CONFIGURATION MANAGEMENT
BCS, THE CHARTERED INSTITUTE FOR IT

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Shirley is highly regarded within the industry and is an authority on service management and configuration management practices. Shirley is a co-author of the OGC’s *ITIL Service Transition* book with Ivor Macfarlane and is also project mentor for the 2011 ITIL update.

Shirley is the author of the British Standards Institute (BSI) publications on Achieving ISO/IEC 20000 with Jenny Dugmore. She is also the BCS representative on the British Standards committee for IT Service Management, IST/15/-8 BSI IT Service Management group (ISO/IEC 20000). She is the UK Principal Expert on the ISO Working Group for Process Assessment standards for software, systems and service management.

David Norfolk first got involved with enterprise systems computing professionally in 1978, and has worked in England and Australia in database administration; development methods and standards; internal control; network management; operations research; and even PC support.

Working conditions in banking in the city in the 1990s eventually drove him into a career as an independent analyst and journalist. He has written for most of the news-stand PC and computing magazines in the UK as well as some in the Middle East and America, and is now an industry analyst (specialising in development and governance) with Bloor Research International.

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ABBREVIATIONS

API  Application Programming Interface
BRM  Business Relationship Management/Manager
BSI  The British Standards Institute
CCO  Chief Compliance Officer
CCRM  Change, Configuration and Release Management Special Interest
   SIG  Group (itSMF)
CFO  Chief Financial Officer
CI   Configuration Item
CIO  Chief Information Officer
CKO  Chief Knowledge Officer
CMDB Configuration Management Database
CMM  Capability Maturity Model
CMMI® Capability Maturity Model Integration
CMS  Configuration Management System
CMSG Configuration Management Specialist Group (BCS)
COBIT® Control Objectives for Information and related Technology
COTS Commercial Off-The-Shelf
CRO  Corporate Risk Officer
CSF  Critical Success Factors
CSI  Continual Service Improvement
DML  Definitive Media Library
DTAP Development, Testing, Acceptance and Production
GUI  Graphical User Interface
IDE  Integrated Development Environment
IP   Internet Protocol
IEC  International Electrotechnical Commission
ISO  International Organization for Standardization
IT   Information Technology
ITSM IT Service Management
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
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<tr>
<td>itSMF</td>
<td>IT Service Management Forum</td>
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<tr>
<td>KPI</td>
<td>Key Performance Indicator</td>
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<tr>
<td>MoSCoW</td>
<td>Must Should Could Won’t</td>
</tr>
<tr>
<td>MTRS</td>
<td>Mean Time to Restore Service</td>
</tr>
<tr>
<td>OLA</td>
<td>Operational Level Agreement</td>
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<td>PIR</td>
<td>Post-Implementation Review</td>
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<td>PTM</td>
<td>Physical Technology Model</td>
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<td>QM</td>
<td>Quality Manager</td>
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<tr>
<td>RFI</td>
<td>Request For Information</td>
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<tr>
<td>ROI</td>
<td>Return On Investment</td>
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<tr>
<td>RUP</td>
<td>Rational Unified Process</td>
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<td>SACM</td>
<td>Service Asset and Configuration Management</td>
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<td>SKMS</td>
<td>Service Knowledge Management System</td>
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<tr>
<td>SLA</td>
<td>Service Level Agreement</td>
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<tr>
<td>SLM</td>
<td>Service Level Management/Manager</td>
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<tr>
<td>SMART</td>
<td>Specific, Measurable, Agreed, Realistic and Time-specific</td>
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<tr>
<td>SMT</td>
<td>Senior Management Team</td>
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<tr>
<td>SOX</td>
<td>Sarbanes–Oxley</td>
</tr>
<tr>
<td>SVP</td>
<td>Senior Vice President</td>
</tr>
<tr>
<td>VP</td>
<td>Vice President</td>
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This glossary was originally based, in part, on the online ITIL glossaries, available at http://www.itil-officialsite.com/InternationalActivities/ITILGlossaries_2.aspx. The most up-to-date ITIL glossaries are those available online; this glossary is modified in the context of the present work and will differ from current ITIL glossaries and, indeed, may not be ITIL-specific (for instance, we mostly talk about services generally, not IT services specifically).

**Asset Management** is the process in service transition which tracks and reports financial assets (such as software and hardware), usually held and maintained in an asset register, through the life of the asset in the system. It is a key part of the overall service asset and configuration management process.

**AXELOS** now manages the ITIL best management practice brand (copyright and trademark), which used to be managed by OGC and then by the UK Government Cabinet Office. It is a joint-venture business involving the UK Government (49%) and Capita plc (51%); the person who was responsible for the portfolio within the Cabinet Office, and the crown commercial lead in the Cabinet Office, are now directors of this new joint-venture company.

**Baseline** is the term used for a reference benchmark employed in the management of service delivery and demonstration of continual service improvement. Typically:

- An IT service management baseline is a key part of measuring the impact of an improvement plan developed for an IT service.
- A performance baseline is used to show performance changes, as a service is augmented and enhanced over its life; and, indeed, to highlight performance degradations, if (for instance) the environment of the service changes and it is not appropriately maintained in response.
- A configuration management baseline is a known working configuration that can be restored if a change or release fails.

**Build** refers to the assembling of required configuration items during a service transition, in order to deliver all or part of a service; it is also used to identify a release candidate authorised for distribution (such as a desktop computer build; or a server build).

**Capability Maturity Model (CMM)** refers to a formal model describing the functions (‘capabilities’) needed to deliver some service and the degree of formality and management optimisation (‘maturity’) of the corresponding processes (from ad hoc practices, to defined processes followed at departmental and then organisational level, to metrics-based management and proactive process optimisation). A CMM model is used as a basis for managing continual service improvement. CMMs were originally popularised by the Capability Maturity Model for Software (also known as the CMM and SW-CMM), which was developed at the Software Engineering Institute (SEI) of Carnegie Mellon University. The original SW-CMM is now obsolete and has been replaced by the
Capability Maturity Model Integration (CMMI®) for Development – see glossary entry for Capability Maturity Model Integration. However, the maturity model concept has become popular with many vendors of process-based software tools used for, for example, testing and supporting service-oriented architectures, and new maturity models are always appearing (some with only a cosmetic relationship to anything to do with the original CMM concept).

**Capability Maturity Model Integration (CMMI®)** is a process improvement approach originally developed by the Software Engineering Institute (SEI) of Carnegie Mellon University. It provides organisations with the essential elements of effective processes that can be used to guide process improvement across a project, a division, or an entire organisation (although the full benefits from maturity are unlikely to be realised by an organisation unless all of its departments are at a similar maturity level; low maturity sales and marketing processes, for example, can compromise the business results expected from high maturity software delivery). The CMMI® helps organisations to integrate traditionally separate organisational functions, to set process improvement goals and priorities, to provide guidance for quality processes, and provides them with a point of reference for appraising current processes (the CMMI SCAMPI – Standard CMMI Appraisal Method for Process Improvement – appraisal process is a useful CMMI® value-add, quite apart from its actual process improvement best practices). The CMMI is no longer specified merely in terms of software delivery (which is now called CMMI for Development); versions are now available for Services and Acquisition, amongst other areas. CMMI has now been transferred from the SEI (which still does research in the area) to the CMMI Institute, a 100%-controlled subsidiary of Carnegie Innovations, Carnegie Mellon University's technology commercialisation enterprise – see http://cmmiinstitute.com/ for more information.

