

Legitimacy Checking in Communicative Workflow Design

Aldo de Moor¹ and Hans Weigand²

¹ Tilburg University, The Netherlands, AdeMoor@uvt.nl

² Tilburg University, The Netherlands, H.Weigand@uvt.nl

Abstract. Communicative workflow modelling is key to describing, analyzing, and designing business processes in virtual collaborative networks, such as present in e-commerce. To make workflow models meaningful and acceptable to all partners, their legitimacy must be ensured. To this purpose, the underlying norms must be made explicit and used to check model acceptability. A key class of communicative workflow models are captured by our extended workflow loop. Using this loop as the basic unit of analysis, we introduce the concept of workflow loop norms, grounded in, amongst others, internal control theory. Workflow loop schemas are used to represent workflow situations, allowing for actual or proposed situations to be matched with the norms. Using these constructs, we outline our legitimacy checking process for workflow designs, and illustrate it with a case.

1 Introduction

In today's networked organizations, organizational hierarchies are rapidly becoming less relevant for structuring business processes. Intra-organizational, self-organizing teams, learning organizations, and inter-organizational e-business alliances are emerging in which fixed power and communication structures no longer suffice. To make sense of the increasing organizational complexity and dynamics, and to design more adequate supporting information systems, a workflow view on organizational interactions is often helpful. A good example is the increasing prominence of supply chain modelling [KS03]. Thus, workflow modelling is becoming increasingly important as a structured way of describing, analyzing, and designing the collaborative business process.

Many workflow models exist, ranging from Petri-nets representing logistical or production workflows [Aal97] to approaches that capture more of the organizational semantics of business processes [Sch96]. One class of workflow modeling approaches takes a communications view, grounded in the Language/Action Perspective (LAP), as originally introduced by Winograd and Flores [WF87]. In contrast to data-oriented methods such as those based on state-transition or UML interaction diagrams, LAP modeling is based on the notion of *communicative action*, which implies that workflows are seen as grounded in social relationships and focused on organizational coordination.

For example, a request for a certain good not only aims at the performance of a particular action, but is also an action in itself. A successful request creates a commitment for the party that has promised to deliver a service, for instance, thus changing the social world. LAP workflows are represented as *communication loops* between business *roles*. For example, in the Action Workflow approach [MMWFF93] *customers* and *performers* go through four communication acts: in the *preparation*, a customer asks a performer to do something; at the end of the *negotiation* stage, the performer promises to do this; in the *performance* the performer reports that he has done so; and, finally, with the *acceptance* act the customer reports that she is satisfied. In the DEMO (Dynamic Essential Modeling of Organizations) approach [DV98], an *initiator* and an *executor* subsequently (inter)act in similar *order*, *execution*, and *result* stages.

From a coordination perspective, communication loops are more than sequences of communicative acts. LAP imposes a certain normative structure on communication processes [Wd03]. For instance, ActionWorkflow modeling requires communication loops to be complete, or “closed”. This means that all stages of a communication loop must be followed, none can be skipped. Another example of a communication norm implicit in, for instance, DEMO, is that the initiator of a transaction must also be the person who evaluates the success of that transaction. It can be argued, however, that, especially in a complex network organization, such evaluative activities can be delegated to third parties. Also, many workflows spawn other workflows, making the coordination of their interdependencies soon very complex. An additional factor is the strong co-evolution of social and technical requirements in the modern organization [Lym96]. The resulting dynamics in organizational requirements, structures, and behaviour greatly increases the complexity of workflow analysis.

In order to ensure successful organizational performance, the workflow specifications of electronic business networks need to be legitimate, implying that they are both meaningful and acceptable to all partners.¹ Such legitimacy is essential to create a sense of trust and ownership in the network and its supporting IT infrastructure. Central to this analysis are the communicative norms that apply to the workflows of a particular community. To ensure the legitimacy of workflow models, it is important that (1) underlying norms are made explicit and (2) actual or proposed workflow models are checked against these norms. However, the complexity of the communicative norms resulting from their subtle definition, compounded by delegation, recursion, and evolutionary aspects, makes manual analysis very hard to perform. In this chapter, we therefore propose a formal approach to the legitimacy checking of communicative workflow loops, as this helps to deal with representational and reasoning complexities.

¹ [dJ01]