Infrastructure and Design drive the Service Oriented Architecture (SOA)

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Agenda

Infrastructure and Design *drive* the Service Oriented Architecture (SOA)

- A bit of history…
- Roadmap to the future
- Critical role of SERVICE
- New Infrastructure and Design Software
- Challenges & Benefits
A bit of history...

When dinosaurs ruled the Data Processing World...

- 1950’s – earliest fossil records exist
- 1960’s – fantastic growth
- 1970’s – more growth
- 1980’s – gradual decline
- 1990’s – almost complete extinction
- 21st Century – many in the industry today do not even remember the “Age of Dinosaurs”
A bit of history...

So what caused the death of these giants???

Standards!!!!

But what was the underlining roadmap that caused this to happen???
A bit of history...

• Open Systems Interconnection (OSI) Reference Model
  – Done by the International Organization for Standardization (ISO) in 1978
A bit of history...

Open Systems Interconnection (OSI) Reference Model

Layer 7 Application
Layer 6 Presentation
Layer 5 Session
Layer 4 Transport
Layer 3 Network
Layer 2 Data Link
Layer 1 Physical
A bit of history...

Open Systems Interconnection (OSI) Reference Model

Layer 7: Application
Layer 6: Presentation
Layer 5: Session
Layer 4: Transport
Layer 3: Network
Layer 2: Data Link
Layer 1: Physical

IT Infrastructure

IT Applications
So here we are today...

“IT” Information Technology Standards Driven

But change is coming...
But change is coming...

• We in the industry today should hear it as clearly as the dinosaurs did in the 1980’s...

• If companies do not adapt to this change they will share the dinosaur’s fate of the 1990’s...

• And just as in the 1970’s when the OSI Model was the roadmap to where we are now... There is the roadmap as to where we will be in future...
Enhanced Telecom Operations Map® (eTOM)
Enhanced Telecom Operations Map® (eTOM)

Customer

Strategy, Infrastructure, & Product

Operations

Enterprise Management

Figure 1 from TM Forum document: http://www.tmforum.org/BusinessProcessFramework/eTOMDatasheet/32722/article.html
Enhanced Telecom Operations Map® (eTOM)

Services Oriented
Everything is SERVICE Oriented

Every Decision is now made in response to:

- Providing SERVICE

  at the level of quality required by the customer and defined in the SERVICE LEVEL AGREEMENT
Everything is SERVICE Oriented

Every Decision is now made in response to:

• Providing SERVICE
• Monitoring SERVICE

to ensure that the SERVICE LEVEL AGREEMENT is met
Everything is SERVICE Oriented

Every Decision is now made in response to:

- Providing SERVICE
- Monitoring SERVICE
- Maintaining SERVICE

again to ensure that the SERVICE LEVEL AGREEMENT is met
Everything is SERVICE Oriented

*Every Decision is now made in response to:*

- **Providing** SERVICE
- **Monitoring** SERVICE
- **Maintaining** SERVICE
- All of this being done with complete **TRANSPARENCY** to the customer
SERVICE Oriented Workflow

- Approval
- Facility
- Inventory
- Funds
- Order
- Get Funding
- Engineering
- Next slide
- Auto-Config
- Manual Config
- Installation
- OSS Alarms
- Work Order
- SLA Fulfillment

- Invoicing
- Billing Mediation

Web-based interface
(knowledge management for all current services)
Facility

Engineering Workflow

- Engineering
  - Design
  - Cost Data
  - Inventory Data
  - Work Unit Rate

- Get Funding

- Funds
- Material
- Order

- Inventory

- Installation
- Outsourced Construction
- Work Order
- Facility Ready

- Web-based interface
Critical need to improve **SERVICE**

**CUSTOMER DEMANDS**

- Customer demands faster delivery of service
- Customer demands for consistent levels of service (Service Level Agreements)
- Customer demands for transparency

**COMPANY DEMANDS**

- Company requirements better demand forecasting
- Company demands for lowering costs (Operations Costs and Capital Costs)
- Company demands for better use of existing infrastructure
- Company demands for faster and more accurate cost estimates and design engineering
SOA – Service Oriented Architecture

SOA is a “view” of architecture that focuses on services as the action boundaries between the needs and capabilities in a manner conducive to service discovery and mapping – Service Description – Interaction Model – Policies and SLA Levels – Design Specifications
  • Equipment
  • Infrastructure
New Infrastructure and Design Software Systems

All Telecommunications Infrastructure information must be in ONE system

ALL = ALL (not some…not most… ALL)!!!!

• **Current** Infrastructure
  – Structures/Spaces (Buildings/Towers/Equipment Racks/MH/etc.)
  – Pathways (conduits/pole lines/etc)
  – Equipment (chassis/slot/cards/ports/etc.)
New Infrastructure and Design Software Systems

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- **Current** Infrastructure
- **Planned** Infrastructure
  - Structures/Spaces (Buildings/Towers/Equipment Racks/MH/etc.)
  - Pathways (conduits/pole lines/etc)
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New Infrastructure and Design
Software Systems

All Telecommunications Services must be in ONE system

ALL = ALL (not some...not most... ALL)!!!!

• Current Services (and what infrastructure is required to support them)
  - Voice (Fixed Line)
  - Voice (Mobile)
  - LAN Connectivity (copper)
  - WLAN Connectivity
  - ADSL
  - FTTH
  - .....and on and on and on and on....

