# White Paper:

# Establishing a Configuration Management Database Schema: A Working Model

## Overview

**Introduction**    Prior to building a Configuration Management Database (CMDB), a schema is needed to identify the working data model that will underpin the database. This paper describes a model that could be used for that purpose.

**Contents**    This publication contains the following topics:

# Schema Design Background

**Introduction**     The following section describes the background for choosing the particular schema structure demonstrated in this document.

**CMDB Schema Defined**     The Schema, which can be thought of as the underpinning data structure, for the CMDB has two main purposes:

1. Identify the key types of CI's that are part of the CMDB.
2. Demonstrate how those CI types are interrelated.

**CMDB Schema Challenges**     This particular area of ITIL is new and little industry work or literature exists around it.

**CMDB Schema Ideas**     Other ideas for schemas include:
- Entity Relationship Data Designs
- UML Diagrams
- Bill Of Material (BOM) Models
- Schema example as shown in the ITIL Service Support Book

# Choosing a Schema Design

**Ideas Rejected**

*ER & UML:*
- These models were rejected because it is easy to lose the big picture as these diagrams quickly get extremely complicated.
- In addition, any new personnel brought in will have to spend a good deal of time learning how those models were put together.

*BOM:*
While many of the models reviewed of those reviewed covered very complex items such as an entire airplane or space shuttle, it was rejected because the approaches were unique and could not be carried forward easily to other businesses.

*ITIL Service Support:*
ITIL's example as published in the Service Support book was rejected because it focuses mostly on technological components and a limited view of everything entailed in an IT infrastructure.

**Successful Schema Design Principles**

The following design principles were used to underpin the model presented in this paper:
- Ability to show the entire infrastructure on one page.
- Supports relationships between configuration items (CI's) that are applicable across most companies.
- Accommodates almost any CI type that an IT organization might use.
- Supports exploding business services into detailed CI's that make up and support those services.
- Intuitive to understand.
- At a level that can apply to many business units and organizations.

# Schema Example

## Overview

**Introduction**     The following section contains an example schema and descriptions of the components that go into the schema.
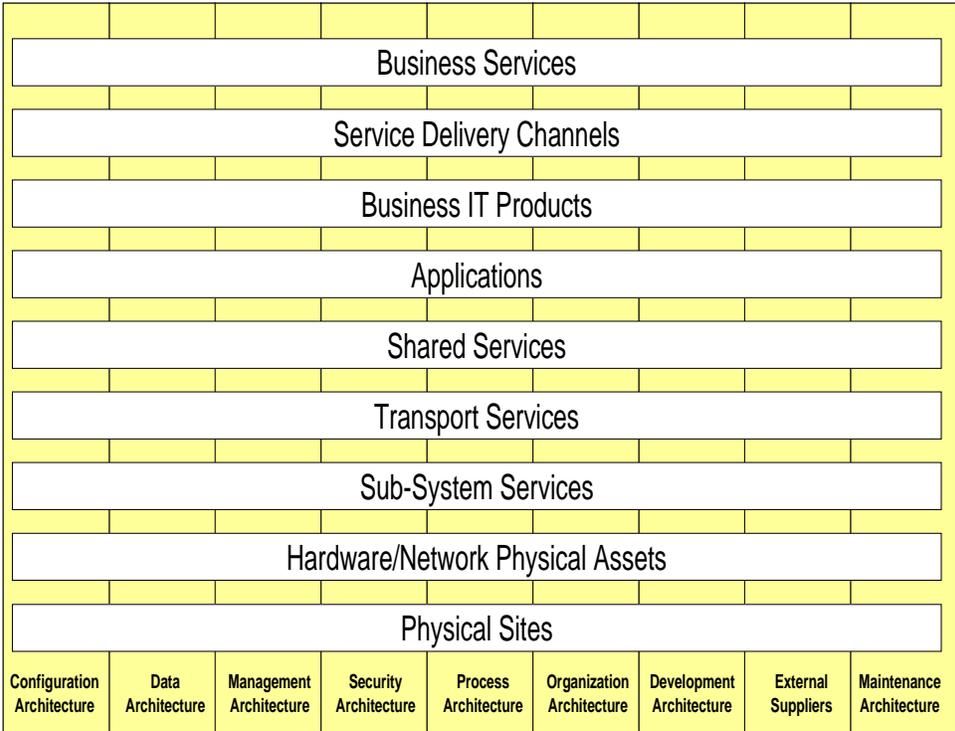
**Contents**     This chapter contains the following topics:

