Version

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CMDBuild ®

» Overview Manual

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ENG

CMDBuild ® uses many great technologies from the open source community:
PostgreSQL, Apache, Tomcat, Eclipse, Ext JS, JasperReports, IReport, Enhydra Shark, TWE, OCS Inventory, Liferay, Alfresco, GeoServer, OpenLayers, Prefuse, Quartz, BiMserver.
We are thankful for the great contributions that led to the creation of these products.

CMDBuild ® is a project of Tecnoteca Srl. Tecnoteca is responsible of software design and development, it's the official maintainer and has registered the CMDBuild logo.

In the project also the Municipality of Udine was involved as the initial customer.

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Everytime the CMDBuild® logo is used, the official maintainer "Tecnoteca srl" must be mentioned; in addition, there must be a link to the official website:

http://www.cmdbuild.org.

CMDBuild ® logo:

- cannot be modified (color, proportion, shape, font) in any way, and cannot be integrated into other logos
- cannot be used as a corporate logo, nor the company that uses it may appear as author / owner / maintainer of the project
- cannot be removed from the application, and in particular from the header at the top of each page

The official website is http://www.cmdbuild.org

Contents

Introduction

CMDBuild is an Open Source web application designed to model and manage assets and services controlled by the ICT Department, therefore it handles the related workflow operations, if necessary according to ITIL best practices.

The management of a Configuration Database (CMDB) means keeping up-to-date, and available to other processes, the database related to the components in use, their relations and their changes over time.

With CMDBuild, the system administrator can build and extend its own CMDB (hence the project name), modeling the CMDB according to the company needs; the administration module allows you to progressively add new classes of items, new attributes and new relations. You can also define filters, "views" and access permissions limited to rows and columns of every class.

CMDBuild provides complete support for ITIL best practices, which have become a "standard de facto" by now, a non-proprietary system for services management with process-oriented criteria.

Thanks to the integrated workflow engine, you can create new workflow processes with external visual editors, and import / execute them inside the CMDBuild application according to the configured automatisms.

A task manager integrated in the user interface of the Administration Module is also available. It allows to manage different operations (process starts, e-mail receiving and sending, connector executions) and data controls on the CMDB (synchronous and asynchronous events). Based on their findings, it sends notifications, starts workflows and executes scripts.

CMDBuild includes also JasperReports, an open source report engine that allows you to create reports; you can design (with an external editor), import and run custom reports inside CMDBuild.

Then it is possible to define some dashboards made up of charts which immediately show the situation of some indicators in the current system (KPI).

CMDBuild integrates Alfresco, the popular open source document management system. You can attach documents, pictures and other files.

Moreover, you can use GIS features to georeference and display assets on a geographical map (external map services) and / or an office plan (local GeoServer) and BIM features to view 3D models (IFC format).

The system includes also a SOAP and a REST webservice, to implement interoperability solutions with SOA.

CMDBuild includes two frameworks called Basic Connector and Advanced Connector, which are able - through the SOAP webservice - to sync the information recorded in the CMDB with external data sources, for example through automatic inventory systems (such as the open source OCS Inventory) or through virtualization or monitoring systems.

Through the REST webservice, CMDBuild GUI Framework allows to issue custom webpages on external portals able to interact with the CMDB.

A user interface for mobile tools (smartphones and tablets) is also available. It is implemented as multi-platform app (iOS, Android) and linked to the CMDB through the REST webservice.

Available documentation

This manual is for those who search certain first introductory information on CMDBuild and who are interested in knowing the general philosophy of the project.

You can find all the manuals on the official website (http://www.cmdbuild.org):

- system usage ("User Manual")
- system administration ("Administrator Manual")
- installation and system management ("Technical Manual")
- workflow configuration ("Workflow Manual")
- webservice details and configuration ("Webservice Manual")
- connectors to sync data through external systems ("ConnectorsManual")

The CMDB

What is a CMDB

A CMDB is a storage and consultation system that handles the information assets of a company.

It is the official central repository and provides a consistent view of IT services.

It's a dynamic system that represents the current situation and knowledge of information technology assets, and related entities.

It is a monitoring system for the processes executed, described and managed through the workflow functions.

What information elements does the CMDB manage ?

- hardware: computers, peripheral devices, network systems, telephone equipment
- software: basic, environment, application
- services provided to users
- other internal and external resources

Questions the CMDB answers to:

- where is a CI (configuration item) ?
- who uses it ?
- what does it belong to ?
- what is it made up of ?
- what and where are other similar CIs ?
- do I have enough licences to use the software ?
- what has happened in the CI life-cycle ?
- what other CIs does a possible change influence ?
- which are the activities waiting for my intervention ?
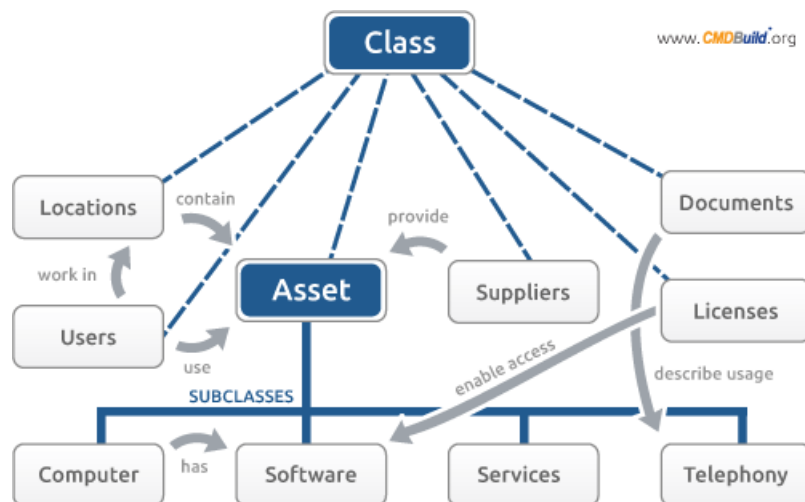
Why use a CMDB

The use of a CMDB allows to control the situation of managed information elements, knowing at every time their composition, dislocation and functional relations.

Missing or outdated information means useless costs, redundant operations, delay in the problem solving, hindrance to the company activities.

Keywords of a CMDB are response time and system control.

A CMDB allows to:

- reduce problems in your information system
- solve more rapidly the remaining problems
- solve at the first answer a major problem percentage, without involving too frequently the expert staff
- keep track of every data-change operations
- have a repository for statistical data, useful to check SLA

In other words, costs decrease and improving of services quality.

Implementation guidelines

ITIL "best practices", which CMDBuild makes reference to, expressly require the adoption of an information tool to manage the CMDB.

The introduction of such tool must be adequately prepared in terms of organisation and formation in order to reduce the risks of failure or refusal for the tool.

By managing the project, it is important to:

- adopt guidelines aimed at a gradual and flexible implementation
- choose a detail level proportional to the available organization needs, and to human, financial, information and technology resources (if you have a really extensible and modular system it is better for you to make use of following autonomous extensions of the support data model, rather than overloading the initial schema)
- introduce the new application in an organizational system based on well-outlined and formalized responsibilities, procedures and roles

A successful project must consider impacts and changes introduced by the system and must acquire the explicit approval of organization's managers.

Starting and managing the project with the tips of ITIL experts means having experience and "best practice", created and developed in different situations of different countries, speeding up their activation and reducing their failure risks.

Open Source

Open source is better!

An open source solution allows to:

- avoid (high) licensing fees

- provide the source code in order to reduce the dependency of the supplier

- grant major freedom of use, in different seats and according to different needs

- reuse evolutionary features, developed on demand by other users

- cooperate with a community of users who share their experiences in terms of organisation and implementation (data model, processes, etc.)

An open source solution is not free of charge, both in terms of external services and internal costs for the activation, but numerous and authoritative sources recognize their lower total required cost (TCO, Total Cost Ownership).

