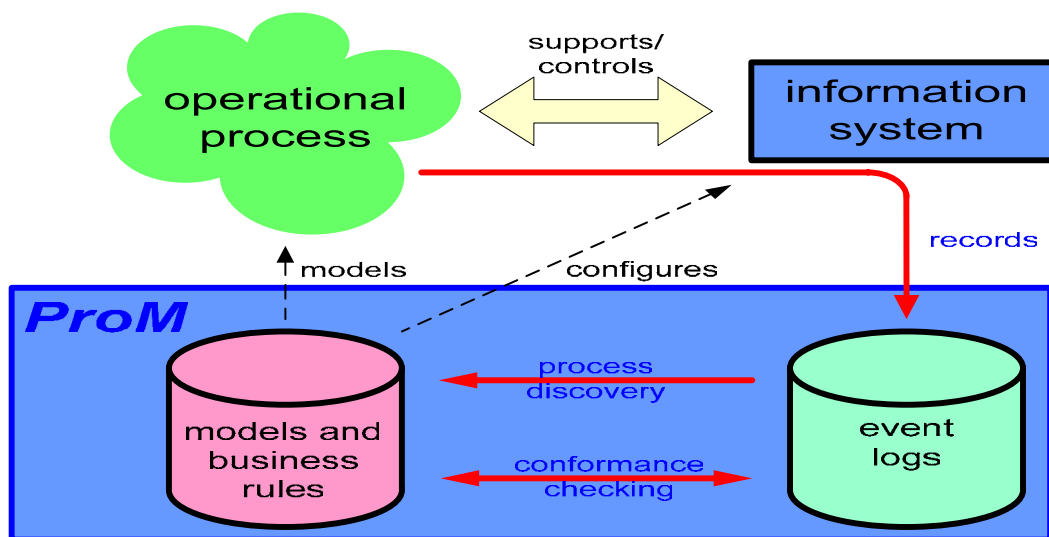


# NIEUWSBRIEF IS

December 2005

Nummer 10

Process Mining @ [www.processmining.org](http://www.processmining.org)



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Several members of our IS group are working on process mining. Therefore, this newsletter highlights some of the activities/results in this area.

*Process mining* techniques allow for extracting information from event logs. For example, the audit trails of a workflow management system or the transaction logs of an enterprise resource planning system can be used to discover models describing processes, organizations, and products. Moreover, it is possible to use process mining to monitor deviations (e.g., comparing the observed events with predefined models or business rules in the context of SOX).

Process mining is closely related to *BAM* (Business Activity Monitoring), *BOM* (Business Operations Management), *BPI* (Business Process Intelligence), and data/

workflow mining. Unlike classical data mining techniques the focus is on processes and questions that transcend the simple performance-related queries supported by tools such as Business Objects, Cognos BI, and Hyperion.

The site [www.processmining.org](http://www.processmining.org) presents the research done in the context of the *ProM framework*. This pluggable framework offers a wide variety of process mining techniques and it is easy to add new plug-ins without the need to recode parts of the system. Moreover, it allows for the import from and the export to a wide variety of formats and systems (ranging from enterprise information systems and workflow products to social network software and classical mining tools) and provides advanced visualization and verification capabilities. For more information visit the website.

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## Nieuwe medewerkers



Hello, my name is Anne Rozinat and I come from Potsdam, Germany, which is close to Berlin and might possibly remind you of the 'Potsdam Conference'

from your history lessons. In 1999, I started studying Software Systems Engineering at the Hasso-Plattner-Institute (HPI), which can be considered a computer-science oriented education focusing on architectural concepts rather than on implementation details.

After finishing my Master courses in January 2004 I went to Madrid as an exchange student for half a year, and, back to Germany, I only had to do my final project. During my studies I had concentrated on the Business Process Technology domain, where I came across an interesting topic called Process Mining and a very active research group around Prof. Wil van der Aalst.

So I decided to ask him whether I could do my graduation project within this group and came to Eindhoven in December 2004. It was about Conformance Testing, which appeared to be a very nice topic we are still working on. Since September 2005 I am a PhD in the BPM group and my project is called "Managing Soft Reliability in Strongly Innovative Product Creation Processes", which will be carried out together with three fellow PhD students and industrial partners at the Design Technology Institute, Eindhoven. It did not really start yet, but my part will be somehow related to the Process Mining domain and I am very curious about it.



Good Day! Let me introduce myself to you. I am called Florian Gottschalk. Together with my supervisors Monique Jansen-Vullers and Wil van der Aalst I recently started my PhD project about "Configurable and executable Reference

Model". Reference models accelerate the modeling process by providing a repository of potentially relevant models. However usually these models cannot be applied without some adjustments and restrictions to individual requirements. In order to highlight configuration opportunities and therefore facilitate the model adaptation I will develop a general approach for adding a notion of configuration to such models within my PhD.

