Trends in Systems Architectures

Central & Eastern European OSS/BSS Seminar

Logan Orviss International

Krakow, 3rd - 6th November, 2005

Agenda

- Logan-Orviss International
- Review of the Telecommunications world
  - Operator Challenges
- Where is the problem?
  - Approach to new clients
  - New Services Architecture
  - Feasibility of major solutions and Schools
- Ideas and Open discussion
  - What should be there?

Facts and Figures:

- **Founded:** 1995 in Sophia Antipolis, France
- **Founders:** Brendan Logan
Colin Orviss
- **Employee strength:** 120+ Consultants
- **Offices:** Australia, France, Germany, Israel, Ireland, Norway, Russia, UK and US

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LOI addresses multiple business area challenges that the communications industry is frequently facing such as:

- Customer care and CRM
- Order management
- Service provisioning and fulfilment
- Service quality management and customer expectation management
- IT and network architecture
- Network management and mediation
- Billing
- Wholesale billing / Interconnection
- Content Management and charging
- Technology and data storage
- Business intelligence
- Training

Deliverables vary depending on the nature of the consulting engagements and the type of customer.

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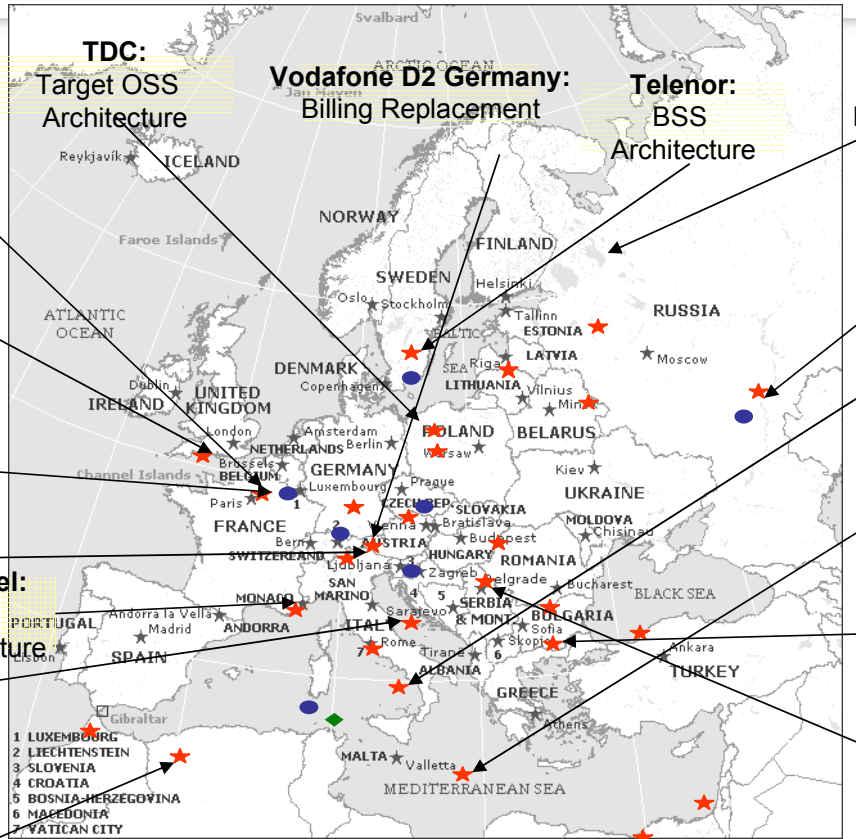
Sample European Projects



TDC: Target OSS Architecture

Vodafone D2 Germany: Billing Replacement

Telenor: BSS Architecture

Telia-Sonera: Enterprise Target Architecture

Vimpelcom: Billing & DWH Solutions

H3G UK: Complete IS Architecture

Eircom: Enterprise Target Architecture

H3G Italia: Complete IS Architecture

Orange UK: 3G Enterprise Data Model

Vodafone-Omnitel: Pre-pay interfaces

Dte. Telekom: Architecture Management

Cegetel: BSS Architecture

Vodafone-Hungary: Billing Replacement Strategy

Swisscom: Target BSS Architecture

Cesky Tel: Enterprise Target Architecture

Telefonica: Target OSS Architecture

Lannet Greece: Billing Target Architecture

- Office
- HQ
- Customer

- **LOI is an active member of the TMF and works jointly with TMF according to NGOSS principles (eTOM + SID + TNA)**
- **Keith Willetts, Chairman of TMF is an LOI Associate**
- **LOI is member of several user groups within the Telco Industry**
- **LOI is a frequent speaker at Telco Conferences such as TMF-World, IIR Billing Conference, etc.**

Sample of Selected Customers

Fixed line operators

- Cesky Telecom
- COLT
- Deutsche Telekom
- Eircom
- Embratel
- Golden Telecom
- Optus
- PCCW
- Portugal Telecom
- TeleDenmark
- Telekom Austria
- Telenor
- Telecom Lithuania
- Telia
- Telefonica
- Tellas
- Telkom South Africa
- UTA

Mobile operators

- Cable and Wireless
- Cegetel
- Cegetel, Paris
- China Mobile
- Digicell
- E Plus
- Hutchinson 3G
- Mobilkom
- Orange, various countries
- Oniway
- O2
- Swisscom Mobile
- T-Mobile, various countries
- Turkcell
- VIAG (now O2)
- Vimpelcom
- Vodafone, various countries