An open source product is not necessarily a good product, but the trade evolution provides a lot of open source solutions technologically more advanced and better supported than the related proprietary applications

Open source components, integrated or interoperable with CMDBuild, are selected among the most complete, widespread and developed ones.

CMDBuild answers

CMDBuild answers to questions and needs of IT Department, simplifying the management activities and granting the availability of precise and updated information

Here's some recurrent questions about IT Infrastructure Management, CMDBuild proposes to answer to.

Inventory of IT assets

- how many PCs does my centre have at its disposal ?
- which were bought by a specific supplier ?
- how many new PCs did I yearly install in the last three years ? how many of them did I stop using ?
- how many monitors do I have in the warehouse ? what model ? when does the warranty expire ?

Maintenance of hardware resources

- since I have to move an entire office in another building, how many IT objects do I have to work on ? which is the updated list ?
- among the PCs of users that wanted to buy a particular software, how many of them have less than 512 MB RAM and should be updated ?
- how many of them are more than 4 years and have an expired warranty - so we suggest you to stop using them ?
- which servers are unattainable when you switch off a specific UPS because of a maintenance intervention ?
- how many users share a certain printer ?
- what network access point is a PC connected to, and what switch port is the network point connected to ?

Software License Management

- do I have enough licences so that all users of the operational office can use a certain software ?
- what is the list of licences used by every department ?
- which licences are expiring ?

Service catalogue

- what are the information services available to users and what services are undersigned by every user ?
- which users should I inform if a web application is not available ?
- what licences does the user I am phoning with arrange on the managing application ?
- what SLA do I have to guarantee ?

Traceability of information over time

- are there offices that complain about too many damages ?
- what users had an account to access the network at a specific date ?
- when did I install the last patch in a specific software ? what version was it ?

Management of telephone equipment

- which users have no telephone equipment ?
- are there free telephone plugs in a room where you need move your employees ?

Documentation management

- the project documents related to a commissioned software application, are they immediately recoverable ?
- do all interested operators have the technical manuals at their disposal to configure a computer or a peripheral device ?

Process management

- are activities pointed out to IT operators when waiting for their intervention ? are operators driven by the system when they execute the activities ?
- are automatic notifications available in order to take in charge the activities more easily ?
- what are the assets or assignees that are mainly interested at a certain assistance ?
- are configuration changes completely and immediately recorded in the system ?
- are there available reports on the activities development and on the performance measurement ?
- SLA calculated for every single service, are they pointed out to me ?

CMDBuild features

CMDBuild is a technologically advanced, flexible and custom solution for the management of IT infrastructures:

- advanced, because it is based on a technological architecture at the state of the art, implemented with Ajax user interface and developed according to SOA guidelines (Service Oriented Architecture) in order to facilitate the interoperability with other systems used by the same organisation

- flexible, because - thanks to a proper configuration application - the system administrator is able to gradually integrate and check new classes of objects and new relation typologies, having at the same time a tool coherent with the modelled data structure

- custom, because it is Open Source, in this way you can always intervene on the project to integrate its missing functionalities useful for your organisation (or better, according to the Open Source philosophy, every user can improve the project with new available contributions)

Among the peculiar features of CMDBuild we highlight in particular the following ones:

- complete and autonomous system configurability

- evidence of correlations among cards and with processes instances

- workflow configurability, even ITIL "compliant"

- system to consult dashboards

- reports system for the autonomous configuration of prints

- advanced interoperability mechanisms with external applications

- generalized system of data synchronization with automatic inventory applications

- integrated system for the document management

- asset and map georeference (GIS)

Configurability

Adopting a policy to gradually carry out the CMDB implies the system development through next steps, in terms of structure and relations among objects.

The system user has to manage autonomously new object types, without recurring to expensive software changes.

The flexibility of CMDBuild was pursued as main standard, allowing the system administrator to define the optimal data model for his/her operative needs in terms of:

- cards treated in the system ("classes")

- superclasses and subclasses hierarchy

- descriptive information ("attributes") of every class

- relation types ("domains") with related distinguishing attributes
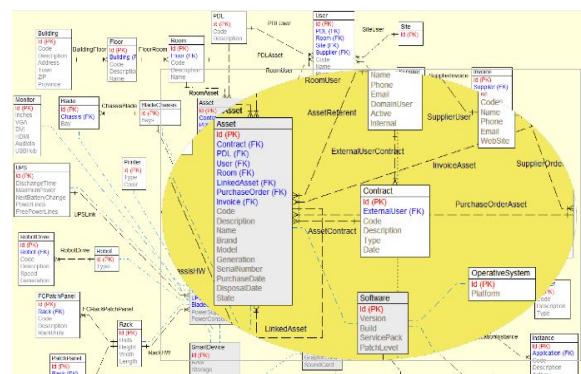
- lists of values ("lookup") used for attributes with predefined values
- users, groups and access permissions
- possible georeference standards
- menu, to organize the access to classes, views and reports

The logic model defined through a schema editor Entity – Relations is then configured in CMDBuild through the Administration Module.

Every data model can provide various assets in the "classes", included software, services, suppliers, users, contracts, network elements, locations, tickets, change requests, etc

You can also create and store search filters, define "views", set access permissions that are differentiated on the various classes and limited to the rows and columns of a class

Furthermore there is an additional mechanism to extend the initial connotation of CMDBuild as a "general purpose" system, allowing the integration of specific application logics in the various cards.

Such mechanism allows to use certain "Widget" typologies, configuring their location directly in the common data cards managed in CMDBuild.

The "Widgets" that can currently be used include:

- print of a report for the current card
- opening of the calendar with a date available in the current card
- navigation tree to select one or more data cards through a hierarchical interface
- starting of workflow
- execution of a "ping" command on the card IP (useful for diagnostics)
- display and editing of a card in a specified class

For the flexibility purposes introduced so far, additional tools were implemented in CMDBuild in order to:

- analyze relations among information
- configure workflows generically
- configure various reports to present data filed in the CMDB
- configure dashboards to represent indicators that should be controlled

Correlation

"Domains" configured in the data model of CMDBuild define and update correlations among cards, such as:

- items with other items (hierarchical, functional dependencies, etc)
- items with assignees, suppliers and contracts
- items and assignees with locations
- items with network peripherals, wiring, network points and VLAN
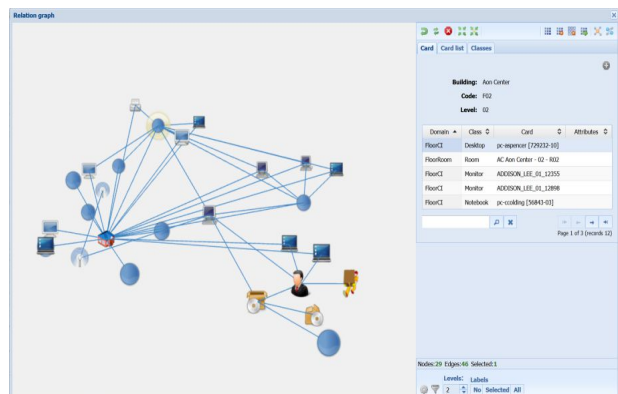
- items, assignees and operators with ticketing processes or configuration change
- items, users, external suppliers and operators with SLA and catalogue of services

The so-called correlations can be navigated both in the basic system through the link mechanism among the cards and with a specific consultation interface called "Relations graph" and integrated in CMDBuild.

The Relations Graph is able to display cards and one or more levels exploded relations in 3D graphics, with "Pan" and "Zoom" options available.

The user interface includes a main area, dedicated to the visualisation of and interaction with the graph, and a control panel containing the main data and commands applicable to the graph.

You can find in the control panel:

- the current card with all attributes and relations details
- the lists of all cards, of all classes and of all kinds of relations available in the graph, with selection / deselection option

There are even graphic commands to centre the selected graph or nodes, to "explode" the selected node relations, to reload the graph, etc.

