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ITIL®, the CMS, and You

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Executive Summary

With so many kinds of "alphabet soup" served up in the IT world, you may be wondering why yet another flavor is being offered to you. You may even be wondering, *what exactly is a configuration management system, or CMS? How is a CMS different from a configuration management database (CMDB)? Why should IT organizations even care?*

While the CMS is not a new concept, it is given considerable focus in the latest release of the IT Infrastructure Library® (ITIL®). ITIL version 3 (V3) is an integrated and cohesive set of best-practice recommendations with common definitions and terminology published by the Office of Government Commerce. ITIL has become the de facto standard for IT service management worldwide.

This white paper describes the CMS as emphasized in ITIL V3, and explores how it differs from a CMDB. Further, it shows how a CMS increases your ability to make better IT decisions that impact business agility, productivity, and quality of service.

What Is a CMS?

According to ITIL V3, the CMS is, "[a] set of tools and databases that are used to manage an IT service provider's configuration data…."[1] More succinctly, the CMS is the foundation that supports a complete service lifecycle across IT.

A CMS may include various IT management tools and databases, such as an asset database, a change management system, or a CMDB. It's up to you to decide what type of configuration you want for your CMS.

To look at the CMS in more everyday terms, think about the options available to you when you purchase a car. In most cases, you choose a standard model and then select add-on options or packages, such as leather seats, a sports rack, or a navigation system.

Taking the analogy a bit further, you can compare the CMDB to the car's engine for the CMS. Hence, the CMDB is the core database that powers the complete CMS system. The CMS is the car, and the CMDB is the engine.

ITIL V3 Definitions

Configuration Management System (CMS): "A set of tools and databases that are used to manage an IT service provider's configuration data. The CMS also includes information about incidents, problems, known errors, changes and releases; and may contain data about employees, suppliers, locations, business units, customers and users. The CMS includes tools for collecting, storing, managing, updating, and presenting data about all configuration items and their relationships. The CMS is maintained by configuration management and is used by all IT service management processes."[2]

Configuration Management Database (CMDB): "A database used to store configuration records throughout their lifecycle. The Configuration Management System maintains one or more CMDBs, and each CMDB stores attributes of CIs, and relationships with other CIs".[3]

Configuration Item (CI): "Any component that needs to be managed in order to deliver an IT service. Information about each CI is recorded in a configuration record within the configuration management system and is maintained throughout its lifecycle by configuration management. CIs are under the control of change management. CIs typically include IT services, hardware, software, buildings, people, and formal documentation such as process documentation and SLAs."[4]

Turning raw data into information

Here's another way to think about the CMS. Picture it as a central knowledge system that, like the brain, turns raw data (nerve impulses) into information. Then, it takes this data even further by converting information, through analytics, into knowledge. By presenting that knowledge to the experts who know how to use it, the formerly raw data moves into the realm of actionable knowledge.

A good example of this would be how children learn not to touch a pan on a stove. They learn by touching the pan (raw data) and translating that raw data into information: "this hurts!" Very quickly, they gain knowledge (pans on a stove can be hot and, therefore, hurt) and learn to be careful before touching a pan on a stove in the future. Better yet, their parents share the knowledge of the "hot pan on the stove" with them, and they can avoid the unpleasant experience altogether. A well-designed CMS can do just that by building in existing knowledge, rather than starting completely fresh without this knowledge.

So why should you care about a CMS? Like most people in IT organizations, you are trying to enable business growth (or at least not get in the way of it), and actionable information is the key to that growth. The core function of the CMS is to provide actionable data.

The CMS and Its Relationship to the CMDB

To understand the full value of a CMS, you need to first consider the role and importance of a CMDB. A CMDB is a repository of information that relates to all the components (*configuration items* or *CIs*) associated to each other across the IT environment.

To help reinforce the CMDB's role, let's look at another analogy. Assume you have to find references from the British Library in London and then determine where these references are located. The library has more than 150 million items in almost every language. It covers information dating back more than 2,300 years, and there are tens of thousands of categories, with three million new items added every year. That's a huge amount of information. While you may not have 150 million items in your data center, you still face a similar challenge to that faced by the British Library: managing a growing amount of data in an increasingly complex environment.

So how does the British Library confront this challenge? They use a library catalog. This "card catalog" is a single place to find basic information about any item in the library, providing users with different ways to search for an item — by title, author, category, code, and so on. That's very similar to what a CMDB provides to the IT environment. When data from multiple sources (hardware asset information, software license information, etc.) is brought together through a federated CMDB, you have a single, consistent way to represent your IT configuration information: a single source of truth about the IT environment.

