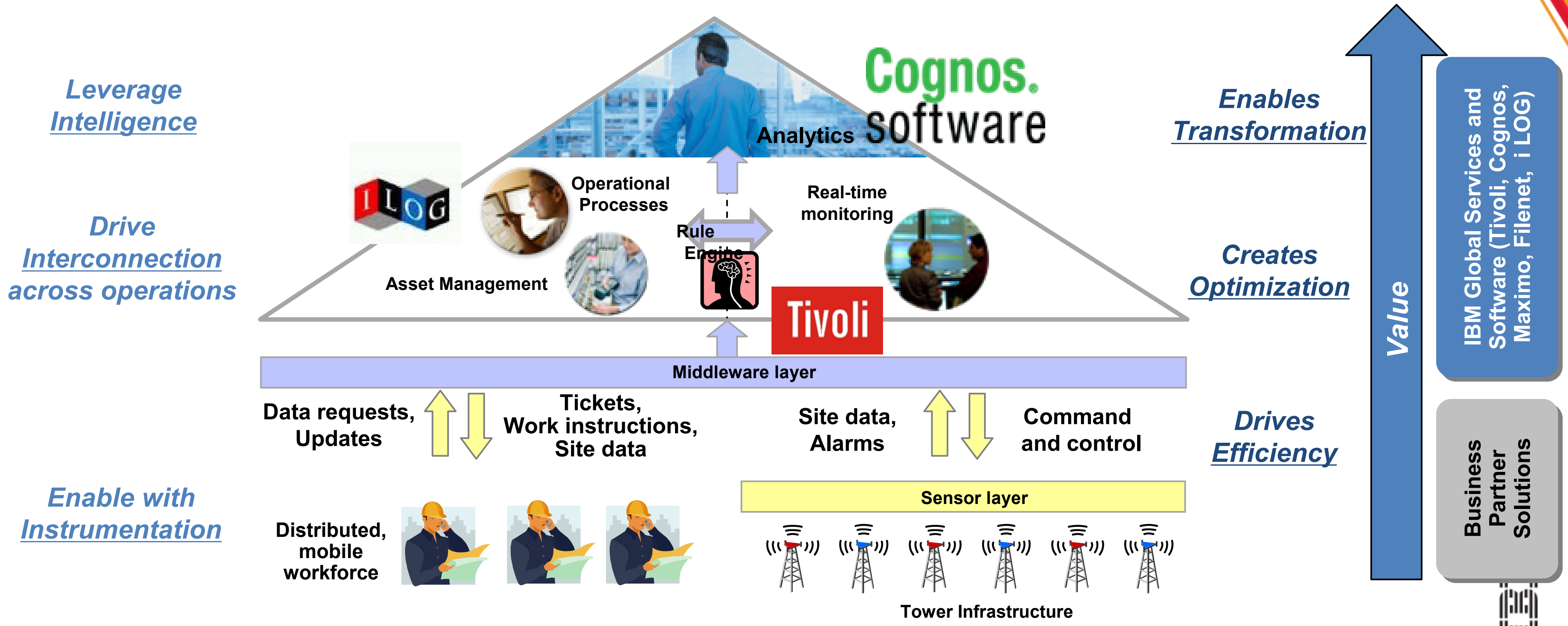
Network Analytics unlock incredible value from the data available to a CSP

From Information Silos | To a Network Data Warehouse | Enabling Network Intelligence