Workflow

The main added value of CMDBuild is the possibility of defining processes to execute the management activities of the IT infrastructure and granting at the same time:

- a certainty about the correct updating of the CMDB, with which it is completely integrated and correlated
- a standard interface for users
- a support system for the accurate operative control of the service
- a repository for activities data, useful to check SLA

As the data model, also the workflow definition system can be configured both in terms of information and management flow chart.

So CMDBuild doesn't supply standard processes implemented in a static way, but a generic configuration system used according to the specific needs of every single organization.

In particular every workflow is described in the system in terms of:

- roles authorized to perform each step of the workflow
- activities sequence, with conditional flows
- information to be displayed or to be filled by user on each step
- tasks performed (start process, update DB, send mail etc)
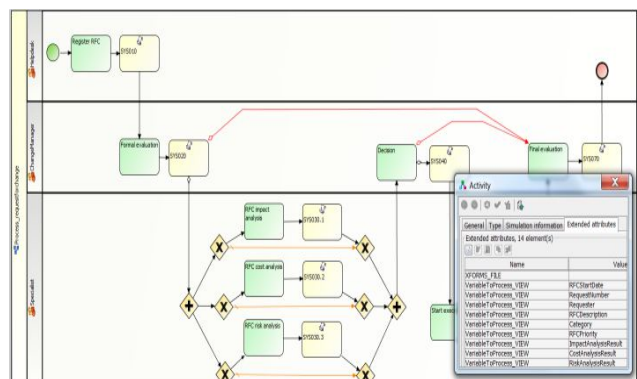
Workflows are designed using open source external visual editors (Together Workflow Editor), and then imported into CMDBuild and executed with the Together Workflow Server engine.

These basic mechanisms allow the "ITIL compliant" configuration of all processes provided by ITIL "best practices", included Incident Management, Change Management, Request Fulfillment, Service Catalog, ecc.

Further workflows - useful for the IT management - can concern the Asset Management (management of the asset life cycle through purchase operations, debug, assignment, transfer, withdrawal, cessation, etc), the management of network cables (cable connection / disconnection from device ports), the management of IP addresses (network interface addition / removal), etc.

Document management

The documents are also for ITIL an important informative component related to the assets treated in the CMDB: manuals and technical documentation, contracts, set of forms, error screenshots, technical drawing, images of objects and locations, etc

CMDBuild uses Alfresco DMS as embedded repository, which is trade leader among open source solutions and is interfaced through native SOAP and FTP protocols.

Thanks to the contribution of the University of Bologna, the system has been then extended to other document repositories that support the standard protocol CMIS (Content Management Interoperability Services).

Using an integration modality, CMDBuild transmits the uploaded documents to the chosen document system, which will file them, classify them in categories and return them to CMDBuild. There they can be viewed as attachments in the current card.

Dashboard

It is important that those people in charge for the management of IT service can immediately consult the trend of main indicators (KPI - Key Performance Indicator), which the system develops analysing the CMDB information (cards and processes).

For this purpose we provided the possibiity of defining various "dashboard" pages, each dedicated to different aspects (assets situation, service desk performance, income statement, etc), and containing various charts configured according IT services.

The system administrator can configure every chart creating the calculator function in the database and defining the aspects of presentation through the Administration Module.

The dashboard system does not replace the reports one, since it usually provides more complete and detailed information or statistical elaborations related to medium-long periods.

Reports

An efficient information management requires the availability of variuos reports on data inserted in the system: summary, analytic, statistical with various charts.

Simple table reports can be created with a wizard in the system and filed in CMDBuild, then they are printed with revised data and - if necessary - they can be changed in the definition.

For the design of advanced reports (formatting, batching, counting, chart creation, etc), you can use the external visual editor IReport of the open source suite JasperReports. Reports configured in this way are then imported in CMDBuild and provided by the various users.

IReport can design reports to create:

- printouts and lists
- letters and documents, integrated with information recorded in CMDBuild
- prints with statistics and various charts
- barcode / qrcode

Furthermore you can also create reports at any time, thanks to the complete card "versioning" of CMDBuild.
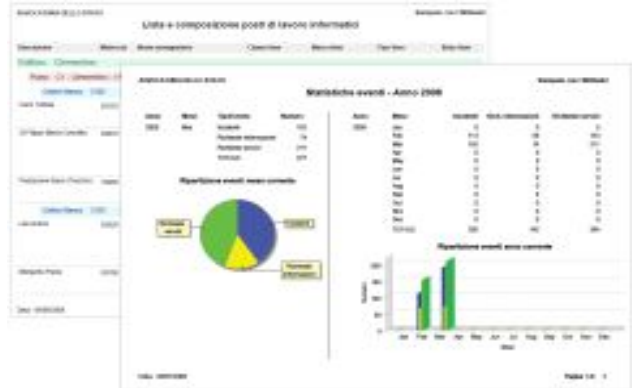
Task Manager

CMDBuild includes a Task Manager that can be configured in the Administration Module through a visual interface. It includes also various operations executed in the background

In particular it allows to:

- receive e-mails from accounts / with predefined patterns and save them into the system
- start workflows
- execute a connector
- check if synchronous (operations on data cards) events occur in the CMDB
- check if asynchronous events occur in the CMDB (predefined thresholds values, e.g. exceeding of SLA or deadline of a license)

If such situations happen, the Task Manager can execute notifications via e-mail, start workflows and execute scripts.

Georeferencing tools

In IT management activities, we suggest you to know the exact items localization and query such information also on maps (geographic locations).

CMDBuild provides features for the management of GIS representation, both local (planimetries) and related to a wider region (external maps).

In the first case you can model the detail of individual rooms and - if necessary - the location of assets in offices or plants in common rooms (in the example, information assets, but also staff, furnishing, pieces of art, equipment, etc.).

Both room perimeters and the item location can be updated directly from the web browser, by accessing in editing modality to the related data cards.

In the second case you can display the information spread in the territory, e.g. assets positioned in different companies (in the example, traffic lights in controlled traffic zones, information points, etc.)

You can use various map services (OpenStreetMap, GoogleMaps, etc) and load any file in "shape" format.
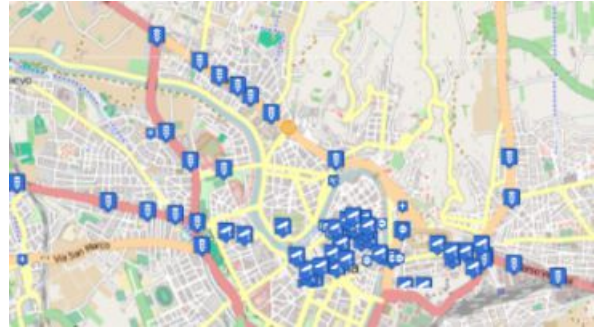
CMDBuild is also an asset management solution able to provide those services required by an enterprise BIM infrastructure (Building Information Modeling).

An unavoidable element of a BIM system is the complementary and integrated management of text, document and chart information, synergic workflows, report functions and interoperability solutions - all these features are fully and extensively supported by CMDBuild.

BIM is a conceptual and technological solution with the aim to support the building design procedure, from the conception of the building to its construction, use and maintenance, and finally to its demolition, if any.

BIM solutions are becoming very important as for their great economic advantages of the base processes (high savings within the complete process), as well as their capabilities to support very well other essential needs, such as the control of energy, security, etc.

Thanks to specific functions of the open standard format IFC (Industry Foundation Classes), one can automatically sync both ways the information managed with the 3D building design software using the CMDBuild database:

- by importing the IFC file (ISO 16739:2013), produced by the external design tool

- by updating in the CMDBuild database the infrastructural elements (rooms, walls, doors and windows, etc.), which are in the imported model based in configurable mapping rules

- by exporting the IFC file enriched with those data processed in openMAINT (mobile assets and installations)

Another element that supports BIM is the interactive viewer for 3D models, integrated in your own standard UI. It allows you to consult realistically the interior of a building and its assets.

