MARKET OVERVIEW

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by Jea -Pierre Garba i a d T omas Me del, P .D.

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THE TIME HAS COME FOR CHANGE AND CONFIGURATION MANAGEMENT

The market for infrastructure management technologies has gone through significant changes in the past two years. First, we saw the re-emergence of the larger, more integrated vendors (commonly referred to as the "Big Four") at the expense of the point product players.[1] Since late 2003, Forrester has witnessed a steady increase in the perceived importance of enterprise infrastructure management technologies, judged by the rising number of inquiries from higher-level IT executives and the overall higher investment in this space.[2] When we analyzed the flow of investments in terms of functionality, we found that in late 2003 and early 2004, companies tended to invest primarily in service-level management and business services management technologies; since early 2004, we have witnessed a large number of change and configuration management initiatives. Why are companies becoming more interested in this?

Defining Change And Configuration Management

To understand the drivers underlying the surge in interest in change and configuration management, we first need to review what we actually mean by the term. It is important to note that change and configuration management is not simply another technology, but both an infrastructure management discipline and a process.

The implementation of a configuration management database (CMDB) is at the core of configuration management. A CMDB stores details of the elements that an organization uses to provide and manage its IT services. Configuration management is responsible for identifying, recording, tracking, and reporting key IT components or assets — these assets are called *configuration items* (CIs). The information that is captured and tracked will depend upon the specific CI, but will often include a description of the CI as well as its version, constituent components, relationships to other CIs, location/assignment, and current status.

Change management is the practice of ensuring that all changes to CIs are carried out in a planned and authorized manner. This includes: ensuring that there is a business reason behind each change; identifying the specific CIs and IT services affected by the change; planning the change; testing the change; and having a rollback plan should the change result in an unexpected state of the CI.

Change and configuration management consists of the following tasks:

- **Planning.** Defining the scope, objectives, policies, procedures, and organizational and technical context.
- **Identification.** Specifying and identifying all IT components — typically hardware, software, documentation, personnel, and (more recently) service dependency models — and their interrelationships and including them in the CMDB.

- **Control.** Managing each CI and specifying who is authorized to "change" it. The control task is concerned with ensuring that only authorized and identifiable configuration items are accepted and recorded from receipt to disposal. It ensures that no CI is added, modified, replaced, or removed without appropriate controlling documentation, such as an approved change request or updated specification.

- **Status accounting.** Recording the status of all CIs in the CMDB and maintaining this information, as well as reporting all current and historical data concerned with each CI throughout its life cycle. Configuration items can be changed, and their records traced — for example, by enabling the tracking of the status of a CI through such states as *development*, *test*, *live*, and *withdrawn*.

- **Verification.** A series of reviews and audits to ensure that the information contained in the CMDB is accurate: Verifying the physical existence of configuration items and checking that they are correctly recorded in the change and configuration management system.

Initial SLM Implementations Left Companies With An Update Mess

The first key driver of the rising importance of change and configuration management is a result of rushed service-level management (SLM) projects.[3] When companies started to look at end-to-end service delivery, they typically started by implementing end user response-time products to understand what goes on at the receiving end of a given service transaction. This was a good first step, but companies quickly learned that two unfortunate effects started to dilute these early successes:

- **Services change over time.** Defining a service and monitoring end user performance is only one side of the coin. Both end users and service components (like server hardware or network equipment) change over time, and companies need to keep track of those changes.

- **Determining root causes becomes a challenge.** The key to problem resolution is determine causality. This is accomplished by creating service models that are used to correlate information on infrastructure components and detect abnormal behaviors. Early SLM implementations did not take this into consideration: As a result, it was possible to discover a service-level breach, but not its impact or root cause.

Today, companies frequently report that this approach to end-to-end service delivery did not bring them any closer to ensuring consistent service levels. Instead, companies tell us that keeping up with the changes in a manual fashion is close to impossible. A better approach is required to relieve companies of the update mess they're in.

Change And Configuration Management Is A Prerequisite For More Automation

The second key driver of the increased adoption of the ideas of change and configuration management can be found in the quest for more automation of IT operations. With more than 40% of the total IT budget of a $1-billion plus company going to human labor and IT operations accounting for 80% to 90% of the budget, automating repetitive tasks will result in substantial cost savings. Many companies have started automating some configuration management tasks, such as asset discovery and client software distribution, but by and large, this has been on an ad hoc basis without a long-range plan behind it.

More companies are now taking the issue of automation more seriously — the threat of outsourcing is often the trigger — and starting to take a more holistic approach. Most commonly we hear about activities around asset and application discovery, user and service provisioning, software distribution, and root cause analysis, all of which require a more mature approach to configuration management.

