COSA

COSA BPM 5.7

Product Description
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1 Purpose of this document

The purpose of this document is to provide overall information of the COSA BPM 5.7 product portfolio. It addresses people having a basic knowledge about BPM but not about COSA BPM. They will get a first overview about the product, its architecture and its components.

Further information can be found in the detailed COSA BPM product documentation. We provide documentation for all kind of target groups and all product components. The following documents can be provided:

- COSA BPM Process Designer Manual
- COSA BPM Simulator Manual
- COSA BPM Process Viewer Guide
- COSA BPM Context Handler Guide
- COSA BPM Control Station Guide
- COSA BPM Script Language Manual
- COSA BPM Programmer Reference
- COSA BPM Administrators Guide
- COSA BPM Installation Guide

Chapter 2 gives an overview of all components and the approach of COSA BPM to cover the whole BPM lifecycle.

Chapter 3 provides more detailed information about the existing product components.

2 About COSA BPM

2.1 The company

We have been specializing in the development of custom-made Business Process Management (BPM), Workflow and Document Management solutions for individual requirements. Regardless of the type of organization, for example insurance companies, industry and trade companies or public authorities – the primary objective is always the same: increasing the efficiency by intelligent Business Process Management.

2.2 The product

COSA BPM is a powerful Business Process Management Suite that supports customers in handling highly structured and ad-hoc processes. In this respect, COSA BPM does not only support human-centric Workflow (H2H, H2S) but also completely automated processes (S2S) without any user interaction.

COSA BPM not only controls processes but it also cares about processes’ context. In the COSA BPM Suite, this context is provided and stored by the elaborate Document Management module COSA DM. As COSA BPM customers usually have their own standards regarding operating systems, database platforms, etc., our philosophy has always been that COSA BPM fits seamlessly into this existing system environment. Our commitment to J2EE allows customers to make their own choice for their platform and environment. COSA BPM will work in this infrastructure.

Business Process Management and Document Management are more than simply handling processes and documents. The COSA BPM Suite covers the complete BPM lifecycle.
COSA BPM Suite covers the complete BPM lifecycle

**COSA Process Designer**

According to the Business Process Modelling Notation (BPMN) standard, the COSA Process Designer serves for modelling business processes and organization models in a graphical, intuitive user interface.

To enhance representing processes and hierarchies as detailed as possible, the modelling phase is strictly subdivided into a business-related and a technical part. Business processes can be modelled based on process or activity libraries, using sub-processes and process hierarchies.

**COSA Process Viewer**

Creating process maps and process models is an important aspect, spreading this information is essential, too. The COSA Process Viewer is a publishing component for all process specific information created within the COSA Process Designer. Using the COSA Process Viewer the employees can view the processes and can participate in the organization’s 'process culture'.

**COSA Simulator**

COSA Simulator simulates the run-time behaviour of process models. This allows avoiding bottlenecks and optimizing cycle times. It can be used during the build time of processes but also during run time to predict workload and resource utilization.

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1. Those components, which are still under construction but from our perspective important to close this lifecycle, will also be explained in this chapter. In the figure above, these components are represented without icon.
In addition, the simulation provides detailed results regarding resource consumption and process costs. To predict the future behaviour of a run time system, initial workload can be loaded directly from the run-time system.

Simulation scenarios consist of an arbitrary number of processes and a simulation scenario. The scenario describes the process environment in terms of resource availability, process load and expected process volume in the future, etc.

**COSA Server**

The COSA Server is a powerful engine based on a relational database. Being the core component of the COSA BPM Suite, it controls and manages the BPM system on the server side.

The COSA BPM Database stores all relevant run-time and historic data including context data like documents. The context data, i.e. archived dossiers, documents and other files, can also be stored in another server.

**COSA Tool Agent Manager**

Connectivity or integration is an important aspect of BPM. The COSA Tool Agent Manager provides numerous adapters, so-called Tool Agents. These Tool Agents allow connecting directly to third-party applications (e.g. SAP) or to integrate with the infrastructure following a classical EAI (Enterprise Application Integration) approach, e.g. orchestration via web services in Service-Oriented Architectures (SOA).

**COSA Context Handler**

The COSA BPM Suite provides various user front-ends for different requirements. The purpose of all user front ends is to present all relevant tasks to a user including the process context.

Therefore, the COSA Context Handler combines Business Process Management and Document Management functionalities. The COSA Context Handler addresses all users working intensively with the workflow system.