Providers of IT management solutions offer commercial CMDBs to hold configuration data and make that information accessible to the management applications that need it — whether this applies to a *data provider* or a *data consumer*. The CMDB provides a single point of reference, making it the definitive reference mechanism for all IT decisions by providing business-aware visibility into the dependencies among business processes, users, applications, and underlying IT infrastructure. This raises the awareness level for operators of the status of real-time business services, such as e-mail availability, Web site performance, and so on.

The leading CMDB solutions are all built to support a federated CMDB approach, meaning that not all configuration data must reside in a single physical database. The concept of federation relies on the premise that the CMDB should contain as little data as possible, while still being able to do its job. Instead, the primary systems and data repositories remain the authoritative source for information, while the CMDB becomes the "card catalog" for where this information lives and how to access it. This eliminates the need for having a single, monolithic repository. In fact, ITIL V3 now recognizes the importance of this federated approach and recommends that it be a core part of the structure of a CMS.

With federation, core data is stored in the CMDB, just as information can be stored in a library's card catalog. Then, all detailed and related CI data are federated, which simply means that a centralized database is linked to other, more detailed data stores. This linkage provides a CMDB access to the entire library content (the CIs). Hence, the CMS includes the CMDB or multiple CMDBs, and through federation, access to all primary data stores and their respective contents. By adding key functions, such as analytics, dashboards, and asset management, the CMS extends the value of the CMDB across IT.

Making better business decisions using CMS knowledge

The core function of the CMS is to help IT organizations solve problems from the business perspective. By ensuring all IT management applications have access to properly cataloged IT configuration data, the CMS can provide you with the insight necessary to make improved business decisions.

For example, let's assume an incident was logged with the service desk because someone couldn't access payroll information. The *incident* view would tell you that the payroll function can't be accessed. Then you would go to the *service impact* view to determine what is likely causing the incident and what business services it might be affecting. In this scenario, you might determine that a server is down, which has caused the payroll service to be unavailable. Further, you might learn that the same server also supports your sales order entry service, for which you have a Severity 1 service level agreement (SLA).

You could then add the *asset* view to discover that the payroll server is located at your headquarters and dispatch the right resource to address it. With the *dashboard* view, you'd learn that payroll service is unavailable, affecting 20 people. You might also learn that the sales order-entry system outage is impacting 100 sales people during the end of quarter; that it's been unavailable for two hours; and that you are about to breach a critical service level. The *business service* view would help you understand why this problem is important — such as the revenue that is at risk if the system is not brought online — or at least make you aware of how severe the business considers this situation to be. It would let you know that the payroll service is not immediately critical, but the sales order-entry service is down and impacting the core business. You could then deal with the most business-critical problem first.

With this knowledge, you could make a timely business decision to reprovision the sales order-entry service activities onto another server, or to fix the server immediately to restore both business systems.

Business Service Management and the CMS

BMC solutions offer all of the required elements of a CMS to help you manage IT from a business perspective. This approach is known as Business Service Management (BSM), and is another best practice featured in ITIL V3. BSM solutions from BMC dynamically guide IT actions and decisions

according to their impact on business services. They provide out-of-the-box support for best-practice IT processes, automated technology management, and a shared view of how IT supports business priorities.

BMC solutions leverage the BMC Atrium CMDB to provide a single view of IT configuration data and information from various systems, applications, and databases. Then, using analytics, they deliver an integrated "knowledge processing" architecture to provide IT decision-making knowledge to other solutions.

BMC Atrium Enabling Technologies support ITIL's recommendations for a CMS by providing a comprehensive architecture made up of four layers (see Figure 1):

> Data and Information Layer

> Information Integration Layer

> Knowledge Processing Layer

> Presentation Layer

Data and Information

This layer is the foundation required to enable IT to have a consistent view of business services and improve decision making so that it is based directly on business priorities. For example, you can capture both logical and physical CIs to provide an accurate picture of how your services map to the underlying technology. BSM solutions enable you to automate the population and maintenance of configuration and relationship data, allowing you to discover information to manage identities, assets, requests, and so on. They also enable IT to be more efficient by providing a richer set of shared information in support of integrated processes. By standardizing, reconciling, and normalizing configuration changes across data sources, you can reduce the chance of changes disrupting the business.