Vendors

- Amdocs
- Comsoft
- Convergys
- Dimension Data
- EDS
- EDB Telesciences
- ESI Expert Systems Int.
- EMC2
- Formula Telecom
- HP
- Kabira
- Oracle
- Portal
- Sentori
- SGI
- Staffware
- Telcordia

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Some Fundamentals impacting Fixed or Mobile business …

- Concurrent Deregulation and Technological “Quantum Leap”
- Cost per bit
  - Ratio of 1 to 7-10 between IP and Circuit-switched
- End-User Terminals
  - “Moore’s Law” drives enhanced power and functionality
- Demand for Communication Services
  - How much are YOU willing to spend?
- Mobile substitution and vice versa
  - More mobile subscriptions than fixed line subscriptions in many developed countries
  - Developing countries are better off providing “dial tone” through cellular
  - IP Services in combination with Mobile for customer retention
- High Existing Margins
  - Gross Margin on Transmission Services (Leased Lines, Long-Distance Voice) rapidly decreasing

Some Market Dynamics for Operators

- Overcapacity on Trunk Networks
- Traffic volumes are rising (data), but margins are dropping
- Interconnect a new source of Revenue
- Top 20% customers represent 80% of the profit
- SME'S are becoming more important - price sensitive
- No frills MVNO put pressure on the margnins
- Costs and Financial Systems are top priority
- Asset identification and recovery
- In 1984, BT had 100% market share and 240,000 people – in 2000 75% Residential and 50% Business with 70,000 people – now 60% of Residential and 45% Business with 55, 000 people

- Competition everywhere
  - Access: WLL, LL Unbundling, Cable, Mobile as Fixed Line substitution
  - Transport/Core: ATM/FR/IP, Satellite
  - MVNO
- Competitors
  - Target for ROI < 5-7 years
  - Interconnect can represent up to 50% of Cost
  - Interconnect cost is forcing Infrastructure build
  - Focus on Time-to-Market: No architectural focus
  - Incumbents responding quickly
  - Same chaos after 3 years as a PTT after 100 years

- Wholesale/Retail logical separation
  - Does one “own” or “manage” a Network?
  - How far does one’s Network extend?
- Increasing Interdependencies
  - Interconnect, Roaming, Unbundling, Number Portability, etc
  - Co-opetition
- “Historical” segmentation
  - Incumbents (ex PTTs)
  - “First generation” competitive network operators
  - “Second generation” competitive network operators
  - New Service Providers (ISPs, ASPs, CSPs, etc)

The other players …

- Content Providers
- Media/Advertising Companies
- Financial Institutions
  - Banks
  - Credit Card Companies
- Resellers/Retailers/Distribution Outlets
- Suppliers
  - Network Equipment Manufacturers
  - Computer Manufacturers
  - Integrators
  - Software Vendors
- The Value Chain is getting more and more complex!

Regulation

- Fixed Line market particularly regulated
- Termination Costs dilemma
- Roaming still an open issue
- Spreading gradually throughout the world:
  - US and Asia always at the forefront
  - Western Europe next
  - Easter Europe and Latin America next
  - Middle-East, Africa following
- Australian model often used
  - Initially a limited (2-3) number of competitors
  - Full deregulation after a period
- Major regulatory mandates:
  - Indirect access (e.g. selecting long-distance carrier)
  - Pre-selection (e.g. no access for access codes)
  - Number portability
  - Local Loop unbundling (various facets)
- Infrastructure investment must be protected
- Positive price discrimination to new Competition
- Major dilemma with FMC and VoIP
- Interconnect still a headache

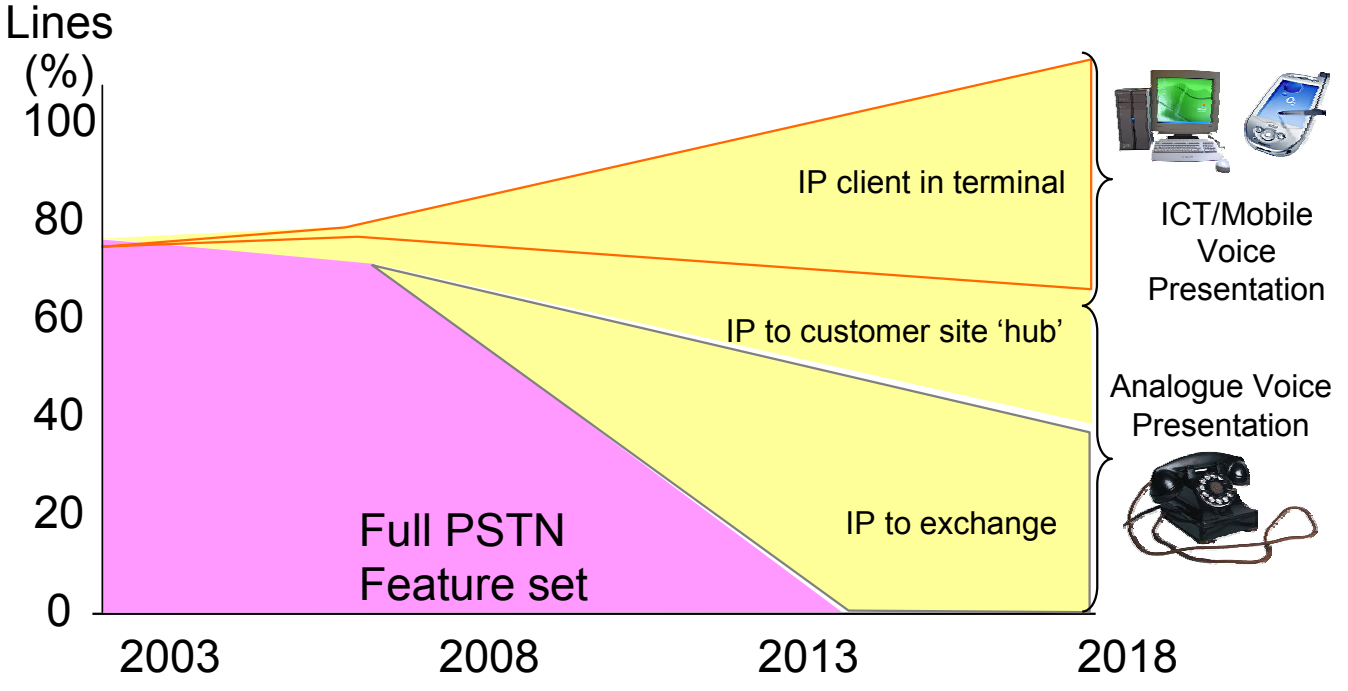
Summarizing the Operator imperatives / trends

