Summary of the Dissertation

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Title of the dissertation: Inter-organizational Performance Analysis from EDI Messages

Abstract:

The evaluation of Inter-organizational Relationships (IORs) is important in today's businesses for increasing competitiveness and business potential, especially in the Business-to-Business context. However, the evaluation of IORs is often based on success factors, such as trust and flexibility, which are difficult to be measured quantitatively. This motivates us to seek for an approach for evaluating IORs in a concrete manner. Nowadays, Electronic Data Interchange (EDI) widely enables information exchanges between business partners via electronic business messages. Therefore, it is considered as one potential data source for deriving knowledge about IORs. In this research, we aim at providing an approach for evaluating IORs from EDI messages by means of inter-organizational performance analysis. Considering this ultimate aim as a main research question, we further derived three relevant sub-research questions which are necessary to accomplish the main goal. This includes (i) extracting business information from EDI messages, (ii) identifying inter-organizational Key Performance Indicators (KPIs), and (iii) lifting the performance evaluation to the strategic level. In addressing the problem of business information extraction from EDI messages, we defined an ontological approach to conceptualize EDI data into business information concepts by user-defined mappings. Thereby, EDI data can be represented at any abstraction level which eases further querying tasks. Furthermore, to obtain inter-organizational KPIs from EDI messages, we firstly conducted a literature review on inter-organizational success factors together with their measurements and interdependencies among them. We further investigated EDI messages for identifying inter-organizational KPIs and grouped the KPIs according to success factors found in the review. Finally, we built a framework for inter-organizational performance analysis from EDI messages based on the aforementioned works. The framework integrates (i) a bottom-up approach supporting the identification of KPIs from business information, event logs, as well as process models derived using process mining techniques, and (ii) a top down approach for measuring business performance on the strategic level based on the Balanced Scorecard (BSC) method. For evaluating the framework, we presented two case studies on inter-organizational performance analysis of a beverage manufacturing company and a consumer goods manufacturing company. The case studies show that the framework enables (i) the derivation of quantifiable KPIs from operational data and (ii) the alignment of KPIs with business objectives allowing an evaluation of IORs on the strategic level. The main contributions of this research are the artifacts developed for addressing the relevant research questions which include (i) an approach for business information extraction from EDI messages, (ii) a set of inter-organizational success factors and a corresponding cause and effect model, (iii) a set of inter-organizational KPIs and a method for deriving them from EDI messages, and (iv) an inter-organizational performance analysis framework.