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Jianwei Liu
Free University Amsterdam, jliu@feweb.vu.nl

Ziv Baida
Free University Amsterdam, ziv@baida.nl

Yao-Hua Tan
Free University Amsterdam, ytan@feweb.vu.nl

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E-Customs control procedures redesign methodology: model-based Application*

Jianwei Liu, Ziv Baida and Yao-Hua Tan

Free University Amsterdam, Faculty of Economics and Business Administration
De Boelelaan 1105, 1081 HV Amsterdam, the Netherlands
jliu@feweb.vu.nl, ziv@baida.nl, ytan@feweb.vu.nl

Abstract. Growing trade volumes and increased security, health and financial control regulations require customs administrations to change their working practices worldwide. An existing dilemma however, is that governments would like on the one hand to reduce the administrative burden for businesses and on the other hand to increase security and control. The traditional single side power-posing by customs administrations to trade parties is not appropriate any more. The European Union is now realizing the potential benefits of establishing Customs-and-Business partnerships. To achieve such collaboration, current customs procedures need to be redesigned, and ICT is a key enabler for the redesign. In this paper we present a model-based approach using two levels of abstraction – value and process levels – to support domain experts in investigating how customs procedures can be redesigned while coping with business and administrative challenges. Especially, we focus on a methodological application of control principles from accounting and auditing literature, to redesign procedures. We discuss our "AAD"† approach and its application in an e-Customs procedure redesign case study.

Keywords: e-Customs, Inter-organizational control, Procedure design, Conceptual modeling.

1 Introduction

Inter-organizational networks, often Internet-based, provide competitive advantages that a single organization cannot achieve. Also the public sector can benefit from forming networks with businesses, For example, if the electronic invoicing can be introduced across the EU, annual savings could exceed €50 billion for both business and government (EU Commission, 2006b). However, such networks are only sustainable when all participants benefit from the network. Especially the public sector is interested not only in financial benefits, but also in control and security. Government-to-business (G2B) collaboration is often difficult, as government procedures are often paper based and not harmonized. Redesign of government procedures should use ICT instead of paper documents. Furthermore, if businesses are considered as partners by governments, a radical redesign with higher potential can take place.

Our study focuses on customs control procedures redesign, replacing paper-based procedures by Internet-based ones while coping with business and administrative challenges. Currently, for a single container crossing borders, on average 30 documents/signatures are involved (Doing business database, 2006). New ICT-based procedures should replace paper documents and improve the control effectiveness as well as lower the administrative burden for both customs administrations and business.

Kartseva et al. (2005) propose a value-based e^3-control methodology when designing control procedures. While their work is valuable for understanding the purpose and added value of controls, they provide very limited operational solutions for control problems. In this paper, we further develop e^3-control to include both value-based and process-based control modeling, and we elaborate on the process level. We apply control principles from well-known accounting and auditing literature to identify control problems and to redesign control procedures. We develop the "AAD" approach for this purpose, and elaborate on its application in a case study concerning the export of beer from the Netherlands to the UK, where an innovative ICT-based redesign replaces human-based procedures, and results in improved control. Our methodology is not a pure redesign methodology, but rather a domain experts' analysis tool to identify control flaws and provide a "template" for possible redesigns.

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† "AAD" is a process based approach of designing controls, which includes actors, activities and documents as three basic components.

2 Research approach: e³-control --- combining value and process perspectives

Our four-step approach adds to earlier work by combining analyses at both levels of abstraction: a value perspective (focusing on who provides what to whom and why in a network) and a process perspective (focusing on how the above is realized). In step 1 we use a value perspective to describe an initial business model of the current situation (including ideal and sub-ideal situation). We analyze which economic values are being exchanged by actors in a network, and interview domain experts to identify the critical value transfers that should be safeguarded by means of control mechanisms. Our approach deviates from Kartseva et al. (2005) already in this stage. We consider the current situation where existing controls have already been taken into account, whereas in Kartseva et al. (2005) controls are considered only in the later stages. In the next two steps we perform a process level analysis. By focusing on critical value transfers we reduce the work in steps 2 and 3 to a manageable level. In step 2, with the help of domain experts we investigate the business processes that realize the earlier identified critical value transfers (rather than the whole business model). We study how current controls are applied in a network to safeguard these value transfers, and identify control flaws by applying control principles from auditing and accounting to current processes. In step 3 we add or change control mechanisms according to process-level control principles, resulting in a redesign of the business process. Having introduced new controls may change the related business model, as controls can be offered as commercial services and cause value redistribution in a network. Therefore we finally draw a new business model (value perspective) in step 4, and evaluate its financial feasibility. If the evaluation shows a positive result, the redesign is acceptable. Else, we go back to the first step for a new iteration (see Figure 1). The four-step approach is termed as e³-control.
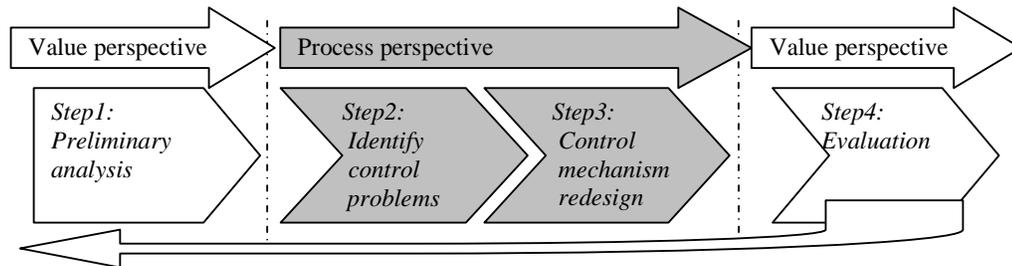

Figure 1. Value & process perspectives combined redesign approach

To facilitate step 2 and 3 in the redesign, we propose a systematic approach – "AAD", which provides a conceptualization of control principles that can serve as a basis for developing IS support for domain experts. The conceptualization contains three core elements, namely, actor, activity and document (AAD). We take auditing control principles of Chen & Lee (1992) and control principles for international trade procedure from Bons et al. (1999) as our basis for the "AAD" approach to identify control problems and redesign control procedures. We further distinguish three sub-classes under each element: Actor – Responsible actor, Evidencing actor and Control actor; Activity – Operational activity, Evidencing activity and Control activity; Document – To-be-verified Document, Supporting Document and Verified Document. "AAD" provides a simple guidance for separating different actors with corresponding activities and documents as well explicit rules of the precedent relationships among the elements, based on which, an effective inter-organizational control can be conducted.

Case application: Beer export procedure redesign

Our study investigates how to introduce e-Customs for handling excise goods (e.g., alcoholic beverages, cigarettes) in cross-border trade instead of current paper-based procedures. In this paper, we examine the export of beer from the Netherlands to the UK. The following actors are involved in this study: (1) BeerCo NL, a large Dutch beer producer; (2) BeerCo UK, the UK branch of BeerCo NL, functions as an intermediary between BeerCo NL and retailers in the UK; (3) Customs NL: the Dutch customs; (4) Customs UK: the British customs; (5) Excise Warehouse (EW) in the UK, a warehouse which has been certified for the deposit without payment of duty of excise goods; and (6) Retailer, a UK-based company that buys Dutch beer from BeerCo UK. We apply the e³-control methodology for the case study and we focus on steps 2 and 3 in applying the AAD approach to identify control problems and redesign procedures.