- **Operators are assessing their "to be" business model and the implications of their various options.**
- **Operators are beginning to become more business value rather than technology focussed and recognising the importance of Brand**
- **Operators tend to view Customers as a revenue source BUT, they can ALSO be partners or suppliers – we need to see them holistically as a PARTY**
- **ARPU, OPEX and CAPEX are the main metrics for measuring performance but AMPU is becoming the critical measure**
- **What planning is being made to address IP and the probability that "traditional" Telco competitors will be augmented (or even replaced) by non-telco "branded" entities and content parties**

Summarizing Market imperatives / trends

- **Customers want services when, where and how they want but we force them to select or use a fixed line connection, mobile connection, BB connection, ISP connection, etc. from different "suppliers" – WHY?**
- **For consumers, there's a finite amount of funds that are available to be spent on communications oriented services – we need to understand this "COMMUNITY" and provide a manageable balance capability. Corporates are also looking for something similar.**
- **What allegiance should a Customer have to an Operator and what are the offerings that would drive this? – competition drives churn!**
- **With IP networks and VOIP increasingly becoming available, where does the revenue come from – working on the assumption that voice minutes will become flat rated or even "effectively free"**

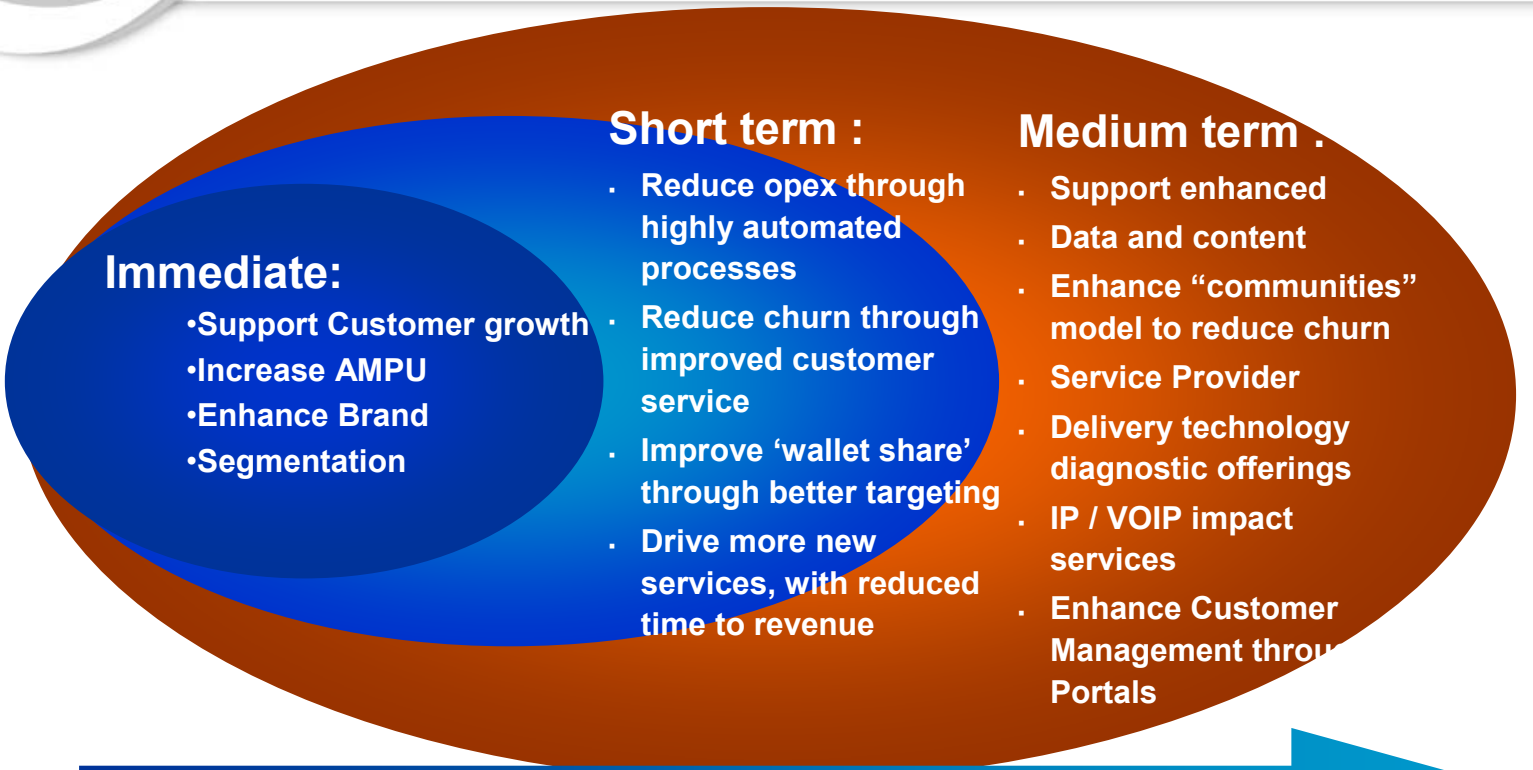
Expected evolution from PSTN to IP



Operator challenges…

- **Improving operational business processes**
- **Enhancing information systems flexibility - Pre/post/pay-now payments**
- **Managing content and Content Providers**
- **Supporting a multi-tier business model**
  - Services provider
  - Content aggregator
  - Lean wholesale operator
- **Bandwidth and content settlement**
- **What will be the impact of IP on I.S.& OSS/BSS?**
- **Determining which are the appropriate offerings**

What are the main Operator initiatives?



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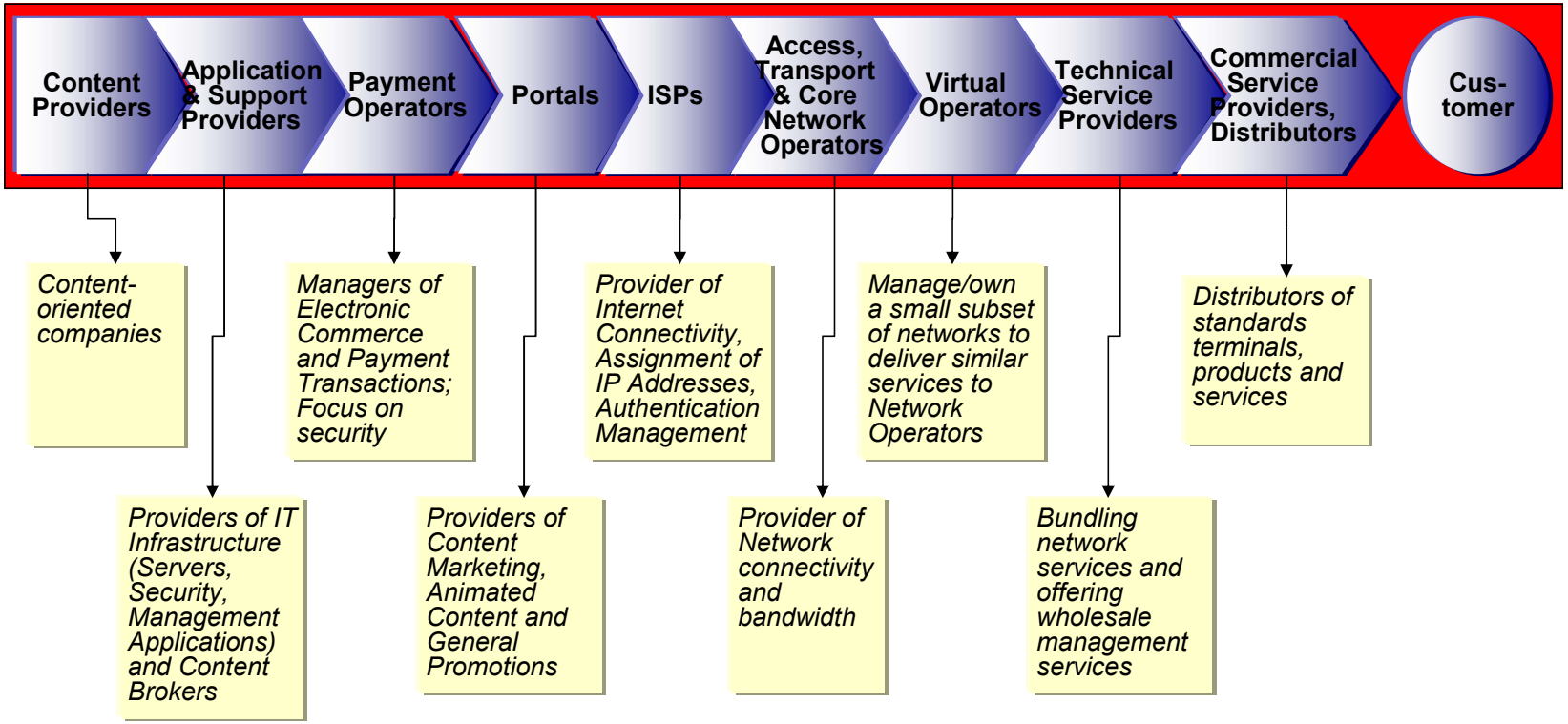
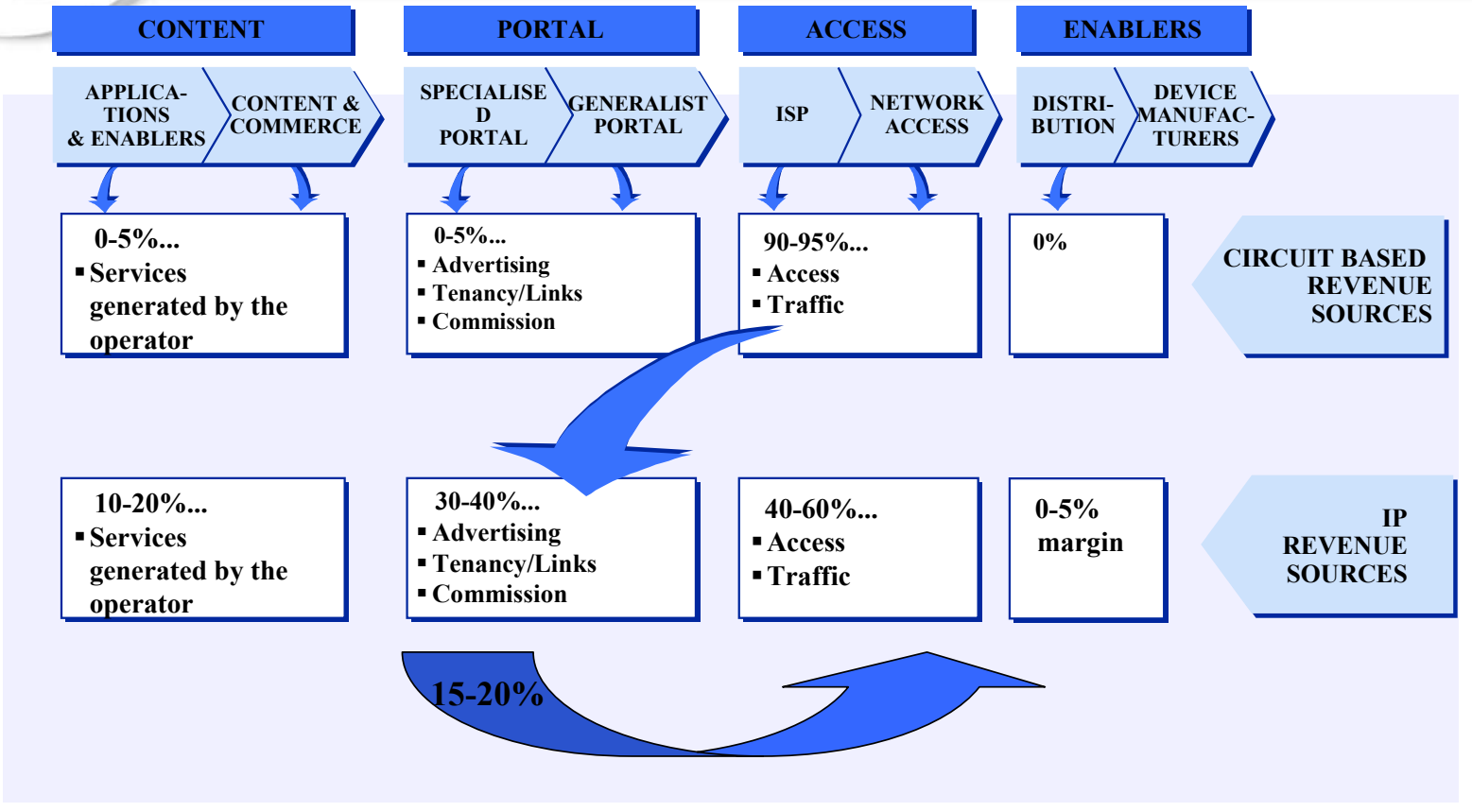
The content value chain – we sell and deliver content!!



