

**DOCFACTORY**

**WE MAKE TECHNOLOGY USABLE**

with Passion, Pride and Performance

Enterprise Content Management Platform

Technical Product Description

# About the DocFactory platform

DocFactory is a platform for producing and managing the information about all your products or services. It takes care of all the information needed to make use of, service or repair your products, whether the information is in the form of text, images, videos or other media. It makes sure that every user can access the information in a way that is useful to them, and makes it easier and faster to produce the information.

Benefits include:

- ✓ A smart way of organizing and linking information makes it easier to use what already exists.
- ✓ A smart way of searching makes it easier for the content creator to find and reuse information, minimizing information redundancy.
- ✓ A smart way of creating, editing and structuring information makes it easier to create publications for different target groups or markets.

## Product vision

DocFactory shall be an enabler for a smarter way of producing and consuming technical information introducing mechanisms like; Smart, Collaboration, Social, Dynamic, Personalized and Accessible. What we call “Technical information 2.0”.

## Release history

Sigma Kudos decided in the autumn 2007 to start developing its own information management and distribution platform DocFactory. The decision was made on the bases that Sigma Kudos needed a platform to be able to manage and deliver global information management projects with the best quality even if the project resources was distributed between Sigma Kudos offices around the world.

Sigma Kudos has long experience with working with other content management platforms but the decision was made to develop an own platform based on the experience that a specialized platform for technical information, only focusing on the core processes of producing and distribution technical information was needed. Sigma Kudos also has a vision of a smarter way of producing and consuming technical information, a vision which is realized within DocFactory.

Sigma Kudos assembled a core team with more than 35 years of aggregated experience of developing and deploying content management platforms.

The first release of DocFactory was released 2007-12-01.

## Corner stones

DocFactory is designed and implemented on a few but very important corner stone's:

### Topic Based Information

By organizing content into topics, the biggest challenges facing technical publication groups are met, and authors can achieve several goals simultaneously:

- Content is readable even when accessed from an index or search, not just when read in sequence as part of a chapter in a manual.
- Content can be organized differently for online and print purposes. Authors can create task flows and concept hierarchies for online orientation, and still compile a print-friendly output that can be published as a manual.
- Content can be reused in different information products/brands. Since a topic is written to make sense when accessed randomly (for example, by search), it should also make sense when included as part of different products' deliverables.

### Efficient Information Management

Traditional content management systems do not provide complete coverage of information management functionality which imposes a huge overhead of manual work. DocFactory focuses on reducing this overhead by implementing integrated management and reporting functions.

DocFactory uses a powerful concept known as faceted search to provide efficient and dynamic navigation to information.

Faceted search is a technique for accessing a collection of information objects represented using a faceted classification, allowing users to explore by filtering available information. DocFactory allows the assignment of multiple classifications to an information object, enabling the classifications to be ordered in multiple ways, rather than in a single, pre-determined, taxonomic order (such as a tree or a matrix).

Using this concept, product information type, product function and product variation are facets of information objects. It is easy to dynamically add more facets to the DocFactory information warehouse to enhance navigation when needed – there is virtually no limit to the number of facets that could be used.

### Topic Applicability

DocFactory uses the concept of facets to provide efficient and dynamic classification of information. DocFactory allows the assignment of multiple facet classifications to an information object, enabling an information object to retain multiple classifications, like information type, product function etc.

Using this concept, facets are used at navigation but can also be used for filtering of information object, for example towards a specific information type, brand, product, product variant etc.

## **Content Reuse**

DocFactory enables easy identification of reusable information chunks, including version and variant management of those reused topics. DocFactory also implements support for reusing standard phrases and terms, enabling reuse on paragraph level.

## **Version and Variant Management**

DocFactory versioning allows organizations to create new versions of content, to track which version is currently published, and to maintain previous versions for auditing or recovery purposes.

