UNIVERSITEIT GENT

FACULTEIT ECONOMIE EN BEDRIJFSKUNDE

TWEEKERKENSTRAAT 2
B-9000 GENT
Tel. : 32 - (0)9 – 264.34.61
Fax. : 32 - (0)9 – 264.35.92

WORKING PAPER

Simulating Liquidity in Value and Supply Chains

Wim Laurier[*]

Geert Poels[†]

April 2009

2009/574

[*] Corresponding author. Wim.Laurier@UGent.be. Dept. MIS and Operations Management, Faculty of Economics and Business Administration, Ghent University, Tweekerkenstraat 2 B-9000 Gent Belgium
[†] Geert.Poels@UGent.be. Dept. MIS and Operations Management, Faculty of Economics and Business Administration, Ghent University, Tweekerkenstraat 2 B-9000 Gent Belgium

D/2009/7012/26

Simulating Liquidity in Value and Supply Chains

Wim Laurier and Geert Poels

Department of Management Information and Operational Management, Faculty of Economics and Business Administration, Ghent University, Tweekerkenstraat 2, 9000 Ghent, Belgium
{wim.laurier,geert.poels}@ugent.be

Abstract. This paper provides an ontology-based set of Petri-nets for simulating the effect of business process changes on an organisation's liquidity, and demonstrates that certain types of business process redesign can increase or reduce the amount of external funding that is required to prevent an organisation from defaulting on its debt. This debt defaulting may lead to proliferating liquidity constraints for subsequent supply chain partners. Consequently, this paper provides a proper toolkit for assessing and mitigating the propagation of liquidity constraints in supply chains. The paper uses the accounting-based Resource-Event-Agent ontology to create workflow patterns for modelling exchanges between supply chain partners and for the value chains that represent an organisation's internal processes. Both the exchange and internal processes continuously convert money into resources and vice versa. These models for money to resource and resource to money conversions are then used for constructing supply chain models for liquidity modelling and analysis.

Key words. Resource-Event-Agent ontology, Petri-net, Simulation, Business Process Management, Workflow Model, Business Performance, Liquidity