**Change Management** is the process in service transition which controls the change lifecycle; its main aim is to facilitate the introduction of beneficial changes, whilst minimising any consequent disruption to service delivery.

**CI** see Configuration Item.

**CMS** see Configuration Management System.

**COBIT® (Control Objectives for Information and related Technology)** provides guidance and best practice for the management of IT processes and is published by the IT Governance Institute. It would be relevant during continual service improvement, for example. See http://www.isaca.org/ for more information.

**Configuration Baseline** is the term used in service transition to describe a configuration that has been formally agreed and is managed by a change management process; it is the basis for future builds, releases and changes and provides a point of recovery if a change fails and has to be rolled back.

**Configuration Control** is the activity in service transition which adds, modifies or removes a CI, using an appropriately formal process (such as the submission and authorisation of a RFC (Request for Change) or a service request).
Configuration Item (CI) is the term used in service transition for a component that must be managed in order to deliver a service reliably. CIs are categorised with a type (e.g. hardware, document, user etc), which defines the required attributes and relationships for its configuration record, used to stores information about the CI in the CMS. The lifecycle of a CI, from creation through maintenance to destruction, is managed by configuration management, under the control of change management. CIs can include IT services, hardware, software, buildings, people and formal documentation such as process documentation and SLAs.

Configuration Management is the process in service transition that maintains the information and relationships for configuration items needed to deliver a service, through the entire CI lifecycle. Configuration management should be thought of as part of an overall service asset and configuration management process.

Configuration Management Database (CMDB) is simply a specialised database used in service transition, which holds some or all of its configuration records during their lifetime. The focus should be on the configuration management system that maintains federated CMDBs, and the attributes and relationships of their associated CIs, not on a single CMDB as an end in itself.

Configuration Management System (CMS) is a set of tools and databases used, in service transition, to manage configuration data for a service provider. It also manages information about incidents, problems, known errors, changes and releases, all essential for reliable service delivery; and may contain data about employees, suppliers, locations, business units, customers and users. CMS tools are used to collect, store, manage, update and present data about all configuration items and their relationships to users of the CMS. Configuration management processes maintain the CMS, which is used by all service management processes. See Configuration Management Database (CMDB); and Service Knowledge Management System (SKMS).

Critical Success Factor (CSF) is the term used to describe something that must happen if a process, project, plan or service is to succeed. Key performance indicators (KPIs) are used to measure the achievement of each CSF. For example a CSF of ‘maintain or improve existing IT service levels when making changes’ could be measured by KPIs such as ‘percentage reduction of failed changes’, ‘percentage reduction in incidents resulting from changes’ etc.

Definitive Media Library (DML) is the term used for the secured repository or repositories (treated as a single logical storage area) in which the definitive and authorised versions of all software configuration items are stored. It may contain the original licensed CDs for software packages, the definitive source-code for in-house software, even associated CIs such as licences and the master copies of current software documentation, and so on. The contents of the DML are under the control of change and release management, as part of service transition, and are recorded in the configuration management system; the relationship with SCM repositories (which store all versions of software not just the authorised production version) and the CMDB (which stores metadata concerning, for example, the relationship between something in the DML and the platform on which it is deployed) can be a source of confusion. Only software from the DML is acceptable for use in a release.
**EIA-649-B** is an ANSI/EIA standard often referred to as the National Consensus Standard for Configuration Management and is available from http://webstore.ansi.org/RecordDetail.aspx?sku=EIA-649-B. It is a well known configuration management standard in US Defence Department and commercial organisations – many US courses are built on it – and it supports all the standard CM concepts defined in terms of five functions and their supporting principles. It attempts to use a neutral Configuration Management and lifecycle terminology; but it relates this to existing terms that have been used historically or by particular product vendors (there is no intent to express preference for any particular terminology).

**Gap Analysis** is the comparison of actual performance (ideally, based on metrics data) with potential or expected performance. It is a continual service improvement activity which might be used to compare a set of requirements with what is actually delivered; and provides a way of making sure that resources are effectively devoted to areas where improvement is needed. See also the entry on baselines; a baseline or benchmark can be the basis for a gap analysis between the baseline and the current status quo.

**International Organization for Standardization (ISO)** is the world’s largest developer of voluntary standards. It is a non-governmental organisation which coordinates the efforts of the national standards institutes in 156 countries.

Further information is available on the web at http://www.iso.org/

**International Standards Organisation** See International Organization for Standardization (ISO).

**ISO/IEC 20000** is the ISO specification and code of practice for IT service management and is formally aligned with ITIL best practice.

**IT Service Management (ITSM)** is the implementation and management of quality IT services that meet business needs. It is carried out by IT service providers through an appropriate mix of people, process and technology. It is also a subset of service management generally; from a business point of view, IT service management is not different in kind to any other kind of service management, although it may have some special features.

**IT Service Management Forum (itSMF)** is an independent organisation dedicated to promoting a professional approach to IT service management. The itSMF is a not-for-profit membership organisation with representation (itSMF chapters) in many countries around the world. The itSMF and its membership contribute to the development of ITIL and associated IT service management standards. See http://www.itsmfi.org/ for more information.

**ITIL** is a set of best practice guidelines for IT service management. It is now owned by an innovative joint venture business called AXELOS, in which Capita plc, a commercial company, owns a 51% share; and the UK government retains a 49% share (thus ensuring that taxpayers share in the risk and benefit of the new business). See http://www.itil-officialsite.com/ for more information; the move into AXELOS is intended to be finalised early in 2014, and minimal disruption to existing ITIL users is promised.
**Key Performance Indicator (KPI)** is the term used for a metric used to help manage a process, service or activity and used as a basis for continual service improvement. Only the most important of the many possible metrics should be defined as KPIs and used to actively manage and report on processes, services or activities. KPIs should be selected from the point of view of managing efficiency, effectiveness and cost-effectiveness.

**Maturity** is one way of defining the reliability, efficiency and effectiveness of a process, function, organisation etc. The most mature processes and functions are those which are formally aligned to business objectives and strategy, and are supported by a framework for continual service improvement - see also the entry for Capability Maturity Model (CMM).

**Maturity Level** is a formally-named level in a maturity model such as the Capability Maturity Model Integration – see the entry for Capability Maturity Model Integration (CMM®).

**Monitor Control Loop** is the term used to describe the monitoring of the output of a task, process, service or configuration item; the comparison of this output with a predefined norm; and the taking of appropriate action based on this comparison. It is an example of a feedback loop and is typically part of ITIL service operation.

**Office of Government Commerce (OGC)** used to be a UK government department which owned the ITIL brand before management of the best management practice portfolio passed to the Cabinet Office and then to the AXELOS joint venture (see the entry on AXELOS).

**Operational Level Agreement (OLA)** is the term used to describe an agreement between a service provider and another part of the same organisation (it usually, but not necessarily, relates to an IT service). An OLA supports the service provider’s delivery of services to customers and defines the goods or services that will be provided and documents the corresponding responsibilities of both parties – it will be developed as part of service design and continual service improvement. For example, there could be an OLA:

- between an IT service provider and a procurement department to obtain hardware in an agreed timeframe;
- between a service desk and a support group to resolve incidents in an agreed timeframe.

**Post-Implementation Review (PIR)** is the term used for the more-or-less formal review that should take place after a change or a project has been implemented. A PIR determines if the change or project was successful, and identifies opportunities for improvement, which makes it an important enabler for continual service improvement.