BIM functions were implemented with the assistance of the open source product BIMServer.

The Department of Mathematics and Computer Science of the University of Udine cooperated in creating them.
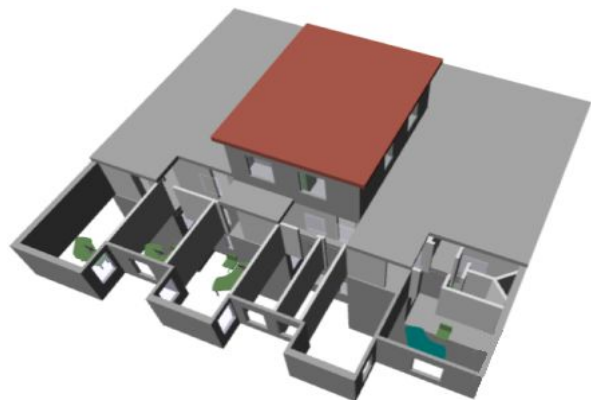
Interoperability solutions

ITIL v.3 extends the concept of single and monolithic CMDB, in view of situations with different interoperating CMDBs.

For this purpose CMDBuild implements various interoperability solutions, used with Service-oriented architecture:

- native SOAP webservice, which expresses all primitive methods for the management of data, document attachments and processes

- native REST webservice

- SOAP webservice, compatible with the CMDBf standard

The above mentioned tools are available if you want to create communication mechanisms between CMDBuild and other external applications.

The same CMDBuild system uses its own SOAP and REST webservices to implement certain standard interoperability solutions:

- connectors with external systems (Basic Connector and Advanced Connector)

- CMDBuild Portlet - Liferay

- GUI Framework

- Mobile Interface

Connectors with external systems

The management of IT Services by large and medium-sized institutions and companies is necessarily carried out through more specialized information systems, which should cooperate within the management of their activities.

Gathering and checking manually the information managed in the CMDB can cause delay issues or create inaccuracies when updating data. Therefore it is better to update it automatically.

Therefore, the configuration of ETL connectors through external systems is important in order to sync in CMDBuild (the central CMDB system) data that are mainly managed ("master") on other specialist applications, among these:

- LDAP directory as repository to file the staff

- HR systems as alternative solution for the staff list or ERP systems for administration data (sources, suppliers, etc.)

- automatic inventory systems to automatically compare technical data of assets and to manage the prominent differences, with a possible activation of a Change Management workflow (it should be the OCS Inventory, but also other products can be linked)

- virtualization systems to extract and compare the current configuration of virtual servers
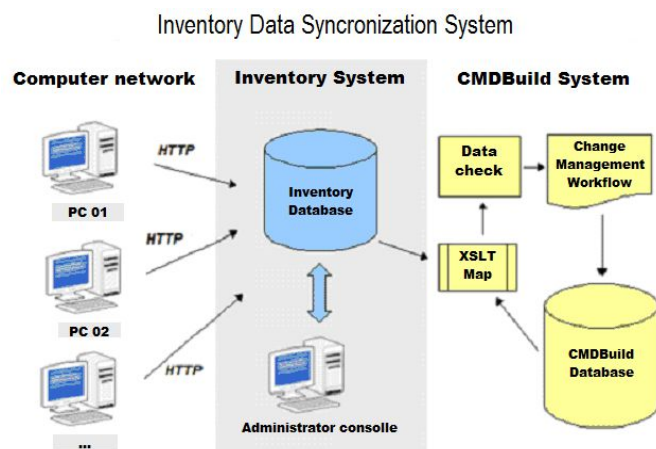
(e.g. VCenter for VMware)

- services running on servers (databases, application servers, etc.) for the extraction of information about the current configuration of the IT infrastructure
- IT Architecture Content Metamodels (such as Archi with TOGAF, thanks to the plugin developed by external project contributors)

Besides data sync needs, the interaction with external systems can be useful to get information in real time and manage them properly (for example getting any alarms from monitoring systems and executing impact analysis and/or activating Incident Management workflow).

For this purpose, CMDBuild provides a Basic Connector, which can be configured though the XSLT transformation language. It works towards the external system through the direct access to the database and towards its CMDB by using the SOAP webservice.

Therefore an Advanced Connector is available (with a source code but with a different licence which allows its use only by an active annual maintenance service). It is based on a framework that can be parameterized through the scripting Groovy language, able to work both through the webservice and the direct access to the DB, file reading or mail receipt.

In the case of less complex sync needs (direct mapping among the entities that should be updated), you can also use the "Wizard Connector", which can be configured from the UI of the Administration Module of CMDBuild.

CMDBuild Portlet - Liferay

CMDBuild provides a standard solution to issue some features in the form of Portlet (standard JSR 268) in the open source Liferay portal.

The portlet is able to access to CMDBuild through the SOAP webservice, adapting to the configuration of the related instance (menu, authorizations, data card structure, process flows, reports).

The portlet includes the starting and progressing of a process, with consultation of active instances or completed instances, of data card management, (input, edit, cancellation) and report execution.

The use of a portal as Liferay allows you to use other available tools for:

- collaboration (wiki, forum, blog, messaging, ecc)
- content management (news, events, informative pages)
- further interfaces provided by a third party through the same JSR 168 standard

This solution is very advantageous because it can adapt to the related CMDBuild instance without developing a code for the management of the interaction between two environments.

Its limit is its "self adaptability" itself that does not allow any kind of customisation.
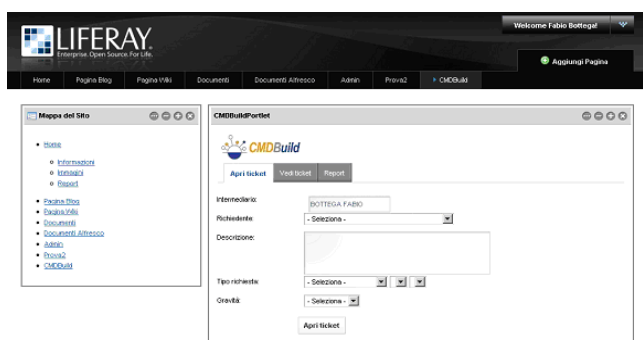
GUI Framework

The GUI Framework makes available a simplified interface to non-technical staff.

Unlike the CMDBild - Liferay portlet, the GUI Framework can be activated in any portals or web site and allows a complete interface customisation, both functional and graphical.

On the other side, the GUI Framework configuration needs a javascript code customisation, that is simplified if templates and libraries are available.

In particular the tool offers the following featuers:

- it can be activated in portals based on different technologies as it is developed in javascript / JQuery environment

- it allows an (almost) unlimited freedom when projecting the graphic layout, defined through an XML descriptor and with the possibility of intervening on the CSS

- it grants a quick configuration thanks to predefined functions (communication, authentication logics, etc.) and to native graphic solutions (forms, grids, upload buttons and other widgets)

- it interacts with CMDBuild through the REST webservice
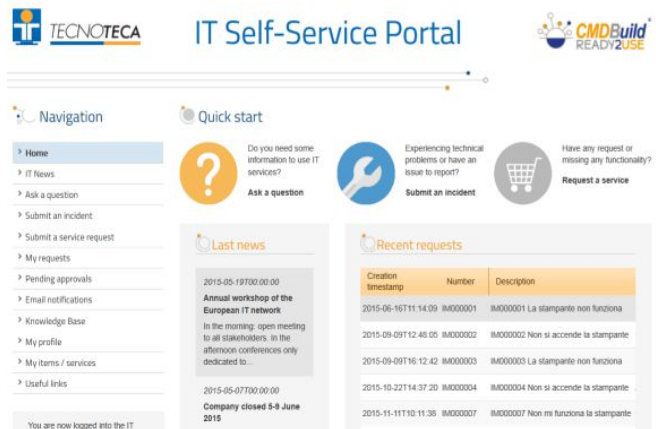
Mobile Interface

There are a lot of operations that are carried direct in the field (delivery / withdrawal of computers and devices, inventory, etc). You can also record them when they are developed, avoiding delays and making use of specific features, i.e. sending asset pictures or reading them through a QR code and receive the complete asset card from the server.