In addition to this front-end, plug-ins are available for Microsoft Outlook and Lotus Notes. These types of front-ends are made for users who do not interact with the BPM system regularly and therefore do not want to use a BPM-specific client.

COSA BPM also provides an extensive API that allows creating individual client solutions.

**COSA Business Performance Center**

The COSA Business Performance Center (BPC) is a graphical tool addressing the management to inform about the current state of business processes, e.g. the actual workload or average process duration. The multi-dimensional reports and statistics can be designed according to individual requirements. COSA BPC helps to detect bottlenecks, identify free resources, check workloads of users, etc.

**COSA Control Station**

The COSA Control Station is a management cockpit addressing the middle management. Based on pre-definable alerts, the COSA Control Station informs e.g. about resource bottlenecks or SLA infringements and provides functionalities to react to these situations. Reactions might be to redefine roles and responsibilities on a temporary basis or to change process priorities.
3 Components of the COSA BPM Suite

To cover the complete business process lifecycle, the COSA BPM Suite provides the components described in the following subchapters.

3.1 What is new in COSA BPM 5.7?

This chapter provides a short overview of the new features in COSA BPM 5.7.

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3.2 COSA Process Designer

The COSA Process Designer is the component that provides functionality for creating process models and other objects related to process models, i.e. users, roles, tasks etc. Due to a standardized package concept, business processes and the organization model are kept together in one single file. Its format is XML Process Definition Language (XPDL).

As the modelling phase is subdivided into a business-related and a technical part, the COSA Process Designer offers different views on processes: one view for business analysts who create process models and one view for technical staff that complete the processes regarding connectivity, respectively integration.
Process maps

Process maps give an overview of all processes which exist in the company. The dependency and interactions between processes are visualized. This is supported by grouping processes into core processes, describing the added value chain of the company, support processes (secondary processes) and strategic management processes.

![Figure 3-1 COSA Process Designer with process map](image)

Business processes

Business processes are designed and visualized using the standardized Business Process Modelling Notation (BPMN). These processes consist of numerous activities that can be combined in a sequence, in parallel or as alternatives based on specific rules. Each activity contains information about authorization, multi-lingual descriptions, priorities, allocated time etc. According to their authorization activities can be shown in swimlanes – each linked to one role or user. Analysts can either compose processes by creating new activities or select predefined activities from an activity library. Usage of sub-processes represented by single activities helps analysts to structure process models.

One key aspect in process modelling is the definition of deadlines with corresponding escalations. In the COSA Process Designer, you can define an arbitrary number of deadlines for processes, respectively the activities of processes.
This allows making sure that service level agreements (SLA) are met. For every deadline, a subsequent escalation in case of failure can be defined, e.g. increasing priorities, sending emails, notifying management, starting escalation processes etc.

Figure 3-2 COSA Process Designer with business process diagram

Usually business process management deals with structured processes, i.e. processes which work according to well-known and predefined rules. In case that even unstructured processes (so-called ad-hoc workflows) should be executed by COSA BPM, analysts can design process fragments (proclets) in the COSA Process Designer. These proclets are combined to ad-hoc processes by authorized users during run time.
Organization models

Organization models can be defined directly in the COSA Process Designer. These models consist of roles and users, each linked to an arbitrary number of roles. User and role objects hold information about permissions, competencies and payroll costs.

Besides the definition of users and roles directly in the COSA Process Designer, you can import this data from external directory services (e.g. MS Active Directory) using the standardized interface LDAP (Lightweight Directory Access Protocol).
Documentation

In addition to process modelling, documenting processes is an important aspect for business analysts. The COSA Process Designer allows establishing extensive documentation at activity and at package level.

At activity level, process modelers can attach links and documents to activities in order to provide detailed process step descriptions.

![COSA Process Designer with attached activity descriptions](image)

At package level, documentation can be generated automatically based on an individual selection of modelling details.
Figure 3-5 Documentation generation
Connectivity

Connectivity or integration into the system environment is part of the process definition, respectively activity definition. As every single activity may be connected to different third-party applications, a “technical designer” has to complete activity definitions. For integration purposes, COSA BPM provides numerous sets of adaptors, so-called Tool Agents (see below for further details). Each Tool Agent offers a set of methods pointing directly to functionality of the third-party application. Tool Agents and their methods can be easily selected from a graphical Tool Agent Wizard.