**PRINCE2® (PRojects IN Controlled Environments)** is a formal process-driven project management method (unlike the adaptive Scrum method often used with Agile projects) that was originally developed by the OGC as a sort of stablemate for ITIL. It was extensively refreshed in 2009 and now, like ITIL, is managed by AXELOS (see http://www.prince-officialsite.com/). PRINCE2 addresses all kinds of projects (it is often used with IT projects but is not limited to these) and remains a popular de-facto standard, especially for UK Government projects, and is used worldwide. It is being challenged
by Agile methods such as Scrum but, used properly, can scale well (but it may be a bit documentation-heavy for small projects).

**Process Owner**  is the term used for the role that is responsible for ensuring that a process is fit for purpose. The process owner’s responsibilities include sponsorship, design, change management and continual improvement of the process, using agreed process metrics. This role is often assigned to the process manager, but the process manager role is a separate one and may be assigned to a different person, especially in larger organisations.

**Release Management**  is the process in service transition (sometimes just called ‘release process’) that is responsible for planning, scheduling and controlling the movement of releases to test and live environments. This can’t really be separated from deployment management, as part of an integrated release and deployment management process. Release management ensures that the correct components are released and thus that the integrity of the live environment is protected.

**Scope**  is the term used to describe the boundaries, or extent, within which a process, procedure, certification, contract etc. applies. For example the scope of change management could include all live services (or only all live IT services) and related configuration items, the scope of an ISO/IEC 20000 certificate may include all IT services delivered out of a named data centre and so on. Getting the scope wrong (for example, if you only manage technology changes to an IT service but neglect changes to associated manual services or business processes) can seriously impact business service delivery in practice.

**Scrum**  (see https://www.scrum.org/ and http://www.scrumalliance.org/community) is a community-based Agile project management framework for completing complex projects effectively. Originating around 1986, it was originally largely used for software development projects but is now often used for any sort of complex project.

**Service Asset and Configuration Management (SACM)**  is the process in service transition that manages both the configurations and the assets associated with a service; it doesn’t make much sense to manage one without the other.

**Service Catalogue**  is the term used for a database or a structured document, developed as part of service design, and containing information about all live services (including those available for deployment), such as deliverables available, prices, contact points, and the process for requesting/ordering a service. It is the only part of the service portfolio made available to customers; it is used to support the delivery and/or sale of services (an organisation might have an internal service catalogue and internal departments might not actually ‘buy’ services).

**Service Design**  is a stage in the service lifecycle, comprising a set of processes and functions; it is also the title of one of the core ITIL publications.

**Service Knowledge Management System (SKMS)**  defines the set of tools and databases used to manage the knowledge and information that is needed for reliable service transition. It is a superset of the configuration management system, and stores, manages, updates and presents all of the information that a service provider needs to manage delivery of services over their whole lifecycle.
**Service Level** is a measured and reported achievement relative to one or more service level targets, although it is sometimes used informally as simply a synonym for service level target.

**Service Level Agreement (SLA)** is part of the fundamental basis for a relationship between a service provider and a customer. It describes the service, documents service level targets, and specifies the responsibilities of the service provider and the customer. SLAs may be used in service design and continual service improvement. A single SLA may be used for multiple services or by multiple customers.

**Service Manager** is the term used to describe someone responsible for managing the end-to-end lifecycle of one or more services. It can also describe any manager in a service provider; but it most commonly refers to a business relationship manager, a process manager, an account manager or a senior manager with responsibility for, say, IT Services overall.

**Service Owner** is the term used for the role that is accountable for the delivery of a specific service.

**Service Strategy** is the development of an overall strategy for delivering and managing a service; it is also the title of one of the core ITIL publications.

**Service Transition** compromises a number of processes involved with building an automated service and moving it from development to production; it is also the title of one of the core ITIL publications.

**Stakeholder** is the term used to describe any one of all the people who have an interest in an organisation, project, service etc. Stakeholders may be interested in the activities, targets, resources or deliverables associated with a service and may include customers, partners, employees, shareholders, owners, external regulators etc.

**Tension Metrics** are a concept used in continual service improvement, in which improvements to one metric have a negative effect on another, related, metric; thus ensuring (if the metrics are properly chosen) that an appropriate (beneficial) balance is achieved.

**Transition** is the term used to refer to a state change, so the term service transition, for example, refers to the movement of a service or configuration item from one status in the service lifecycle to the next one.

**Use Case** is a concept developed by the agile movement to define required the functionality and objectives, together with test cases that can demonstrate that a use case is satisfied, for the design of a piece of code and, by extension, a service. Use cases define realistic scenarios for the interactions between users of a service or system and the service or system itself.

**Version** is used to identify a specific CI baseline and typically uses a naming convention that includes a means of identifying the sequence or date of each baseline; for example: ‘Payroll Application Version 3’ would contain updated functionality from Version 2.
USEFUL WEBSITES

www.bcs.org
BCS The Chartered Institute for IT

www.bcs-cmsg.org.uk
BCS Configuration Management Specialist Group

www.itil-officialsite.com/home/home.asp
ITIL®

www.itsmf.co.uk
IT Service Management Forum
The Configuration Management Specialist Group (CMSG – http://www.bcs-cmsg.org.uk) of BCS, The Chartered Institute for IT (http://www.bcs.org), was set up in 1995 to provide a forum for developing and promoting configuration management as a discrete management process. This publication is the CMSG’s contribution to providing a compact, practically based, vendor-independent, ‘good practice’ guide to making a configuration management system work in the real world.

The CMSG facilitates the free and open exchange of ideas, experience and best practice at regular workshops and special events. Its aims and objectives are to:

- establish a professional development scheme, plotting a career path for professionals in configuration, change and release management;
- influence training and education within the field to achieve professional standards;
- establish a code of practice and standards for configuration, change and release management professionals including formal accreditation;
- facilitate the free and open exchange of configuration, change and release management experiences and ideas;
- influence the production and content of national, European and international standards related to configuration, change and release management;
- promote the benefit of configuration, change and release management within the industry at large;
- assure that industry receives benefits to business from configuration, change and release management;
- guide the makers of software tools to support the work of configuration, change and release management.

In 2008, the CMSG joined forces with the UK branch of the itSMF (the IT Service Management Forum – www.itsmf.co.uk/) to present a conference entitled The CMDB and CMS: The Powerhouse of Service Management at the Olympia Conference Centre, London (8 & 9 July 2008).

This conference series is the premier UK event on change, release and configuration management and ALM (Application Lifecycle Management). It represents an important milestone in the integration of conventional IT systems development and IT operations
support as ‘automated business service delivery’, with the collaboration of the major 
user organisations in the field.

Presentations at the 2008 conference came from world leaders in the configuration 
management field, representing both practitioners and vendors, and included several 
people involved in the formulation of the ITIL v3 framework (from now on, unless we 
need to distinguish ITIL v3 from v2, this will just be referred to as ‘ITIL’), associated 
standards, and the future ITIL 2011 update. The conference objective was to both present 
existing knowledge concerning the way successful organisations are implementing their 
configuration management database (CMDB)/configuration management system (CMS), 
and to capture new knowledge in this area from peer interactions between managers 
and practitioners working across the service lifecycle, in an open forum.