Knowing What You Have Always Saves Money

The third and final driver is more tactical, but not necessarily less important. Forrester is not aware of any company that could not save money by implementing an asset management system. In fact, the savings can be substantial — typically at least 15% to 20% of software licenses, and in some cases up to 30%.[4] The almost guaranteed positive return on investment (ROI) of a more widespread use of asset management, in conjunction with the wider use of change and configuration management, is going to drive increased adoption levels.

THE TECHNOLOGY SIDE OF THE MARKET IS EMERGING

This is an emerging market — not in terms of needs, but in terms of technology. While several solutions to manage parts of the change management process already existed and while several solutions offered asset discovery, configuration data collection, and change workflow management, none could offer all the ingredients of a complete CMDB.

Three years ago, Relicore brought forward a pioneering technology. Its key element was the ability to discover the components used to deliver an application. This provided the first effective implementation of an essential building block of a CMDB.

Since then, several other software companies have announced and introduced similar automated solutions to discover the dependencies between applications and infrastructure components (hardware and software). This approach has several advantages: evaluating the impact of a projected change of a component on an application or a service in advance; visualizing the consistency and compatibility of software and/or hardware versions and quickly rectifying anomalies; automatically discovering undocumented changes

and evaluating their impact on many infrastructure problems, including security; and constructing an audit trail of changes to the infrastructure to establish compliance with various regulations.

While it is difficult to evaluate the value of this market, it is clear that the proliferation of vendors in the space is, by itself, a key milestone announcing the beginning of what could be termed a sales takeoff point.

Most marketing studies show that the increase on the supply side of any emerging technology leads to the following improvements:[5]

- **An improvement of the technology itself through an increase in competition.** The quality of the solutions proposed considerably improves within 12 months.
- **An increased awareness of the market.** This is achieved by increasing the marketing effort and building a sales infrastructure for the solution.
- **A decrease in costs.** Any technology becomes acceptable when it provides tangible economic benefits. As vendors compete for clients' attention, they also vie to decrease the overall cost impact of their products and improve their ROI.

For example, the proliferation of manufacturers of commercial airplanes preceded the acceptance of commercial aviation. By comparison, and on a smaller scale, the proliferation of vendors in the auto-discovery and configuration management space shows that broad market acceptance may be very near.

Market Description And Key Vendors

Several categories of products are emerging in this market; automated dependency discovery, while critically important, does not comprise the whole functionality required from change and configuration management products. There are several different subcategories in the change and configuration management market, and several different vendors serving them (see Figure 1). For this report, we have chosen not to include provisioning vendors like Altiris, Opsware, and BladeLogic, or basic configuration setups from hardware vendors like HP, Dell, and IBM, due to their restricted coverage of the overall change and configuration management space.[6]

- **A range of solutions aim to implement changes.** This space is more mature, and has already seen a lot of consolidation as large vendors snatch up smaller companies (as with BMC Software's purchase of Marimba and Hewlett-Packard's acquisition of Novadigm). A few independents do remain in the space (e.g., Altiris), and new entrants are still appearing (e.g., Configuresoft, Autonomic).

- **Point solutions also aim to discover and push network component configurations.** Most large vendors — including the Big Four — have finished shopping for implementation solutions, the software category aimed at distributing software patches and new software versions. These large vendors have yet to come up with a solution for network components, which today remains mostly in the hands of specialized vendors like AlterPoint, Emprisa Networks, Intelliden, and OPNET Technologies. mValent, which started in the network space, has now expanded its solution beyond that particular space and is trying to deliver both server and network configuration within a single product.

Of the "Big Four", only BMC Software and Computer Associates are trying to bring a complete configuration management solution to market. They start by building a CMDB based on their own original auto-discovery product and then complement it with a software distribution solution, managing the whole process with their service desk solutions. Hewlett-Packard and IBM Tivoli, while pushing in the same direction, have yet to announce a product that matches what BMC Software and Computer Associates have brought to market.

While the market for change implementation is consolidating, the market for auto-discovery and CMDB building is still mostly represented by small vendors using different approaches:

- **Agent-based:** This is usually done by a small agent that helps in dependency and configuration discovery. Relicore, Cendura, and, to a certain extent, BMC Software (through the Marimba agent) fall into this category.

- **Agentless:** A key feature of products from Collation, Appilog (now part of Mercury), and Computer Associates is that they do not require any agent deployment.

- **Appliance-based:** Two new entrants in the market — Tideway Systems and nLayers — use an appliance-based solution, which provides out-of-the-box features for auto-discovery and CMDB building. nLayers is more of a system management solution, similar in spirit to Appilog.

