Chapter 21
Exploring Enterprise Information Systems

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ABSTRACT

The concept of an Enterprise Information System (EIS) has arisen from the need to deal with the increasingly volatile requirements of modern large-scale organisations. An EIS is a platform capable of supporting and integrating a wide range of activities across an organisation. In principle, the concept is useful and applicable to any large and SMEs, international or national business organisation. However, the range of applications for EIS is growing and they are now being used to support e-government, health care, and non-profit / non-governmental organisations. This chapter reviews research and development efforts related to EIS, and as a result attempts to precisely define the boundaries for the concept of EIS, i.e., identifying what is and what is not an EIS. Based on this domain analysis, a proposal for using goal-oriented modelling techniques for building EIS is constructed; the proposal is made more concrete through illustration via an example.

INTRODUCTION

This chapter focuses on a grand challenge for organisations: dealing with their evolving requirements and goals, and the impact of these changes on their Information Technology (IT). In particular, we are interested in large-scale organisations such as multi-national companies, or public-sector organisations, which are sometimes called *enterprises* in the literature.

Organisations use IT in many different ways: to facilitate communication, to support commercial transactions, to advertise, etc. In order to understand the effect of organisational and enterprise changes on use of IT, we start by defining the nature of an organisation. The current literature defines that an organisation is thus about a group of elements (human, automated system, structure, policy etc) that

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are arranged in a specific manner to accomplish a particular purpose (Buck, 2000; Laudon & Laudon, 2007; Terry, 1975). This definition applies to small, medium, and large-scale organisations.

As we said earlier, a large-scale organisation can sometimes be designated by the word *enterprise*. However, we find it helpful to be more precise in defining enterprise; in our view, an enterprise is a large-scale organisation that is involved in, and must orchestrate, more than one independent business processes. We come to this definition by observing that many organisations, such as small IT houses, engage in a single business process. Identically some large organisations, such as online retailers, have a single business process. Organisations that have many different business processes, that must be coordinated in some way, such as Mitsubishi, have different requirements and different characteristics. Such organisations are often very large scale (e.g., public health organisations) and multi-national. In our view, the need to coordinate different business processes is a key characteristic in distinguishing an enterprise from another organisation.

This paper investigates the validity of an assumption regarding the root of complexity of IT systems in complex organisations, where the IT systems support business processes directly. The assumption is that complexity is due to the following factors:

- Increasing size of IT systems and the organisation itself;
- The interactions between different IT systems;
- The involvement of many different organisations in the constructions and use of these IT systems; and,
- The increasing rate of organisational and social change.

By investigating the validity of this assumption, and the importance of these factors, this chapter aims to contribute a better understanding of Enterprise Information Systems (EIS), their dimensions, their boundaries, and the challenges that arise in their construction and development.

As part of this investigation, and as a result of the analysis of the literature that commences in the next section, we propose one key challenge for understanding and building EIS:

- *Understanding diverse and volatile stakeholder requirements.*

To aid in understanding these constructs, we propose the use of goal-oriented modelling techniques; this is discussed in the last section of this chapter.

The rest of the chapter is organised as follow: The *background* section outlines the challenges in large-scale organisations as a motivation for discussing the systems that can address these challenges. A specific instance of large-scale organisations is an enterprise; hence, section 2 also discusses the requirements of IT systems for enterprises. One of the main difficulties in this area is the imprecise definition for EIS, and how an EIS differs from a general purpose IT system. Hence, we provide a working definition for EIS in this section.

The *Enterprise Information System* section describes EIS in more detail by discussing state-of-the-art definitions and effective elements, such as business and organisation, based on a literature review. The *future trend* section describes goal-oriented modelling techniques as a promising approach for attacking one of the main challenges of building an EIS by making the system more clear for its stakeholders. Section 4 also provides an example to clarify this idea.

BACKGROUND

A brief review of the history of enterprises and software systems helped us to construct a working definition for EIS. This working definition is