For this purpose a new mobile CMDBuild interface was created for smartphones and tablets.

It is an app for Android and iOS mobile devices created with Sencha Touch (Javascript framework developed by Sencha, the same producer of the Ext JS framework used by CMDBuild desktop) and able to interact with CMDBuild through the REST webservice.

CMDBuild mobile implements the main features of the desktop interface: multilingual, multigroup login, navigation menu, class management with relations and attachments, researches and filters, workflow management with the most used widgets, report management, usefulness ("app" settings and log management).
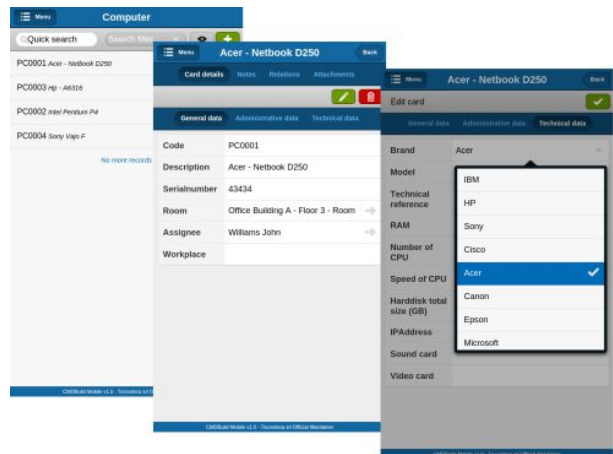
The new mobile interface is made available, with non open source license, to every subscriber of the management services (with a limited additional charge).

Technology

CMDBuild was designed and developed with the most advanced planning standards and the best available technologies.

CMDBuild is designed with Service-Oriented Architecture (SOA), organized with components and services which cooperate also with external applications through webservice. A service architecture represents the best solution to create scalable and maintainable (and interoperable) applications.

The user interface is created with Ajax. This solution, part of the new Web 2.0 paradigm, provides a more intuitive application, improves interaction and gets faster responses from the system.

Server components are developed with Java, independent of the platform, oriented to objects, for a long time used by large organizations to develop web enterprise applications thanks to the validity of J2EE specifications, libraries and other products that create their services.

Application functionalities are created with the support of some of the most mature and popular open source components available on the market. CMDB is based on the database PostgreSQL, the most advanced and solid open source database.

When designing CMDBuild we chose to follow the most recent technological tendencies, to reuse the best pattern design, to adhere - if possible - to the most popular normative standards.

Service-Oriented Architecture (SOA)

In order to make different applications interoperable, they must be created as components that cooperate with the services implementation, and these services must be set through high level interfaces defined under standard protocols.

Through SOAP webservices - and safety policy permitting -, CMDBuild provides the data filed in the CMDB and its management methods to allow the use within external applications involved with the information itself, both for the technical management and for administration.

The webservice creates also the interaction with graphical components integrated in CMDBuild:

- Enhydra Shark (workflow engine)
- GUI Framework (self-service portal)
- Relations Graph

The CMDBuild integration with the document system is implemented through webservice (Alfresco) or CMIS protocol.
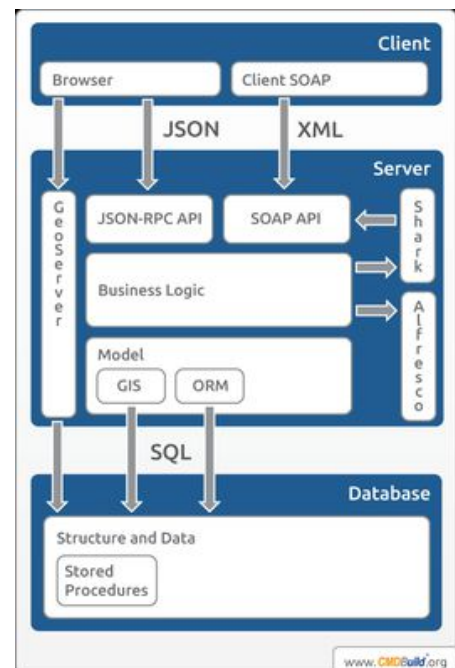
Open source components

CMDBuild uses only open source components selected for the technological validity and diffusion.

In particular, integrated software components or those which interoperate with CMDBuild 1.1 include:

- Ext JS library for client components based on Ajax technology
- PostgreSQL database using "spatial" PostGIS module
- servlet container Tomcat
- JasperReports engine with IReport editor
- workflow engine (Together Workflow Server) with Together Workflow Editor
- scheduler Quartz
- Alfresco or other systems that support the CMIS protocol for the document management
- Liferay portal to publish Portlet
- OCS Inventory for the automatic inventory of assets
- OpenLDAP to access external authentication systems
- GeoServer and OpenLayers for GIS functionalities
- BIMServer as repository for IFC models
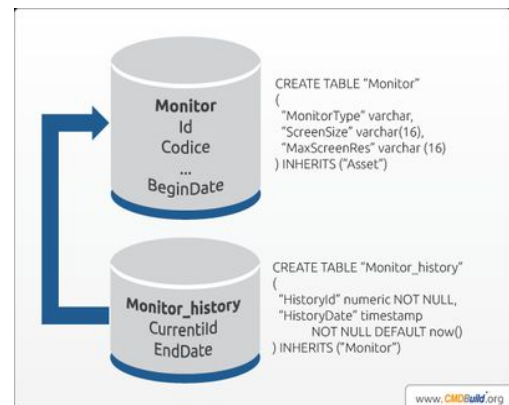- Apache AXIS for the webservice implementation

Change history

In accordance with ITIL directions, in order to assure the complete traceability of operations, CMDBuild historicizes the edited cards (both for the value of every attribute and the possible relations).

In this way you can both view the versioning situation of any card and print a report at any previous date

The mechanism is made possible by the inheritance provided by the PostgreSQL database.

CMDBuild employes such features to create tables (using SQL "inherits" syntax) which derive from the main table and record the complete versioning of every single card or relation.

Standard

The use of standards and open formats favours the application interoperability and the component reuse.

CMDBuild uses the following standards:

- SOAP, for the implementation of webservice
- XML schemas for the report design
- XPDL 2.0 format to describe workflow processes, standardized from the WFMC (WorkFlow Management Coalition)

- CMIS protocol (Content Management Interoperability Services) for the integration of document systems
- XML and XSLT schemas, to synchronize data with Automatic Inventory systems
- XML schemas, for Mail Merge with Open Office
- JSON, as interchange format between client and server
- WS-Security protocol, for the authentication of webservice, standardized with OASIS (Organization for the Advancement of Structured Information Standards)
- JSR 168 standard, to publish Portlets on portals
- WMS protocol, to manage maps
- WFS protocol, to manage vector features
- IMAP and POP3 protocols, to access e-mail servers

CMDBuild functionalities

CMDBuild includes two main modules:

- the Administration Module, used to define and edit CMDBuild data model, to define and import workflows and reports, to define users and groups, and other service functions

- the Management Module, used to manage cards configured in the system, to execute workflows and reports, and other utility features

Administration Module

The main features in Administration Module include:

- creation of new classes, i.e. new object typologies

- creation and change of (common and geographical) attributes in a class

- definition of widgets to place in the management form of the class

- definition of persistence information in workflows and import of the flow externally designed

- printing of Data Model (complete or bounded to the requested class)

- creation of "relation typologies" among classes ("domains") and related distinguishing attributes