Information Integration

BSM solutions in this layer are used to eliminate data duplication and simplify integration. Here, you get a centralized view of all business services without the cost and risk of moving all data into a single, monolithic repository. Without the information integration layer, you would have multiple records for the same CIs, requiring employees to go to multiple reference points to get a complete picture of that CI. This layer also requires a reconciliation engine to "normalize" data (this involves applying data standards from each source to a single source of reference and standards). By having a more complete picture of your configuration data, you are empowered to better align IT with business needs and maintain optimal service levels. Information integration also makes it easier for IT to comply with government regulations, because the auditors can see in a single view the audit trail of "who has done what, when, to which data, and why."

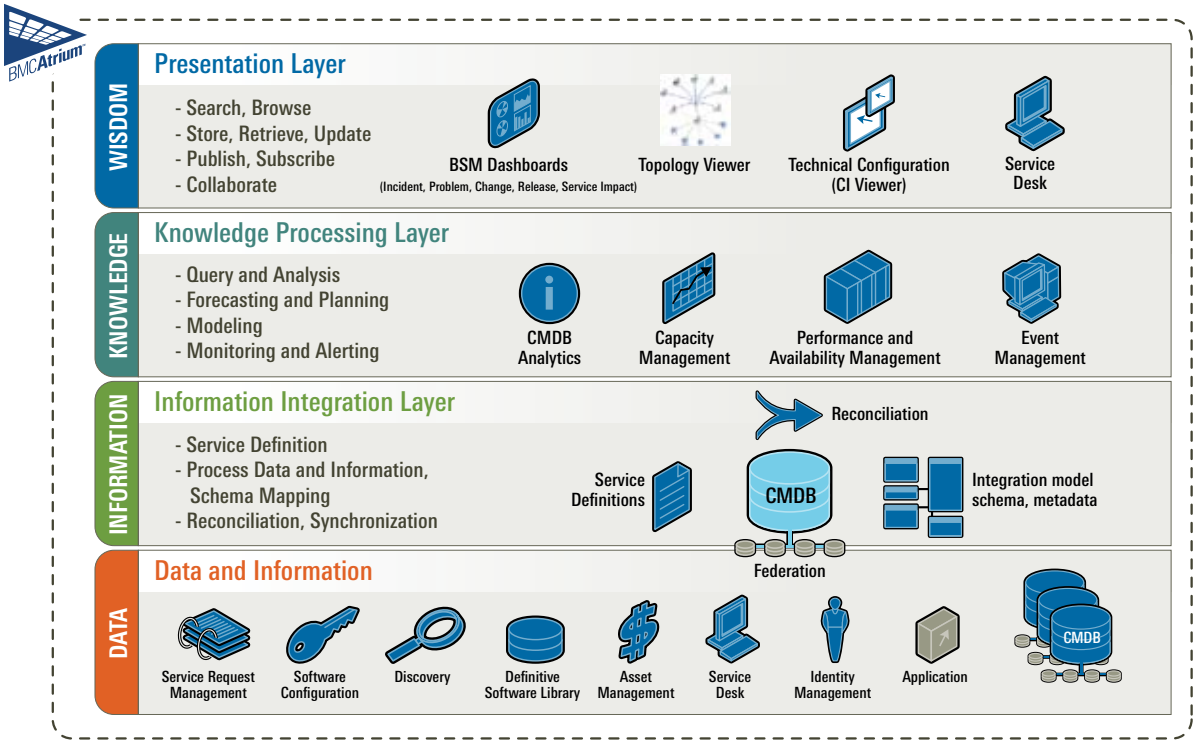

Figure 1. The four layers of the CMS Architecture

Knowledge Processing

In this layer, BSM solutions use the information to help manage IT availability, performance, capacity, and continuity — and to do so from a business service perspective through the use of analytics and event management. IT effectiveness is increased with the ability to provide ad hoc analysis and data drill-down across IT functions using the same, consistent configuration data. What's more, knowledge processing quickly establishes the business context and impact of various problems. For example, you can leverage configuration data analytics and on-the-fly report creation through interactive, ad hoc query and analysis capabilities. This enables a change process management solution to carry out "what if" scenarios based on what is known compared to what is proposed, highlighting any potential issues before commencement of approval of the requested change. Viewing this information in the context of business services and established SLAs truly empowers IT staff to make smart decisions.

Presentation

Finally, at the presentation layer, your IT organization can leverage the contributions of each of the other layers to make better-informed IT decisions that are more tightly linked with business needs. The presentation layer gives you the appropriate knowledge at the appropriate time to meet your business objectives. Dashboards link critical IT processes into an easy-to-understand, graphical view that provides aggregated performance indicators that give you insight to improve decision making. Specific views are created based on your role and responsibilities, so a business manager, for example, can see and drill down from the business services perspective. An IT service manager can do the same from the perspective of delivering value-added services to those business services.