# Example CMDB Schema

**Introduction**   The model shown below presents how an entire IT infrastructure can be viewed.

**Schema Model**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Business Services | | | | | | | | |
| Service Delivery Channels | | | | | | | | |
| Business IT Products | | | | | | | | |
| Applications | | | | | | | | |
| Shared Services | | | | | | | | |
| Transport Services | | | | | | | | |
| Sub-System Services | | | | | | | | |
| Hardware/Network Physical Assets | | | | | | | | |
| Physical Sites | | | | | | | | |
| Configuration Architecture | Data Architecture | Management Architecture | Security Architecture | Process Architecture | Organization Architecture | Development Architecture | External Suppliers | Maintenance Architecture |

**Service View CI's**

The white bars represent the Service View of the infrastructure.

This starts at the top with the Business Services CI Type and explodes downwards to the lowest level which has the Physical Sites CI type that services and service components reside in.

**Management View CI's**

The vertical bars represent the Management View of the infrastructure.

Note that each level of the Management View crosses all levels of Service Views. The reason is that each level in the service delivery chain may have management components that are unique to its scope.

# Example CMDB Schema, Continued

**Sub-Schemas**     At the Configuration Manager's discretion, it is perfectly okay to include sub-schemas within each CI. For example, the Hardware/Network CI type could have sub-schemas such as Mainframe, Server, Com Line, etc.

# Service CI Types

## Overview

**Introduction**   The following section contains descriptions of the various Service CI types, shown vertically on the schema graphic.

**Contents**   This chapter contains the following topics:

# Business Service CI Types

**Definition**        These CI's represent the services offered by the business to their end customers. They may also represent key business units within the company.

**Examples**        Examples of Business Service CI's include:
- Sales support functions
- HR/Finance
- Online services to customers
- Manufacturing department
- Marketing business unit

# Service Delivery Channel CI Types

**Definition**     Business services are delivered to customers over delivery channels. These CI types cover those mechanisms business services use to deliver to customers.

**Examples**     Examples of Service Delivery Channel CI's include:
- Web-enabled
- PDA
- Online
- Hosted delivery

# Business IT Product CI Types

**Definition**    These types of CI's represent products that are sold or given to outside customers.

It would be used for those companies that are in the business of selling or giving IT solutions, in the form of IT products or solution offerings, to outside entities.

**Examples**    Examples of Business IT Product CI's include:
- Company built products sold to outside customers.
- Pass through licenses or products sold/delivered to outside customers.
- Solution offerings sold or given to outside customers.

# Application CI Types

**Definition**    These CI types cover application CI's that make up business products and
services.

**Examples**    Examples of Application CI's include:
- Application modules and programs
- Code segments
- JAVA applets
- Include files

# Shared Service CI Types

**Definition**    These CI types cover corporate IT services that are shared across business organizations.

**Examples**    Examples of Shared Service CI's include :
- E-mail
- Intranet web services
- Middleware used to support application messaging.
- Development testing environments

# Transport Service CI Types

**Definition**     These CI types cover company networking elements that are not hardware (OSI stack layers 2 and above).

**Examples**     Examples of Transport CI's include:
- Satellite
- TCP/IP
- Ethernet
- X.25
- X.500
- Token Ring

# Sub-System Service CI Types

**Definition**        These CI types cover operating software that is used to directly support applications and business services.

