

The CMDB Landscape: Market Directions, Vendor Solutions and IT Deployments

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Executive Summary

EMA's work in assessing the probable advantages and possible pitfalls of the industry movement towards a Configuration Management Database (CMDB) began with analysis of the requirements for next-generation management architecture. As described in the first report in this series, "The ITIL Configuration Management Database: Panacea or Pandora's Box?," this architecturally-centered work took on a new life in 2004, when industry awareness of IT Infrastructure Library (ITIL) best practices, and in particular ITIL's notion of a CMDB, began to soar. During the course of researching and developing the first two reports in this series – the first in December and this one during the first five months of 2005, the industry interest in an ITIL-driven CMDB visibly expanded. It became, in fact, an even more intense discussion than EMA anticipated, as many vendors and many IT implementers began asking some of the same questions that EMA had posed surrounding ITIL's process-centric notion of a CMDB and its real-world, software-based, architectural equivalents.

In its first report, EMA discussed ITIL's view of the CMDB. In short, the CMDB becomes for ITIL a trusted resource for assuring consistency and efficiency across many IT disciplines in support of service management (IT Service Management or ITSM). According to ITIL, "Many organizations are already using some elements of Configuration Management, often using spreadsheets, local databases, or paper-based systems. In today's large and complex IT infrastructures, Configuration Management requires the use of support tools, which includes a *Configuration Management Database (CMDB)*. Physical and electronic libraries are needed along with the CMDB to hold definitive copies of software documentation. The CMDB is likely to be based upon database technology that provides flexible and powerful interrogation facilities." ITIL also posits that the CMDB should capture both the interrelationships and relevant histories across all system components, including incidents, problems, known errors, changes, and releases as they relate to services and business requirements.

EMA, along with many vendors, and to a lesser extent some IT implementers, has focused in particular on the opportunities and pitfalls of taking ITIL processes and practices surrounding its CMDB – and from these trying to develop an architecture and a real database system to support them. While some IT implementers are developing their own CMDB software, most are very early in the adoption curve and are, for the most part, seeking to invest in third-party software and products that can be customized to serve them. As a result, their concerns are typically less architectural, per se, and more investment and process oriented. This report surveys product implementations (planned and shipping) from more than 20 vendors, and assesses early-phase IT perspectives and implementation concerns.

Methodology

EMA surveyed more than 20 vendors in depth, and has had CMDB-related discussions with more than 50 vendors across the enterprise management marketplace. As discussed below, these vendors ranged from centrist, "framework" providers to configuration and change vendors, to asset and help desk vendors, to storage and security vendors. For the vendors profiled in the report, a detailed questionnaire was used (See Appendix A). In some cases, vendors received as many as five interviews in order to complete a balanced view of what for many was a still evolving story. For other vendors, discussions were more self-contained.

EMA also researched IT perspectives and implementation directions regarding the CMDB. More than 20 IT organizations were surveyed in some manner or other. These IT surveys took the following forms:

- Engagements (actual and pending) with IT organizations seeking guidance on CMDB adoption strategies
- In-depth phone dialogs with IT organizations
- E-mail correspondence with IT organizations

EMA has tapped six of its analysts to cover the full CMDB marketplace, and in the course of this report, many conclusions are the results of internal discussions and assessments within EMA itself.



Summary of Conclusions

The conclusions within the following report follow its table of contents and organizational structure. A very condensed summary of key findings might be as follows:

- Vendor activity regarding CMDB-related development exceeded EMA's expectations. In EMA's view, the pervasiveness of vendor attention to the CMDB phenomenon is reflective of a broader trend within enterprise management – the trend towards a more structural approach to market evolution. This structural approach places more attention on architectural elements, which have in the past been typically “under the hood.” Along with the CMDB, and related to it, there is similarly an increasing focus on analytics, portals and visualization, topological discovery, workflow, identity management, and software-centric policy enforcement.
- Vendor CMDB development was, not surprisingly, viewed according to the native role that each vendor had within the enterprise management marketplace. Configuration vendors, for instance, emphasized configuration and change. Portal-oriented vendors emphasized visualization. Asset and Help Desk vendors took an asset focus, etc. Even within the framework vendors, there is usually a clear beginning point from which a broader CMDB direction evolves, typically within the context of the service desk and/or asset management.
- IT organizations are less sure than their vendor counterparts about the urgency and value of the CMDB, and as a group seem to be in more disarray on the subject. But even here EMA saw a strong interest in creating standards and consistency for critical management tasks. These tasks spanned operationally focused service assurance, change and configuration management, and asset management. Most IT organizations were in the process of assessing CMDB directions rather than doing actual deployments, and among those with deployments, few had gotten beyond a first phase, single-discipline focus for the CMDB.
- The ITIL roots of the CMDB were strongest overall not among the vendor community, but among those few IT organizations that had already undergone significant process-oriented initiatives. In these cases, planned or actual CMDB deployments were a part of a broader ITIL ITSM initiative. Vendors, probably correctly, needed to focus more on the architectural demands of developing an ITIL-supportive CMDB in conjunction with their own product development directions. As a result, a number were only marginally conversant with ITIL processes per se, but understood the need for a consistent architectural, trusted source for data sharing across management applications.