A novel aspect of this conference was a stream of ‘interactive session’ workshops 
using decision-support tools that promote dynamic interaction, rich brainstorming 
and better discussion between users, practitioners and the vendor community. The 
knowledge gained from the workshops helped to create a shared understanding of 
today’s challenges and the strategies that will cope with them as we move forward into 
a ‘service-oriented’ future. This understanding is presented in the present publication 
and the decision-support technology used is described towards the end of Chapter 1 
(see knowledge capture during the interactive sessions on page 4).

AUDIENCE

This book is primarily directed towards practitioners in configuration management. 
However, the customers of configuration management, the service desk and operations 
teams, compliance and risk managers, service delivery managers and operations 
managers, and service managers and process owners are also considered to be 
important members of our target audience.

Vendors of configuration management technology are included in our audience and 
one conference objective was to have a shared understanding of the implementation 
issues with vendors (this was the theme of the last session in the plenary room). 
Effective vendors need to form long-term partnerships with practitioners and, thus, 
to understand their point of view. Technology is an essential part of the configuration 
management message, and the practical tips in this book and the people/process context 
it recommends, will ensure that the technology is seen to be successful in practice.

The reader value from this book is from the access it provides to sound practical 
knowledge from experienced practitioners in configuration management; this will not 
be particularly time-dependent. In addition, the techniques and technology used to mine 
conference attendees’ knowledge should be of interest both to vendors and their larger 
customers because it could be applied to their own conferences and seminars.

CONTEXT

The relevant parts of ITIL have become the de facto standard for configuration 
management. This does not mean that everyone has adopted ITIL, or even that they
should do so, and alternatives (such as CMMI for Services at http://cmmiinstitute.com/cmmi-solutions/cmmi-for-services/) are available. ITIL merely provides one convenient and widely available frame of reference for this publication, and the content of this work is not intended to be ITIL-specific. There are many standards and frameworks that require configuration management besides ITIL, including COBIT®, ISO/IEC 20000, ISO/IEC 27001 and CMMI®, as well as the more specific ISO 10007:2003 Quality Management Systems: Guidelines for Configuration Management, and ISO/IEC 19770-1:2006 Information Technology: Software Asset Management Part 1, Processes, and the general standards for software and system lifecycle management, ISO/IEC 12207 and ISO/IEC 15288. In general, practitioners in these areas will find that there are accepted mappings onto ITIL. Many of the concepts and best practices in ITIL are common to all of these standards and frameworks, even if they are often expressed using different terminology. The overall objective for service management is to provide services to business customers that are fit for purpose, stable and reliable. Adopting the guidance enables a service provider to adapt its services and respond effectively as business demand changes with business need.

The ITIL Service Transition publication (ISBN 978-0-113310-48-7) provides guidance for the development and improvement of capabilities for transitioning new and changed services into live service operation including change management, configuration management, asset management, release management and deployment management, and elements of programme and risk management. It is the key facilitator for meaningful risk-based management decision-making. It provides guidance on managing the complexity related to changes to services and service management processes while preventing undesired consequences and allowing for innovation. This publication also introduces the Knowledge Management process and the Service Knowledge Management System (SKMS), which broadens the use of service and configuration information into knowledge capability for decision and management of services.

At the heart of the configuration management process is the configuration management database (CMDB). The CMDB may be a single physical repository of configuration information or federated set of physical databases and repositories. It is a repository for assets, configuration items (CIs) and the relationships between them. To be effective, it requires a system to deliver usable information and processes to maintain the integrity of the configuration items, components, data, information and tools. This book deals with implementing an effective and useful CMS, including the processes it involves. All changes to service assets and configuration items are recorded in the CMS. This book also covers the achievement of desirable ‘business outcomes’ from configuration management, not just the configuration management of IT systems as an end in itself – this is also part of the ITIL vision, but hardly an ITIL-specific concept, of course. It is intended to be useful for any CMS implementation, even one outside the ITIL framework. It is also independent of any vendor-sponsored process and specific configuration management solutions or tools.

The context for this publication is provided by the plenary sessions at the 2008 BCS/itSMF conference, dealing with place of the CMS in business service delivery.

The general objectives of this work are to identify the likely barriers to implementing a CMDB/CMS in the 21st century; and provide pragmatic ‘good practice’ approaches to overcoming them.
1 INTRODUCTION

The text of this chapter is formed from a presentation on the configuration management system (CMS) that was given by Shirley Lacy and Ivor Macfarlane, co-authors of the ITIL Service Transition publication, at the start of the 2008 itSMF CMSG Conference. It provided the context for the conference as a whole and for the interactive sessions. The latter form the basis for this publication.

INTRODUCTION TO THE CMS

The CMDB

The introduction covered current thinking on why people and organisations think they need a configuration management database (CMDB) solution – that is, a CMS. Typical reasons include support for inventory and asset management, governance and compliance, and just that it is best practice implementation. Many organisations want to create a better capability to support service delivery by integrating data and information across multiple sources and providing higher levels of automation for improved performance management.

The rationale for extending the concept of the CMDB in was covered in the session. Originally, a CMDB was often thought of as a single database containing details of configuration items (CIs) and the relationships between them. Although some, more mature, practitioners thought of this as a logical database that could comprise many federated physical CMDBs, a lot of people thought of it as just one physical CMDB, a view often encouraged by vendors trying to market their solutions. Believing that the CMDB must always be one physical database often becomes a barrier to implementation because the management buy-in and investment for a single CMDB is too great a challenge for some medium to large organisations.

Another implementation barrier is believing (mistakenly) that auto-discovery tools provide a ‘magic’ solution. Some marketing and sales people encourage this view, in order to sell their tools. Although auto-discovery tools can provide an efficient way of obtaining an up-to-date view of the IT environment, they do not collect data about everything that is needed for good configuration management and they can encourage the collection of unnecessary information. A critical success factor is capturing only data that is required for valid business reasons. Many implementations fail because too much unnecessary data is captured or there is a lack of process supporting CMDB maintenance and data capture.
Why ITIL?

The plenary session summarised the reasons behind ITIL. The ITIL guidelines were updated in 2007, and again in 2011 (see the ITIL 2011 Summary of Updates at www.itil-officialsite.com/nmsruntime/saveasdialog.aspx?lID=1193), in recognition of the advances in technology and emerging challenges for IT service providers that include:

- demonstrating value delivery by integrating business and IT services;
- the drive for innovation and change;
- the move to global sourcing;
- changing architectures, including service-oriented and virtualisation architectures;
- convergence of strategy, governance and management practices to meet compliance and control requirements;
- a greater focus on security and risk management;
- managing complex services and systems, with a consequent need for better impact assessment;
- balancing the needs for stability and change.

The structure of ITIL is based on the ITIL service lifecycle, which contains five elements:

- Service Strategy;
- Service Design;
- Service Transition;
- Service Operation;
- Continual Service Improvement.

The ITIL service portfolio represents all the resources presently engaged or being released in various phases of the service lifecycle. It contains a service catalogue, which provides a central and accurate information set for all services running in production. Each service comprises a number of service assets vital to the running of every organisation. The continual feedback at each stage of the lifecycle enables a service provider to optimise its services from a business perspective throughout the service lifecycle.

