Chapter XVI
COCA:
Concept–Oriented Course Architecture Towards a Methodology for Designing and Teaching Information System Courses

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ABSTRACT

This chapter introduces the concept-oriented course architecture (COCA); an architecture that utilizes IS concept as a fundamental building block to guide a methodology for designing and teaching IS courses. COCA aims at supporting rapid composition of IS course/curriculum out of a sound and complete set of IS concepts provided by well-specified business models, market or standardization organizations such as ACM and IEEE. COCA is defined, composed of three roles: (R1) concept providers, (R2) a concepts registry, and (R3) IS course/curriculum designers. These roles interact through four operations in order to design/teach an IS course/curriculum: (O1) publish, (O2) consider, (O3) validate, and (O4) teach. This methodology, based on a flexible, scalable, well-specified architecture of the IS concepts and their organization, will assist the complex and resource-consuming task of designing and teaching IS courses in the information age, where the IS tools, including management information systems (MIS) and information technology (IT) are rapidly evolving.

INTRODUCTION

In the information age, businesses are becoming more and more customer centric, and their main role is to serve customers at their moment of value. They are focusing on information that describes the customer moment of value, that is, the delivery information related to: time (when to deliver), location (where to deliver), and form (form and quality of delivery) (Haag, Cummings, & Dawkins, 1999). The information becomes then a key resource to gain competitive advantages (Laudon & Laudon, 2005). This has changed the way we view the concepts of information, information systems (IS), and the function of MIS, which mainly consists of planning for developing IT in order to capture, store, use, communicate, and manage the information (Haag et al., 1999; Kaplan et al., 2004).

Accordingly, setting IS concepts and courses, composing flexible curricula out of them, and

teaching these curricula needs to be flexible and even dynamic, which is a complex activity, yet of paramount importance to both education and market (Martin & Deans, 1994; McGinnis & Slauson, 2003). This requires a methodology based on a flexible, scalable, and well-specified architecture of the *course concepts*, their relationships, and their organization.

This chapter introduces COCA as a paradigm that utilizes course concepts as a fundamental building block to build courses/curriculum. Course concepts are open concepts that support rapid composition of IS courses/curriculum out of a sound and complete set of IS concepts adapted to the market requirements, namely the business changing and IT innovation. They encapsulate the fundamental organization of IS discipline concepts and paradigms concepts, which are open components that support rapid composition of an IS course/curriculum.

COCA is defined, composed of three roles:

- **(R1) Providers of the concepts:** They may be the instructors themselves, the standardization organizations such as the Association for Computing Machinery (ACM) or the Institute of Electrical and Electronics Engineers (IEEE), the market; or well-recognized valid business models. However, COCA considers a valid business model as the main concepts provider. Indeed, we believe that we cannot design and teach IS courses/curriculum without having in mind a valid, flexible business model that represents the properties of today's businesses.
- **(R2) Registry of concepts:** Where the providers register their concepts, a registry may be public or private.
- **(R3) Designers** of the IS courses/curriculum.

These roles interact through four operations in order to design or teach courses/curriculum:

- **(O1) Publish***:* Whereby the providers can publish their IS related concepts
- **(O2) Consider:** Whereby the courses/curriculum designers can look up and find the concepts in the registry in order to consider them in the composition of an IS courses/curriculum
- **(O3) Validate:** Whereby the course/curriculum designers can validate the courses/curriculum they design against the providers
- **(O4) Teach:** Whereby the instructors can access the course/curriculum and the required tools to teach them

COCA aims at:

- Providing guidance for a methodology to design and teach IS courses/curriculum as a composition out of a sound and complete set of concepts representing the business elements and their relationships.
- Providing IS teaching cases, where cases are steadily developed and introduced through progressive instantiations of COCA architecture. An instantiation consists of giving a real value to each element of the architecture.

Therefore, we first describe the most relevant properties of a business, with respect to the IS discipline, such as system, information, business systems, IS, and tools such as MIS and IT.

Next, we develop a business model that represents the fundamental properties of the elements of today's businesses, where the IS provides the right people with the right information at the right time. These elements are: (E1) customer; (E2) operation system and its related subsystems, which are the production system, logistics system, partners, and suppliers; (E3) management/control system; and (E4) IS (or subsystems built on top of it) and its related tools, namely MIS and IT.

Then, we use the business model, as the main provider of the IS concepts, to build COCA.

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