Implementing an
IT Service Management Architecture

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IT Service Management

ITIL
IT Infrastructure Library

ISO 20000
Currently 75% of most IT budgets are spent on maintenance & support activities

2005 total IT spending on IT internal staff

- Hardware support and maintenance: 18%
- System and network management: 14%
- Help desk: 10%
- Software support and maintenance: 18%
- Software application development: 14%
- IT administrative staff: 17%
- Advanced technology group, planning, architecture: 4%
- Project or program management: 7%

“Seventy-seven percent rated improving IT efficiency as a priority.”

The primary goal IT Service Management is to improve the efficiency and effectiveness of the IT services

While the specific goals of an ITSM program may vary in different organizations, any IT Service Management program must incorporate the four domains of **people, process, technology and information**.

### People
- Roles, teams and functions
- Skill requirements
- Job descriptions
- Staffing levels
- Training curriculum
- Staff training

### Process
- Technology and information requirements
- Resource acquisition
- Policies and governance
- Process design
- Detailed workflow implementation
- Procedures

### Technology
- ITSM architecture
- Tool requirements
- Tool evaluation and selection
- Tool installation
- Interfaces and integration
- Development environments
- Customization and integration
- Testing
- Deployment

### Information
- Information requirements
- Data models
- Information flows
- Measurements
- Reports
- Performance indicators
The business case for IT Service Management Automation

- **Challenge:**
  - The operational processes that directly support delivery of revenue generating business services and processes are not automated or integrated.

- **Solution: ‘Operational’ Automation**
  - Automates and integrates the operational processes and tools that directly support the delivery of critical business services and processes – to help maximize productivity and reduce new labor expense, while improving service assurance.

- **Operational Spend**
  - 70% of CIO budget is labor

- **By 2008**
  - 73% of CIO budgets will be labor spend
  - Growth supporting app. dev. will decline at -10% CGR
  - Total operations labor spend will reach $325B

*Automating IT operations to support greater business agility.*
It can be a challenge to ensure IT technology solutions are implemented in a way that is integrated and effectively supports process automation.

**Typical Issues**

- Disparate monitoring tools exist for different platforms;
- Monitored events are not consolidated into a single view;
- Some critical resources are not monitored;
- IT configuration data is maintained in separate sources, duplicated and not updated;
- Service requests are not logged consistently for proper follow-through of resolution;
- Etc…

*Ad-hoc purchasing of management solutions without regard for an overall plan or strategy typically leads to an unplanned environment with a disarray of tools that are not optimized to realize ITSM goals.*
An ITSM Architecture provides a holistic view of IT Service Management capabilities, providing the “city plan” for “building projects”
Without an IT Service Management Architecture…

… even if an individual house is well architected, if each house is different (e.g. different electricity voltage, water pressure) then the city will not work…

Some of the greatest value comes from:

- Common vision & principles between the IT teams, and IT management
- Centralized information
- Cost avoidance/reduction – avoid purchase of incompatible tools
- Shortened development/deployment time
- Reduce duplication and waste
- Reduced support and maintenance costs
So what’s the value of an ITSM Architecture?

- Some of the greatest value comes from **intangible** things
  - Common vision & principles between the IT teams, and IT management
  - Creates deliverables and processes as an organization
  - Enhanced communications
  - Common language
  - Centralized information
  - Logical models of technology
  - Increased knowledge base
  - Cost avoidance/reduction – avoid purchase of incompatible tools
  - Shortened development/deployment time
  - Leverage installed architecture
  - Reduce duplication and waste
  - Reduced support and maintenance costs
  - Reduce learning cycle

- But there are also **tangible** benefits
  - Cost avoidance/reduction – avoid purchase of incompatible tools
  - Shortened development/deployment time
  - Leverage installed architecture
  - Reduce duplication and waste
  - Reduced support and maintenance costs
  - Reduce learning cycle
IBM has identified a common set of patterns in which ITSM architectures are often built – the IBM Service Management Reference Architecture

**Service Quality Management**
- Establishes the framework for end-to-end collection of quality metrics
- Includes real-time monitoring and historical reporting of service levels

**Service Asset Management**
- Information required to provide accurate details about the IT environment.
- Includes the supporting resources (people, applications, infrastructure and information) and the services provided with them.