My background: I grew up in a suburb near Hanover/Germany. In 2000 I started my studies of Information Systems at the Technical University of Clausthal, located in the German Harz mountains (about 100km south of Hanover). In parallel I worked part-time in the e-business & web

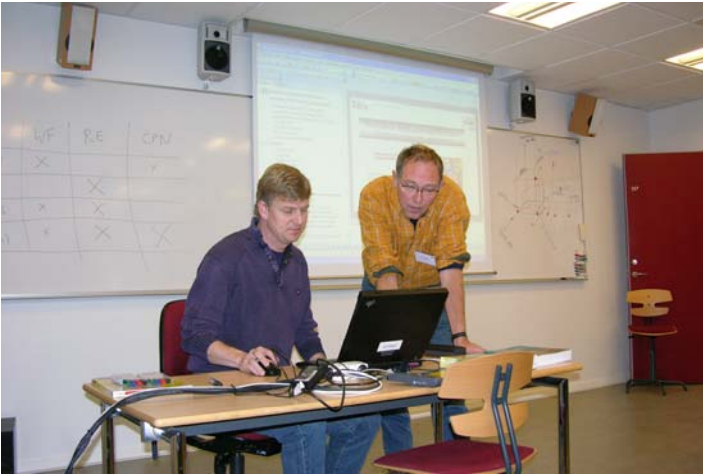
department of a German IBM subsidiary. Also responsible for their intranet I gained a lot of insights into business processes of large enterprises. Before graduating with the German, master-equivalent diplom-degree this summer I wrote my diplom thesis in a joined project of the Queensland University of Technology and SAP Research in Brisbane, Australia. During my stay in Brisbane I heard from the PhD position in Eindhoven and also met Wil van der Aalst. The project in Brisbane was dealing with configuration of process models in the context of Enterprise Systems. So, it was not only a very interesting area for my diplom thesis but also a perfect starting point for my PhD project.

## Wil van der Aalst will move to Computer Science department



Wil van der Aalst, chair of the IS group, was offered a professorship position within the Computer Science department at the TU/e. He accepted and will start in his new position in September 2006. He will keep a part-time position in the TM-IS department to supervise the projects and PhD students that remain there. Currently, the faculty is looking for a new professor to take over his position.

## CPN Workshop



Professor Kurt Jensen has been a BETA chair both in 2005 and 2006. The position of BETA chair is reserved for well-known and respected scientists and it is been very productive to have Kurt visiting us twice for a longer period. Several PhDs did an extensive course on process modeling with him and this resulted in several papers that were accepted for the annual CPN

workshop. This workshop is devoted to application of Colored Petri Nets and focusing on the use of tools such as Design/CPN and CPN Tools.

From our group the following papers were presented. Monique Jansen-Vullers presented the paper "Business Process Redesign at a Mental Healthcare Institute: A Coloured Petri Net Approach", Nataliya Mulya presented "Towards a Pattern Language for Colored Petri Nets", Irene Vanderfeesten presented "Modelling a Product Based Workflow System in CPN Tools", Maja Pestic presented Modeling Work Distribution Mechanisms Using Colored Petri Nets, Ana Karla Alves de Medeiros presented process Mining "Using CPN Tools to Create Test Logs for Mining Algorithms", Christian Gunther presented "Modeling the Case Handling Principles with Colored Petri Nets", and Mariska Netjes presented "Analysis of Resource-Constrained Processes with Colored Petri Nets". In addition a workflow tutorial was given by Wil van der Aalst.

See <http://www.daimi.au.dk/CPnets/workshop05/> for copies of the papers, slides, and photos of the event.

## Paper on Coupling in Communication Middleware selected as best paper of DOA

The paper "On the Notion of Coupling in Communication Middleware" by L. Aldred, W.M.P. van der Aalst, M. Dumas, and A.H.M. ter Hofstede was selected as the best paper of the International Symposium on Distributed Objects and Applications (DOA 2005). It is published in volume 3761 of *Lecture Notes in Computer Science*, pages 1015-1033. Springer-Verlag, Berlin, 2005. The paper identifies 16 patterns and models these patterns using CPN Tools in order to specify and

analyze them. Moreover, the communication patterns were also used to evaluate middleware software. The paper was also nominated for the Manfred Paul award. However, this award was given to the paper "On the controlled evolution of access rules in cooperative information systems" by Stefanie Rinderle and Manfred Reichert. The authors of this paper are also collaborating with members of our IS group in the BPM area.