These vendors are all trying to offer a solution with the best possible ROI: Whether agent-based, agentless, or appliance-based, these solutions all tend to lessen the burden on IT operations.

Other solutions that do not include dependency discovery still exist in the market, and are still capable of providing excellent services. But it's increasingly becoming like the comparison between a horse buggy and an automobile: Both will get you there, but not in the same amount of time. Creating and updating a server inventory manually, for example,

could consume several hours of administrator time per server. In large infrastructures, such an inventory requires tens of person-months over the course of several weeks. The same result could be achieved automatically, with almost zero human resources, by an automated discovery product. The same type of ROI can be found when new applications are deployed; knowledge of the infrastructure is needed before deployment.

Figure 1 Change And Configuration Management Vendors

Vendor	Auto-discovery of application dependencies	Auto-discovery of networks (Layer 2/3)	CMDB	Server configuration implementation	Network device configuration
BMC Software	✓	✓	✓	✓	
Computer Associates	✓	✓	✓	✓	
IBM Tivoli		✓	✓	✓	
Hewlett-Packard	†	✓	✓	✓	
Mercury	✓	✓			
Relicore	✓		✓	✓	
Collation	✓	✓	✓	✓	
Cendura	✓		✓	✓	
Tideway Systems	✓	✓	✓	✓	
nLayers*	✓	✓			
Configuresoft‡	✓ §	✓ **	✓	✓	✓
mValent		✓		✓	✓
Novell				✓	
Intelliden		✓	✓ ††		✓
AlterPoint		✓	✓ ††		✓
OPNET Technologies		✓	✓ ††		✓

*These vendors are currently oriented more toward problem resolution and infrastructure optimization than change control and configuration management.
†Except for some standard applications in service management (e.g., SAP, PeopleSoft).
‡Microsoft Windows only; future releases will include Unix.
§Some standard applications, i.e., Exchange.
**In partnership with AlterPoint
††CMBD limited to network devices (routers, switches, etc.)

Source: Forrester Research, Inc.

Market Trends

If we follow the technology adoption dynamic, the next step will be a progressive level of consolidation. In all market studies that look at technology innovation, the peak of new entrants is not only a signal that adoption is forthcoming — it is also a signal that vendors will either consolidate or a bigger fish will buy them for their technologies. When sales really take off, the number of vendors on the market has in fact decreased.

To a certain extent, this has already started — if the recent moves from BMC Software, Computer Associates, and Hewlett-Packard are any judge. We also see a number of vendors in the SLM and BSM (business services management) market starting to look at potentially acquiring auto-discovery vendors.

Because a complete CMDB is also an enabling technology for many other management disciplines (SLM and BSM, capacity planning, and incident and problem management), a number of companies are eager to add these enablers to improve their current solutions. As most BSM and SLM solutions are based on some form of application-to-infrastructure modeling, the prospect of creating these models automatically is an important factor in the ROI of BSM and SLM solutions.

The difficulties of putting together an IPO in a market segment that is relatively esoteric to most investors may also be the factor that pushes smaller innovators to look at acquisition by a larger vendor as an exit strategy.

WHAT BEST PRACTICES CAN YOU USE TO GET STARTED?

When we talked to companies that have already implemented change and configuration management about the best way to get started, a clear set of best practices began to emerge. To be successful, start with asset discovery; try to discover as many IT assets as possible. Discovery products are now stable, mature, and scalable, so this should not present a huge issue. However, when it comes to mapping the application dependencies to the infrastructure assets, start with only a select few applications (either the most business-critical ones or the most common ones like email and ERP). This has proven to be important because 1) you otherwise run the risk of starting a project that will never finish; and 2) you have to think about a process for updating these mappings right from the start. Both parts should then be stored in the CMDB for use in other infrastructure management services like change management, service monitoring, SLM, and performance and capacity management.

Use SLM Initiatives To Get The Budget . . .

If you've bought into this approach so far, the next question is how to get the funds to embark on the voyage toward change and configuration management. Many companies told us that piggybacking on SLM initiatives is the most likely way to succeed here. Why?

Because 1) SLM is a natural fit with change and configuration management; and 2) early SLM adopters have clearly experienced the pain of not implementing change and configuration management at the same time.

. . . And Asset Management To Achieve Quick Wins

A nice side effect of this is that you will be able to show cost savings simply through gaining a better understanding of the assets that you currently use (and comparing that with the ones you actually pay for). Typical savings estimates, calculated conservatively, will be 15% to 20% of hardware and software licensing costs.

RECOMMENDATIONS

KNOWLEDGE IS POWER

The complexity of new applications is such that manual change control solutions will soon be unable to cope. Many activities, such as server consolidation, new application deployment, and operating system updates, require a precise and complete inventory of infrastructure components. In a complex environment, this can no longer be done manually.

