

Performatives, Performatives Everywhere but Not a Drop of Ink

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Abstract. The feasibility of open, flexible electronic commerce relies heavily on the effective management of documentary procedures, i.e., the sequence by which (structured) business documents are exchanged among contracting parties. The communication of such documents is not merely the passing of information, but reflects, indeed *enacts*, the formation and discharge of commitments. Such communications are called *performative* (versus informative) in that the act of communicating itself is a social action that alters the (contractual, legal, ownership) relationship among the parties.

This paper proposes four tasks for supporting performative aspects of electronic commerce. The first is that performative documents be communicated using cryptographic protocols (including digital signatures) and the involvement of trusted third parties. A special problem is negotiable documents, which may involve the use of chip cards, specialized registries, or both. The second task is the definition of a common, publicly available language for the specification of documentary procedures, which is formal, computable and executable. We propose a formalism, called Documentary Petri Nets, for this purpose. The third task is the definition of standard business scenarios using this representation. This definition might be done on a proprietary basis, or perhaps by industry-wide user groups and/or international bodies such as the ISO (International Standards Organization) and the ICC (International Chamber of Commerce). A CASE (Computer Aided Software Engineering) tool presented in this paper, InterProcs, is designed to support undertaking this latter task by providing both a modeling platform and a testing environment for proposed documentary procedures. The fourth task is development of an architecture and a protocol for sharing these procedures among contracting parties. Three modes are suggested: globally standardized procedures; proprietary procedures; and multi-lateral coordination.

1 Performative Aspects of Commerce and Public Administration

1.1 Performatives as Social Action

Our everyday world consists of a variety of physical entities such as houses, cars and people, with corresponding physical properties, such as color, size, and location. But also in our everyday world are a wide variety of non-physical

entities, properties, and relationships. Examples include corporations, government agencies, departments in these organizations, one's position of employment, ownership (of land, of objects), contracts, promises, rights, privileges, and so on. These belong to the social aspect of our world. That aspect is putative—we believe in the existence of these things—yet, for the most part they are not directly perceptible. Though we may recognize the buildings of a corporation, the legal entity itself is invisible; it has neither color, nor shape. Likewise, we regularly acknowledge a wide variety of social properties and relationships—that Smith is a lawyer, that John and Alice are married, that Jones owns the house on the corner. Again, these are aspects of our world that we do not directly observe.

What is the basis of this invisible world? It is not material and does not arise in the way that atoms, electricity, and black holes do. Rather, it is consensual, a product of social interactions and institutions. These are conventions that make our societies work. A promise to meet for lunch or a contract to build an airport are ways to achieve coordination of human behavior. This leads us to consider the dynamics of this social world, how social entities, properties and relationships are brought about, modified, and terminated. We refer to this as *social action*.

The focus of this paper is on how social action and social coordination might be supported by computerized telecommunications networks. The goal is not only to make social coordination more efficient, reducing the effects of distance and bureaucratic red tape, but also more effective in permitting new types of inter-organizational relationships and alliances not presently feasible.

Computerized networks supporting social action are appearing in a wide variety of areas, such as automated teller machines, airline and hotel reservations systems, automated supplier ordering, and electronic financial markets. However, our objective is not simply to observe such developments, but rather to develop a deeper, more formal theory of the principles they reflect. Presently under development is a representation language and modeling platform for social action infrastructures. In the course of this project, we hope to demonstrate the design and behavior of a wide variety of computerized social agents and institutions, both private and public sector, and how they might flexibly interact and mutually adjust their behaviors. We also seek to make these systems adaptable by their human constituency.

In this paper we focus specifically on *doing* business via electronic networks: e-business as well as related e-government interactions with agencies such as customs and other regulatory authorities.

An important enabler for electronic commerce is the evolution of electronic document interchange (EDI), providing standard, computer-interpretable formats for common business documents so that many routine transaction-oriented communications can be handled directly by the parties' computers, without human intervention.