

Internet-enabled Workflow Management

Michael zur Muehlen and Edward A. Stohr

Wesley J. Howe School of Technology Management

Stevens Institute of Technology

Castle Point on the Hudson

Hoboken, NJ 07030, USA

{mzurmuehlen|estohr}@stevens-tech.edu

When research in the area of office automation began more than 25 years ago [4] the typical enterprise infrastructure consisted of heterogeneous computing platforms and operating systems, different networking standards, a variety of email products and limited user interface technologies. These technical inconsistencies and the lack of process-orientation within enterprises led to a slower-than-expected adoption of office and process automation technology [3]. In the 1990's, when the Business Process Reengineering wave created process-awareness in many corporate boardrooms and led to the restructuring of enterprises [1], the search for technology to support these new structures finally accelerated [2].

In the last decade, many technical difficulties of the early workflow days were eliminated through the evolution of defined or de-facto standards, and process management technology was increasingly deployed within enterprises. Nevertheless, it was not until the rapid adoption of Internet technology created a unified communication platform between enterprises that workflow systems began to reach out and connect processes across enterprise borders. Internet technology affects organizations and creates new challenges on three levels: technical, organizational, and managerial.

- On the technical level, the evolution of data definition standards like XML and communication protocols such as HTTP allows system designers to create interfaces between information systems on top of established standards. Systems can be layered and connected without exposing too much internal complexity,

which shifts the focus of application designers to questions such as the discovery of matching services and the automated negotiation of interaction protocols. The articles by Cai et al. and Dustdar discuss architectural and technical issues for the design of Internet-enabled process management systems.

- At the organizational level the expansion of processes beyond enterprise borders allows for new opportunities for process optimization. The transparency of supplier inventory and customer demand in the modern supply chain creates opportunities for intermediaries to optimize the throughput of goods and information. On the other hand, the new openness creates new requirements for data authentication, information assurance and access control that need to be addressed at the organizational level. The article by Nickerson addresses various organizational aspects of Internet-enabled workflow management.

- At the managerial level the monitoring and controlling of cross-organizational interactions create new sources of decision support data, but also require the coordination of managerial activities with those of business partners. The article by Klischewski and Wetzel offers a new approach for service-oriented interaction between business partners in this context.

Five articles have been selected for this special issue, spanning the technical, organizational, and managerial aspects discussed above.

In his op-ed article, Keith D. Swenson takes a long hard look at the development of workflow standards in the context of the Internet. He outlines the history behind process interoperability standards such as Wf-XML and BPEL4WS, and draws the conclusion that it will take a while for the dust to settle and the winners of the current standards battles to emerge.

Jeffrey V. Nickerson classifies communication channels in cross-organizational workflow scenarios. Using different web services scenarios he distinguishes between

interpersonal interaction, negotiation, invocation, flow and monitoring channels. His article shows that designers of cross-organizational process management solutions need to architect their systems to accommodate the requirements arising from these different channels, and that current web service solutions fall short of considering all of them.

Ralf Klischewski and Ingrid Wetzel focus on the set-up phase for cross-organizational workflows, and describe an architecture that is driven by contracts (i.e. the “what”) rather than a detailed specification of the interaction (i.e. the “how”). They argue that using such a contract-based interaction organizations are enabled to create cross-organizational processes on the fly, using predefined patterns.

Jian Cai, Stephen C-Y. Lu, Francois Grobler, Michael Case and Nan Jing present a model for collaborative processes that explicitly takes the perspective of stakeholders into account, and shows their evolution as the process progresses. They present the STARS process management prototype that implements the stakeholder perspective and relies on a set of XML-based languages that describe collaborative processes and their behavior.

In the final article of this special issue, Schahram Dustdar discusses the architecture and implementation of an Internet-enabled system that integrates workflow and groupware characteristics. The Caramba system presented in his article supports ad-hoc as well as predefined process structures and has been tested in a variety of virtual team settings.

We hope you enjoy reading the articles of this special issue as much as we did. We are looking forward to any comments and suggestions you might have. Please visit the AIS special interest group on Process Automation and Management at <http://www.sigpam.org> to share your thoughts with other interested readers.

Michael zur Muehlen and Edward A. Stohr
Hoboken, September 2003

References

- [1] T.H. Davenport, *Process Innovation. Reengineering Work through Information Technology*, Boston (MA): Harvard Business School Press, 1993.
- [2] T.H. Davenport, "The fad that forgot people," *Fast Company*, vol. 1, no. 1, 1995, pp. 70.
- [3] C.A. Ellis and G.J. Nutt, "Workflow: The Process Spectrum," in *Proceedings of NSF Workshop on Workflow and Process Automation in Information Systems: State-of-the-Art and Future Directions*, Athens (GA), 1996, pp. 140-145.
- [4] M. Zisman, *Representation, Specification, and Automation of Office Procedures*, PhD Thesis, University of Pennsylvania, 1977.