- creation of "views", both through filters and through SQL queries, which can be used in a way that is similar to the classes

- creation of predefined filters used during the data reference on the various classes

- definition of navigation trees (subsets of the graph "domains")

- creation of tablelists (lookup) to manage attributes with predefined values

- definition of dashboards

- import of custom reports' layout externally designed

- definition of custom menus for different users' groups

- definition of roles and authorizations for various classes, also limited to groups of rows and columns

- configuration of the Task Manager and its various operations executed in the background

- definition of e-mail notification templates

- GIS configurations

- BIM configurations

- localisation features

- definition of parameters and options
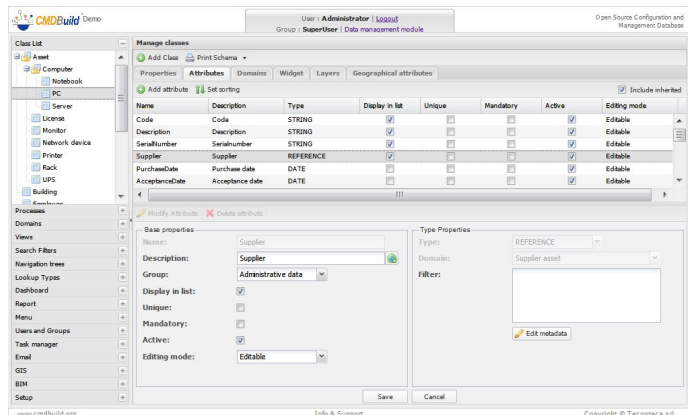
Management Module

The main features of the data management module include:

- card management or "views" on data cards
    - search on cards specifying both filters on data and relation standards with other classes, including the possibility of storing new filters or using predefined filters
    - insertion, creation and change of cards
    - use of provided widgets
    - master view - detail
    - creation and change of relations among cards
    - consultation of change history to data and relations among the managed objects
    - uploading of attachments related to the cards
    - display of georeferenced cards in the cartography
    - 3D viewer of BIM models
    - printing of cards, choosing columns and row filter definition
    - printing of the current card with relation details
- workflow management
    - processes start
    - process advance using the provided widgets
    - consultation of workflow intermediate status
- reports
    - execution of complex reports designed through external editors and imported into the system (including also various charts, barcodes, crosstabs and other advanced elements)
- dashboard
    - consultation of charts configured in the system and control of related KPIs
- relations graph
- utility features
    - massive card editing
    - CSV import
    - CSV export
    - password change
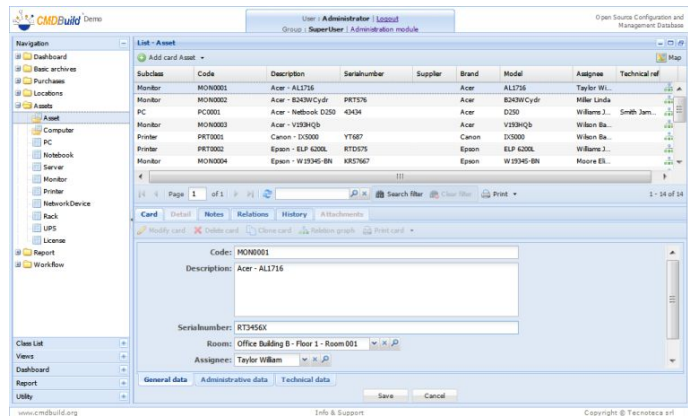
APPENDIX A: Glossary

ATTACHMENT

An attachment is a file associated to a card.

Attachments containing text (PDF, Open Office, Microsoft Word, etc.) are indexed in full text mode so that they can appear in search results.

WORKFLOW STEP

"Activity" means one of the steps of which the process consists.

An activity has a name, an executor, a type, possible attributes and methods with statements (CMDBuild API) to be executed.

A process instance is a single process that has been activated automatically by the application or manually by an operator.

See also: Process

ATTRIBUTE

The term refers to an attribute of a CMDBuild class.

CMDBuild allows you to create new attributes (in classes and domains) or edit existing ones.

For example, in "supplier" class the attributes are: name, address, phone number, etc..

Each attribute corresponds, in the Management Module, to a form field and to a column in the database.

See also: Class, Domain, Report, Superclass, Attribute Type

BIM

Method with the aim to support the whole life cycle of a building: from its construction, use and maintenance, to its demolition, if any.

The BIM method (Building Information Modeling) is supported by several IT programs that can interact through an open format for data exchange, called IFC (Industry Foundation Classes).

See also: GIS

CI

We define CI (Configuration Item) each item that provides IT service to the user and has a sufficient detail level for its technical management.

CI examples include: server, workstation, software, operating system, printer, etc.

See also: Configuration

CLASS

A Class is a complex data type having a set of attributes that describe that kind of data.

A Class models an object that has to be managed in the CMDB, such as a computer, a software, a service provider, etc.

CMDBuild allows the administrator - with the Administration Module - to define new classes or delete / edit existing ones.

Classes are represented by cards and, in the database, by tables automatically created at the definition time.

See also: Card, Attribute

CONFIGURATION

The configuration management process is designed to keep updated and available to other processes the items (CI) information, their relations and their history.

It is one of the major ITIL processes managed by the application.

See also: CI, ITIL

DASHBOARD

In CMDBuild, a dashboard corresponds to a collection of different charts, in this way you can immediately hold in evidence some key parameters (KPI) related to a particular management aspect of the IT service.

See also: Report

DATABASE

The term refers to a structured collection of information, hosted on a server, as well as utility software that handle this information for tasks such as initialization, allocation, optimization, backup, etc..

CMDBuild relies on PostgreSQL, the most powerful, reliable, professional and open source database , and uses its advanced features and object-oriented structure.

DOMAIN

A domain is a relation between two classes.

A domain has a name, two descriptions (direct and inverse), classes codes, cardinality and attributes.

The system administrator, using the Administration Module, is able to define new domains or delete / edit existing ones.

It is possible to define custom attributes for each domain.

See also: Class, Relation

DATA FILTER

A data filter is a restriction of the list of those elements contained in a class, obtained by specifying boolean conditions (equal, not equal, contains, begins with, etc.) on those possible values that can be accepted by every class attribute.

Data filters can be defined and used exceptionally, otherwise they can be stored by the operator and then recalled (by the same operator or by operators of other user groups, which get the permission to use them by the system Administrator)

See also: Class, View

GIS

A GIS is a system able to produce, manage and analyse spatial data by associating geographic elements to one or more alphanumeric descriptions.

GIS functionalities in CMDBuild allow you to create geometric attributes (in addition to standard attributes) that represent, on plans / maps, markers position (assets), polylines (cable lines) and polygons (floors, rooms, etc.).

See also: BIM

GUI FRAMEWORK

It is a user interface you can completely customise. It is advised to supply a simplified access to the application. It can be issued onto any webportals and can be used with CMDBuild through the standard REST webservice.

See also: Mobile, Webservice

ITIL

"Best practices" system that established a "standard de facto"; it is a nonproprietary system for the management of IT services, following a process-oriented schema (Information Technology Infrastructure Library).

ITIL processes include: Service Support, Incident Management, Problem Management, Change Management, Configuration Management and Release Management.

For each process, ITIL handles description, basic components, criteria and tools for quality management, roles and responsibilities of the resources involved, integration points with other processes (to avoid duplications and inefficiencies).

See also: Configuration

LOOKUP

The term "Lookup" refers to a pair of values (Code, Description) set by the administrator in the Administration Module.

These values are used to bind the user's choice (at the form filling time) to one of the preset values.

With the Administration Module it is possible to define new "LookUp" tables according to organization needs.

MOBILE

It is a user interface for mobile tools (smartphones and tablets). It is implemented as multi-platform app (iOS, Android) and can be used with the CMDB through the REST webservice.