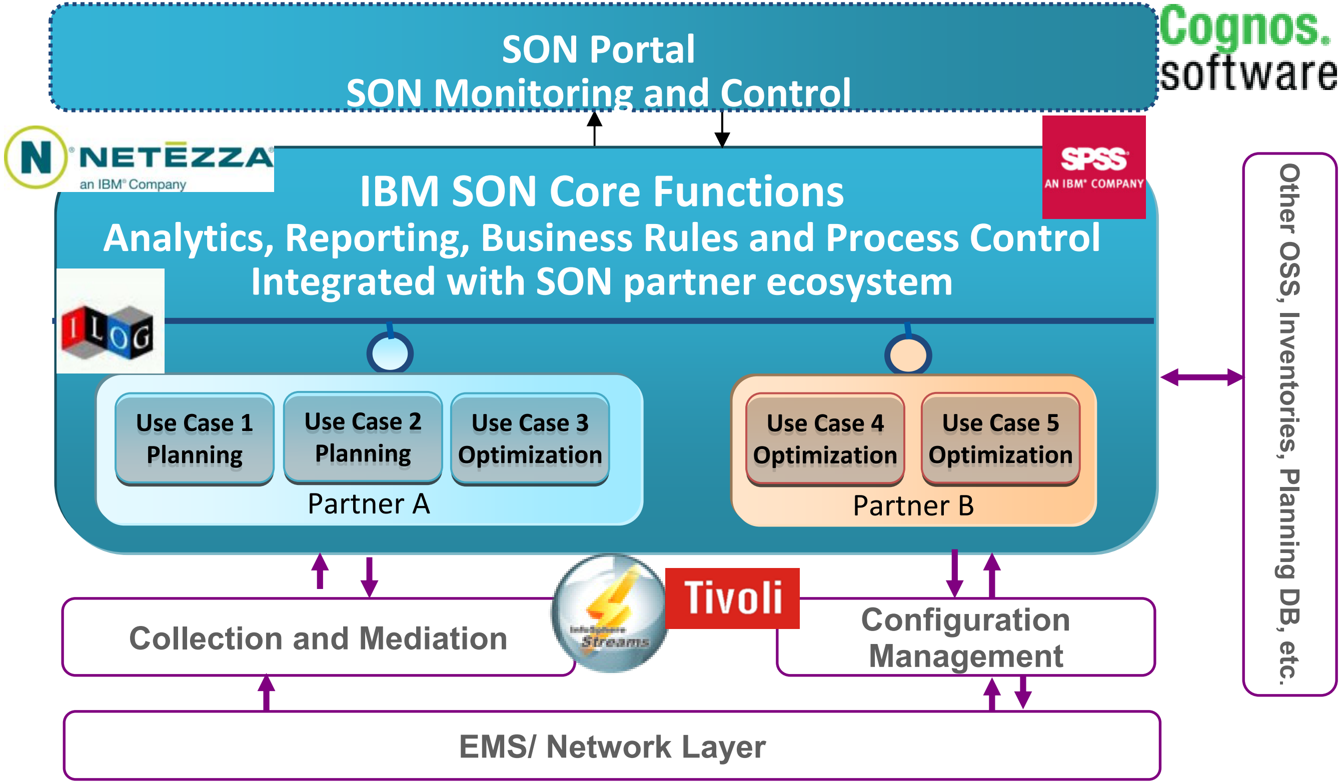




Operators of smarter networks can use analytics to convert real time data into actionable information with Intelligent Site Operations



Smarter networks apply network analytics to enable Self Organizing Networks



Pre-integrated IBM products along with partners enable an open multi-vendor framework to use best of breed innovation and create a hybrid self organizing network

Intelligent Infrastructures optimize and monetize the traffic of the smarter network

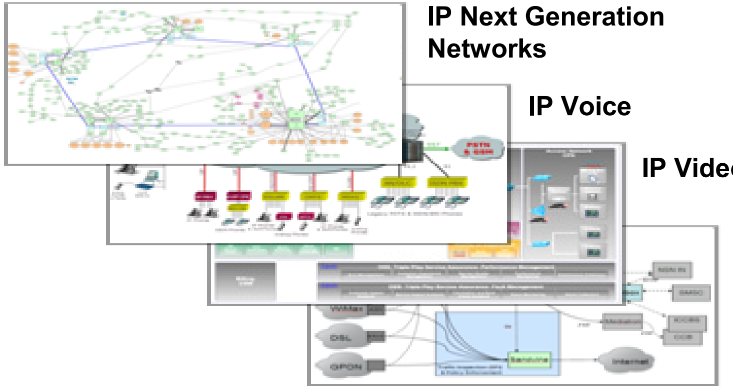
Intelligent Infrastructure through:

- Network Infrastructure Services
- Network Optimization
- Intelligent Data Services

IBM Global Technology Services offer 'Network Infrastructure Services' to implement intelligent infrastructures for the smarter network

IBM Global Technology Services offer s productized services and solutions for CSPs to design, build and manage Smarter Networks:

- Next generation core, converged core and the Evolved Packet Core for mobile networks
- Wireless network optimization with dynamic policy control
- Telco IP MPLS network, IP Video and IP Voice services



