

Chapter 14

A Platform for Collaborative Outbound Logistics

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ABSTRACT

Electronic collaboration in the field of Supply Chain Management notably allows enhanced visibility for each of the involved actors through information sharing and global optimization through coordination. The proper achievement of these advantages is nevertheless not trivial since it implies the development of rather complex IT systems. Each actor is indeed mostly dealing with his own data semantics and custom processes so that data centralization and sharing is seldom achieved. Moreover, even if there would be a willingness to share data, this inherent heterogeneity would constitute a serious burden for software developments. The present chapter presents the results of a research aimed to partially solve these issues. It indeed presents the analysis and design of a platform for e-collaboration among the main Outbound Logistic (OL) actors based on a common conceptualization (including unified data semantics) and a set of services (supporting business processes realization). The chapter briefly presents the generic processes but mostly focuses on the representation of these services at a strategic level through an analysis of their added value and risk for OL actors potentially adopting the software solution.

INTRODUCTION

In nowadays economic context, information systems development and management has become a determinant issue. New concepts and technologies continuously emerge allowing a better representa-

tion and more efficient data exchanges in complex software problems. The significance of these can notably be found in supply chain management (SCM). Indeed, modern supply chains involve series of actors incarnated by various collaborating or competing companies where several roles

DOI: 10.4018/978-1-4666-4506-6.ch014

played by lots of individuals are interacting to achieve common as well as individual goals. In such a context, one needs powerful tools to represent logistic flows, to deliver strategic information to supply chain partners and to ensure e-collaboration. Collaborative decision will tend to avoid local equilibriums (at actor level) and wastes in the global supply chain optimization, giving opportunities to achieve the greatest value that the chain can deliver at lowest cost (Pache and Spalanzani, 2007; Samii, 2004). This paper is part of the effort to combine advanced software engineering (SE) and project management concepts to structure complex collaborative software development and deliver added value information technology (IT) systems in SCM.

Outbound logistics (OL) is the part of the supply chain which focuses on the product delivery with consequently a strong highlight on stocking and transportation. The development of a collaborative platform for OL actors induces high complexity which implies the necessity of a software engineering (SE) framework presenting various levels of knowledge and views to:

- Furnish adequate documentation to each stakeholder;
- Allow strategic reasoning (opportunities/risk balance);
- Cover all of the traditional software development disciplines;
- Be integrated in a mature development life cycle;
- Ensure adaptability and flexibility;
- Envisage third party software data reuse.

To that extend, we propose a framework structured through three levels of knowledge:

- A *strategic* level where the applicative package is represented in terms of highly

aggregated functionalities called *services* (with actors as service providers) providing a basis for opportunities/risk management. Besides being a view of the software problem every stakeholder can understand, this high level representation enables them to evaluate (with the services as scope elements) the opportunities and threats that would result from the use of the software application. This view is consequently useful for top-management;

- A *tactical* level where each of the services are detailed in a static manner using rich organizational concepts, i.e. *tasks*, *goals* and *resources* and their *depending actors*. This view is useful for middle managers in charge of the development of the objectives defined at strategic level;
- An *operational* level where each of the elements required for service fulfillment are operationalized through the behavior of software agents in charge of the successful realization of the sub-processes defined at tactical level through atomic actions.

The paper is structured as follows. Firstly, the context of this research is overviewed. The structure of the software development framework is then depicted using a pyramidal perspective. The concepts and technologies used into the software development framework are positioned. Afterwards, the application domain – outbound logistics – is outlined, followed by the description of the software applicative package development. Finally, a framework made of success factors for IT realizations in SCM is applied onto our contribution for validation purpose. Finally, the paper turns to the related work and conclusions are derived.

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