......and on and on and on and on....
......and on and on and on and on....
New Infrastructure and Design Software Systems

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- **Planned** Services *(and what infrastructure is required to support them)*
New Infrastructure and Design Software Systems

All Telecommunications Services must be in ONE system

ALL = ALL (not some...not most... ALL)!!!!

- **Current** Services (and what infrastructure is required to support them)
- **Planned** Services (and what infrastructure is required to support them)
- **SLA** defined for all Services
- SLA’s monitored immediately upon Service Activation
The “GOOD” News...

These types of Infrastructure and Design Software Systems do exist from multiple vendors...

Most are found under the general label of...

- **OSS/BSS** = Operations Support System / Business Support System

Or *(maybe)* more accurately under...

- **NGOSS** = New Generation Operations System & Software
The “GOOD” News...

These types of Infrastructure and Design Software Systems *do exist* from multiple vendors...

Most are found under the general label of...

- **OSS/BSS** = Operations Support System / Business Support System
- **NGOSS** = New Generation Operations System & Software
- **GIS** = Geographic Information System
GIS = Geographic Information System

- GIS is “Spatial” data
- Two main GIS formats in this market
- Map information (may be already available)... What format???
- GIS traditionally for OSP design...
  - Conduit formations and Maintenance Holes
  - Cables in Conduits (and/or subducts)
  - Pairs or Fibers inside the Cables
  - Splicing/Termination Location and Details
GIS = Geographic Information System

- Inside the Buildings (and beyond)...
  - Floor Plan Layouts (outlet information)
  - User equipment connected to outlets
  - Telecommunication Room Layouts
  - Equipment Racks
  - Equipment Chassis / Slot / Port
  - Physical Connection details (port to port)
  - Logical Circuit details (origin – destination)
  - Logical Configuration Details
OSS/BSS – NGOSS – GIS

• Service Delivery
  – All the infrastructure and configuration details as to how “Service” is delivered to user #1 in office #404 on Floor #4 of Office Building “XXX” in City “YYY” in Country “ZZZ”
OSS/BSS – NGOSS – GIS

- Service Delivery
  - All the infrastructure and configuration details as to how “Service” is delivered to user #1 in office #404 on Floor #4 of Office Building “XXX” in City “YYY” in Country “ZZZ”
The “BAD” News...

*In case you had not guessed this yet*...

This is **NOT** GOING TO BE...

- EASY
- FUN
- PAINLESS
Challenges to Success...

• Usually involves a complete re-organization of the organization (and nobody likes change)...  
  – *The bigger the organization the bigger the challenge*  
  – *Executive Management Support is CRITICAL*

• Discovering and documenting all the ASSETS and INTRASTRUCTURE that exist

• Defining what SERVICES you currently offer and how the Quality Level of these existing services is monitored and maintained

• Defining how you PLAN and FORECAST requirements
Challenges to Success...

• Organizational Rules - which groups control which functions...
  – Who creates the proposal and the initial forecast???
  – Who approves a proposal Technically???
  – Who approves a proposal Financially???
  – Who orders the materials and controls inventory???
  – Who builds it???
  – Who operates it???
  – Who maintains its???

• Did all of these costs actually get associated with the original proposal???
Challenges to Success...

*It is only once you have this overall view that you can move toward a selection process as to which software tool best meets your requirements.*
Challenges to Success...

All of the software tools will start with...

• Building DATABASE MODELS
  – PHYSICAL “Things”
  – SERVICE “Things”

• Input of the existing Assets / Infrastructure / Services

• Building RULES about how the models can interact and which organizations can do what

• Building WORKFLOWS
Challenges to Success...

Customer Relationship Management (CRM)

• How to interact with the Customer
  – Receiving orders
  – Providing updates
  – SLA violation resolutions
  – Billing
  – New Services
Challenges to Success...

Service Level Monitoring & SLA’s
- Alarm Monitoring / Management
- SLA Alarm Monitoring / Management
- Root Cause Analysis

OSP Example... When a fiber cut happens...
- How long does it take you to determine that the problem is a fiber cut?
- Where that fiber cut is located?
- Materials required to repair?
- Where is the closest active work team to dispatch?
- Print a work order with an exact map of the cut location?
Challenges to Success...

And one thing that is too often forgotten...

**TRAINING**

- Employee Training *(before implementation)*
- Employee Training *(during implementation)*
- Employee Training *(after implementation)*
- Employee Training *(skills updates / new staff)*

If your employees are not comfortable with how to use the system to do their everyday jobs...

**IT WILL FAIL!!!!!!!**
Benefits

- Customer demands faster delivery of service
- Customer demands for consistent levels of service (Service Level Agreements)
- Customer demands for transparency
- Company requirements better demand forecasting
- Company demands for lowering costs (Operations Costs and Capital Costs)
- Company demands for better use of existing infrastructure
- Company demands for faster and more accurate cost estimates and design engineering
Sources of Help and further research...

- Old friends ...
  - BICSI www.bicsi.org

- New friends...
  - ITIL (IT Infrastructure Library) = “IT World”
    - IT Service Management Forum (itSMF)
    - www.itil.org
    - ISO/IEC 20000 - An international standard based directly on ITIL and enhanced with wider management requirements
  - TeleManagement “TM” Forum www.tmforum.org
  - Enhanced Telecom Operations Map® (eTOM)
    - Business Process Framework (eTOM) = “Telco World”
The PAST was...

IT has often operated on a paradigm of...

BUILD IT and THEY WILL COME...
The FUTURE is...

IT paradigm for the 21\textsuperscript{st} Century will be...

SERVICE!!!

And Service will be \textit{driven} by the Infrastructure and Design
Questions???

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