In this chapter, we take a deeper look at the problem area and provide a comprehensive example from the field of supply chain management that will be used throughout the book, particularly in Chapters 4, 5, and 7, to explicate various aspects of the approaches introduced herein. Readers interested in an overview of the results presented may browse this chapter to only get an impression of the problems motivating the methods and procedures described in this book and to get an idea of the running example also used in other chapters.

Collaborative business processes (CBPs) as defined, for instance, by Coetzee and Eloff\(^{22}\) denote business processes that span organisational boundaries in order to support business interactions involving cross-organisational workflows. Modelling of such CBPs has been discussed, for instance, by Lippe \textit{et. al.}\(^{23}\). The definition of workflow views that provide as much information as required to allow for specification of CBPs assuring cross-organisational interoperability, but at the same time as less information as possible about the internal aspects of a workflow as implemented by a particular partner in a CBP is considered essential\(^{24}\). Approaches to provide the required functionality for cross-organisational workflows based on SOA are considered particularly beneficial\(^{25}\). SOC established by those approaches facilitates the definition of CBPs. Standardised BPDLs play a central role in the definition of CBPs due to their ability to specify business processes on top of Web services and their platform-independency\(^{26}\). Though currently the definition of executable business processes across organisational boundaries seems not yet to have found much interest in research, using standardised BPDLs particularly for this purpose would exploit the capability offered by a standard more than is done currently. This consideration will be explained in more detail below.

In an SOC environment, first the situation is considered where the task of defining CBPs and related enhanced Web services using a BPDL is distributed between several nodes in different organisations. This state-of-the-art employment of a BPDL, where each organisation engaged in a particular CBP defines on its own the respective business processes or enhanced Web services executed within their system, is

\(^{22}\) Coetzee and Eloff, 2003
\(^{23}\) Lippe \textit{et. al.}, 2006
\(^{24}\) Dickson \textit{et al.}, 2004
\(^{25}\) Papazoglou and van den Heuvel, 2007
\(^{26}\) Sayaha and Zhang, 2005
depicted in Figure 2. Of course, agreement on the overall task of the CBP has to be achieved between the organisations involved.

Figure 2 illustrates an exemplary environment for the distributed development and execution of a BPDL-defined collaborative business process, with two systems residing in two different domains A and B. Each node depicted in Figure 2 is supposed to belong to a different organisation, but still is capable of running processes defined in a particular BPDL.

![Figure 2: Collaborative Business Process Using Locally Defined Subprocesses](image)

Consider the case where in domain A there is a need for a CBP, for instance, in a supply chain application, requiring information IA offered by a Web service W2 at system 2 in domain B. Because of restrictions imposed by security policies in domain B, Web service W2 would not be allowed to be accessed directly from outside domain B, because, for instance, it provides further information besides IA that must not be leaked from domain B. For solving this conflict with security policy restrictions, a conventional approach would be the provision of an enhanced Web service in domain B, say W1 at system 2. W1 would access the information required from Web service W2 and offer the non-restricted part of the results (i.e., IA) to system 1 in domain A across the domain boundary. Since a business process defined by a BPDL script offers services to its environment, it can itself be considered a Web service. Therefore, in this example W1 is assumed to be defined by a BPDL script S1.