Revenue Sources are changing …

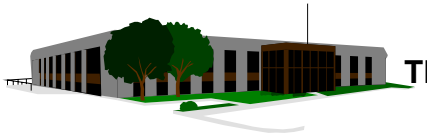


Problem statement – why is charging so critical ?

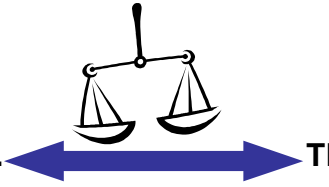
- The charging environment turns the potential value of network capabilities and business models into real revenues

- To extract this value, it must evolve from a passive ‘collect and rate’ workflow to an active and intelligent environment, able to
  - Increase profitability, penetration and usage by **charging on value** rather than cost
  - Enhance customer experience and operator control through an increased **realtime design** of processes
  - Place the end-user at the centre of the design in a **convergent approach**
  - Interface with a multitude of in-house and external applications simultaneously in an **open,secure and controlled manner**

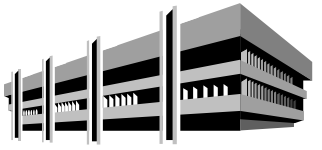
Operators must find the right balance between pricing sophistication and implementation constraints in a given competitive market



The Media Co.



The Telco



Charge for Value

e.g.
- You can charge more for the latest track by Britney Spears rather than one that is 6 months old

- You can charge more to watch a replay of a goal in the first 30 mins after it was scored

Pros:
- **Increased profits**
- **Matches with perceived value**

Cons:
- **Higher risk of not covering costs**
- **More complex charging model**

Cover Costs

e.g.
- Data traffic across the Network can be charged by the byte

- Storage can be charged by the byte

Pros:
- **Revenue based on costs, low risk**
- **Simple charging model**

Cons:
- **Lower profits (becomes a commodity)**
- **Customer does not understand value**

From an architectural point of view, value based charging requires

- Flexible rating engine(s), able to :
  - Handle the wide range of potential charging units and parameters
  - Provide advanced rating features, such as cross products promotions, usage based discounts, high segmentation,…
  - Be flexible enough to allow on-the-fly subscriptions and rapid configuration changes
- Smart network mediation(s), able to
  - Interface with multiple networks of different types
  - Manage usage consolidation and correlation so as to expose the relevant (from the end-user viewpoint) charging unit to rating
  - Monitor more than simply the number of Kbytes

Operators must find the right balance between the advantages and hurdles of realtime

