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eCommerce for Reverse Logistics

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E-COMMERCE FOR REVERSE LOGISTICS

Chair:

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Panelists:

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Costas Pappis

Piraeus University, Greece

Sarah Ryan

Iowa State University, USA

Angelika Kokkinaki

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The focus of the proposed panel will be on issues pertaining e-commerce and reverse logistics activities, which typically include operations for collection, selection and decision making for the optimal recovery option (reuse, remanufacture or recycle) of post-retail or surplus products nearing obsolescence.

In recent years, reverse logistics becomes a priority in the social agenda as well as the strategic agenda of Original Equipment Manufacturers (OEMs) for the following reasons:

- *Legislative frameworks:* A number of EU Directives requires Original Equipment Manufacturers (OEMs) in certain sectors (packaging, ITC equipment white and brown goods and vehicles) to develop a policy for the collection and reuse of their products at the end of their lifecycle. These directives aim to shift waste management costs to producers, reduce volume of generated waste and increase use of recycled materials.
- *Environmental impact:* Post-retail products are recognized as a serious environmental thread, if disposed improperly. For example, in USA, the Environmental Protection Agency ranks end-of-use PCs as the fastest growing category of solid waste. Beyond their ever-increasing volume, end-of-use computers should be taken for direct environmental threats, if simply disposed in a landfill, because they contain heavy metals.
- *Asset Recovery:* Industry-wide, annual costs related to returns represent .5% of the GDP in USA. Instead of a liability, returns can be a source for value recovery by re-using the return (possibly in a secondary market), remanufacture its parts to be used as spares or recycling the remaining to recover the materials value.

E-commerce applications in this sector are examined for their potential to de-fragmentize this highly dynamic market and connect a large set of buyers and sellers who were previously unaware each other. Furthermore, e-commerce applications in this sector act as an enabling factor for efficient exchange, reduced marketing costs for sellers and procurement costs for buyers.

Developing optimal policies to facilitate cost-effective returns handling becomes very difficult due to several contributing factors including:

- High uncertainty; income flows to reverse logistics networks are associated with high uncertainty regarding their quantity, quality, place of origin, and timing of returns.

- *High devaluation rate*; this requires an effective and speedy re-distribution of returns in the original market (customers returns) or in secondary markets (excess inventory).
- *End-users' reluctance to release their equipment*; this is a burden for optimal recovery. Thus, an effective mechanism needs to be designed and implemented to pull these units back from the end-users in a timely manner.
- *Capture of assessment data is delayed*; these data become available only when the units are actually retrieved. However, exploitation of Web technologies can support the earlier capture of this information.

The panel will be chaired by Prof. Rommert Dekker, Erasmus University Rotterdam who is the leader of the TMR Network REVLOG (www.fbk.eur.nl/OZ/REVLOG). This network investigates reverse logistics issues and is a cooperation of researchers from Erasmus University Rotterdam (NL), Eindhoven University of Technology (NL), INSEAD (F), University of Piraeus (GR), University of Magdeburg (D) and Aristotle University of Thessaloniki (GR). The proposed panel consists of researchers from EU and USA who have studied aspects of this topic. The contributions aim to form a comprehensive overview of the findings and outline some open research questions. The following issues will be addressed.

Dr. Rob Zuidwijk from Erasmus University Rotterdam (Netherlands) will present an introduction on the topic of IT applications for reverse logistics. He will discuss the main requirements that reverse logistics activities introduce to the IT systems and what are the implications on the design and development of IT systems.

Prof. Costas Pappis from Piraeus University (Greece) will present the value chains in reverse logistics and he will discuss the dynamics of the emerging e-business models for reverse logistics. He will outline the competitive advantages for each model and outline their requirements for further development.

Prof. Sarah Ryan from Iowa State University (USA) will discuss the roles of exchange mechanisms and information delivery in achieving high participation in electronic marketplaces for reverse logistics. Also, she will present methods of improving scalability in online auctions as participation grows.

Dr. Angelika Kokkinaki from Erasmus University Rotterdam (Netherlands) will present an agent-based prototype for configuration detection and quality assessment for ITC returns and recommendation of the optimal recovery policy, namely reuse, remanufacturing or recycling for the registered returns.

RELATED PUBLICATIONS

BAYLES, D. (2001). E-commerce Logistics and Fulfilment: Delivering the Goods, Prentice Hall PRT, Upper Saddle River, NJ, U.S.A.

GEMMILL, D., A. QUAMHIYAH and S. RYAN (2001). Electronics Manufacturers' Support for Product Recycling. In Proceedings of the 10th Annual Industrial Engineering Research Conference, Dallas, USA.

van HILLEGERSBERG, J., R. ZUIDWIJK, J. van NUNEN and D. van EIJK (2001). Supporting Return Flows in the Supply Chain, Communications of the ACM, 44 (6), 74-79.

KOKKINAKI, A.I., R. DEKKER, R. LEE and C. PAPPIS (2001). Integrating a Web-based System with Business Processes in Closed Loop Supply Chains, Econometric Institute Report Series EI2001-31, Erasmus University Rotterdam, ISSN 1566-7294, The Netherlands.

KOKKINAKI, A.I., R. DEKKER, M.B.M. de KOSTER, C. PAPPIS and W. VERBEKE (2002). E-business models for reverse logistics: contributions and challenges, IEEE Computer Society (ITCC) 2002 International Conference on Information Technology, Las Vegas, Nevada, USA, 8-10 April.

KRIKKE, H., A.I. KOKKINAKI and J. van NUNEN (2001). Information Technology in Closed Loop Supply Chains, in *Business Aspects of Closed Loop Supply Chains*, V.D.R. Guide Jr. and L.N. Van Wassenhove Eds., Carnegie Mellon University Press.

NWANA, H., J. ROSENSCHEIN, T. SANDHOLM, C. SIERRA, P. MAES and GUTTMANN, R. (1998). Agent-Mediated Electronic Commerce: Issues, Challenges and some Viewpoints, In *Proceedings of Autonomous Agents 98*, ACM Press, 189-196.

OLAFSSON, S., K.J. MIN, G. SUBRAMANIAM, S. SULAKHE, S. VARGHESE and J. YANG (2001). Internet-Based management and Archival System for Recyclable Products. In *Proceedings of the 10th Annual Industrial Engineering Research Conference*, Dallas, USA.

RYAN, S., K.J. MIN, and S. OLAFSSON (2001). Experimental Study of Scalability Enhancement for Reverse Logistics E-Commerce. In *Scalable Enterprise Systems*, V. Prabhu, S. Kumara and M. Kamath (Eds).