![Figure 3-6 COSA Tool Agent Wizard](image-url)
Selections of Tool Agent methods can be linked directly to an activity script or can be linked to a task, i.e. a re-usable script. These tasks can be linked to activities in the next step using a Task Wizard.

Figure 3-7 COSA Task Wizard
Forms and dialogs

As business processes usually appear in a context, the COSA Process Designer enables modellers to create individual forms and dialogs, including data lists, tables, calendars etc. These forms can be linked directly to activities or to tasks to make the forms re-usable.

3.3 COSA Process Viewer

Having knowledge about processes is one of the key assets of an organization. The COSA Process Viewer as a process publishing component enables the organization to build and enhance this knowledge.

By just using any browser employees have permanent access to all relevant process descriptions. The processes are displayed in the same look and feel as they have been modelled in the COSA Process Designer. As the COSA Process Viewer is directly derived from the COSA Process Designer, a smooth step from creating process models to spreading this information is possible – with no discontinuity of media or systems.
3.4 COSA Simulator

An important aspect of a BPM system is the analysis of run-time behaviour already during the modelling phase. For this purpose, the COSA BPM Suite provides the COSA Simulator.

On the one hand, the COSA Simulator allows verifying the logical correctness of processes to ensure that they remain operable even in case of an interruption or error. On the other hand, the COSA Simulator enhances a functional analysis and simulation of process models regarding resource utilization, workload of users and roles, process costs etc.

To run the simulation of processes, a simulation scenario has to be defined. A simulation scenario contains information about working strategies, the simulation time schedule, resource schedule and the process workload. The time schedule consists of a concrete starting time and duration for the simulation. In the resource schedule, analysts describe the availability of human resources, systems/machines and material. The process workload definition is split into the actual workload, i.e. the base line quantity of process activities before the simulation starts, and the expected quantity of new processes within the simulation time frame. This number of newly started processes may follow any distribution over the time-axis, not necessarily an equal distribution. The actual workload may be either edited manually or read out of the run-time system to reflect the as-is situation.

As real-life processes are not stand-alone objects, the COSA Simulator does not only take one single process model into account but it considers a set of processes simultaneously. This leads to realistic results close to reality.

The result of the simulation is divided into workload, resource utilization and process costs.

![COSA Simulator with system utilization chart](image)

**Figure 3-9 COSA Simulator with system utilization chart**

Resource utilization enables the analyst to detect bottlenecks in advance. Focus is not only on roles and users but on material and systems as well.
Charts describing the quantity of process activities on a time-axis describe which type of work arises at a certain time. Derived from this information, management can schedule the staff with the right skills at the right time.

Figure 3-10 COSA Simulator with workload chart
Getting information about process costs in advance helps to calculate budgets and pricing. Process costs are described in total and in detail, i.e. per process model, per resource and per time unit.

Figure 3-11 COSA Simulator process costs
Essential for process simulation is the forecast of working times, delay times and durations. These timing aspects are covered by the COSA Simulator, too.
3.5 COSA Server

A powerful Business Process and Document Management system needs an efficient control unit that administers all relevant processes. It is the core component of the COSA BPM Suite.

The COSA Server controls the flow of process instances, based on process models that have been defined in the Process Designer. Controlling is done by an integrated rules engine. It takes care of authorization and distribution of work, watches deadlines and starts escalations if necessary, all based on the defined process model.

All actions (e.g. execution of work items, delegation of work items, resubmission of process instances, etc.) and events (e.g. start of new process instances, exceeded deadlines, etc.) are stored in audit trails.

The COSA Server is fully scalable and multi-company-enabled (i.e. several companies can work on one COSA Server and each company has its own set of processes and data).

Rules engine

Real-life business processes are not always "straight-through" processes but may consist of alternatives depending on external influences. In the COSA Process Designer, you can model all types of case distinctions and alternatives. The integrated rules engine interprets the modelled distinctions and alternatives and schedules the corresponding work items to the responsible users and roles.

Authorization

Another important aspect is the concept of authorization. The COSA BPM Suite provides an elaborate four-stage concept:
Basic rights:
These rights determine whether a user is generally allowed to forward business activities to other users, change business step priorities and so on. However, these general rights can be overruled by activity-related rights. These rights are defined either individually for each user or generally for all users.

Activity-related rights:
Activities, i.e. single steps of a business process, may be executed either by a real user or by an automatic user. COSA BPM provides separate rights for displaying and executing access rights. These rights are defined when you model an activity.