"delayed" "near real-time" "real-time"

e.g.
-calls and sessions are simply switched; no control is carried out

- usage records are "pulled" on a regular basis (e.g. a few hours) and processed through traditional mediation, rating and invoicing processes and systems

Pros:
- **Low cost**
- **Handles large volumes**
- **User experience is simplified (no/limited delays and dialogue)**

Cons:
- **Higher credit risk**
- **Not a competitive differentiator**

e.g.
-calls and sessions are allowed to proceed; limited control is possible

-usage records are "pushed" and processed as quickly as protocols and systems would allow

Pros:
- **Satisfactory levels of credit risk**
- **Return on Investment**
- **Technically proven**

Cons:
- **Complex integration**
- **dependent on equipment capabilities**

e.g.
- all calls and sessions are controlled through "signalling" messages

-actions (advice of charge, recharge, barring, etc) can occur during the call/session

Pros:
- **Maximum risk control for operator**
- **Customer can choose interaction and method of payment**

Cons:
- **Costly**
- **Technically complex for new services**

Key Architectural Issues to consider

- Authentication and Authorisation
  - Which ID to use and in which context?
- Location of content services catalogue
  - Separated or integrated with main product catalogue
- Balance Management
  - Centralised or distributed
  - Multiple counters
  - Multiple units (monetary and non-monetary)
- Partner content kit for “untrusted” traffic
  - “buffer” dialogue management function to funnel traffic from third-party platforms outside of the “trusted” operator domain

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Realtime means more than simply boosting CPU to speed up existing processes

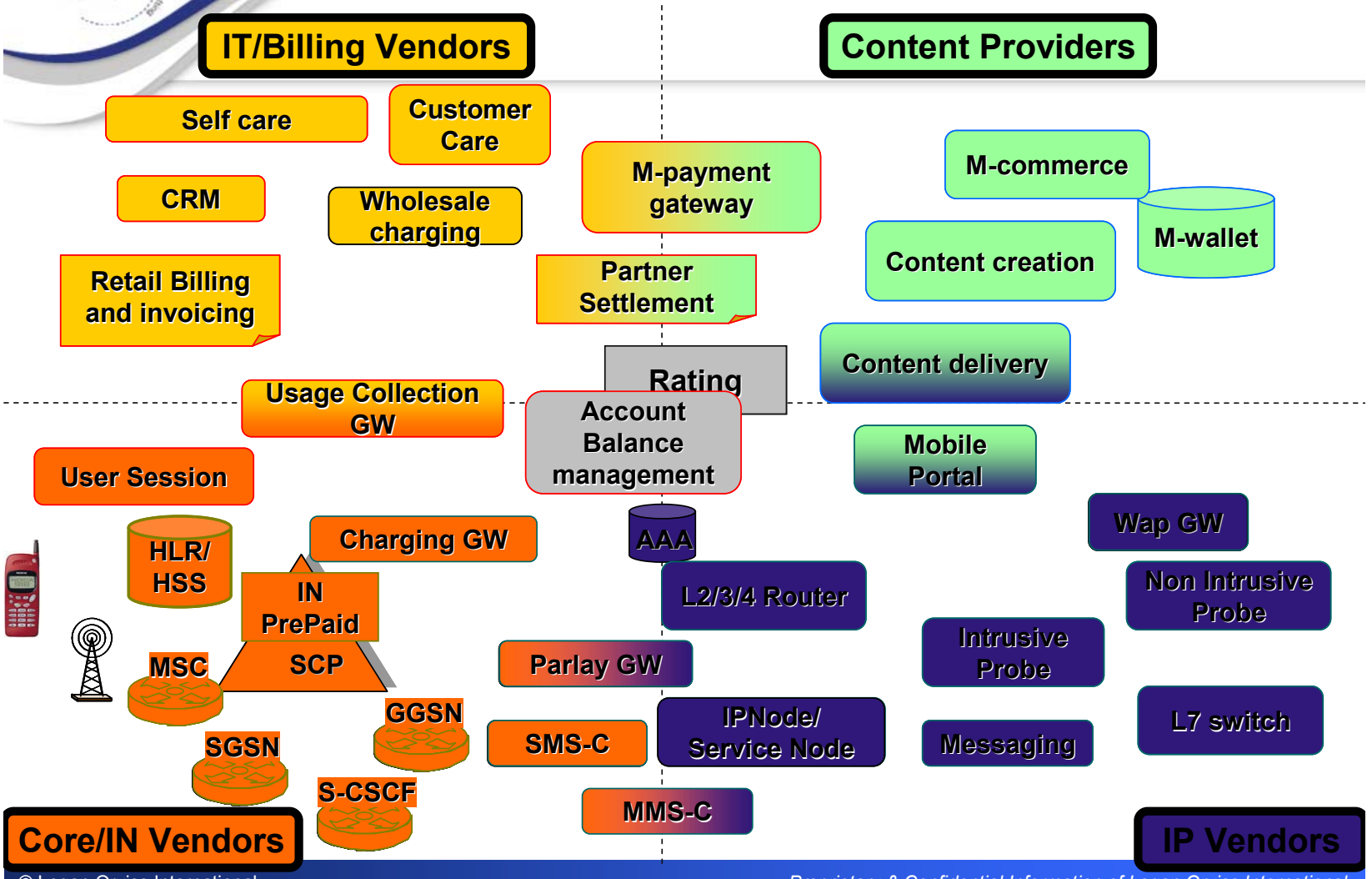
- Realtime requires a reengineering of information flows
  - 'take control before and during' rather than 'collect after' the call/communication
  - specific realtime mechanisms such as state/session handling, pre-call authorization, post-call refund, mid-call notifications, bucket allocation, triggers, simultaneous calls handling,…
- Realtime requires an adapted middleware
  - realtime requires a 100% availibility through the whole chain => redundancy, no single point of failure, error monitoring, recovery process, on-line provisioning, specific software release management procedures,…
  - Realtime requires a high level of performance => hardware/software mix, identification of bottlenecks (CPU, memory,…), dynamic data handling, cache procedures, careful use of distribution and APIs,…

The different schools

Who should you listen to …and believe?

