Abstract. Many previous attempts at classifying business rules rely on oversimplified frameworks that conflate business concerns with technical features. Such frameworks hamper traceability between information systems and business needs and can lead to paradoxes that are difficult to reconcile. This paper offers an alternative framework for business constraints, including those that can be embodied in information systems. We assume that such information systems are likely to be automated, but the proposed scheme does not rely on any automation. The paper uses several examples to illustrate the issues that arise with current classification frameworks and the benefits that a more realistic framework can provide.

1 Introduction

The capture, modeling, and management of business rules has been a major concern for two decades. More recently, there have also been several initiatives aimed at defining standards relating to business rules.

A persistent interest has been the desire to classify rules into a number of categories. As was shown in [1], however, a recently popular categorization scheme used in SBVR [14], classifying rules according to the modal-logic categories “alethic” and “deontic”, leads to some serious and intractable paradoxes, such as:

- the anomalies of the idea “alethic business rule”;
- being forced into the anomalous expedient called “enforcement levels”.

This scheme also contributes little help to the problem of providing traceability of business concerns, between different expressions or artifacts classifiable under it.

But it is not only this categorization scheme, as such, that leads to such paradoxes and issues. A deeper analysis shows that an over-simplistic but common assumption about information systems and their development frameworks leads to these problems. On the other hand, a more realistic and flexible approach to these matters effectively resolves these problems.

Section 2 of this paper explores a more generic approach to frameworks and their construction. In section 3 we elaborate consequently a more-flexible framework for business-constraint capture and modeling, which remedies the built-in, over-simplistic assumption inherent in traditional frameworks and causing the above problems. In section 4 we locate, within this framework, the native “levels” or domains of several
different types of business constraint, and indicate some natural mappings between some of these rule types. In section 5 we draw out a further, perhaps unexpected benefit of this set of categories, for information-system design. Section 6 presents our conclusions.

2 Towards a More Generic Approach to Information-System Development

2.1 The Organizational Need

In this section we define some concepts that are precursors to the discussions in later sections. This a necessary step, because there is no consistent set of terms used in the available literature. In fact, the opposite is true: the same terms are used in different senses by different authors, making it hard to compare the underlying significance of different approaches. In this paper we are primarily concerned with the construction of computer-based information systems, but we believe that the approach is sufficiently general to encompass other outcomes, such as defining activities that have no corresponding computer implementation.

The general scenario we assume is the following. An organization wants some particular concerns addressed in a systematic manner. These concerns relate to activities carried out by the organization and/or records kept by the organization of its activities. The organization deliberately wants to constrain its activities and/or record keeping so that it is coerced towards operating in a particular fashion. For example, the organization might wish to meet certain goals, or avoid particularly undesirable situations. Recent legislative moves, such as the Sarbanes-Oxley Act [2] have added a further dimension. It is no longer sufficient to state out some directives and assume that they will be followed. Organizations (particularly senior executives in those organizations) need positive assurance that either a directive is definitely followed, or the management chain is alerted to its non-observance so that relevant action can be taken.

Such issues have raised interest in traceability between organizational needs and how those needs are being satisfied. For example, in the context of a computer-based information system we might want to ask the following questions:

(a) considering a particular organizational concern, how is it addressed in the information system?

(b) considering a particular element of the information system, what organizational concern(s) does it address?

We return to the topic of traceability in a later section.

2.2 The Use of Models

Our approach to the situation outlined above is based on the use of models. Here, we define the terms that we use in our descriptions.