See also: GUI Framework, Webservice

PROCESS

The term "process" (or workflow) refers to a sequence of steps that realize an action.

Each process will take place on specific assets and will be performed by specific users.

A process is activated by starting a new process (filling related form) and ends when the last workflow step is executed.

See also: Workflow step

RELATION

A relation is a link between two CMDBuild cards or, in other words, an instance of a given domain.

A relation is defined by a pair of unique card identifiers, a domain and attributes (if any).

CMDBuild allows users, through the Management Module, to define new relations among the cards stored in the database.

See also: Class, Domain

REPORT

The term refers to a document (PDF or CSV) containing information extracted from one or more classes and related domains.

CMDBuild users run reports by using the Management Module; reports definitions are stored in the database.

See also: Class, Domain, Database

CARD

The term "card" refers to an element stored in a class.

A card is defined by a set of values, i.e. the attributes defined for its class.

CMDBuild users, through the Management Module, are able to store new cards and update / delete existing ones.

Card information is stored in the database and, more exactly, in the table/columns created for that class (Administration Module).

See also: Class, Attribute

SUPERCLASS

A superclass is an abstract class used to define attributes shared between classes. From the abstract class you can derive real classes that contain data and include both shared attributes (specified in the superclass) and specific subclass attributes.

For example, you can define the superclass "Computer" with some basic attributes (RAM, HD, etc.) and then define derived subclasses "Desktop", "Notebook", "Server", each one with some specific attributes.

See also: Class, Attribute

ATTRIBUTE TYPE

Each attribute has a data type that represents attribute information and management.

The attribute type is defined using the Administration Module and can be modified within some limitations, depending on the data already stored in the system.

CMDBuild manages the following attribute types: "Boolean", "Date", "Decimal", "Double", "Inet" (IP address), "Integer", "Lookup" (lists set in "Settings" / "LookUp"), "Reference" (foreign key), "String", "Text", "Timestamp".

See also: Attribute

VIEW

A view not only includes the whole content of a CMDB class, it is a group of cards defined in a logical way.

In particular, a view can be defined in CMDBuild by applying a filter to a class (so it will contain a reduced set of the same rows) or specifying an SQL function which extracts attributes from one or more related classes.

The first view type maintains all functionalities available for a class, the second one allows the sole display and search with fast filter.

See also: Class, Filter

WEBSERVICE

A webservice is an interface that describes a collection of methods, available over a network and working using XML messages.

With webservices, an application allows other applications to interact with its methods.

CMDBuild includes a SOAP and a REST webservice.

WIDGET

A widget is a component of a GUI that improves user interaction with the application.

CMDBuild uses widgets (presented as "buttons") that can be placed on cards or processes. The buttons open popup windows that allow you to insert additional information, and then display the output of the selected function.

APPENDIX B: ITIL Best Practices

In order to keep the levels of the required service, IT managers are suggested to adopt an IT Governance system organizing management processes in terms of flows, roles and responsibilities.

ITIL (IT Infrastructure Library) is a model made up of guidelines and best practices for the management of IT services, successfully adopted in various contexts and described in proper publications.

Developed for the UK Government ICT strategy at the end of 80s, it is widespread all over the world as "standard de facto", not proprietary, encouraging recent ISO / IEC 20000 standards (previously BS 15000).

ITIL V3 core books are shared among various areas:

- Service Strategy: alignment between business and IT services
- Service Design: planning of Service Management
- Service Transition: change management and production start
- Service Operations: management of operation processes
- Continual Service Improvement: continuous improvement of services

Among the main ITIL advantages there are:

- easy-to-use thanks to the "adopt and adapt" philosophy (the method should be adapted to individual companies' needs, and activated in a gradual and selective way)
- process approach
- strong specialization and complete IT service orientation
- IT environment according to a system and integrated vision
- proactive approach in the service management
- to sum up, better quality and less costs

Among the most common ITIL processes, there are the planning and operative ones, such as:

- Change Management
- Configuration Management
- Event Management
- Incident Management
- Problem Management
- Service Catalogue Management

For each process, ITIL handles description, basic components, criteria and tools for quality management, roles and responsibilities of the resources involved, integration points with other processes (to avoid duplications and inefficiencies).

CMDBuild provides complete support for ITIL best practices, which are compliant both in the CMDB implementation and updating, and in those mechanisms provided for the configuration and usage of IT management processes.

APPENDIX C: Useful links

Meetings and workshops

SALPA 2005

Presentation of CMDBuild at SALPA (National Conference on Open Source in Public Administration) in Pisa

www.salpa.pisa.it/salpa/22/02/36/SALPA_ATTACH_FILE220236.pdf

Annual Conference of itSMF Italy (2005)

The Municipality of Udine presents the reorganization project of internal IT processes with the support of ITIL and CMDBuild

www.itsmf.it/download/GRUPPO01~ATTI_CONFERENZA_MILANO_2005/itSMF_ITIL_e_PA_Scaramuzzi.pdf

COMPA 2006

Presentation of CMDBuild at COMPA 2006 (European Exhibition of Public Communication and Services) in Bologna

http://www.cmdbuild.org/file/cmdbuild_compa_2006.pdf

Annual Conference of itSMF Italy (2006)

The Municipality of Udine presents the progress of reorganization projects of internal IT processes with the support of ITIL and CMDBuild

http://www.cmdbuild.org/file/slide_itsmf_comuneudine.pdf

Think Open 2007

The Municipality of Udine - together with the project partners - presents CMDBuild during the first edition of Think Open, event held in Rovigo from 26th to 28th September 2007.

Click the following links to view the slides of the presentations:

http://www.cmdbuild.org/filesystem/Slide_ThinkOpen2007_Master_R03.pdf
http://www.cmdbuild.org/filesystem/Slide_ThinkOpen2007_Technical_R03.pdf

Linux day 2007

Tecnoteca introduced CMDBuild at the Linux Day 2007 within the programme organized by IGLU (Linux Users' Group in Udine), at the local University of Udine.

Click the following links to view the slides of the presentations:

http://www.cmdbuild.org/filesystem/Slide_LinuxDay2007_Presentazione.pdf
http://www.cmdbuild.org/filesystem/Slide_LinuxDay2007_ApprofondimentoTecnico.pdf

PLIO 2008

CMDBuild was one of the projects presented during the event "Il software libero in Friuli Venezia Giulia" (Free software in FVG), held in the Palazzo della Regione of Udine and organized by Associazione PLIO (OpenOffice.org Italian National Language Project).

Click the following links to view the slides of the presentations:

http://flossfvg.plio.it/atti-del-convegno/Slide_EventoPlioFVG_R02.pdf/

ITIL at Work 2008

Cogitek fully dedicated to CMDBuild the meeting organized in Milan at the Atahotel Executive.

Click the following links to view the slides of the presentations:

http://www.cmdbuild.org/file/ITILatWORK_Tecnoteca.pdf
http://www.cmdbuild.org/file/ITILatWORK_ComuneUdine.pdf

itSMF, spring 2008

We talked about CMDBuild in Rome and Udine, within two events organized in May by itSMF.

Slides of the presentation held by the State Legal Advisory Service:

http://www.itsmf.it/download/PERSONAL4~EVENTO_PRIMAVERA08/AVVOCATURA_SITO.pdf

Slides of the presentation held by the Municipality of Udine:

http://www.cmdbuild.org/file/Antonio_Scaramuzzi_itSMF_Udine.pdf

itSMF 2008

Within the fifth annual conference of itSMF Italy, CMDBuild was shown at the stand of Cogitek.

Within the conference, Toscana Regional Council introduced ITIL Best Practice supported by CMDBuild.

Click the following link to view the slides of the presentation:

http://www.cmdbuild.org/file/03-_regione_toscana.pdf

CLUB TI TRIVENETO 2009

Within a workshop dedicated to the IT Governance, CMDBuild was introduced in two speeches by Tecnoteca and the Municipality of Udine.