DocFactory helps organizations meet the challenges of managing changing product and content variants which derive from a continuous flow of new products, content updates, additional languages, and additional distribution channels.

## **Phrase Recognition**

DocFactory implements phrase recognition when writing content, enabling users to get direct access to predefined and approved standard phrases and terms.

## **Object based**

In DocFactory everything is managed as objects according to one or several domain models.

DocFactory provides an advanced object model that enables declaration of feature rich and complex domain models. The basic building blocks in DocFactory domain models are:

- Object classes.
- Object interfaces – contracts for objects and object classes.
- Properties – actual information carriers for an object.

All information (text, XML, images, integers, etc.) is stored as property values for objects. In addition to the basic building blocks it is possible to specify constraints, permissions and behavior for individual properties.

Reuse of information is realized in DocFactory as multiple references to a single information object so that it “exists in several locations”. References are indexed by default by DocFactory making it very easy and efficient to see how and where information objects are used and reused.

DocFactory supports the concept of retention for objects to prevent them from being modified under specific circumstances. This concept allows locking (e.g. at check-out) and freezing (e.g. after approval or publishing).

## **Platform technology**

The DocFactory platform is based on the Microsoft .NET Framework, a development and execution environment that allows different programming languages and libraries to work together seamlessly.

Microsoft .Net Framework combines the framework APIs with technologies for building applications. Windows Presentation Foundation (WPF) is Microsoft’s strategic presentation technology for

Windows smart client user experiences. Windows Communication Foundation (WCF) provides a unified programming model for rapidly building service-oriented applications.

DocFactory implements a modular software architecture in order to be flexible, scalable, customizable, and future proof. Software modules can be easily added and integrated to support customer specific functionality. DocFactory is a data driven platform enabling functionality of the runtime systems or the rendering of publications to be steered with authored data, minimizing the need for application changes to support new brands, models, or configurations.

DocFactory is developed on a foundation of open standards for communication, data exchange, and integration. DocFactory uses component-based architecture on top of the Microsoft .NET Framework to enable communication, data exchange, and integration tasks to work seamlessly within IT environments.

While DocFactory is committed to delivering a comprehensive set of function areas out-of-the-box, Sigma Kudos understands that every industry and organization has unique needs. Rather than treating these needs as an afterthought, Sigma Kudos has devoted substantial efforts to understanding these types of need and we have implemented many extensibility solutions in DocFactory to support them. This extensibility ranges from advanced configurability capabilities to customization interfaces for specific needs using familiar development environments.

## Using open industry standards

### Core infrastructure

DocFactory is hardware agnostic and employs a client/server architecture primarily based on Microsoft technologies. It is therefore the Microsoft Windows operating system that mandate core infrastructure requirements.

Any typical PC environment suitable for serving multi-tiered client/server applications will be compliant with DocFactory.

For optimal performance in a large scale environment we do recommend using a high performance multi-CPU server with gigabit network, large dedicated RAM, redundant disk array and with hardware for backup storage. However, DocFactory will scale efficiently and automatically on the server side with more CPU power, faster network access, more RAM and faster disk access.

### Application infrastructure/architecture

DocFactory is built entirely on the Microsoft .NET Framework which provide nearly all required infrastructure components. In addition DocFactory use the database for durable storage, indexing, logging, crash recovery and transaction processing.

DocFactory is designed in distinct architectural layers which each in turn are modularized into components with strict purpose and contracts. The architecture is extensible by “value added services” that are pluggable into the DocFactory server engine.

In DocFactory all information is managed as objects that can be stored and retrieved in a variety of interchangeable formats, notably XML and JSON.

The structure, behavior and constraints of objects are declared in domain specific models consisting of attributed object classes and interfaces. Such domain models can be declared in XML and/or in any .NET compliant programming language.

In addition, DocFactory may store a complete history of all changes made in a repository making it possible: to track all modifications by date and/or user; to restore deleted information; and even to retrieve the exact state of the repository at any historical point in time. It is also possible to subscribe to changes using for example RSS and/or e-mail.