Service Asset and Configuration Management

The Service Asset and Configuration Management (SACM) process (often just called the configuration management process) manages the service assets in order to support the other service management processes. Optimising the performance of service assets and configurations improves the overall service performance while mitigating costs and risks caused by poorly managed assets (e.g. service outages, fines, corrective licence fees and failed audits).
The ITIL configuration management process provides a systematic method of breaking down, identifying and managing complex systems and services. It aims to establish the integrity of all identified service assets and configurations within, typically, the IT services environment and includes the following activities:

- **Configuration planning**: understanding and defining the purpose, scope, objectives, policies and procedures as appropriate and required within the context of your organisation.

- **Configuration identification**: identifying the configuration model, the assets and configuration items (CIs) to be managed, their attributes, associated documentation and relationships to other CIs and records. Establishing unique identifiers for CIs, documentation, forms such as Requests for Change and libraries.

- **Configuration control**: the procedures used to control each CI (i.e. to create, build, install, move, add and modify a CI).

- **Configuration status accounting and reporting**: the recording and reporting of current and historical information on a CI throughout its entire lifecycle, using information held within the CMS and its CMDBs.

- **Configuration verification and audit**: checking the CI data held in the CMDB(s) against what is in the real world.

The 2011 review of ITIL was mandated to make no changes to the core ITIL content; but it made extensive revisions in order to remove inconsistencies, clarify things, add structure and add better examples – it markedly increased the accessibility of the content. The CMS incorporates a set of applications, tools and databases for collecting, storing, managing, updating, and presenting data about all configuration items and their relationships including a view of an end-to-end service configuration. Some of these application products interface to point solutions such as software version control, release tools and auto-discovery tools. Understanding where a configuration management tool or CMDB fits into the overall architecture, illustrated in Figure 1.1, will help you to select the best solution for your organisation.

The processes and functions that comprise configuration management maintain the CMS. The integrated CMDB in the integrated information layer provides the ‘single source of truth’ about service assets and each configuration item: historical, current and planned. It maps the important relationships between configuration items to deliver a configuration model of an IT service provider’s portfolio of services.

The CMS should support all process owners, service owners, service management, service operations and IT staff. The CMS is effectively the basis of data and information that supports and facilitates the success and viability of the organisation as a whole, through direct influence and improvement of its processes. It is the major source of data to allow effective risk management.

Without a sound basis for understanding and managing risk, an organisation will be uncompetitive due to an overly conservative risk attitude, or it will be unable to deliver due to excessive risk taking. People need the CMS to perform their IT and service...
management activities, and also to make informed decisions at appropriate times, for example when assessing the impact of a release going into production or the impact of incidents and problems. People therefore need relevant and accurate configuration data and information in a form that is quick, accessible, easy to update and easy to use and understand, and which is achieved through the presentation layer.

Chapter 2 summarises the feedback from the Conference interactive session about the practices covered in the plenary.

**KNOWLEDGE CAPTURE DURING THE INTERACTIVE SESSIONS**

The interactive sessions consisted of short 45 minute workshops that harnessed the collective knowledge and experience of the delegates and enabled the capture of a broad body of valuable information for further discussion and analysis.

This interactive approach involved using a combination of collaborative technology (with networked laptops), facilitation and the availability of content experts for each session. The wireless laptops used had specialist software installed to enable ideas, questions and knowledge to be gathered and shared in a fast and efficient manner.

The facilitators led and supported the whole process, providing more in-depth idea generation, deeper group interaction, clearer consensus building and measurement, plus highly efficient documentation of the whole event.
Significant value was added because all participants were able to contribute simultaneously and anonymously. This enhanced the session dynamics of engagement and openness.

The interactive environment demanded a structured and disciplined approach to planning to deliver the best value. During the planning, the outcomes were defined and each session had a customised process depending on the type of session and feedback required. Although the planning was structured, the facilitators were responsive to reshaping and redirecting the sessions as necessary during the conference.

Each session was planned in advance using a combination of methods and techniques selected from the following:

- **Brainstorm:** Delegates brainstormed a specific question and put their responses into category ‘buckets’.
- **PMIQ:** Following a presentation or part of a presentation, delegates identified:
  - PLUS (P) – this is what I liked about what I heard;
  - MINUS (M) – these are my issues and concerns;
  - INTERESTING (I) – my insights or points of interest;
  - QUESTIONS (Q) for the speakers.
- **Stimulus presentation** followed by table discussion and answering specific questions.
- **List:** Delegates were asked to suggest missing items from a list (e.g. a list of users of a CMS).
- **Discussion:** Each table group selected one or two topics from a list to discuss and feedback (e.g. ‘What are the barriers to implementing CMS and how can they be overcome?’).
- **Gap analysis:** Working in table groups; ‘Where are the gaps or weaknesses in XXXX? Explain.’
- **Voting:** Delegates voted individually and the results were displayed immediately as a graph.
- **Question and answer session.**
- **Summary and feedback** on key observations and findings.

The objectives and outcomes for ‘implementing a successful CMS’ for each day, and the corresponding interactive sessions were:

**Day 1**

**Objective:** Successful positioning of CMDB/CMS requires clear explanation of the value to stakeholders. Methods for creating a clear business case were examined and what needs to be overcome in order to implement a CMS successfully was discussed.
**Outcome:** The collective understanding of the value proposition for CMS across a range of organisations and stakeholders was documented. A validated set of key barriers and associated strategies to mitigate these were identified. The document created was made available to participants immediately following the conference.

**What is the CMDB/CMS all for?** A presentation by Shirley Lacy of ConnectSphere and by Ivor Macfarlane of IBM. (Shirley Lacy is a management consultant with a wealth of service and configuration management experience. Ivor Macfarlane is an IT Service Management consultant and trainer working with IBM customers.)

**How can we judge the value of CMDB/CMS?** A presentation by John Dixon of GlaxoSmithKline. (John Dixon was the Director, Quality & Compliance within GlaxoSmithKline’s IT Infrastructure Division, involved with managing a project to establish a configuration management function within GSK.)

**CMS: barriers and Critical Success Factors (CSFs)** A presentation by Kevin Holland, NHS Connecting for Health. (Kevin Holland is the Head of Service Quality Improvement for the NHS National Programme for IT.)

**CMS implementation case study** A presentation by Andrew Pieri and Mark Smith of Associated Newspapers Limited (ANL). (Andrew Pieri is Central Operations Director, responsible for Support Service Delivery across ANL’s Publishing, Advertising, Commercial and Online business divisions. Mark Smith is Head of Process Management, responsible for the definition, ownership and governance of IS processes.)

**How to improve an existing CM process** A presentation by John Metcalfe, BCS CMSG and Deirdre Connis, itSMF CCRM Working Party.

**Day 2**

**Objective:** Using shared experiences, how to create alignment between stakeholder requirements and vendor products in CMDB/CMS implementations was debated.

**Outcome:** Structured strategies to close the gap between stakeholder needs and vendor offerings were documented.

**Service management requirements for the CMDB/CMS** A presentation by Ian Salvage, then of IBM, now of ITAdapt Consultancy Ltd. (Ian Salvage was a consultant for IBM’s Global Technology Services in the field of Service Management for over 10 years. He has a very broad experience of working across multiple industries delivering IT Service Management solutions to customers.)

**Service asset and configuration management visions and strategies** A presentation by Mike Tomkinson, BT Global Services. (Mike Tomkinson is the Configuration Management Beacon for BT Global Services, acting as the touch point for all issues related to CM across the business where required.)