While the need exists, and is starting to appear on the list of many enterprises, the market for automated configuration management is still getting started, and the technology needs some time to mature and deliver complete end-to-end solutions.

We see today's market as relatively fragmented, with multiple technologies converging toward a common goal.

This should not be a deterrent to early implementation. Most of the components of configuration management can work independently, provided that the integrity of the configuration management database is guaranteed through a strictly enforced change management process.

The key to a successful implementation is to select components that provide the following functions:

- A CMDB that includes application-to-infrastructure dependencies. The CMDB will be the repository of all configuration data, and is the cornerstone of planning and change impact analysis. It will be also a major building block for other system management disciplines.
- An automated and secure change distribution strategy. Pushing patches, pushing new versions of operating systems and applications, and configuring network switches have to be controlled, auditable activities. To avoid painful problems, this requires more than a scripted or manual solution.
- A change control process that not only uses the data from the CMDB but also guarantees its integrity.

WHAT IT MEA S

THE BASIS FOR ORGANIC IT

Cr a.ge a.d co.figuratio. ma.agemea.t is .ot o.ly tr e e.abli.g tecr .ology for otr er ma.agemea.t discipli.es — most .otably, SLM, BSM, capacity pla..i.g, a.d i.cide.t a.d problem ma.agemea.t — but also aids i. tr e quest for more automatio. of IT operatio.s. Tr is quest will ultimately lead to fully-fledged impleme.tatio.s of Orga.ic IT.

ALTER ATIVE VIEW

NOT DOING ANYTHING WILL RESULT IN OUTSOURCING

Failure of i.ter.al IT departme.ts to fully embrace tecr .ologies for cr a.ge a.d co.figuratio. ma.agemea.t as tr ey come to market will provide ample opportu.ities for outsourcers to offer IT operatio.s services at a cost base .ot acr ievable by traditio.al (mostly ma.ual) ways of doi.g tr i.gs.

SUPPLEMENTAL MATERIAL

Companies Interviewed For This Document

BMC Software

Computer Associates International

Configuresoft

Hewlett-Packard

IBM

mValent

OPNET Technologies

Relicore

ENDNOTES

[1] The "Big Four" are BMC Software, Computer Associates, Hewlett-Packard, and IBM.

[2] Forrester surveyed IT infrastructure managers at GigaWorld US about their spending plans in the infrastructure management market for 2004. They reported that, on average, spending will increase by 10%. This increase is driven primarily by an increase in the perceived importance of infrastructure management technologies for overall IT service delivery. The top areas where companies are going to increase their investment are service-level management, business service management, Windows Server platform management, and configuration management. However, companies are going to reduce their investment in network management technologies and are increasingly less likely to purchase point solutions. See the May 26, 2004, Trends "Infrastructure Management Spending."

[3] SLM is defined here as the process of measuring the service quality, reporting results, and taking action to ensure that quality stays within agreed parameters. BSM takes this approach one step further by mapping the actual business processes to the underlying IT infrastructure. See the September 11, 2003, Planning Assumption "Market Overview 2003: Service-Level Management And Business Services Management Technologies."

[4] Traditionally, the focus on knowing exactly how many licenses of a specific software product a company has already purchased has not been top of the list of many IT executives. See the November 16, 2001, Planning Assumption "Microsoft Licensing: Negotiate Up to 30 Percent Savings And Tackle Compliance."

[5] The work of Klepper and Graddy explores the evolution of 46 new products introduced in the US during the last century. They characterize the introduction of new products as having three stages: 1) the number of firms proposing the new product grows to a certain maximum number that varies with the product; 2) the number of firms declines due to mergers and acquisitions; and 3) the number of firms stabilizes at a new equilibrium. Further work by Rajshree Argawal shows that, at the peak of stage 1, there is enough competitive pressure to improve the technology, lower the costs, and create market awareness for the technology. These factors apparently lead to a takeoff in sales.

[6] Forrester has previously published a more detailed analysis of the how the market for provisioning software and basic hardware configuration software is shaping up. See the December 30, 2002, Report "Which Provisioning Vendor?" and see the September 23, 2002, Planning Assumption "Criteria For Selection: Enterprise Service Provisioning Tools."

FORRESTER

Helping Business Thrive On Technology Change

Headquarters

Forrester Research, Inc.
400 Technology Square
Cambridge, MA 02139 USA
Tel: +1 617/613-6000
Fax: +1 617/613-5000
Email: forrester@forrester.com
Nasdaq symbol: FORR
www.forrester.com

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