# Proposal for a Special Issue in Information Systems on *Integrating Process-oriented and Event-based Systems*

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## 1 Context and Topics

Process-oriented information systems control operations by coordinating the execution of elementary activities. These systems have been traditionally used in domains such as business process automation, enterprise application integration, and collaborative work. Recently, there has also been a significant uptake of process-oriented information systems in transportation, logistics, and medical infrastructures—domains that impose new challenges in terms of system reactivity and adaptability. Here, trends such as sensing of data (e.g., based on RFID technology) and advancing system integration (driven by technical standards such as EPCglobal) represent opportunities to strengthen the event-perspective in process-oriented systems in order to achieve more flexible and comprehensive process control.

Event-based systems, in turn, have been put forward to integrate heterogeneous systems in a flexible and scalable manner by separating communication from application logic. These systems provide interaction models, mechanisms for routing events between components, and techniques for the detection of composite events. Although event-based systems are typically positioned as general-purpose technology, they have found their way into many applications where event generation is relatively deterministic and follows structured behaviour. In domains such as transportation, logistics, and the medical sector, events handled by event-based systems stem from the execution of processes, which are partially supported by process-oriented information systems. Exploiting the process-perspective, therefore, promises to lead to advancements in the design, analysis, and optimisation of event-based systems.

The increasing overlap of application scenarios that involve concepts and techniques of process-oriented as well as event-based systems, however, is only marginally supported by exchange and convergence of the related research fields. Despite the manifold opportunities for cross-fertilisation, only a small amount of research has been conducted on how process-oriented systems and event-based systems can be integrated, which is why a recent Dagstuhl Seminar was devoted to establishing connections between these research areas.[1]

Given this background, this special issue invites quality submissions focusing on various aspects of the interplay of process-oriented and event-based systems. We welcome both theoretical contributions as well as papers describing interesting applications. Topics include, but are not limited to:

- Process-driven distribution of event processing
- Process-driven handling of event data quality issues
- Process-driven definition of complex events
- Process-driven optimisation of event processing
- Event semantics in processes
- Process-event correlation
- Events for flexible and adaptive process management
- Events in inter-process correlation
- Event-driven choreographies
- Applications of event-driven process management
- Benchmarks and evaluation of event-driven process management

[1] http://www.dagstuhl.de/16341/

## 2 Key Dates

**Submission:** 15th December, 2016

**First Round Notification:** 1st March, 2017

**First Round Revisions:** 1st May, 2017

**Second Round Notification:** 1st July, 2017

**Final Submission:** 1st September, 2017

**Publication:** 1st December, 2017

## 3 Submission Information

We intend to follow the general submission guidelines of Information Systems:
`https://www.elsevier.com/journals/information-systems/0306-4379/guide-for-authors`

## 4 Guest Editors

**Dr. David Eyers** has been a Senior Lecturer at the University of Otago since 2011. Earlier, he worked as a senior research associate at the University of Cambridge, from where he was awarded his PhD in 2006. His undergraduate degrees (Computer Engineering and Pure Maths) are from UNSW in Sydney, Australia. His recent research has examined security enforcement and data dissemination mechanisms within wide-area distributed systems. In particular, he has worked with event-based middleware, role-based access control, decentralised information flow control, and tries to develop connections between these technologies. His research is of growing importance to cloud and grid computing: large-scale public services, such as electronic health record repositories, must manage sensitive data in a secure manner.

Dr. Eyers has ample experience in the design and analysis of event-based systems. He has served as one of the PC-Chairs for the DEBS conference in 2015.

**Professor Avigdor Gal** is an Associate Professor of the Faculty of Industrial Engineering & Management at the Technion. Gal is a Technion graduate and an expert on information systems. Prof. Gal received his bachelor's degree in Computer Science in 1990, and in 1995 earned his doctorate, focusing on temporal active databases. After a two-year stint from 1995–1997 as a post-doctoral fellow at the University of Toronto in the Department of Computer Science, Prof. Gal started as an assistant professor at Rutgers University. He joined the Technion in 2001. His research focuses on effective methods of integrating data from multiple and diverse sources, which affect the way businesses and consumers seek information over the Internet. Another line of research involves the identification of complex events such as flu epidemics, biological attacks, and breaches in computer security, and its application to disaster and crisis management. Prof. Gal has published more than 100 papers in leading professional journals (e.g. JACM, ACM TODS, IEEE TKDE, ACM TOIT, VLDB Journal) and conferences (ICDE, BPM, DEBS, ER, CoopIS) and books (Schema Matching and Mapping). He has won the IBM Faculty Award each year from 2002–2004, several Technion awards for teaching, the 2011–13 Technion-Microsoft Electronic Commerce Research Award, and the 2012 Yanai Award for Excellence in Academic Education, and others. Among his many professional activities, he is a senior member of the Institute of Electrical and Electronics Engineers (IEEE), a member of the Association for Computing Machinery (ACM) and an affiliate member of BPM Center. He has served on several advisory boards including DEBS (Distributed Event-Based Systems) and CoopIS (Cooperative Information Systems).