**How do you populate your CMDB?** A presentation by Harvey Davison of Lloyds TSB. (Harvey Davison is the full-time Configuration Manager, designing and implementing a
INTRODUCTION

CMDB for LloydsTSB, primarily to support the incident, problem and change processes, one of the foundations for LloydsTSB achieving ISO/IEC 20000 certification.

Bringing the CMS to fruition A presentation by Mark Bools of Principia IT. (Mark Bools has been involved with configuration management for large and small organisations, on projects, programmes and at the corporate strategic level for over 20 years.)

Selecting CMS tools A presentation by John Metcalfe of Mentor IT. (John Metcalfe has over 25 years of experience in IT applications. He has provided guidance to IS department management in the development and implementation of strategies for improving change, configuration and release management (CCRM) policies, processes and tool selection to deliver return on investment and benefits to the business.)

Implementation: what works and what doesn't A presentation by Shirley Lacy of ConnectSphere and Ian Salvage then of IBM.

A feedback session from the interactive sessions was presented in the main conference room at the end of each day. This was followed by a question and answer session. Most people, regardless of background, level or role, were motivated by this different way of working because they felt engaged with the process. Feedback from delegates at the conference is summarised in Chapter 12.

ACKNOWLEDGEMENTS

Session presenters

The CMSG would like to thank the following people for their presentations and general contributions to the 2008 conference (their positions are generally as at the time of the conference):

- Mark Bools, Principia IT;
- Deirdre Connis, itSMF CCRM;
- Harvey Davison, LloydsTSB;
- John Dixon, GlaxoSmithKline;
- Kevin Holland, NHS Connecting for Health;
- Shirley Lacy, ConnectSphere Limited;
- Ivor Macfarlane, IBM;
- John Metcalfe, Mentor IT;
- Andrew Pieri, Associated Newspapers Limited;
- Ian Salvage, then IBM;
- Mark Smith, Associated Newspapers Limited;
- Mike Tomkinson, BT Global Services.
The interactive sessions were designed by:

- Sarah Boulton, Director and Founder of Realise Group Consulting Ltd. Sarah specialises in organisational development consulting, facilitation and coaching. She has over 15 years of experience with companies as diverse as British Airways, BT, BP, BDP Media Group, Rolls Royce, eircom, Inter-American Development Bank and the NHS. Sarah facilitates workshops using RealTools, an innovative group engagement technology that enables sessions to be more open, productive and compelling. She holds postgraduate qualifications in Organisational Behaviour and Psychotherapy.

- Shirley Lacy, of the BCS CMSG and the itSMF. Shirley is Vice Chair of the BCS CMSG. She represents BCS on the BSI committee that develops the IT service management standard, ISO/IEC 20000. She holds the ITIL Expert accreditation and is an accredited ITIL trainer. She regularly organises and facilitates workshops.

- Nick Leigh, Director of TheReallyUseful.com Ltd. Nick specialises in the design and delivery of workshops and events using interactive technology and collaborative processes. Laptop-based collaborative processes enable large groups to rapidly brainstorm ideas, share information, problem solve, and feedback in an open and transparent way leading to a richer outcome for a meeting. Over 10 years, Nick has designed and delivered hundreds of interactive meetings, workshops and events of all sizes, both face to face and remote.
OBJECTIVES

This chapter is derived from the first interactive session at the conference. This followed the plenary session that covered the CMDB/CMS and what configuration management (CM) has become in the 21st century. The objectives of this chapter are to review why organisations use a CMS and the initial barriers to starting a CMS implementation. It also identifies key deliverables that can be used to stimulate ‘buy-in’ to the project at all levels.

SUMMARY

This chapter sets the scene for the rest of the book by presenting the accepted view of the CMS and what it is for. The interactive sessions then explore any issues with this.

THE NORMATIVE VIEW OF WHAT A CMS IS FOR

A presentation by Lacy and Macfarlane: co-authors of the original ITIL Service Transition volume. They led the assembled delegates through the configuration management system (CMS) and the anticipated barriers to its implementation, as a preliminary to the open discussion on the subject.

The CMS primarily supports asset and configuration management by enabling an organisation to identify, control, report and audit assets and configurations, and to manage changes (see Chapter 1). It incorporates a set of applications, tools and databases for collecting, storing, managing, updating and presenting data about all configuration items and their relationships, including a view of an end-to-end service configuration. Some of these application products interface to point solutions such as software version control, release tools and auto-discovery tools. The CMS is maintained by the configuration management process and/or function. The CMS also contributes business benefit via other service management (and wider) processes, facilitating their effectiveness and efficiency. For example, configuration management delivers the means to achieve impact analysis for incident and change management, and trend analysis within problem management. This secondary role has, in the past, to an extent hidden the crucial role a CMS plays in an organisation.
People use the CMS to perform their IT and service management activities and also to make informed decisions at appropriate times. Key stakeholders for the CMS are therefore the process owners, service owners, service management, service operations and IT staff. The CMS architecture can be visualised in four layers, which helps people understand the scope and applicability of different CMS applications and tools. They need relevant and accurate configuration data and information in a form that is quick, accessible, easy to update and easy to use and understand. This is achieved through the presentation layer of the CMS shown in Figure 2.1.

The integrated CMDB in the information integration layer of Figure 2.1 provides the ‘single source of truth’ about service assets and each configuration item: historical, current and planned. It also maps the important relationships between configuration items needed to deliver a configuration model of an IT service provider’s portfolio of services.

Figure 2.1 Four architectural layers of the CMS and SKMS

<table>
<thead>
<tr>
<th>Presentation layer (Layer 1)</th>
<th>Knowledge processing layer (Layer 2)</th>
<th>Information integration layer (Layer 3)</th>
<th>Data and information sources (Layer 4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Search, browse, store, retrieve, update, publish, subscribe, collaborate</td>
<td>Query, analysis, reporting, modelling, monitoring, alerting, dashboards, scorecards</td>
<td>Integrated service and configuration management information including the integrated CMDB</td>
<td>Unstructured documents/records, Definitive Media Library, CMDB1, CMDB2, Software configuration management tools, Discovery and audit tools, Enterprise applications</td>
</tr>
</tbody>
</table>

The layers of the CMS and SKMS shown in Figure 2.1 are:

- Presentation layer (Layer 1): This layer presents information to users to enable them to do their activities such as searching and finding specific configurations, updating information, reporting, and publishing information and reports. Example users might be operations staff who need to understand the impact of incidents and changes, and software asset management staff who need to audit the software licences.
- Knowledge processing layer (Layer 2): This layer collates information to pass to Layer 1. An example might be a tool that analyses information needed to find the likely sources of unauthorised changes and software licence compliance issues.

- Information integration layer (Layer 3): This layer integrates data and information from Layer 4. This layer holds definitive configuration information for the CMS in federated CMDB that can be used by Layers 1 and 2. For example the federated CMDB can integrate application data with infrastructure data to create the configuration information for an end-to-end service.

- Data and information sources (Layer 4): These are the definitive sources of data and information that are maintained from different internal and external suppliers. It includes platform specific CMDBs (e.g. on Unix or the mainframe platform) and the Definitive Media Libraries (DMLs) that store definitive master sources of electronic or physical objects such as source code, executable files, software licence documentation and CD-ROMs.

It is important to recognise the broader role of knowledge management within the delivery and support of services. The real value of the CMS is as a fundamental element within a business-focused Service Knowledge Management System (SKMS – illustrated in Figure 2.2). The SKMS stores, manages, updates and presents all information that an IT service provider needs to manage the full lifecycle of IT services. It covers a much wider base of knowledge than the CMS, for example it includes the experience of staff. The decision-making process should be used to drive the design of the SKMS and the CMS.