## **Business processes**

DocFactory Server use Microsoft Workflow Foundation (WF) and Windows Communication Foundation (WCF) for Business Process orchestration (i.e. description and execution).

These framework technologies allow advanced workflow processing, asynchronous dispatching and a very high degree of interoperability with external systems (for example using SOAP, RPC or message queuing).

Loose coupling between components are achieved by having distinct architectural layers and a modularized component design. This is fundamental to the design team as DocFactory is a platform used in many different application areas. In addition, information models are loosely coupled too because they are object oriented and often re-used in multiple installations.

Furthermore, the “value added service” feature of DocFactory allow business processing units to be plugged in to the server, this architecture imply loose coupling of business logic and external systems.

## **Simplicity in solutions**

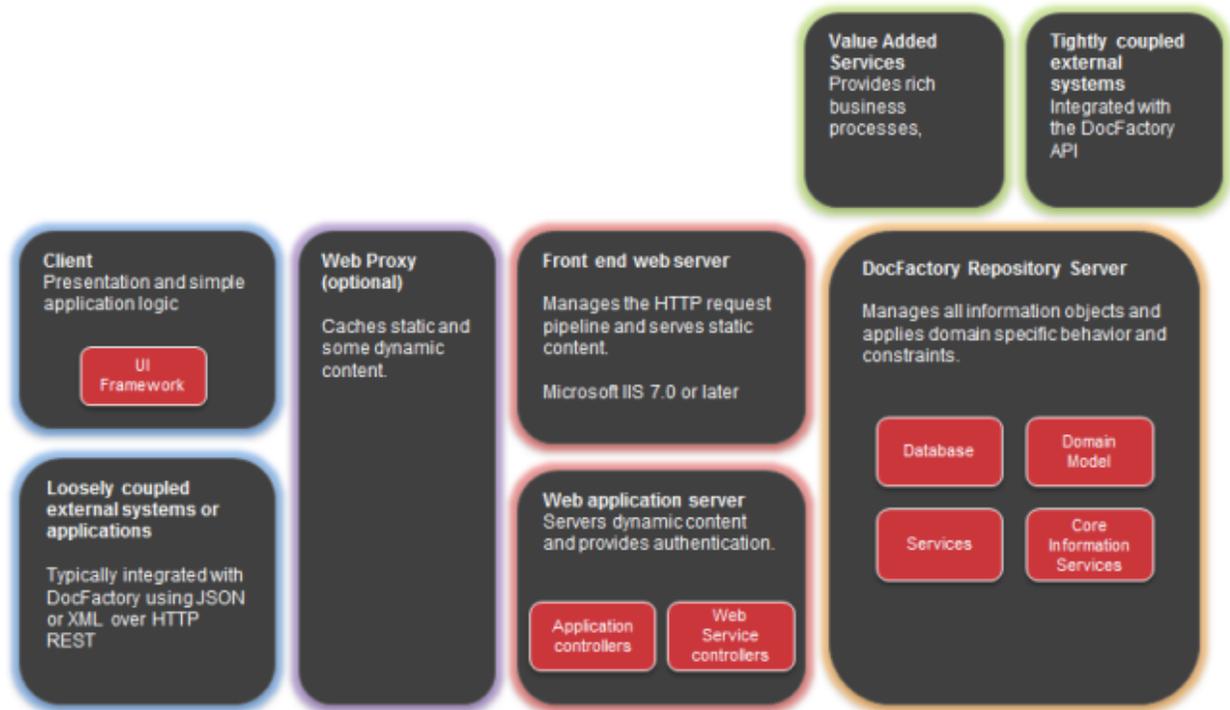
Sigma Kudos develops DocFactory as an information management platform with a primary goal to support multiple application areas simultaneously. This fundamental requirement forces the DocFactory team to use and invent generic solutions and patterns. It also allows Sigma Kudos to maintain and support a single code base having only a few small and well-defined customizations.