Prof. Gal has been an active researcher both in the complex event processing community and in the business process management community, serving if the roles of program and general chair both in BPM and in DEBS, and a member of DEBS steering committee.

**Professor Dr. Hans-Arno Jacobsen's** pioneering research lies at the interface between computer science, computer engineering and information systems. He holds numerous patents and was involved in important industrial developments

with partners like Bell Canada, Computer Associates, IBM, Yahoo! and Sun Microsystems. His principal areas of research include the design and the development of middleware systems, event processing, service computing and applications in enterprise data processing. His applied research is focused on ICT for energy management and energy efficiency. He also explores the integration of modern hardware components, such as FPGAs (Field Programmable Gate Arrays), into middleware architectures. After studying and completing his doctorate in Germany, France and the USA, Prof. Jacobsen engaged in post-doctoral research at INRIA near Paris before moving to the University of Toronto in 2001, where he has been worked as a professor in the Department of Electrical and Computer Engineering and the Department of Computer Science. In 2012, he accepted the Alexander von Humboldt Professorship at TUM.

Prof. Jacobsen is one of the initiators of the DEBS conference (PC-Chair of the first DEBS conference in 2007) and, since then, has been the DEBS Steering Committee Chair. He also gave a keynote on event-based process management at BPM 2010.

**Professor Dr. Matthias Weidlich** is a junior professor at Humboldt-Universität zu Berlin (HU) heading the Process-Driven Architectures group that is funded by an Emmy Noether grant from the German Research Foundation (DFG). In addition, he is a Visiting Researcher in the Department of Computing at Imperial College London, United Kingdom, where he was a research associate before joining HU in April 2015. Earlier, he held positions as a research fellow and adjunct lecturer at the Technion—The Israel Institute of Technology, Israel. He received his PhD in Computer Science from the Hasso Plattner Institute (HPI), University of Potsdam, Germany, in 2011. His research focuses on process modelling and analysis, event-based systems, data interoperability, and uncertainty management and his results appeared in leading journals (IEEE TSE, IEEE TKDE, Information Systems, The Computer Journal) and conferences (SIGMOD, BPM, CAiSE, VLDB, ICDE, ER). He received the Grand Challenge Audience Award at DEBS 2014 and DEBS 2013, and a Best Paper Award at ICSOC 2010. As of 2016, he is a Junior-Fellow of the German Informatics Society (GI).

Prof. Weidlich has worked on event-based monitoring of processes and formalisations of event-processing networks. He served as PC-Chair of BPM 2015 and, together with Prof. Gal and others, edited a recent Special Issue on Event Recognition in the ACM Transactions on Internet Technology (TOIT).

# 5 Additional Information (not for posting)

**Relation to the Dagstuhl seminar** The special issue is proposed as a follow-up of a Dagstuhl Seminar on *Integrating Process-oriented and Event-based Systems*,[2] which will be held in August 2016 and is organised by the authors of this proposal.

We intend to invite the participants of this seminar to submit their work to this special issue. In particular, we will explicitly encourage participants to continue to work on ideas on the integration of process-oriented systems and event-based technology that are developed as part of the seminar.

**Annual or upcoming meetings**

- ACM SIGMOD Conference (SIGMOD)
- International Conference on Business Process Management (BPM)
- International Conference Very Large Data Bases (VLDB)
- International Conference on Distributed Event-Based Systems (DEBS)
- International Conference on Advanced Information Systems Engineering (CAiSE)
- International Conference on Service Oriented Computing (ICSOC)
- International Joint Conference on Artificial Intelligence (IJCAI)
- International Artificial Intelligence Conference (AAAI)
- Web Rule Symposium (RuleML)

**Mailing lists**

- DBworld
- SEworld

[2] http://www.dagstuhl.de/16341/

- AISworld
- bpm-conference mailing list
- Event Processing Technical Society mailing list and web page
- www.complexevents.com
- event@cig mailing list