The SKMS lets a vast amount of (relatively) easily collected data to be processed through the information and knowledge layers into delivering the wisdom (targeted and directed information and knowledge) that forms the real basis for effective business decision-making. This focus on delivering accurate business decisions (the key differentiator for most businesses) has also helped expose the myth that configuration management is mostly facilitated by the successful purchase and implementation of technology in the shape of sophisticated software: one the most persistent and traditional myths around configuration management. Although this has been the approach taken by some organisations for many years, the first and most powerful step in the development and implementation of configuration management is the planning (i.e. determining the

**Figure 2.2 The role of the SKMS and CMS in decision-making**

![Diagram](image-url)
constraints, what the CMS will cover, what its purposes are, how the information will be maintained and so on).

The tradition of technological focus has led to organisations acquiring and populating CMDB technology without really considering its use or its possible impact on the business. The fact that this CMDB-centric view fits with the marketing strategies of some vendors who have a CMDB to sell has fuelled the fire over recent years. In fact, the CMS and SKMS need to be process-oriented and there are simply no technological ‘silver bullets’ that will solve the real issues.

Understanding the role that the CMS and broader SKMS can play in an organisation and how the data collected must support and help bond the wide range of required processes is key. Often consultancy, to help change the mindset, rather than improvements in technology, can offer the best chance of something approaching a ‘silver bullet’. This is because the successful CMS/SKMS approach requires a mature culture, which helps organisations focus on business success metrics, on whole lifecycle delivery cost/value, and which considers all the stakeholders in configuration management, not just operations staff. This also helps to avoid collecting data for its own sake.

Establishing the knowledge focus allows an organisation to determine its configuration requirements by reference to its business goals, the business services that support the goals, and the IT and other services that in turn support those business services. Starting at the business end and driving from there, via the service structure, to the data requirements, establishes a CMS approach that:

- collects only data that will be used to support business objectives: not wasting resources on collecting data that will never be used or cannot be maintained;
- ensures that technology purchases reflect what is required and can be justified;
- allows non-technology data and information to be collected and held within the SKMS and CMS;
- facilitates the use of relevant data and information in support of non-IT services.

CONTRIBUTORS TO THE INTERACTIVE SESSION

Twenty-three contributing delegates from the practitioner community included representatives from Principia IT, LFEPA, Bloor, Fujitsu Services, Mediatek, BAA, HMPS, Lloyd’s of London, BAE Systems, EADS DS UK Ltd, iCore, Teliasonera, Eracent, Shell, Prudential, Stannah, ECB, and Axios Systems.

PARTICIPATING PRACTITIONER COMMUNITY FEEDBACK

Barriers to implementation

The delegates were asked to consider and discuss the question ‘What are the common problems in implementing a CMDB/CMS?’ Feedback was collected under the headings:
• Demonstrating value/benefit
• Stakeholders
• Requirements
• Design
• Realisation
• Other

Common problems in implementing a CMDB/CMS

Delegates thought that the benefits of a CMS are often difficult to sell because they are often indirect or intangible. IT people (who often, wrongly, see the CMS in terms of ‘their’ CMDB) are often poor at communicating the benefits in any case.

It is important to be able to demonstrate the value or benefit of your CMS in business terms, so delegates thought that you should establish useful metrics from the start. You must cover the bigger picture, always remembering that the ultimate (business) client may not have much idea of what a CMS can do for them.

One danger is that the CMS is often implemented to provide compliance with company governance standards or to gain certification against standards, without any real thought as to how the business will benefit. In other words, sometimes people implement a CMS ‘because it’s the right thing to do’, but they don’t think about what it could achieve for the business. You must be able to tell the CMS story in language that business stakeholders can understand and you must be able to produce simple cost–benefit examples appropriate to each stakeholder. In the end, everybody involved in implementing a CMS needs to know ‘what’s in it for me’ in order to commit to involvement.

Ultimately, you must be able to persuade people to use the CMS and maintain the CMDB. This means coping with the unfortunate fact that the theory often differs from reality when implementing a real CMS, especially when implementing it in a complex real-world organisation with extensive legacy technologies to replace or integrate with.

Common stakeholder-related issues in implementing a CMDB/CMS

A common problem delegates found is that senior stakeholders in management can ‘talk the talk’ without really investing in the process and people issues surrounding the CMS. They sometimes appear to think that buying the right tool (e.g. a new CMDB or auto-discovery tool) is all that is necessary for success.

On the other hand, each organisational silo often wants its own CMDB and process in order to maintain control of its own information. This probably reflects a part of the organisation at a low level of organisational maturity, leading to lack of confidence in other teams outside its own. Previous experience of failures with organisation-wide initiatives is also a barrier for some people.

It is vital to get informed senior management buy-in and to identify the key influencers who can get the business to understand the value of what is proposed and sign off
the various commitments needed. You must identify and get the support of the right stakeholders, those who stand to gain by the implementation and also those who hold the key to removing any barriers.

The biggest stakeholder problems you will meet are probably due to a lack of suitable or knowledgeable people in the appropriate areas and to a lack of management and user buy-in. A little knowledge, however, is a dangerous thing, and stakeholders with a small amount of experience or training can hold dangerous misconceptions and sometimes use obfuscating jargon as a defence or barrier to being seen as incompetent or simply unaware of state-of-the-art process.

Ultimately, however, the delegates thought that the key to managing the stakeholder-related issues associated with implementing a CMS is to understand who will pay for the implementation and make sure the resources you will need for it are firmly and formally allocated in the appropriate budgets.

**Common requirement-related problems in implementing a CMDB/CMS**

The primary concern here seemed to be with getting the scope of the CMS implementation correct, that is ‘What CIs do we need to know about?’ Continual scope creep, both from customers and users, can be an issue, but, according to some delegates, the final scope is usually wider than originally thought. Prioritisation is important: you must capture only what is really required for your CMS, not just whatever is available.

The time frame for implementing a CMDB is often unrealistic and perhaps this is related to unrealistic scoping.

There are sometimes mismatches between the expectations held by the various stakeholders. It’s good to have a firm (but negotiable) specification at the start of any phase of a CMS implementation to ensure that all areas are covered to everybody’s satisfaction.

**Common design-related problems in implementing a CMDB/CMS**

Delegates said that it can be an issue knowing where to start with assets and/or stakeholders. You need to know what, in your organisation, needs to be controlled and where this information is currently held. Legacy silos within the company can create difficult CMDB design issues, redundancy in existing CIs and issues with deleting obsolete CIs. It is also important to get the scope and depth of configuration items correct. If the level is too high the information may not be useful, but too much detail means that you will drown in detail with an expensive maintenance overhead.

Designing the appropriate CI granularity can be difficult: it must be balanced between a technical and a business focus, and kept at a manageable level. The identification of what constitutes a CI will be specific to a given organisation.

The complexity of information and communications technology services can make design difficult and a technical architecture supporting discovery automation, reconciliation and integration with change and other processes (to facilitate maintenance) is not easily available at a reasonable price.
Part of the design phase should be the creation of an appropriate data model, which pulls together the IT design requirements with the requirements from other areas such as finance, commercial etc.