Conclusion

The CMS, which is used to manage configuration data, will help your IT organization to solve its problems from a business perspective. Through the use of a CMS, IT management applications have access to cataloged IT configuration data. By accessing this information, the CMS can provide your IT organization with the data to make well-informed decisions, thereby increasing its value to the business.

For more information about BMC solutions that support the ITIL V3 CMS, visit www.bmc.com/atrium.

PICCASO: A CMDB Work of Art

Because a CMDB is the foundation of the CMS, it's important that it be implemented correctly. A leading power company recognized this need, and recently implemented the BMC Atrium CMDB.

The company has gone through numerous mergers and acquisitions, and has faced typical IT and business challenges associated with these changes. For example, the company needed to assimilate and integrate data systems, tools, and processes, and integrate functions across the merged companies. It needed better knowledge of which hardware and software it owned, and needed a better understanding of the relationships among its servers and applications. The company's existing approach relied heavily on tribal knowledge in people's heads and in pockets around the organization. What's more, it had multiple processes for each of the following: incident management, change management, and asset management — and it did not have a CMDB or dedicated process owners. This made auditing more painful because it took months to manually gather asset information from each of the knowledgeable individuals.

With the help of BMC Partner Column Technologies, an information management architect company, the power company successfully tackled these challenges by implementing the BMC Atrium CMDB. The focus for the company's CMDB implementation was artfully named PICCASO: Problem, Incident, Change, Configuration, Asset, Service, and Optimization.

As a result of its implementation of the BMC Atrium CMDB, the company is now able to consolidate, centralize, and simplify processes to achieve more with less. The company implemented a centralized, federated CMDB, and consolidated incident, problem, change, and asset management processes with a single, shared view of business services. This enabled the company to manage IT much more effectively and become better aligned with the needs of the business. Now, process owners are assigned to all of the ITIL service support and service level management processes, thus providing clearly articulated accountability and responsibility. In addition, the process owners are now responsible for a clearly defined documentation structure, which helps provide more efficient controls and a simplified audit process.

Not only did the power company solve its most pressing challenges with the BMC Atrium CMDB, but it also gained the ability to centrally and comprehensively control assets to facilitate future acquisitions and mergers.

End Notes

1 ITIL® V3 Glossary V3.1.24, 11 May 2007, http://www.best-management-practice.com/gempdf/ITIL_Glossary_V3_1_24.pdf. See Configuration Management System

2 Ibid. See Configuration Management System

3 Ibid. See Configuration Management Database

4 Ibid. See Configuration Item

About BMC Software

BMC Software delivers the solutions IT needs to increase business value through better management of technology and IT processes. Our industry-leading Business Service Management solutions help you reduce cost, lower risk of business disruption, and benefit from an IT infrastructure built to support business growth and flexibility. Only BMC provides best-practice IT processes, automated technology management, and award-winning BMC Atrium technologies that offer a shared view into how IT services support business priorities. Known for enterprise solutions that span mainframe, distributed systems, and end-user devices, BMC also delivers solutions that address the unique challenges of the midsized business. Founded in 1980, BMC has offices worldwide and fiscal 2007 revenues of $1.58 billion. Activate your business with the power of IT. www.bmc.com.

About Column Technologies

Column Technologies is a global IT infrastructure management consulting firm that helps companies streamline IT service delivery. Incorporated in 1998, Column Technologies is a respected leader in the field of infrastructure management solutions and is an Elite BMC Software partner. Column Technologies has U.S. offices in Dallas, Chicago, and New York, and international offices in London and India. Column Technologies offers expertise in process consulting; system design and integration; application development; customer support; hosting; remote administration; and training in products, processes, and ITIL best practices. Visit www.columnit.com.

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Tom Bishop was named one of the top 25 CTOs by *InfoWorld* Magazine in 2004, and is a well-known industry innovator. He holds nine patents in fault-tolerant computing and has been involved in leading the development of industry standards, such as the Distributed Management Task Force (DMTF) and POSIX.

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Ken Turbitt assists corporations in aligning with the best practices for IT. He was involved in ITIL V3 quality reviews and has provided input to several of the authors. He has held an International Standards Examination Board credential, has had an ITIL Manager qualification for more than 12 years, and has been a Gartner qualified TCO consultant for more than ten years.

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