**Service Monitoring**
- Monitoring of Services from a business/consumers’ perspective.
- Correlation of Service Availability and Performance to Utilization, Capacity and Problems.
- Uses predictive modeling and forecasting of service availability & performance based on real-time service and resource capacity, performance and utilization data.

**Service Provisioning**
- Resource deployment, capacity allocation, metering, billing and managing operations.

**Service Request Management**
- Management of the portfolio of IT services, and an IT Service Catalog for receiving, evaluating and processing service requests.

**Service Management Foundation**
- Core building blocks for establishing consistency and control over the IT environment.
- Includes Incident, Change, Problem, Knowledge, User Contact Management and Reporting.
Within each pattern we can see the typical management functions it enables...
We can drill down to the specific IT capabilities required - including both the management applications and information that are needed.
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And each capability will ultimately be implemented as a physical set of applications and databases.
The sequence in which you build and deploy these capabilities should be determined by your business priorities.

**IT Challenges:**

- Poor Service Availability of ATM Machines
- Frequent outages and long outage duration for Internet Banking Service
- Inability to meet change request demands
- Poor customer perception of IT

**Root Cause:**

- Lack of service availability monitoring, no event correlation and incident management
- No standard process to identify, diagnose and resolve incidents; incident prevention is not practiced
- Lack of change policies; no service levels defined for change requests; no formal approving authority
- Services, service levels and metrics are not defined; No mechanism for service review and improvement

**ITSM Processes Identified:**

- Service Monitoring & Availability Management
- Service Mgmt Foundation, Incident & Problem Management
- Service Provisioning & Change Management
- Service Quality Mgmt & Service Level Management
In our experience we see five common phases that many organizations go through in building their ITSM architecture

**Provide essential resource availability monitoring and basic event management**
- Implement system management tools and processes with basic event management
- Basic Configuration information should exist to support component identification

**Implement system management tools and processes with basic event management**

**Effectively manage IT services to the users**
- Implement Service Desk solution with Incident, Service Request, and Knowledge Base Management with basic Change, Configuration and Problem Management

**Provide enterprise-view of IT capacity and availability against SLAs**
- Implement an integrated IT dashboard for proactive operational monitoring
- Advanced correlation of events to allow automated diagnosis and recovery

**Ensure that IT Configuration Items and Assets are managed**
- IT asset management, configuration management, advanced change management & device auto-discovery functions

**Provide integrated IT & business performance monitoring**
- Implement an integrated IT & business dashboard to support management reporting of business-aligned KPI's and continuous improvement

**Progressively implement**
- KPIs
- Service Level Agreements

**leading to continuous improvement**
1. Most organizations begin by building essential resource availability monitoring and basic event management capabilities

Objectives:

- Ensure that critical resources and composite applications are monitored and managed (keep the lights on)
- Identify performance and availability bottlenecks by monitoring infrastructure, applications and transactions to:
  - Ensure performance and availability of IT infrastructure & applications
  - Resolve problems quickly if they occur to minimize impact
  - Contain the IT support and maintenance costs

IT challenges Addressed:

- Manage and administer systems and technologies across multiple platforms, open standards and proprietary standards.
- Need to monitor and manage composite applications that span multiple subsystems and rapidly resolve application performance problems that occur during production
- Drive down costs through efficiency and maximum usage of existing assets
Operational Monitoring & Event Management provide the inputs into proactive Capacity & Availability Management
2. Effectively managing IT services to the users is typically the next set of priorities to address

- The **Service Desk** and **Incident Management** are the most critical from an ITSM operational perspective
  - They are the daily link with the business
  - They allow Incident Management to be planned and managed
  - They bring together valuable data for management reporting

- **Change Management** is almost always viewed as critical
  - It manages risk which is essential within many industries

- **Problem Management** should be done but is often not done well
The IT components that are implemented as part of the Service Desk may come from more than one service management pattern.
3. Ensure that IT Configuration Items and Assets are managed