**Common problems in implementing a CMDB/CMS associated with realisation**

A realisation that ‘one size does not fit all’ is important. Try starting small and see what can be done without massive investment. This enables faster buy-in from stakeholders.

Tool scalability can be an issue, but do not forget scaling down: delegates pointed out that some tools are not scalable for SMEs. Vendor tool lock-in (e.g. from the service desk area) can also be an issue. Vendors say they have open interfaces, but so far this has not been well demonstrated. And, of course, there is the ‘buy it or build it’ issue to resolve.

Data quality can be a huge issue: how to ensure it; how to measure it; how to maintain its quality and consistency. Distributed data sources and lack of format commonality can be real issues if you haven’t planned for them. A general lack of integration tools for various CMDB sources does not help.

Legacy systems can be a problem too. Most organisations have too many existing systems already embedded into existing processes. You need to maximise the appropriate utilisation of the different legacy ‘CMDBs’ (or configuration files) while still allaying fears of possible staff redundancy, but gathering all the correct information about certain CI types in disparate environments may not be easy.

In the end, it is important to focus on what you really want from your CMDB/CMS, and make sure that it does it.

**Other common problems in implementing a CMDB/CMS**

Choosing the wrong approach can be fatal. Delegates agreed that a gradual (evolutionary) approach is a much lower risk than a big bang (revolutionary) approach.

A lack of adequate resources is often an issue, but the biggest barriers are probably organisation and cultural change. It can be useful to make use of non-IT examples, such as automotive production or using and refining a food recipe, to illustrate the role and benefits of configuration management.

**Specific likes, dislikes and insights arising from the session**

Delegates seemed to appreciate reassurance that they are on the correct course and that the industry is generally behind initiatives such as ITIL. The need for an additional ‘comfort factor’ when moving from a technology silo ‘comfort zone’ to a model encompassing the whole business should not be underestimated.

Delegates thought that this CMSG/itSMF event, for example, was pulling unique people with shared interests together, so that they can find out that they are not alone. This probably underlines the importance of giving the people involved in implementing your CMS access to a wider community, whether through face-to-face courses, seminars, BCS events or conferences.
Delegates also appeared to see ITIL v3 as an improvement, commenting that ‘it is much more integrated than v2, it looks at the bigger picture and the interfaces between the different areas of service management’. Participants appreciate the ITIL structures and models generally, being able to ‘put things in the right place’. ITIL provides a framework that encourages people to think about the end result they expect from configuration management. The outputs include: views and reports, and quality and assurance improvements. Some delegates could already see benefits from implementing CMS in their organisations using the ITIL models.

However, some delegates expressed a concern that the information presented was at a very high level and that, although it all looked good on the diagram, implementation may be too challenging. It appeared rather complex and the models were sometimes incomplete or had too much in them (a difficult balancing act). Some delegates thought that the scope of ITIL is too big and the technology is not yet ready to achieve it.

What are really, in effect, cultural issues were mentioned: the danger of the CMDB becoming an end in itself and the difficulty of measuring improvement when very limited configuration management capabilities are in place to start with. Almost anything, good or bad, can look like an immediate improvement in these circumstances, even if it causes problems in the longer term. Issues may arise when attempting to show management that CMS is the best way forward, when little process or standards are in place (i.e. no ITIL processes are being used).

One possible technology-related barrier was thought to be that many IT people see software configuration management as all there is to configuration management. Another was that a central CMDB may be seen as an unacceptable security risk if you cannot enable secure role-based access to the CMS.

Some very interesting insights came out, especially that the service knowledge concept can usefully be applied at the application level. ITIL can be applied at the application development and business levels.

Some participants wondered about the application to smaller organisations. Some delegates asked whether a specialised CMDB tool is always needed or whether a spreadsheet could do the job, and whether, in a small organisation, a single CMDB product could embody both CMDB and CMS. The answer is yes, in both cases, but you need to fully understand the concepts behind CMS and establish the right process if you are to make a success of this.

**Specific issues identified**

Participants were asked to identify specific issues that would need to be addressed during any practical CMS implementation so the feedback could be prioritised and the key issues highlighted, making sure that none were overlooked.

- Delegates thought that the normative model presented is all very well, but people will need to see practical examples of its implementation before trusting it fully.

- There is a possible issue with using the Intellectual Property Rights associated with the published ITIL models (these are explained at
http://www.best-management-practice.com/). These concerns may well be exacerbated by the recent move of ITIL into the AXELOS joint-venture (see https://www.gov.uk/government/news/new-deal-will-market-government-professional-qualifications; and the comment blog here: https://www.bloorresearch.com/blog/the-norfolk-punt/2013/6/privatisation-of-itil.html; the move into AXELOS is expected to be finalised early in 2014). Obviously ITIL has worth and if it is given away for no charge, it may not be valued, but the world would benefit if it was more widely adopted. It would be useful if ITIL and other standards, while fully chargeable to organisations, could be made available at discounted prices to individuals.

There is a small-scale ITIL implementation, but a ‘dummies guide’ for small organisations would be appreciated to explain CM concepts to non-technical management. These are the sort of things that will appear in the ITIL supplementary materials and ITIL Live – and the ITIL 2011 update has made its best practices more accessible. Nevertheless, if any practitioner cannot adequately explain the benefits of configuration management to a business manager without a ‘crib’, perhaps they aren’t adequately trained yet!

Identifying a good starting point for converting those reluctant to change to new ways of working was thought to be a possible issue. As usual, managing change, and especially cultural change, will be the biggest barrier to implementation. In particular, how do you stop the CMDB becoming an end in itself?

Technical issues identified included the possible administrative burden of a CMS. It is not the cost of implementation that matters in the end but the continuing maintenance cost. A CMS with incomplete information won’t be used; but neither will a CMS with so much information that no one can afford to maintain it and it becomes out of date.

Another technical issue raised is to do with how commercial products map onto ITIL terms such as CMDB, for example the question ‘Can IBM ClearCase/Quest be a CMDB?’ was asked. To some extent, this needs to be addressed by vendors. There is also the ITIL Software Scheme that vendors can use to certify their software solutions, although ‘following ITIL’ is about adopting a process, not any particular tool. There are issues with terminology, but hopefully international standards and the ITIL glossary can help with this.

### CONCLUSION

The presenters disposed of the myth that configuration management is simply a matter of the successful purchase and implementation of technology in the shape of sophisticated software.

The CMS is now recognised as a key element of the necessary decision-support system on which the effective delivery of services rests. Although this was always true, the higher profile afforded by the take-up of revised guidance has brought this to the attention of management and this is an important factor in making it more possible to obtain funding to implement an effective CMS. The CMS is central to successful IT service management.
The first and most important step in the development and implementation of configuration management is in identifying the constraints, planning for what the CMS will cover, what it will be used for and by whom.

The interactive discussions covered the key areas of CMS implementation, utilisation and maintenance. They identified issues with demonstrating the value of the CMS to the business (a CMS has no value in itself and is only of value if it is used by the business); with obtaining the right kind of stakeholder buy-in (senior management buy-in is particularly important); designing the appropriate level of granularity for CIs (not so high level as to be useless, but not so low level as to be an unacceptable maintenance overhead); the importance of data quality and of integrating legacy systems; and the importance of dealing with cultural issues.

General issues were identified with the amount of detailed practical assistance available for implementing a CMS and with the difficulty of mapping vendor claims for products onto, say, ITIL requirements.

The issues raised in this chapter will be addressed in later chapters.
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