Hewlett Packard's OpenView

Context and Market Focus

Hewlett Packard's OpenView management solution first introduced inventory and configuration management in 1994 and has been supporting CMDB capabilities in its HP OpenView Service Desk offering for several years. As an interesting aside, HP has documented a current "CMDB" environment in one of its customer environments with 121,593 Configuration Items (CIs), across 4,995 locations, supportive of 28 maintenance contracts and 43,051 organizations representing 174,051 people requiring 948 services. HP claims that there are already thousands of CMDB implementations already in place via OpenView Service Desk.

However, HP is formally introducing a new, federated CMDB offering with HP OpenView Service Desk in mid 2005, which is based on a common core data model and will leverage SOA as an integration platform. This CMDB offering should be viewed as the first phase in a longer-term rollout that will include a deeper integration with operations processes and more dynamic updates for real-time currency of CIs and their topological as well as performance-related interdependencies. This rollout will also direct HP from a more distributed/monolithic architecture toward a truly federated CMDB system that will extend HP's investments in CIM, and broaden its support for SOA-based information exchange across multiple sources, including third-party brands.

The importance of the CMDB for HP is profound – not so much as a marketing initiative in itself, but because the notion of the CMDB, with its ITIL roots, is pivotal to HP's broader ITSM and service management strategy. Given the CMDB's pervasive relevance to the entire OpenView portfolio, HP is taking its investment in architecture and design very seriously, in order to maximize the value of its overarching direction to support "model-based automation" across a whole host of IT management disciplines.

HP's definition of the CMDB not surprisingly follows ITIL's: "The CMDB should hold the relationships between all System components, including Incidents, Problems, Known Errors, Changes, and Releases. The CMDB also contains information about Incidents, Known Errors, and Problems, and corporate data about Employees, Suppliers, Locations, and Business units."

CMDB: Concept, Product and Design

When HP adapted ITIL best practices in 1994, work began on HP's first CMDB, which then launched in 1997. It contained operations information for systems, applications, LANs/WANs, storage transactions, and the Internet. In the late 90s, OpenView's data store, then separate from the CMDB, began to include service-related information, and the relationships between business services and the computing elements they depend on. This information included services, service level agreements, projects, change orders, service calls, and customer and operational affiliations.

In 2000, the two data stores were harmonized through XML, leading to the formation of the CMDB that is available today. The OpenView Service Desk is CIM-based, with extensions to support organizational and other requirements. As it evolves, it will become a federated system exploiting HP's overarching commitment to model-based automation.

Central to HP's directions in the evolving of its CMDB product strategy is the notion of "State." HP posits six key states to be supported through either a single or federated system for the CMDB:

- **Actual state** is the real state of CIs and their topological interrelationships at any given moment of time, as for instance would be apparent in real-time monitoring applications.
- **Discovered state** is the real state as it is discovered by autodiscovery-related solutions, such as network layer 2 and 3 discoveries of systems configuration, inventory, and discovery.
- **Desired state** is the approved standard deployment for individual CIs, including configurations and interdependencies. Central to the notion of desired state is the concept of enforcement to support a standardized and stable environment. Desired state technology drives a continuous automated process to make the environment reflect the CI's describing it in the CMDB.

