Collaborative Business and Information Systems Design

Peter Rittgen, Vlerick Leuven Gent Management School, Belgium, and University College of Borås, Sweden

ABSTRACT

Collaborative business and information systems design touches a number of issues that lie within the realm of different research areas. It deals with design as such, and in particular with design in and for groups. It is also concerned with socio-technical systems and hence with human-computer interaction as well as IT-mediated human-human interaction. This introduces collaboration issues. The significant complexity of the business and information systems that are in the focus of the design endeavor calls for modeling as an instrument for managing this complexity. This article maps the terrain of collaborative business and information systems design by surveying the contributions that are made by related areas of research.

Keywords: Collaborative Support Systems, Decision Support Systems, Design Methodologies, Electronic Meeting Systems, Information System Design, IS Models, Participative Design, Socio-Technical Design, User-Centered Design

INTRODUCTION

Designing anything—whether a simple object of daily use or a complex information system—is a challenging task. It requires creativity, courage, inventiveness, and a sense for innovation. In the case of businesses and their information systems, the situation is further complicated. On the one hand they determine each other, which makes it impossible to design or study them in isolation. On the other hand these systems are collaborative systems, that is, human beings work together with others and/or computerized systems to fulfill business objectives. This suggests that the design of such systems also has to be a massive collaborative effort that involves contributions from a large amount of stakeholders with different backgrounds: project managers, domain experts, information technology experts, consultants, executives, and so on.

Apart from design and collaboration, there is a third aspect that plays an important role. The complexity of business and information systems is such that building them requires a succession of abstraction layers, each of them more concrete than the preceding one, until a level is reached that can actually be realized. Each of the layers is typically represented as some kind of model. Modeling is therefore also an issue that needs to be considered.

Figure 1 illustrates the three aspects of collaborative business and information systems design (CBISD). It shows that all three overlap

each other with CBISD in the middle. So far a substantial body of research exists concerning the pair wise intersections. The following sections elaborate on that.

The following sections are structured as follows. We first introduce the dimensions of collaborative design. These dimensions are a useful instrument for the classification of collaborative design problems. But they can also help us in finding out which type of solution fits to which type of problem, that is, in understanding the characteristics a solution must exhibit in order to solve the respective problem.

Collaboration issues have been studied thoroughly in a field that is called computer-supported cooperative work. Many of the methods and techniques from this field have been used in the collaborative design of business and information systems; we will take a closer look at them later on.

As already mentioned, the design of business and information systems requires levels of abstraction to manage the inherent complexity. Modeling as a discipline provides the tools (e.g., modeling languages and methods)

to handle each abstraction level. We therefore focus on aspects of collaborative modeling in the fourth section.

The section after that briefly outlines approaches to collaborative and model-driven design. The former deals with issues such as participatory design and user-centered design, the latter with the model-driven architecture of software design.

DIMENSIONS OF COLLABORATIVE DESIGN

We distinguish three dimensions of collaborative design: type of group, abstraction level, and degree of participation (see Figure 2). The parameter type of group relates to the homogeneity of the design group. In a homogeneous group all participants have a similar background and share common knowledge with respect to the design problem. An example of such a group is a number of architects that work on the design of a house. They have the same education and they master the common design language of architectural drawings. They also share knowledge

Figure 1. Collaborative design and modeling
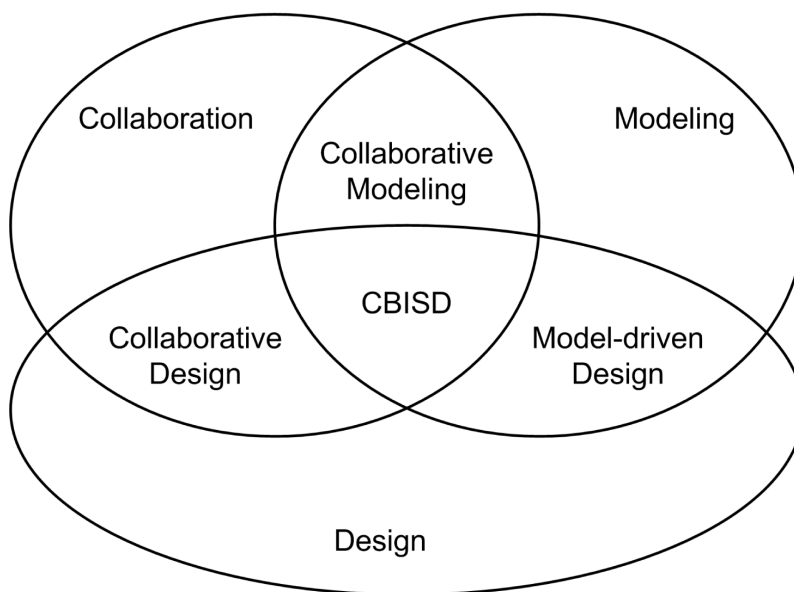
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