**Researchers who would be likely authors and reviewers**

- Agnes Koschmider, Karlsruhe Institute of Technology
- Agnès Voisard, Freie Universität Berlin
- Alejandro Buchmann, Technische Universität Darmstadt
- Alessandro Margara, Università della Svizzera Italiana
- Alex Kozlenkov
- Alexander Artikis, NCSR Demokritos
- Anne Baumgrass, Synfioo
- Anne Rozinat, Fluxicon
- Annika Hinze, University of Waikato
- Arik Senderovich, Technion
- Assaf Schuster, Technion—Israel Institute of Technology
- Barbara Weber, University of Innsbruck
- Bose Jagadeesh Chandra, Xerox Research Center India
- Boualem Benatallah, The University of New South Wales
- Cesare Pautasso, University of Lugano
- Chunyang Ye, Haidan University
- Claudio Di Ciccio, Wirtschaftsuniversität Wien
- Daniel Keren, Haifa University
- Dimka Karastoyanova, University of Stuttgart
- Dirk Fahland, Eindhoven University of Technology
- Dorothy Sisi Duan, Oak Ridge National Lab
- Elke Rundensteiner, Worcester Polytechnic Institute (WPI)
- Fabiana Fournier, IBM Research
- Florian Daniel, University of Trento
- Francois Bry, Ludwig-Maximilians-Universität München
- Frank Leymann, University of Stuttgart
- Frank Puhlmann, BOSCH SI
- Hagen Völzer, IBM Research Zurich
- Hajo Reijers, VU University Amsterdam
- Hamid Motahari, IBM Research
- Henrik Leopold, VU University Amsterdam
- Holger Ziekow, Hochschule Furtwangen
- Izchak Sharfman, Technion—Israel Institute of Technology
- Jan Mendling, Wirtschaftsuniversität Wien
- Jan Sürmeli, Humboldt-Universität zu Berlin
- Jana Koehler, Lucerne University of Applied Sciences & Arts
- Jean Bacon, University of Cambridge
- Jianmin Wang, Tsinghua University
- Johannes Gehrke, Cornell University
- John Meehan, Brown University
- John Mylopoulos, University of Trento
- Lars George, Humboldt Universität zu Berlin
- Ljiljana Stojanovic, FZI Forschungszentrum Informatik
- Lucinéia Heloisa Thom, Universidade Federal do Rio Grande do Sul
- Manfred Reichert, University of Ulm

- Mani Chandy, California Institute of Technology
- Marco Montali, Free University of Bozen-Bolzano
- Marlon Dumas, University of Tartu
- Martin Jergler, TU Munich
- Martin Ugarte, Université libre de Bruxelles
- Mathias Weske, Hasso Plattner Institute (HPI)
- Michael Eckert, TIBCO
- Michael zur Muehlen, Stevens Institute of Technology
- Minos Garofalakis, Technical University of Crete
- Mohammad Sadoghi Hamedani, IBM T.J. Watson
- Nenad Stojanovic, Nissatech Innovation Centre
- Nesime Tatbul, Intel Labs
- Olga Poppe, Worcester Polytechnic Institute (WPI)
- Oliver Kopp, University of Stuttgart
- Opher Etzion, Yezreel Valley College
- Peter Pietzuch, Imperial College London
- Pnina Soffer, Haifa University
- Rania Khalaf, IBM T.J. Watson
- Raul Fernandez, Imperial College London
- Remco Dijkman, Eindhoven University of Technology
- Richard Tibbetts, TIBCO
- Rick Hull, IBM T.J. Watson
- Ruth Breu, University of Innsbruck
- Sankalita Mandal, Hasso Plattner Institute (HPI)
- Schahram Dustdar, TU Vienna
- Sergey Smirnov, SAP
- Shazia Sadiq, University of Queensland
- Songlin Hu, Chinese Academy of Sciences
- Stefan Appel, Siemens AG
- Stefan Schulte, TU Vienna
- Stefanie Rinderle-Ma, University of Vienna
- Stijn Vansummeren, Free University of Brussels
- Susan Urban, Texas Tech University
- Sven Graupner, HP
- Thomas Heinze, SAP AG
- Tobias Freudenreich, TU Darmstadt
- Ugur Çetintemel, Brown University
- Vana Kalogeraki, Athens University of Economics and Business
- Vinod Muthusamy, IBM T.J. Watson
- Wei Song, Nanjing University
- Wil van der Aalst, Eindhoven University of Technology
- Wolfgang Reisig, Humboldt-Universität zu Berlin
- Yanlei Diao, University of Massachusetts Amherst
- Zbigniew Jerzak, SAP AG
- Zhang Kaiwen, University of Toronto