Company

A company can have one or more factories and is a legal entity.

Factory

A factory is a location that is or belongs to a company and that can be a manufacturer, service provider, supplier or customer. A real factory is not to be confused with a Virtual Factory, which is a virtual model entity. A real factory always has a physical location.

ADVENTURE Virtual Factory

A temporary strategic alliance of factories from multiple partners/companies, managed by a distributed, integrated, computer-based system – the ADVENTURE Platform – that interfaces with all systems necessary to make design, production and delivery of a product possible.

The core of the ADVENTURE Virtual Factory is a Smart Process, which integrates reusable smaller processes and other metadata from the ADVENTURE Repository, defined by the ADVENTURE enabled factories that take part in the Smart Process.

ADVENTURE Framework

The framework provided by ADVENTURE comprises…

1. **ADVENTURE Platform**: The complete technological and software components of ADVENTURE.
2. **ADVENTURE Methodology**: A guideline to perform ADVENTURE Adoption and creation of a Virtual Factory.
3. **ADVENTURE Knowledge Base**: A knowledge and information repository that encompasses patterns, guidelines, best practices, reference models, etc. for the context of ADVENTURE and the ADVENTURE Methodology.

ADVENTURE Roles

There are two roles involved in ADVENTURE:

1. **ADVENTURE Facilitator**: The person who performs the ADVENTURE Adoption in a real factory. The ADVENTURE Facilitator can be an employee of the factory where ADVENTURE is about to be adopted, or can be an employee of the company that the factory belongs to, or even an employee of a partner company, which is interested in the factories' participation in ADVENTURE.
2. **ADVENTURE Broker**:
    a. The person who designs/creates a process, proposes business opportunities to ADVENTURE Members and ADVENTURE Enabled Factories.
    b. The person who watches / supervises the Smart Process while it's in the Execution Phase.

    The ADVENTURE Broker will usually be an employee of a real factory/company. He is the person who uses the tools provided by ADVENTURE. The subparts a) and b) could be different persons with a different set of access rights though.

Smart Process

Manufacturing processes designed utilising the ADVENTURE Framework and collaboratively executed by the parties participating in an ADVENTURE Virtual Factory.

ADVENTURE Adoption

The process of …

1. … setting up the necessary hardware and software to use the ADVENTURE Dashboard and the tools ADVENTURE provides,
2. … integrating the ADVENTURE Platform with the systems used in the Factory, e.g. ERP systems, etc.
3. … performing the ADVENTURE Provisioning for the factory.

ADVENTURE Provisioning

The process of identifying the necessary data about a factory and its processes, that are needed to take part in Smart Processes, and the formatting of this data in appropriate ways (so the data is compatible with the ADVENTURE Repository) and the process of putting this data into the ADVENTURE Repository. ADVENTURE Provisioning is supported by the ADVENTURE Methodology and a Data Provisioning component accessible through the ADVENTURE Dashboard.

ADVENTURE Repository

A cloud-based storage for all data needed in the ADVENTURE Framework, including the services needed to access the data and provide access control.

ADVENTURE Enabled Factory

Performing ADVENTURE Provisioning on a factory makes the factory enabled to take part in ADVENTURE Virtual Factories.

ADVENTURE Business Environment

The group of all ADVENTURE members and ADVENTURE Enabled Factories forms the ADVENTURE Business Environment.

ADVENTURE Member

Performing ADVENTURE Adoption for a factory lets the Factory become an ADVENTURE Member. ADVENTURE Members additionally are ADVENTURE Enabled Factories, as they also can be part of Smart Processes. Only ADVENTURE Members can use the ADVENTURE Platform to create ADVENTURE Virtual Factories, as they have performed the necessary ADVENTURE Adoption.

Smart Process

In a Virtual Factory, several steps and sub-processes need to be executed to produce the desired product. In the ADVENTURE context, the process created by combining individual process steps and existing sub-processes fragments is called Smart Process, as it can be adapted to changes at runtime. The goal of a Virtual

Factory is to create such a Smart Process, to optimize it and to put it into the Execution Phase.

Virtual Factory Lifecycle

The ADVENTURE Virtual Factory lifecycle refers to the process that takes place when the ADVENTURE Framework is used to exploit a new business opportunity. The lifecycle encompasses six main stages: (Collaborative) process analysis, virtual factory design, execution, adaptation, improvement and dissolution. There will be an entire lifecycle for each business opportunity.

Design Phase

The Design Phase is a phase in the lifecycle of a Virtual Factory in which initial Partner Finding is done and in which a Smart Process is designed. The Design Phase includes Process Simulation, to refine the process before it is put into the Execution Phase.

Execution Phase

The Virtual Factory puts its Smart Process into the Execution Phase as soon as the process should be executed and the building of the desired product should begin. The Execution Phase does not stop the Smart Process from being changed, but the Execution Engine needs to represent both, the process currently in execution and the changed (parts of the) process. Additionally, data from Smart Objects can influence the Smart Process during the Execution Phase.

