# Software Component Technology:
## Concepts, Design, and Management Method

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## INTRODUCTION

Data and Knowledge are at the level of all organizations. Due to the amount of data generated, companies require different analyzes, supporting data-driven decision making (Nimmy et al., 2017). Well-organized management of data and knowledge are the key to the success science related data and then the almost of any enterprise.

The issue of data and knowledge management (Ermine and al., 1996) has been defined as the implementation of a management system that allows all components of the company (Brunet et al., 1994) to use and enrich knowledge and to consider this heritage of knowledge as the same subject of the information system of the company (Ermine, 2000). As a result, the technological revolution has brought about a change in the way information/data is collected (Kamal et al., 2017) and treated and so the implication of the *Components*.

Any conventional design of complex software systems always starts with the identification of the system in parts (subsystems, blocks, class, etc.) where the idea and the concept of the components come from, i.e. the decomposition of the system is to bring out the parts which are interested. It is no coincidence that the notion of component gives a great interest in the development of complex systems.

Certainly, the importance and usefulness of components in scientific research are not new topics, especially in the reuse of components. Formerly, this work focuses on the complete definition of component-based information systems approach design.

The idea of component-based development is introduced by defining the concept and providing its management. The approach primarily seeks to explain and analyze and manage the variety of data and information exchanged in a company. This method is useful for a global vision of the company's system, using phases and steps designed tailored to the needs. This represents a lot of "Components" not yet developed in implementation.

The difficulty is to design the components and the services most relevant to the goals. Design requires a method for modeling that involves creating a virtual representation in such a way as to bring out the goals interested in and build upon.

In fact, there is no standard for modeling a component-based system, so it is necessary to try to propose a component identification approach, and an approach to illustrate the management of a software system.

The objectives of this chapter the contribution of a new solution of the method based on software components, and a communication management approach between these identified software components mediators between the components and the information system. Hence, the idea that software systems can be developed by components intended to provide specific services such as combining, managing, connecting and communicating between system units.

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This paper is organized in separate paragraphs and sections, distributed as follows:

- Section 2: Provides definitions incorporating general discussions on Data Management and Component Development, presents the state of the art (literature review).
- Section 3: formalizes the model of the proposed approaches.
- Section 4: presents the different elements of the technology served in this area.
- Conclusion: The paper ends with a conclusion.

## BACKGROUND (SECTION 2)

Commonly, a system processes the data with a set of actions from a huge store of information and then invoking the input / output functions. A computer system has the function, in a very general way, of processing information. One of the first difficulties is to define the notion of information and in particular to delimit it in relation to related notions such as data and knowledge. Knowledge is used all the time and on many occasions, it refers to information. The difficulty of defining knowledge comes from its relationship to two concepts, data and information. Data are not organized in any way and provide no further information. As a result, data, information and knowledge are defined as follows:

The first concept to meet is the **data** which is a raw element not yet explained or guessed. The contextualization in an interpreted **data**, by creating one or more added values, generates **information** (Davenport & Prusak 2000).

**Information** systems are supported by processing systems that process only data and then the **data** is transformed into **information** when it is communicated to a human being capable of interpreting and deciding it(Bali et al. 2009).

The interpreted **information** is then transformed into contextualized **knowledge** and put in relation with existing **knowledge**.

Subsequently, **knowledge** comes and considers itself as **information** understood, that is to say, assimilated and used, which leads to an action(Davenport & Prusak 2000).

For **data** to become **information**, it is required to be contextualized, categorized. The **data** give the key to make the decisions and methods suitable for improvement (Kamal and al., 2016), supporting data-driven decision-making and management.

Design of meaning assigned to the data to make it an information and knowledge in a Micro-credit Agency does not extend credits for people over 60 years of age: the **data** 05-11-1956 generates the **information** that November 5, 1956 is a date of birth and 64 years is the **knowledge** that will alert and decide that his file will be rejected by the system.

In order for Knowledge Management (KM) to succeed, one needs a deep understanding of what constitutes knowledge.

More technologically, it is often treated as something can be codified and transmitted, similarly to information mainly involving information systems- knowledge. These two terms are often regarded as lower denominations of knowledge. However, even today, some KM systems are little more than information management systems using knowledge as a virtual synonym for information. Here, in summary the meeting of the three concepts:

- **Data** is the lowest point, an unstructured collection of facts and numbers;
- **Information** is the next level, and it is regarded as structured data;
- Finally **knowledge** is defined as “information about information”.