Click the following links to view the slides of the presentations:

http://www.cmdbuild.org/file/Slide_ClubTI2009.pdf
http://www.cmdbuild.org/file/Slide_ClubTI_2009-03-11_Scaramuzzi.pdf

ITIL & PMBOK 2009

CMDBuild was presented within the event "ITIL e PMBOK, Service management and project management a confronto", held in Florence on the July 1st, 2009 on the premises of Toscana Regional Council.

Click the following links to view the slides of the presentations:

http://www.cmdbuild.org/file/itil-e-pmbok
http://www.cmdbuild.org/file/pmbok-iv-e-itil-v.3

CMDBUILDAY 2010

The first Convention for CMDBuild users was held in Udine on April 15, 2010.

The meeting was organized with the purpose of spreading and sharing experiences about the project; it was held by the contact people of the main companies that use it.

Click the following link to view slides and videos of all speeches:

http://www.cmdbuild.org/it/diffusione/cmdbuild-day/2010

IT CLUB 2011

IT Club FVG and the "Centro di Competenza Open Source" of Ditedi (Digital Technology District) organized a meeting on open source software at the premises of Confindustria of Udine on February 23, 2009.

During the meeting, we presented our experience with CMDBuild.

Click the following links to view the slides of the presentations:

http://www.cmdbuild.org/diffusione/convegni-e-workshop/itclub-2011

Roma città... open ("Rome, open... city"), 2011

This meeting was organized in Rome on April 8th by Yacme Srl, Tecnoteca Srl and Seacom Srl, with the purpose of fostering the open source software through the presentation of certain important successful cases.

CMDBuild was one of the three projects introduced during the event, in the presence of the State Legal Advisory Service which represented the event.

Click on the following link to view the slides and videos of the presentation:

http://www.cmdbuild.org/diffusione/convegni-e-workshop/8-aprile-2011-roma-citta...-open

Al servizio del Cittadino ("At Citizens' Disposal"), 2011

The event, organized on May 19, 2011 by the Municipality of Tavagnacco and in cooperation with the University of Udine, presented to local PAs and citizens some solutions adopted by the Municipality itself and based on open source solutions.

Among these, at the premises of Social Services we presented the usage of CMDBuild to manage the drawdown of contributions to citizens. The qualified councillor introduced the project.

Click on the following link to view the slides and videos of the presentation:

http://www.cmdbuild.org/diffusione/convegni-e-workshop/al-servizio-del-cittadino-2011

CMDBuild at TIS in Bolzano 2011

On May 31, 2011, Mynt and Tecnoteca organized an event dedicated to CMDBuild, held at the premises of TIS Innovation Park in Bolzano.

The meeting purpose was a food for thought to manage assets in accordance with ITIL guidelines, taking into consideration also Open Data.

Click the following links to view the slides of the presentations:

http://www.cmdbuild.org/diffusione/convegni-e-workshop/evento-cmdbuild-bolzano

CMDBUILDAY 2012

The second Convention for CMDBuild users was held in Udine on May 10, 2012.

The meeting was organized with the purpose of spreading and sharing experiences about the project; it was held by the contact people of the main companies that use it.

Click the following link to view slides and videos of all speeches:

http://www.cmdbuild.org/it/diffusione/cmdbuild-day/2012

TOGAF, Archi and CMDBuild

"Tool open source per le organizzazioni che hanno adottato TOGAF: Archi e CMDBuild" (Open source tools for organisations that use TOGAF: Archi and CMDBuild) is the title of the meeting that will be held next 28th May in Florence in the Sala delle Feste of Palazzo Bastogi (via Cavour 18), provided by the Regional Council of Toscana.

TOGAF is an open framework that supports the design and management of computer enterprise architectures, while Archi is the reference open source tool to design TOGAF compliant models.

We needed an open source repository to file the elements shaped through Archi. CMDBuild can now be used for this purpose thanks to the "plugin" developed in cooperation with the University of Bologna and with SIAE, that grants the complete bidirectional synchronisation with Archi.

Slides and videos of all speeches will be available under the following link:

http://www.cmdbuild.org/it/diffusione/convegni-e-workshop/togaf-archi-e-cmdbuild

Open Source for Real !

On the 26th February 2014, a meeting organized by SUSE was held in Rome. It was devoted to the open source ecosystem.

During the meeting Suse presented three products selected from the areas of databases, enterprise middlewares and CMDB. CMDBuild is the CMDB solution that Suse chose.

Click on the following link to view the slides and the video of the Tecnoteca's intervention:

http://www.cmdbuild.org/it/diffusione/convegni-e-workshop/open-source-for-real

CMDBUILDAY 2014

The third Convention for CMDBuild users was held in Rome on May 15th, 2014.

The meeting was organized with the purpose of spreading and sharing experiences about the project; it was held by the contact people of the main companies that use it.

Click the following link to view slides and videos of all speeches:

http://www.cmdbuild.org/it/diffusione/cmdbuild-day

Press review

ALTRA PA

In the following links you can find the project registered among the best practice of ALTRA PA, describing in detail the project and interviewing the IT director in the Municipality of Udine (its customer):

http://www.forumpa.it/archivio/3000/3800/3820/3827/cmdbuild-veloci.html
http://www.forumpa.it/archivio/3000/3800/3810/3818/scaramuzzi-veloci.html

FORUM PA

The contact person of CED at State Legal Advisory Service in Rome describes on the Forum PA's website the activities performed to introduce the process management within the service supplied for users in the institute:

http://www.innovatori.forumpa.it/innovatore.php?id=135

DATA MANAGER

CMDBuild was registered on the online version of the magazine.

The interview to the project mantainer is available online:

http://www.datamanager.it/cms/view/sezioni_web/open_source/cmdbuild_la_soluzione_open_source_per_il_configuration_management_data_base/s152/c78432

CNIPA

CMDBuild was registered on the portal of CNIPA.

The interview to the project promoter is available online:

http://www.osspa.cnipa.it/home/index.php?option=com_content&task=view&id=77&Itemid=36

OSOR portal European Commission

The interview on the CNIPA portal is available on the OSOR portal of the European Commission:

http://www.osor.eu/news/it-open-source-it-system-management-software-is-mature

EGOV

On the online magazine for Public Administration you can find the presentation of CMDBuild during the CMDBuild Day 2012:

http://www.egovnews.it/evento/1586/

http://www.egov.maggioli.it/testo-news/24004

Open source components

PostgreSQL (database)

Reference website: *www.postgresql.org/*

Tomcat and Apache (webserver)

Reference website: *www.apache.org/*

Alfresco (document repository)

Reference website: *www.alfresco.com/*

JasperReports (reports)

Reference website: *http://www.jasperforge.org/*

Enhydra Shark (workflow engine)

Reference website: *www.enhydra.org/workflow/shark/*

TWE (workflow editor)

Reference website: *http://www.together.at/prod/workflow/twe*

OCS Inventory (Automatic Inventory)

Reference website: www.ocsinventory-ng.org/

ExtJs (GUI client ajax)

Reference website: http://extjs.com/

Quartz (job scheduler)

Reference website: http://quartz-scheduler.org/

Liferay (portal)

Reference website: http://www.liferay.com/

GeoServer (server-side GIS)

Reference website: http://geoserver.org/

OpenLayers (client-side GIS)

Reference website: http://openlayers.org/

BiMserver (repository for IFC models)

Reference website: http://bimserver.org/

ITIL references

ITIL official website

Reference website: *www.itil.co.uk/*

ITIL IT Service Management Zone

Reference website: *www.itil.org.uk/*

Italian Association of itSMF

The Association "information technology Service Management Forum Italia" is a no-profit organization to promote and exchange experiences and information about the management of ICT Services and the adoption of best practices following ITIL directions

Reference website: *www.itsmf.it/*