The major approaches

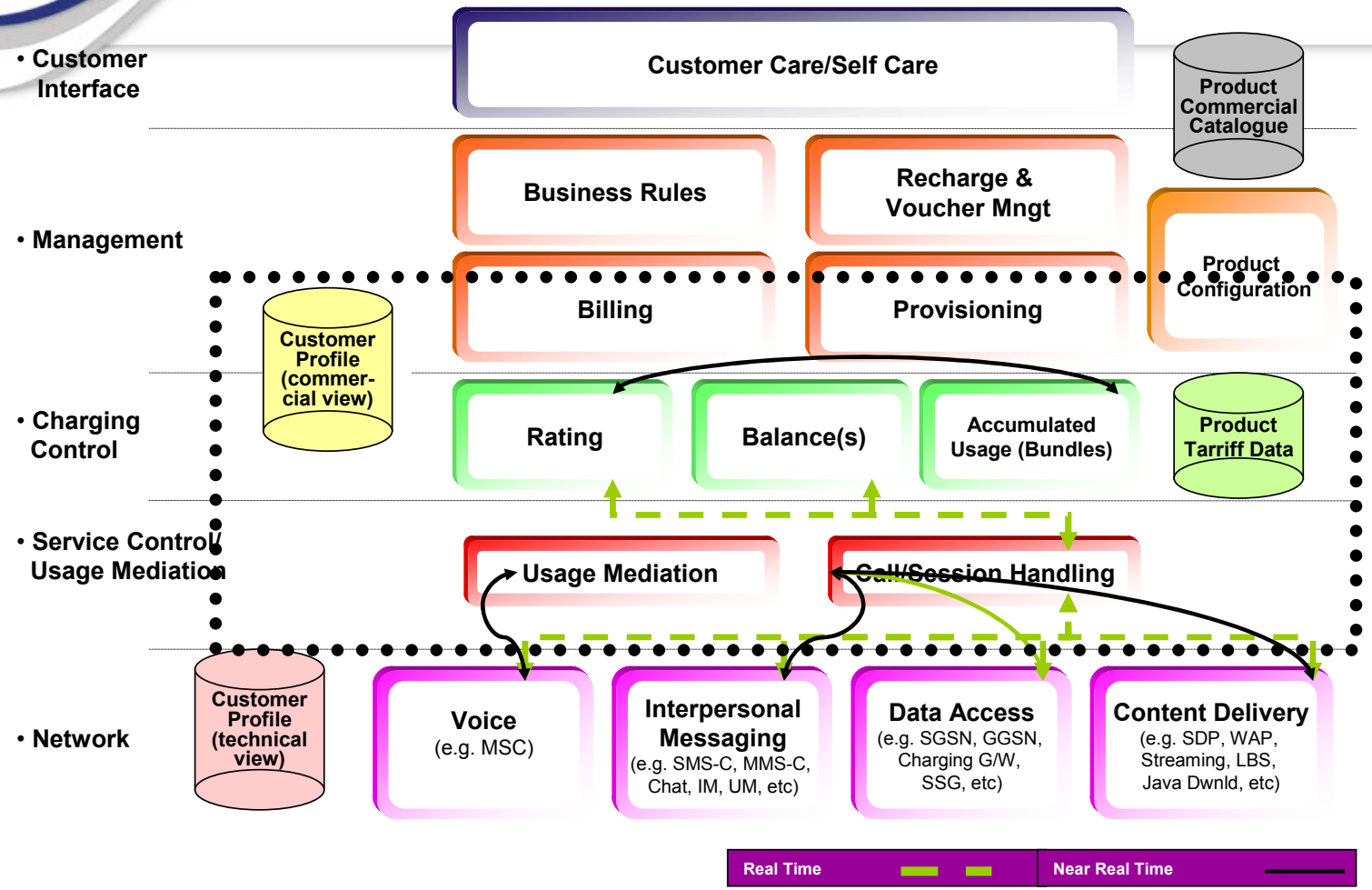
- “Core Network approach”
  - Led by Core (Circuit and Packet) Network professionals
- “IP approach”
  - Led by Services Network professionals
- “IT approach”
  - Led by Information Systems professionals
- “Content service approach”
  - Led by Content and Commerce professionals



Where are the main bottlenecks to meeting the challenge …?

- Management
  - Real definition of business goals and objectives
  - Commitment to make the changes necessary
- Information Systems
  - Customer model / Product Catalogue poorly defined / implemented
  - Billing – inflexible and not really “real-time”
  - Service Assurance not Customer focussed (e.g. SLA)
  - Legacy stove-piped applications and processes
  - Poor data quality
  - Poor business intelligence (we don’t know our Customers well!!)
- People
  - Working in the “old” ways although our business is changing
  - Changing new systems to work the way the people work as opposed to getting people to work the way the new system works!