Challenge:

- **Without proper IT asset control**: Poor control increases CapEx, OpEx, risk impacting growth and innovation
  - *Finance Week*: Only 40% of assets are well described and can be easily found

- **Without accurate information about the IT Configuration Items**: it is difficult to assess the full impact of single changes or incidents
  - Over 85% of service problems result from changes to the infrastructure

Solution: Integrated IT Asset Management and Configuration Management

*Helps recover assets and implement effective access control and change management processes across business and technology investments—maximizing ROI, minimizing service problems and improving security.*
A CMDB will help maintain and provide information on IT components and relationships
Your IT Asset Management solution should allow you to perform the following functionalities…

**Contract Management**
- Contract Terms & Conditions
- Notifications
- Software Contracts
- License Compliance

**Procurement**
- Procure based on standards
- Create and route purchase orders
- Use catalogs
- Integrate with ERP systems

**Financial Management**
- Purchase/Lease Cost Tracking
- Work/Service Cost Tracking
- Usage Accounting
- Total Cost of Ownership

**Asset Management**
- Software Asset Management
- Hardware Asset tracking
- Installs, moves, adds, changes
- Reconciliation/Audit
- Extend IT AM beyond computing resources (data center facilities, power, etc.)

**Asset Discovery**
- Desktop Discovery
- Server Discovery
- z Platform Discovery
- Software License Usage
- Deep Network Device Discovery
- Storage Device Discovery

**Work Management**
- Work planning and scheduling
- Skills, labor, and inventory management
- Service plans and cost management

**Service Management**
- CMDB
- Support service desk with asset configuration data
- Service Impact Management
In order to effectively manage IT Assets you must include Asset Mgmt, Configuration Mgmt and Discovery Services

**Asset Management** – This system must be implemented in a manner that

- Ensures the assets in the asset database match configuration items in the CMDB.
- Supports IT Asset Lifecycle
- Support an integrated audit capability

**Configuration Management**

- Capture types of CIs managed, attributes and relationships
- Mapping CIs to the asset database is essential

**Discovery**

- Tools and technologies required to facilitate the collection of asset- and configuration-related information.
- The more automated these services are the more effective
- Data accuracy and ability to track changes is critical.
4. Provide enterprise-view of IT capacity and availability against SLAs

Challenge:
- Different monitoring platforms generate multiple alerts and messages that may be difficult to interpret and sometimes conflicting
- Overwhelming number of events without advanced capabilities to filter and perform sense and recovery

Solution: Advanced Event Correlation and Management with automated recovery
- Provides advanced event correlation and visualization capabilities which allow operational control teams to proactively track and manage the IT infrastructure in a consolidated view
- Intelligently filter events by business rules
- Auto-recover pre-configured events

Proactive control over the IT operational environment
Integrated Event Management & Monitoring functions deliver a consolidated view of the health of the environment

- An Enterprise Console is implemented to harness and improve the systems management capabilities:
  - Collate events from various monitoring sources
  - Filter events based on pre-defined templates, event priority etc…
  - Single-view of status of the environment
  - Proactive alerting and escalation
  - Trigger auto-recovery
Event Management & Monitoring tools provide an integrated view of IT resources through a single console.
5. Provide an integrated dashboard of the IT and business KPIs

Challenge:
- Business and operational audiences lack the visibility needed to directly support and deliver against business objectives
- Key performance indicators are not well understood and presented to customers and management

Solution: Targeted real-time dashboards
- Business, Compliance, and Operational dashboards leverage existing assets and provide the real-time visibility needed to manage against business objectives

Any data. Anywhere. For any audience. In real-time.
The “holy grail” of IT services

- Make quicker, better, business-informed decisions about IT operations
- Improve customer service levels
- Improve ability to identify problems and fix them before they can impact the business
- Comply with regulatory and auditing requirements and facilitate an overall lower cost of compliance
- Increase IT staff productivity

Reduce the cost of IT systems management and maintenance, thereby releasing funds for investment in growing the business, all the while maintaining a good IT service that keeps the customers happy!
An integrated Dashboard is a valuable asset for the entire organization

- Enable tactical decisions
  - Prioritize IT resources and services
  - Support continual improvement with Six Sigma
- Automate service level reporting
  - Reduce and manage risk of infrastructure changes
- Reduce problem-resolution time
  - Understand business impact of IT
- Gain access to domain tools

Executives and business and IT managers

Operations

Services and processes

Applications and infrastructure

Tivoli software, HP, BMC software, CA

Business management

Service management

Business-enabled IT management
The Dashboard incorporates data from numerous, cross-platform sources to present business, service and IT views.