Dissolution Phase

The Dissolution Phase is a part of the Lifecycle of a Virtual Factory that occurs when the Virtual Factory is not needed anymore and will be deleted from the ADVENTURE Platform. During the Design and Execution Phases of the Smart Process, knowledge is gathered about the ADVENTURE Enabled Factories, the used Smart Objects and the involved Processes as well as additional Metadata. Being more than a simple deletion step, during the Dissolution Phase all this Knowledge is formalized and collected in the ADVENTURE Repository, to make future Virtual Factories more efficient.

Partner Finding

Partner Finding is an action involving the Data Discovery component accessible through the ADVENTURE Dashboard to find suitable partners for an ADVENTURE Virtual Factory, which are ADVENTURE enabled factories and ADVENTURE Members that fit the needed criteria. Partner Finding will not only happen during the Design Phase of a Smart Process, but can also happen in the Execution Phase, as the Smart Process can be adapted to changes during Process Execution, which can make the inclusion of further ADVENTURE enabled factories and ADVENTURE Members necessary which didn’t take part in the Smart Process so far.

ADVENTURE Dashboard

The ADVENTURE Dashboard is the graphical user interface for all ADVENTURE components. The ADVENTURE Dashboard is the entry-point for all ADVENTURE users and roles and gives access to the applications developed in ADVENTURE.

ADVENTURE Process Editor

The ADVENTURE Process Editor is a graphical tool integrated into the ADVENTURE Dashboard to design Smart Processes in a BPML kind of language.

ADVENTURE Business Model

ADVENTURE Business Model is a new business model, established by the virtue of the new possibilities of doing business provided by ADVENTURE.

Optimisation

The term optimization refers to solving a given problem optimally, i.e., finding the best possible solution to a problem from a set of possible solutions. A solution thereby describes an alternative that solves the problem. What makes a solution being best depends on the context of the problem and must be specified before solving the problem.

Optimisation in the ADVENTURE context means optimizing the selection of partner factories based on predefined and specified requirements and preferences of the user, i.e., the Broker of the Virtual Factory, including a model of the regarded process as well as a list of candidate factories and appropriate attributes as e.g., capacity, price, size, weight, delivery time, Carbon Footprint, etc.

Component

A component is a part, which constitutes an element of a bigger whole. The bigger whole might for example be a software product (→ software component) or a manufactured good or a machine.

Cloud

An information technology system that adheres to the principals of the cloud computing paradigm. This term is used for cloud storage architectures, cloud computing architectures as well as for combinations of both.

Cloud Storage

A data storage cloud is a distributed system managing a number of storage devices, which effectively provides a very big storage capacity to the user of the cloud storage.

Service-oriented Architecture

Service-oriented Architecture (SOA) is an IT paradigm based on three major concepts: service, interoperability, and loose coupling (cf. Josuttis, N.: SOA in Practice. Bejing, Cambringe, Farnham, Cologne, Paris, Sebastopol, Taipei, Tokyo, O'Reilly, 2007).

Service-oriented Computing implies leveraging SOA concepts regarding modeling, operating and maintaining IT architectures and systems and therewith supporting Business-IT-alignment. E.g., assembling application components into a network of services that can be loosely coupled to (create and) support flexible, dynamic business processes. (cf., e.g., Liang-Jie Zhang. EIC Editorial: Introduction to the Knowledge Areas of Services Computing. IEEE Transactions on Services Computing, 1(2):62–74, 2008.; Thomas Erl. Service-Oriented Architecture: Concepts, Technology, and Design. Prentice Hall PTR, Upper Saddle River, NJ, USA, 2005.)

Service is an IT representation of self-contained business functionality. It therefore either provides or encapsulates software (systems) and provides an interface for (multiple) messages. I.e., in other words, a service is a software running on hardware that can take an input of data and provides a specific output of data or triggers an action in a software system.

Cloud Computing

“Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. This cloud model promotes availability and is composed of five essential characteristics (On-demand self-service, Broad network access, Resource pooling, Rapid elasticity, and Measured Service),, three service models (Software as a Service, Platform as a Service, and Infrastructure as a Service), and four deployment models (Private cloud, community cloud, public cloud, and hybrid cloud)”. (Mell & Grance, 2011)

Ubiquitous computing describes information processing integrated into everyday objects and activities. Thanks to ubiquitous computing discrete everyday objects in the real world can become “smart”.

Future Internet

Over time, the formerly simple and clear internet architecture became a patchwork of new balconies, detours, wormholes, workarounds and bypasses. When designing mechanisms and technology for a future internet, all current and foreseeable demands must be taken into account. The expectation is that there will never be a fixed set of mechanisms and techniques fulfilling all kinds of demands. In consequence, even a newly designed future internet will be subject to ongoing evolution. To avoid an architectural patchwork similar to today’s Internet, there must be evolutionary principles allowing deliberate extensions and replacement of functionality. Service-oriented architectures define structures of loosely coupled self-contained elements (i.e. services), which are well suited to build secure, dependable, flexible and adaptable software systems. In the evolution towards a future version of the internet, a SOA-based system is expected to be the foundation, because the internet can be considered an inherently distributed software system. (Müller, 2008)