Context-related rights:
These rights refer to objects in the COSA DM component. As objects in the COSA DM component are usually created, processed and stored during run time, the corresponding rights for reading, modifying and deleting archive objects are defined individually for each object.

Process-related access rights:
These rights are meaningful for users of the monitoring tool Control Station. Users of this tool can only access processes for which they have explicit access rights.

In addition to these access rights, you can define user-/role- and activity-related competencies to make access rights more granular.

Distribution of work
Work can be distributed in many ways to the responsible roles or users. Besides overall strategies such as push-based, pull-based, case-based, task-based and workload balancing, the COSA BPM Suite provides the following options.

- An ‘on the spot’ decision by a superior or team manager
- A choice by a predecessor in the process
- Competencies of users and / or roles
- Responsibilities of users
- Priority rules

Unique in COSA BPM is the ability to create wide-ranging combinations of the above-mentioned possibilities. The distribution of work can be defined and determined in a completely algorithmic manner so that COSA BPM will support the processes in a way that is entirely in conformity with the way in which the client has organized its operations and its organization.

Automatic activities
COSA BPM has special functions for automatic operations, such as batch processing, ‘straight- through’ processing and ‘message-based’ Workflow. The COSA Server is responsible for the automatic starting and ending of batch operations. These can be performed by the COSA Server in a fully scalable way at any time.

Document Management
COSA DM (Document Management) is a component of the COSA BPM Suite. However, it can be used as a stand-alone full-blown Document Management System (DMS).

COSA DM stores documents in a customizable document structure. This structure can contain any combination of dossiers, cases, folders or any other type of document container. The structure for storing documents is completely generic.

COSA DM supports an arbitrary number of different document types, like contracts, invoices, orders, etc. Each document type contains a customizable set of index attributes. E.g. invoices may have attributes like invoice number or amount, whereas contracts may have attributes like subject or name of contracting parties. Independent of the document type, the document can have any format (e.g. Microsoft Word or Excel, Adobe PDF, TIFF, JPEG, etc.). I.e. COSA DM can handle invoices as Microsoft Word document and
Adobe PDF as well as orders as TIFF documents, each with the corresponding set of indexing attributes.

Authorization for reading and writing documents is checked. Authorized users can reserve documents to change them (check-out) and release documents afterwards (check-in).

COSA DM comes along with version control of documents, i.e. whenever a document is changed, a new version is created automatically. The old version remains in COSA DM. All document changes are stored in audit trails.

COSA DM has a mature search engine, which allows users to search for documents not only by their indexing attributes but also by full text retrieval.

All user interfaces of COSA DM are part of the COSA Context Handler.

### 3.6 COSA Context Handler

The COSA Context Handler is the user front-end. It does not only provide the user’s list of work items (single business process steps) but also context-related information concerning work items and processes, i.e. process-related data and linked documents. Process-related data contains process milestones, deadlines, notes and process specific data, e.g. invoice number and amount for invoice processes or order number for procurement processes.

By presenting the process context, users can work much more efficiently on their work items as they always have all relevant information. Any table-based data in the Context Handler, like process information or work item journals can be printed or exported.

The COSA Context Handler allows users to perform numerous actions on processes or work items, e.g. executing, postponing, resubmitting, rerouting.
To guide users through the large amount of information in an intuitive way, the displayed items in the Context Handler can be configured individually. On the one hand, users can create desktop settings that fit their preferences. On the other hand, the Context Handler can be adapted to corporate designs in the COSA configuration. In addition, table data can be pooled in groups as it is known, for example, from Microsoft Outlook.
Regarding documents, authorized users can create and modify documents including their index attributes. In addition, users can search for documents, which are not part of their process context.

Figure 3-17 COSA Context Handler with document explorer view and opened document

The COSA Context Handler contains a personal calendar, with which users can indicate that they will be absent during a specified time period. During their absence, COSA BPM is responsible for sending work items to defined substitutes. Therefore, it is guaranteed that activities are executed in time.

The COSA Context Handler is available as a fat-client, as browser-based solution or as plug-in for Microsoft Outlook and Lotus Notes.

Figure 3-18 Work items in the COSA Outlook Plug-In

In Microsoft Outlook and Lotus Notes, new work items appear in the task list of the responsible user. When a user double-clicks a work item, it is started, executed and removed from the task lists of other responsible users.
3.7 Integration

Integration is an important aspect of Business Process Management. It is in the nature of integration that this is the most technical part of BPM. A concept was introduced of dividing business analysts and technical experts into roles. Each role has a specific view on processes, i.e., a business- and object-related view and a technical integration-related view. So, business analysts do not have the necessity to take care of integration. This can be done by technical experts exclusively.