## **Robustness**

DocFactory can be setup to use one or more failover servers. A failover server is a redundant server that is replicated from the current active server in real-time by change log shipping.

Upon failure or abnormal termination of the currently active server a switch is made to make the failover server the new current active server. Failover occur automatically without human intervention.

## Application architecture



The application architecture structure and tiers used in DocFactory are:

1. Client – presentation and simple application logic.
2. Proxy server – caches static and some dynamic content. This is an optional tier.
3. Front end web server – manages the HTTP request pipeline and serves static content.
4. Web application server – serves dynamic content.
5. Repository server – manages information objects and applies domain specific behavior and constraints.
6. Pluggable value added services – manages rich business processes and logic.

## Integration solutions

DocFactory provides a .NET API for complex integration. In addition, the following customizable solutions are available:

- XML import/export, either file based or over HTTP REST
- JSON over HTTP REST
- SOAP
- RPC

- RSS notifications
- E-mail notifications and even import of data over SMTP
- Asynchronous message queuing

The typical pattern for another application to integrate with DocFactory is to use JSON or XML over HTTP REST. This is a very easy to use and intuitive form of application integration over the web.

The typical pattern to integrate DocFactory with another application depends on what integration patterns that application supports, but the most common pattern is to use XML import/export to transfer information objects.

This import/export may either be human controlled by implementing a “feature button” in the DocFactory user interface that start export or import of a pre-defined information set, or by declaring a business process as a DocFactory value added service that runs import/export integration towards the other application continuously or over a time schedule.

## Performance

DocFactory provides intricate indexing techniques for information objects so that queries in the application can be executed only on the relevant indexed information. In addition, each information object is associated with a “change version” (a concept similar to ETAG in HTTP) enabling intelligent caching of information on all tiers in the system.

Furthermore, DocFactory has a transparent reporting feature that allows complex aggregated information objects to be reconstructed automatically in the background when needed or on a time schedule.

The multi-tiered, multi-layered and modularized architecture in DocFactory provides the means for ensuring high quality and high performance operation.

Full integration builds are run on a daily basis on the DocFactory code base. During integration builds the code quality and logical correctness of all features in DocFactory are tested by running several thousand unit tests and benchmarking scripts. The development team is therefore constantly updated on how their work affects all parts of the system.

## Secure solutions

DocFactory uses the following infrastructure components/services for authentication and authorization:

- Passwords digest – password based authentication scheme provided by DocFactory. Passwords are never stored or transmitted in their plain form, but always using a time limited hash digest. This authentication scheme is similar to HTTP Digest.
- User certificate – authentication scheme based on private/public key pairs. This authentication scheme support authentication using smart cards.

- NTLM or Kerberos – DocFactory authenticate users by using Windows integrated security, allowing true corporate single sign on.
- Trusted security token provider – By registering a trust based on certificates it is possible to authenticate users in DocFactory using a third party security token provider.

There are two kinds of security principals in DocFactory: Users and Groups. Each principal can be member of zero, one or many groups.

DocFactory enables object level access control by granting and/or denying permissions to principals per object or group of objects (access control inheritance). This access control model is similar to and compatible with the access control model (role based access control lists) in the Windows operating system.

## Recommended system environment

The following client- and server system environment is recommended.

Environment	Hardware	Software
<b>Client</b>	No specific hardware requirements	Microsoft Windows XP or later .NET Framework 3.5 or later
<b>Server</b>	Microsoft Windows Server 2008 or later Internet Information Services 7 or later Database engine	1 CPU (XEON 55xx, 4 Cores) 6 GB RAM RAID1 System Disc RAID10 Data/Log Disc (2 15k SAS)  If the server load is heavy and more data is stored and managed, the following is recommended to ensure optimal performance: 2 CPU (XEON, 55xx, 4 Cores) 12 GB RAM RAID1 System Disc RAID10 Data Disc (2 15k SAS) RAID10 Log Disk (2 15k SAS)  If the server is a virtual server, it should be enough with 2 – 4 Cores and approx. 2 – 4 GB RAM. The data storage should be on a high performance disc with approx. 50 – 100 GB of storage space

# Agile work methods

One of the primary goals for DocFactory is to support multiple application areas.