Functional scope for Convergent Charging

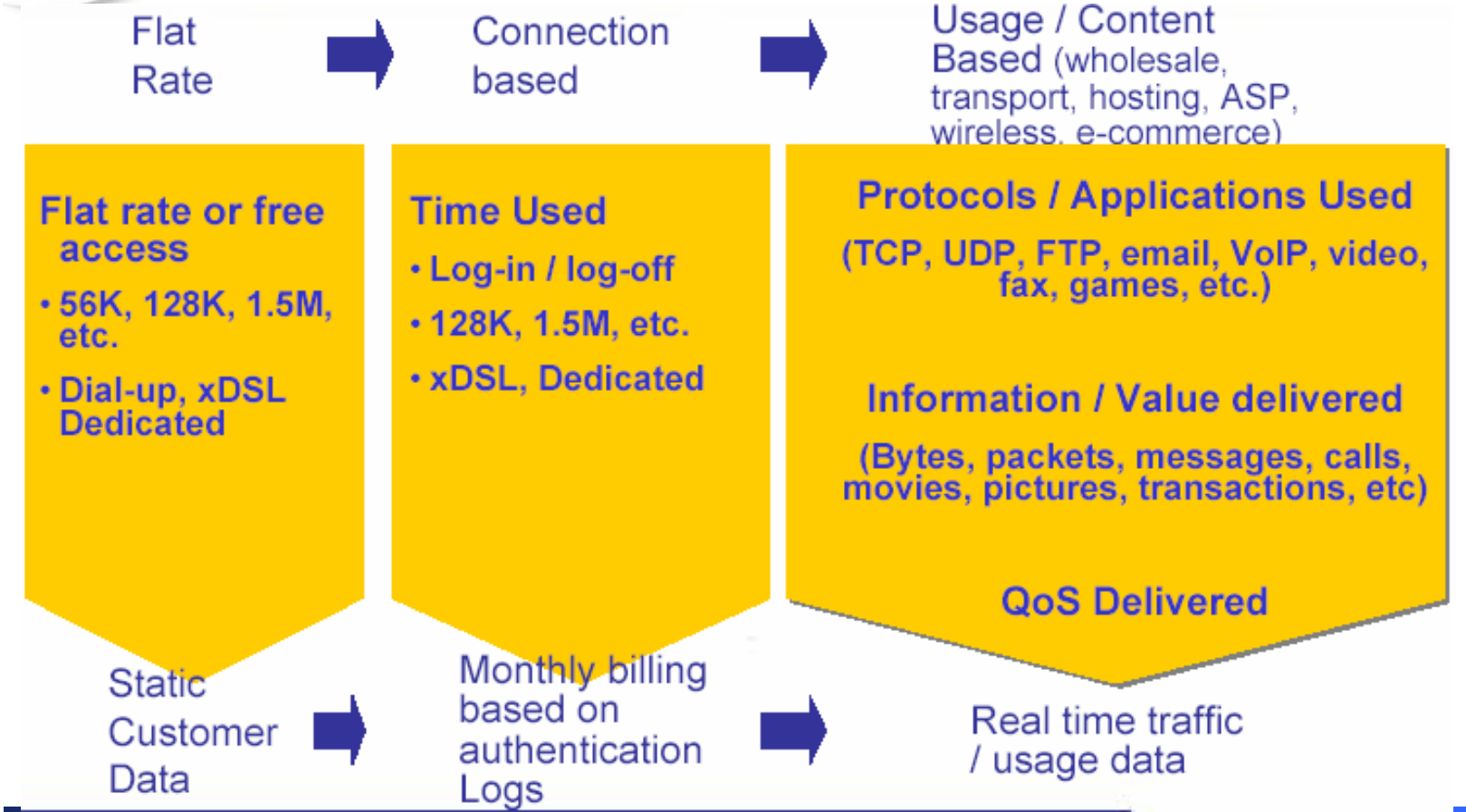


Billing for IP services is very different from billing for traditional PSTN based services

- PSTN Networks
  - Call usage data
  - Easy user identification
  - Out-of-band signaling
  - One service quality
  - One traffic type
  - Established pricing models
  - Periodic (batch) billing

- **IP Networks**
  - **Huge volume of data**
  - **Dynamic IP addresses**
  - **In-band signaling**
  - **Variable service quality**
  - **Variable traffic types**
  - **Emerging, varied pricing models**
  - **Real-time billing**

Evolution of usage based billing



Key architectural concepts

- The Product architecture
  - Logically independent from supporting systems
  - Enabling the entire architecture, facilitating
    - Faster product development
    - Faster time to market
    - Support for increasingly complex products
- Virtual distributed datasets
  - Supported by EAI
  - Key entities
    - Product
    - Party (customer, subscriber, 3rd party, interconnection partner, etc.)
- Balance architecture
  - Getting more complex as content and service increases
  - Market drivers to offer products and services can not be constrained by credit classes and payment methods.
  - Convergence (e.g. Pre-paid Post-paid)
- The use of Enterprise Application Integration (EAI)
  - EAI is essential to realize the full benefits of the target architecture
  - Saving Cost, Time and People

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Cha(lle)nging Systems Architectures – some key Parameters

- Sourcing – In / Out
  - Keeping the control
  - Not only facing the immediate cost savings
- Convergence
  - Pre/ Post paid - Realtime
  - Markets Convergence: Data, Voice, Content
  - Products Convergence
  - Going Global: Convergence between Countries/Regions
- Keep it simple
  - Towards Flat, more Simple Tariffs
  - Value added Services to be charged on Top

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Are you ready for the change?

Many thanks for listening.

Any questions?

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