- **Business Views**
  - Business Assurance
  - Business Impact

- **Service Views**
  - Service Assurance
  - Quality of Service

- **Resource Views**
  - Element Health
  - Fault

- **Customer Satisfaction**

- **Zero Down-time = Always Available**
An example of a Business & IT dashboard

A warning light shows a potential problem with customer service.

The map shows where the problem is occurring.

Drilling down reveals more details.
Five common phases that many organizations go through in building their ITSM architecture

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2. Implement system management tools and processes with basic event management

3. Effectively manage IT services to the users
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4. Effectively manage IT services to the users
   - Implement an integrated IT & business dashboard to support management reporting of business-aligned KPI’s and continuous improvement

5. Provide integrated IT & business performance monitoring
   - Implement an integrated IT & business dashboard for proactive operational monitoring
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Provide enterprise-view of IT capacity and availability against SLAs
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leading to continuous improvement
The result – an integrated ITSM Architecture to support efficient, quality IT services to the business
Some Final Thoughts – Why Architecture? Because…

- "Everything should be made as simple as possible, but not simpler."
  Albert Einstein

- "Out of intense complexities simplicities emerge."
  Winston Churchill

- “Ah – so That's what architecture is all about! Herding cats! It’s easy, really, isn’t it?!?”
  SJP
A Case Study
University of Pittsburgh Medical Center

- **Who is UPMC?**
  - Largest employer in Western Pennsylvania. 40,000 employees, 5,000 physicians

- **The Challenge**
  - Infrastructure was highly diverse as result of growth by mergers/acquisitions. Complex infrastructure was making it nearly impossible to respond to changing business needs of the health system
    - 3 Mainframes, 184 Unix servers, 5 versions of Unix, 769 Wintel servers
  - Cost of managing infrastructure was escalating at an ever increasing rate
  - All of these were combining to make it very difficult to achieve the goal of fully integrated electronic health records by 2014

- **Service Management automation initiatives:**
  - Multiple management tools
  - No enterprise console
  - Minimal automation
  - Siloed management processes
  - ITIL–based mgmt processes
  - Enterprise console
  - Highly automated mgmt tools
  - Enterprise security
This transformation of their infrastructure and management capabilities will occur in four phases over a period of three years

**ESM Phase 1 (2Q05 – 1Q06)**

Service Desk & Infrastructure

- Server consolidation
- Enterprise console and monitoring
- Incident and problem management
- Change and configuration mgmt
- Enterprise storage and management
- Resource virtualization

**ESM Phase 2 (2Q06 – 4Q06)**

Service Level Management

- Service catalog and service level management
- IT governance
- Capacity and provisioning management
- Workload scheduling and management
- Federated CMDB

**ESM Phase 3 (1Q07 – 3Q07)**

License and asset management

- License management
- Basic orchestration
- Enterprise workload management
- Usage metrics
- Service workflow choreography

**ESM Phase 4 (4Q07 – 2Q08)**

Business Service Management

- Automated policy-based resource allocation and optimization
- Business service management
- Resource orchestration
- Cost transparency and “showback”
UPMC Transformation Benefits

- Improved service quality
- Improved scalability
- Faster deployment of new services
- Higher availability
- Enhanced business resilience
- Greater operational efficiency
- UPMC expect to reduce overall IT operating costs by 20 per cent

- Reduced 786 servers to 305, increase capabilities 7% year-on-year
- Reduce 40 storage arrays to 2
- Reduce 9 operating systems to 4
Thank you