**Examples**        Examples of Sub-System CI's might include:
- Operating systems such as UNIX or Windows
- Operating system service modules
- Custom developed systems software programs
- Operating system utilities that support applications and business services

# Hardware/Network Physical Asset CI Types

**Definition**   This CI type covers all physical IT assets that are used to support applications and business services.

**Examples**   Examples of Hardware/Network Physical Asset CI's include:
- Mainframes
- Servers
- Routers
- Switches

# Physical Site CI Types

**Definition**     This CI type covers physical facilities where hardware/network assets reside to deliver services to applications and business services.

**Examples**     Examples of Physical Site CI's include:
- Data Centers located in various geographies
- Local banking branch site
- Corporate Data Center
- Wiring closet locations

# Management CI Types

## Overview

**Introduction**     The following section contains descriptions of the Management CI Types, shown horizontally in the graphic.

**Contents**     This chapter contains the following topics:

# Configuration Architecture CI Types

**Definition**    This type of CI contains information on how the IT infrastructure is assembled and put together.

CI relationships are also stored here.

Configuration Architecture CI's can be viewed as the "glue" that holds the infrastructure together.

**Examples**    Examples of Configuration Architecture CI's include:
- Pointer to Service Catalog
- CI Relationships (including what holds this model together)
- Asset Information
- Blueprints
- Floor plans
- Infrastructure Architecture descriptions and designs
- Pointers to Definitive Hardware Stores (DHS)
- Pointers to Definitive Software Libraries (DSL)
- Pointers to ITIL databases and repositories

# Data Architecture CI Types

**Definition**    This CI type covers all data element components that reside in the
infrastructure.

**Examples**    Examples of Data Architecture CI's include:
- Database schemas
- Logical database designs
- Physical database designs
- SAN architecture layout
- ITIL database and repository data layouts
- Application metadata descriptions
- Pointers to physical databases

# Management Architecture CI Types

**Definition**    This CI type covers tools used to monitor and manage the infrastructure and additional tools in place to support IT Service Management processes.

**Examples**    Examples of Management Architecture CI's include:
- Event management tools
- Incident logging and escalation tools
- Service desk tools
- Network management tools
- Monitoring and control tools
- Service reporting tools

# Security Architecture CI Types

| | |
|---|---|
| **Definition** | This CI type covers hardware, software and networking assets that make up the security infrastructure. |

| | |
|---|---|
| **Examples** | Examples of Security Architecture CI's include:<br>• Identity Management software components<br>• Security event logs<br>• Pointers to security databases<br>• Security Management software<br>• Physical security devices such as cameras, biometric devices, etc.<br>• Virus detection software |

# Process Architecture CI Types

**Definition**      This CI type covers process and procedural components that are used to provide IT Service Management support and control over the IT infrastructure.

**Examples**      Examples of Process Architecture CI's include:
- Incident Management process guide
- Problem Management process guide
- Capacity Management process guide
- Change Management process guide
- Guiding principles
- Process KPI's and measurements
- SLA and OLA targets
- Service Desk call procedures

# Organization Architecture CI Types

**Description**     This CI type covers organizational elements related to personnel that operate and manage the IT infrastructure.

**Examples**     Examples of Organization Architecture CI's include:
- Organization structure
- HR policies
- Job descriptions
- Roles/skills descriptions

# Development Architecture CI Types

**Definition**     This type of CI covers those components that are used to build application solutions.

**Examples**     Examples of Development Architecture CI's include:
- Compilers
- Code libraries
- Testing architectures
- Code generators
- Test data generators
- Make files

# External Supplier CI Types

**Definition**     This type of CI covers those elements related to outside suppliers to the IT infrastructure.

**Examples**     Examples of External Supplier CI's include:
- Underpinning contracts
- Supplier billing histories
- License agreements
- Outsourcing agreements
- Vendor histories
- Vendor correspondence

# Maintenance Architecture CI Types

**Definition**      This type of CI covers those elements used to maintain infrastructure components.

**Examples**       Examples of Maintenance Architecture CI's might include:
- Pointers to maintenance agreements
- Supply inventories such as toner, paper, etc.
- Inventory reorder/restock points
- Maintenance instructions for hardware components
- Service patches