A small board (group of people) is responsible for the success in each application area while another board is responsible for the big picture (DocFactory as a platform). This approach combined with our agile work methods and practices enables Sigma Kudos to achieve quick responses to requirement changes and to quickly resolve bugs and other issues.

When new features are introduced to DocFactory they are typically first considered and designed as customizations for a specific application area. By refining and generalizing such new features, Sigma Kudos strives to incorporate mature features into the DocFactory core feature set. This makes maintainability feasible over time and enhances quality and operation of each individual feature.

The DocFactory team is using the following agile methods and practices in the development of DocFactory:

## **Feature Driven Development (FDD)**

Sigma Kudos is using this iterative and incremental development process to overcome weaknesses in the traditional waterfall model. It allows us to quickly adapt to new requirements and to early detect impediments in the development process to prevent them from becoming production problems.

## **Extreme Programming (XP)**

Sigma Kudos is working with frequent releases of DocFactory, typically once every three weeks. The extreme programming method is used to plan, review, test and evaluate the code base in small iteration steps by tight development groups.

## **Test Driven Development (TDD)**

This development technique, related to XP, is used in each development cycle and for each component in the system. When a new component is designed we also define a set of test cases for that component that verify the intended behavior. This is done before implementation of the component and ensures high quality and a good modularization.

## **Continuous Integration**

Sigma Kudos is using automated build processes integrated with our source control manager. The automated build validates all test cases and applies quality control and coding policies on every change of our code base. This technique combined with XP and TDD allows us to quickly identify and resolve problems and gives project managers great control of progress.

## **Quality assurance**

Sigma Kudos implements a Quality Management System, which is the key to managing our processes. The management system is critical for developing and delivering quality services/products as well as

satisfying the customers' quality requirements, complying with regulations, or meeting environmental objectives.

The Sigma Kudos Management System is ISO 9001:2000, ISO 14001:2004 and ISO 27001:2005 certified. These certificates are tokens of our process focus and commitment to delivering services/products of the highest quality. The ISO certification also requires that we demonstrate that we measure our performance through our management systems goals and key performance indicators.

## About Sigma

Sigma is a long-term business partner within information technology. The Sigma Group consists of 1,400 committed and skilled employees in nine countries. Sigma is listed on the Nasdaq OMX Stockholm Small Cap-list.

Sigma carries out operations within the two business areas, Information Logistics and IT & Management. Sigma's deliveries are coordinated at the group level and cuts across the ordinary subsidiary and business area boundaries in both our delivery forms, Specialized Services and Managed Services.

Information logistics is our collective name for our technical information and information management offerings. The formulation and management of information is the critical factor in how a product is perceived by the end-user. Our information logistics customers are primarily development units within customer companies, who are themselves often leading, global companies at the cutting-edge of their respective industries.

Several of our services are delivered independently of geographic location and involve the customer's and Sigma's establishments in other countries. We also offer advanced IT support, which, working together with our information processes, enables us to take comprehensive responsibility for your information management. The majority of our information deliveries are made as part of our 'Managed Services' commitment, and are carried out under the brand Sigma Kudos.

Our delivery is based on quality-driven development. We constantly measure a number of quality factors, not only in the actual delivery, but also in the way our own processes meet our customers' demands. Our units are ISO certified within information security, and from an environmental and quality perspective.

For more information about Sigma Kudos, visit [www.sigmakudos.com](http://www.sigmakudos.com).

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