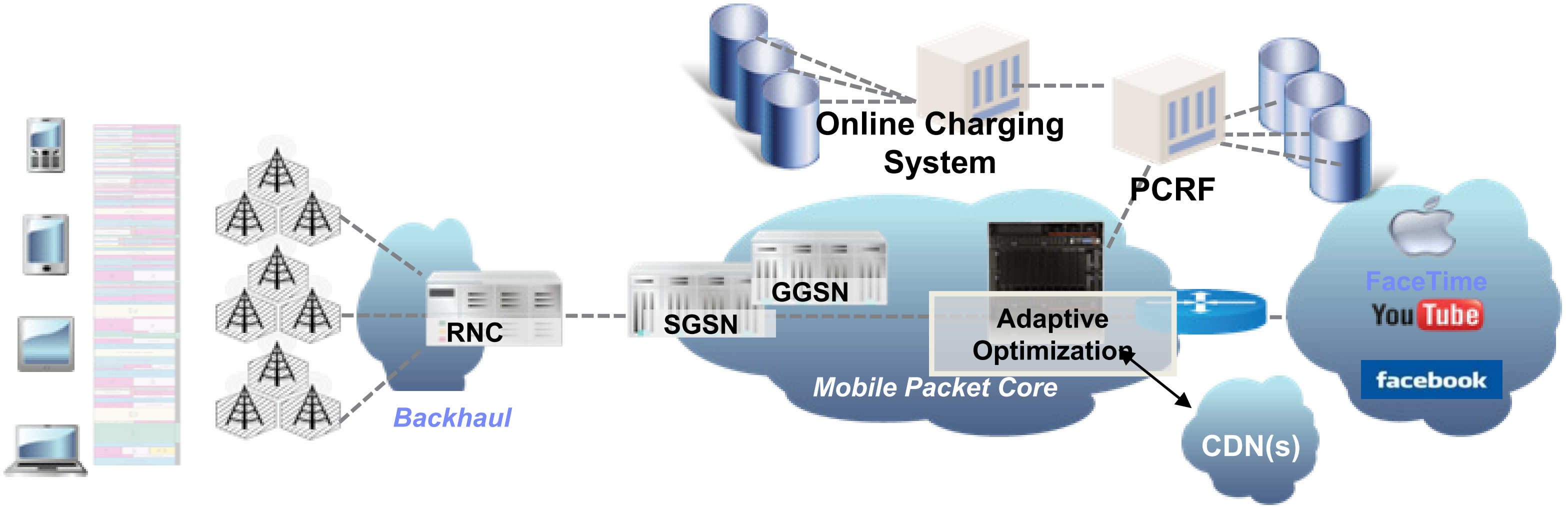
IP Next Generation Networks

IP Voice

IP Video

Service Assurance Monitoring And Dynamic Policy based Management

Smarter networks use adaptive wireless optimization blending multiple optimization capabilities



Integrated Optimization Techniques:

- Caching; Compression; Transformations; Transcoding; Pacing
- Lossless and lossy optimization

Producing:

- User, session, and content unique experiences
- Analytics of experience and content for monetization

Intelligent Data Services provide a differentiated user experience and enable an operator to “monetize content and insights” to the subscriber and the content providers

Intelligent Data Services enable:

- Monetizing Quality of Experience
- Analytics as a Service
- Content driven Advertising
- Flexible Charging Features
- Campaign Management

Smart phone

Mobile Internet

..and make a smarter network out of “dumb pipes”

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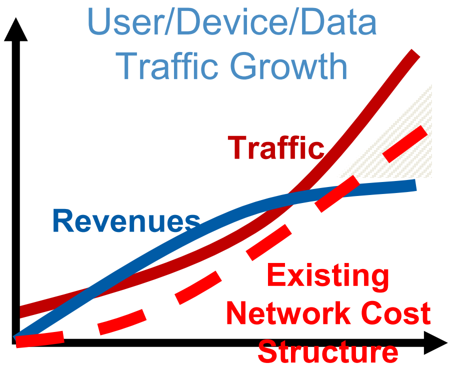
Back to the point – it's ultimately about improving profitability…

P (Profit)	=	R (Revenue)	-	C (Cost)

Improve Margin	**Create New Revenue Streams**	**Reduce OPEX/CAPEX**
	Build new business model to monetize OTT contents	Reduce OPEX for radio interface, backhaul and core network traffic
	Increase ARPU with differentiated Premium Services	Deferred CAPEX by increasing carrier's network capacity
	Intelligence w/ Analytics	**Optimized Network**



Intelligent & Optimized Network for Sustainable Competitive Edge in the Market…

IBM's Point of View on Network Transformation…

Transforming network into an intelligent & optimized service innovation platform

… enabling new business model for CSPs

- Decoupling between data and revenue growth has been stronger driver for network transformation around the world than ever before
- Big Data / Advanced Analytics provides a comprehensive network data management, a foundation for network transformation
- Holistic approach to Network Optimization leads to sustainable cost structure and improved quality of user experience
- Dynamic and Intelligent Network brings new opportunities to monetize content provides and higher quality of user experience
- Intelligent & Optimized Network works as future service innovation platform, providing CSP with competitive edge in the market

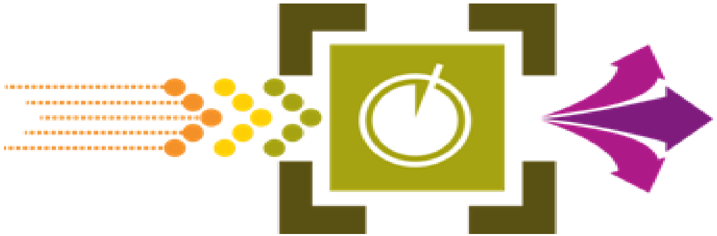
Transforming Networks

for future service innovations…

IBM, Network Transformation Partner

- Clear network transformation strategy aligned to business priorities and desired outcomes
- Deep industry expertise and global experience working with major CSPs around the world
- Proven end-to-end solution provider combining consulting, technology service, analytics software, hardware, along with world-class research in Telecom industry

IBM provides market-leading services, proven solutions, use cases, accelerators, and world-class research to help transform



… enabling CSPs to go beyond solving current problems to capturing new business opportunities

How can IBM help you unlock your network's potential?

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