

Application of Event-oriented Process Chains for Information System Optimisation

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- 5) **Organizational unit:** Departement Maschinenbau und Verfahrenstechnik, Institut für Energietechnik (IET), Kröger, Wolfgang, kroeger@mavt.ethz.ch, LZ=03292

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- 10) **Partner organizations:** no entry

- 11) **Short Summary:** Modelling and simulation of information systems (IS) by event oriented

process chains is the base of a novel methodology for risk analyses of ICT. The partition of an IS in business processes simplifies the system modelling and enables to build up a library of common process modules, e.g. data input.

12) Keywords: Computer Science

13) Project description:

The research project aims at to deliver a tool to service providers in order to identify risks from the operation of their information and communication technology (ICT). However, ICT systems are highly complex impeding precise and practical risk analyses. It is the project's goal to support the computation of frequency and consequences (i.e. risks) of undesired events in computer network operation, e.g. unavailability and down-time costs. So, resources for risk analysis implementation are saved and optimization measurements become selective.

However, the practical and methodological difficulties in ICT risk analysis are immense: interactions among hardware, software and persons have to be taken into account as well as a very high modification rate of ICT components and systems among others. The problem is simplified when modelling information systems and associated business processes instead of complex and extended computer networks. In other words, as a computer network is built up to support and fulfil services, the underlying information system consisting of business processes is modelled. In doing so, business process models have to be transformed into risk analysis models. The transformation bases on the usage of event driven process chains (EPC).

These EPC are used to model the branched chains of reactions after an incident happens. In a worst case scenario such an incident results in a business process interruption. Once more, the EPC representation is transformed to graph oriented, discrete modelling approaches, (i.e. object oriented, agent based). This application of state-of-the-art modelling, simulation approaches and tools enables analysts to represent networked systems in general (e.g. computer networks), their components and process interactions.

The final agent based model makes possible the computation of availability figures even of complex computer networks commonly beyond of detailed risk analyses. A library of common process modules(, e.g. data input, server maintenance actions) enhances the demanded modelling practicality.

14) Popular description:

The reliable operation of information and communication technology (ICT) is a pre-condition for an effective operation of enterprises. However, ICT are highly complex impeding precise and practical risk analyses. It is the project's goal to support the computation of frequency and consequences of undesired events in computer network operation, e.g. unavailability and down-time costs.

The application of state-of-the-art modelling and simulation approaches and tools (object oriented, agent based) enables to represent networked systems (e.g. computer networks) and their com-

ponents and process interactions. As a computer network is built up to support and fulfil services, the underlying information system consisting of business processes is modelled. A library of common process modules, e.g. data input, server maintenance actions, enhances the modelling practicability.

15) Graphics: no entry

16) Publications:

- Diergardt M., Mock R. 2005. New Ways of Applying the Petri Net Formalism in Risk Analysis. Proceedings of the European Safety and Reliability Conference (ESREL 2005), London, Taylor & Francis Group, 439-446.

- Kaegi M., Mock R., Ziegler R., Nibali R. 2005. Information Systems' Risk Analysis by Agent-based Modelling of Business Processes. European Safety and Reliability Conference (ESREL 2005), accepted paper.

- Mock R., Corvo M. 2005. Risk Analysis of Information Systems by Event Process Chains. Int. Journal of Critical Infrastructures, (2/3/ 1), 247 - 257.

- Mock R., Kaegi M., Hechelmann B. 2005. Risk Assessment of Computer Networks by Means of Business Process Modelling. Proceedings of the IEEE International Conference on Technologies for Homeland Security and Safety TEHOSS 2005 September 28-30, 2005, Gdansk, POLAND.

17) Links to important web pages: no entry