Business Process Management implies connectivity or integration of process activities to the system environment. This aspect of Enterprise Application Integration (EAI) is divided into two different directions of integration: COSA BPM calling third-party systems via Tool Agents and third-party systems calling COSA BPM via COSA’s API (Application Programming Interface).

Tool Agent Manager

COSA BPM connects to the system environment via adaptors, so-called Tool Agents. COSA BPM comes along with numerous sets of Tool Agents that are provided via the Tool Agent Manager.

There are different types of Tool Agents:

- Tool Agents for proprietary interfaces: these Tool Agents make the third-party functionality directly accessible in COSA BPM. Usually, there is one Tool Agent per third-party application, e.g., a Tool Agent for SAP.
- Tool Agents for standardized interfaces: these Tool Agents follow a generic approach. One Tool Agent can orchestrate any third-party application that provides interfaces like web services, messaging or COM. Orchestrating web services in Service-Oriented Architectures (SOA) can easily be achieved by the Web Service Tool Agent, no matter which application is behind the web service. Microsoft Office components (Word, Excel, etc.) can be integrated via the COM Tool Agent.
- Data-related Tool Agents: data stored in databases or files (XML) can directly be accessed by database Tool Agents (JDBC Tool Agent) or XML Tool Agent.
- General Tool Agents: these are Tool Agents that can be used in any system environment for sending mails, working with calendars or accessing the file system.

The Tool Agent Manager with all its Tool Agents is available for the COSA Server and for the COSA Context Handler. So, COSA BPM cannot only integrate back-end systems but COSA BPM allows controlling client applications as well. This makes execution of business processes more efficient.

Application Programming Interfaces (API)

Based on the COSA BPM API, the complete set of functionality can be accessed. This enables customers to integrate COSA BPM in their system environment by sending messages to COSA BPM, by starting new processes, by storing documents or by reading and writing process-related data. Based on this API, customers can even implement their own user interfaces, i.e., their own Worklist Handler or Context Handler applications.

COSA BPM provides its API in different technologies:

- COSA Java Library: this pure Java interface is addressed to customers focusing on J2EE applications.
- COSA WebService: this web service interface fits perfectly into service oriented architectures (SOA).
- COSA COM Library: this interface is addressing customers focusing on Microsoft Windows environment.
- OpenCOSA: this C interface has the most general approach and is accessible from within nearly any environment.
3.8 COSA Control Station

BPM does not mean that processes always run flawlessly. Absences of employees or an unforeseen increase of workload will still have impact on business.

The Control Station is a management cockpit that enables team leaders to detect and eliminate bottlenecks and deadline violations proactively without changing process models.

![Figure 3-19 COSA Control Station with process time view](image)

The Control Station allows to view information from different perspectives, i.e. process-based, work-item-based or milestone-based.
Based on pre-defined alerts authorized users are notified in case of resource bottlenecks or infringements of service level agreements (SLA). The COSA Control Station does not only provide a notification mechanism but it allows intervening into running processes:

- Rescheduling work items to other users or roles
- Changing process priorities
- Adding and removing users to roles temporarily
- Supervising milestones and deadlines:
  As milestones and deadlines are crucial factors in business processes, milestones and deadlines are displayed in a specific view with traffic light colors depending on their status.

These actions only impact certain running processes. They do not affect process models in general. The Control Station access is subdivided into process access and user/role access. In other words, Control Station users can only monitor process and user/role data for which access is explicitly granted.

The Control Station can be run as stand-alone client and as plug-in in the COSA Context Handler.
3.9 COSA Business Performance Center

The COSA Business Performance Center (BPC) is a graphical information system for the management monitoring aggregated key performance indicators (KPI) like average duration of processes, delay times, etc. For each KPI detailed information is displayed in multi-dimensional way visualized in a graphical and tabular view.

Reports can be customized according to customer-specific requirements. For every report, the user’s authorization is checked.

![Figure 3-20 COSA Business Performance Center (BPC) with aggregated key performance indicators](image)
Figure 3-21 COSA Business Performance Center (BPC) with graphical detail chart

Figure 3-22 COSA Business Performance Center (BPC) with multi-dimensional details