- **Formal state** is the environment as IT expects it to be, a trusted state from which IT can plan longer term evolution to a next trusted state, which is the envisioned state described below. It requires an aggregate, formal stature across all CIs and their interdependencies versus the more component-centric approach of “Desired State.” HP’s view of the core CMDB for Service Desk is directed at ensuring a formal state standard.
- **Envisioned state** is a desired evolution of the formal state with key associated functions such as planning, design, and simulation.
- **Modeled State** describes the model of an IT service, its components and their relationships. HP provides predefined models for standard applications such as SAP – customers can define their own models to define an IT service. HP maps products to the various states in the following way:
 - Actual state – OV Operations, NNM, Radia
 - Discovered State – Radia, Automation Manager, OV Operations, Service Navigator, NNM
 - Desired State – Radia
 - Formal State – OV Service Desk
 - Envisioned State – OV Service Desk
 - Modeled State – OV Service Desk SLM

The CIs included in HP’s CMDB include network, systems, application, business policy, and identities (such as people groups and roles as well as machine identities). HP is also making contractual information accessible to its CMDB system – for example SLAs with provider and receiver, valid dates, prices, and performance metrics. Cost-accounting data is also captured. This includes information such as purchase prices of equipment and software associated with contracts as well additional cost related to repairs and upgrades. Some other capabilities supported in HP’s currently shipping CMDB offering are discovery and reconciliation, lifecycle history and tracking, automatic downtime planning and license usage metering.

CI relationships include parent-child – or one CI contained within the other. Users can define dependencies in terms of such metrics as consumption and connectivity. Dependency relationships can be defined in “Service Definitions” – which indicate levels and types of dependencies. HP also retains ITIL’s strong focus on CI relationships, supporting CI mapping to users, owners, and administrators of the CIs themselves for the assignment of problems, or for notification, or for impact analysis.

While HP’s Service Desk CMDB does not directly support ITIL’s notion of the Definitive Software Library (DSL), OpenView Radia does. HP has referred to Radia as a “CMDB Lite” – focused on software configuration and change in a systems context.

HP’s CMDB strategy, as it moves from the initial Service-Desk-centric offering towards a more federated system supportive of operations, can be understood as broadening and enriching CMDB scope in terms of the states above. For instance, operational requirements dictate powerful, dynamic insights into “Actual” and “Discovered” states. Some of this will be achieved in HP’s Service Operations Manager, which will act as a bridge between Service Desk and Operations, and provide enhanced autodiscovery automation to dynamically update the CMDB and help minimize administration.

Discovery and CMDB Population

HP supports third-party as well as HP sources of discovery. While Service Desk’s CMDB will automate import systems and desktop inventory and discovery from Radia, and network autodiscovery from Network Node Manager, it will eventually support agent-less discovery, file registry analysis, and Smart Plug-In (SPI) autodiscovery. Automation and reconciliation of HP and third-party solutions into the CMDB system will be done through object reconciliation leveraging XML, and eventually, Service-Oriented Architecture (SOA).

Reconciliation rules allow IT to put unplanned changes under formal change control. The reconciled information is accompanied by a change history that will log all the changes to the CIs and their relationships for the purposes of change monitoring, compliance reporting, and troubleshooting.

Multi-vendor Directions

HP is designing its CMDB to be a very generic data model that can be customized on the attribute level in order to support extensible integration across multi-brand management investments. As mentioned above, while initial data import is done via XML, SOA will over time become a dominant means of communicating and exchanging information bi-directionally throughout a federated CMDB system.

Standards Directions

HP is currently supporting CIM and XML in its CMDB, and is examining other standards as they may become relevant. Chief among these are DCML, SLP, UML, and BPL, as well as WSDM and other Web Services-related standards.

Product-related Availability

HP OpenView Service Desk provides the foundation for the currently shipping HP OpenView CMDB, and HP recently launched the ITSM Express Pack for Consolidated Service Desk as a way of enabling rapid CMDB implementations based on ITIL best practices. The current offering provides a context for harmonizing data across multiple OpenView solutions, and their relationships to services, incidents, problems, changes, contracts, etc. Later in 2005, HP will introduce a new, federated CMDB offering, which is based on a common core model and will leverage SOA as an integration platform.

EMA Perspective

EMA believes that HP is taking an evolutionary approach to its CMDB rollout, focusing primarily on Service Desk support in its initial offering, with a broadening requirement over time to support more real-time, operations-centric tasks, as well as multiple data sources that will need to be integrated and reconciled. HP is firm in its strategy to support a model-based approach to CMDB as a part of its overall direction in terms of model-based automation, which it favors as “declarative” – or contextually rich meta data supportive of analysis and scrutiny (you can see the modeling and the conceptions behind them) versus “imperative” – as is the case with scripts and workflow, where typically more linear chains of action are defined without the same level of context. The challenge that HP will face is that its deliberately strict approach to model-based automation may allow more niche, or less architecturally ambitious new entrants to claim CMDB high ground before HP has had the time to roll out its fully federated view of the CMDB. However, since there is little likelihood of a fully federated, all-points-addressable CMDB becoming both effective and viable before at least several more years, HP’s caution and discipline may well prove wise in hindsight.