## Huixin Tan returns to China

After working on the work-list handler of YAWL for about one year, Huixin Tan returns to China. YAWL is a powerful workflow systems developed by members of the IS group and QUT in Brisbane Australia. The YAWL language is based on the so-called workflow patterns and is supported by an open-source workflow management system. Until recently, YAWL emphasized the process perspective, i.e., control-flow. As a result, YAWL is superior with respect to this perspective. However, issues associated with the resource perspective, i.e., the people and machines actually doing the work, have been largely neglected. Although the process perspective is of most significance, appropriate consideration of the resource perspective is essential for the successful implementation of

workflow technology. To address this we have developed a set of 43 resource patterns. These patterns capture the various ways in which resources can be represented and utilized in workflows. Huixin Tan developed a work-list handler based on these patterns. The goal of this work-list handler is to make YAWL also superior with respect to the resource perspective. The work-list handler is named YAWL RA (YAWL Resource Allocation) and has been realized using the service-oriented architecture of the YAWL system.

For more detailed information we refer to [www.yawl-system.com](http://www.yawl-system.com). See <http://sourceforge.net/projects/yawl/> for downloading the software.

## Hungarian visit to Eindhoven



### Introduction

We came from Hungary to the Eindhoven University of Technology for a one month research and development project. Gábor Bóka is an engineer of Budapest University of Technology and Economics (BUTE) from the Department of Control Engineering and Information Technology. Zádor Dániel Kelemen is a msc student of the university mentioned above. Both of us are also co-workers of SQI (Software Quality Institute Hungary).

### About our project

We are working on a project launched by SQI. The project scope is "Development in Hungary of world-class services connected to software quality improvement and auditing". Within the project we participate in the development of a software tool and methodology which support the implementation of the QMIM model (Quality through Managed Improvement and Measurement).

QMIM has been developed in the late nineties by dr. Katalin Balla during her Ph.D research at TU/e. The current research team is composed of engineers and researchers from three institutes, respectively: SQI, BUTE and TU/e. TU/e professors, i.e. Rob Kusters and Jos Trienekens, help us to improve the conceptual model of the software tool. Actually, from the part of TU/e two Dutch exchange students are working in Budapest on the same subject; we started to work together two months ago in Hungary.

### The journey

We arrived on the 5<sup>th</sup> of November in Eindhoven. Our travel became a little bit longer than we expected, because our bus company took some kind of experimental route, so we arrived in Eindhoven after about twenty hours. Fortunately, we had a lot of stops. Owing to these breaks it seemed that the time passed 'just in a minute'; moreover we were able to make short trips in cities, for example in Vienna we have seen an Irish folkdance presentation.

### Housing

We have tried to find our accommodation by following the street-tablets "De Lismortel" (in this street we have got our housing). Unfortunately our first trial ended in failure. Following the arrows to De Lismortel, we succeeded 'successfully' in getting out of the university area. However, after a long period of city-surfing, we finally found the right address. Our efforts have been rightly compensated by the inner side of the accommodations: the space-boxes (which are also called containers by the local people) show excellent design and comfortable arrangement.

### Local experiences

In contrast with the swarming Budapest we really appreciate the quiet of the city and the university here. The great green spaces are also calming and we are learning a lot about Dutch customs and products. For example after the first shopping trial we learned that "Karne" means sour (so we had bought sour milk instead of milk). Since we do not understand the inscriptions completely, we now are always testing the Dutch taste-specialties on the spot.

Our neighbors and also the colleague researchers are kind persons, all the people we met are helpful, and the pubs are full of interesting feelings. For the weekends we plan to visit other Dutch cities in order to get a deeper understanding of all kinds of specialties in The Netherlands.

We are glad to have the opportunity to be here, and we hope that we can return in the near future many times to this engaging atmosphere.



## Dutchmen visiting Budapest



We (Peter and Dirk) went to Budapest for three months to do our International Practical Training, part of our study Industrial Engineering and Management Science, at the Hungarian Software Quality Institute (SQI). There we worked on two assignments related to software quality management. Peter invested his attention in the further development of the QMIM (Quality through Managed Improvement and Measurement) Framework, which was developed by Dr. Katalin Balla during her Ph.D research at TU/e (supervisors: Rob Kusters, Jos Trienekens). Dirk developed a 'Personal Software Process' (PSP) - training program.

### **About our project (in brief)**

The QMIM Framework is one of the main projects of SQI, and Peter's task

was to help in making the framework more applicable in practice. Eventually, the framework will be implemented in a Software Application (a DataBase structure) which will guide software companies through an apparent Software Quality 'jungle'. The framework focuses on three elements (Project Management, Technical Process, and Product) through Definitions, Quality Attributes and Metrics. An assessment will be related to this framework to point out which approach is the right one to follow.

The PSP training program will be used to learn MSc students in the field of Software Engineering and Hungarian software engineers the principals and methods used in the PSP-theory developed by Watts S. Humphrey.

### **Housing**

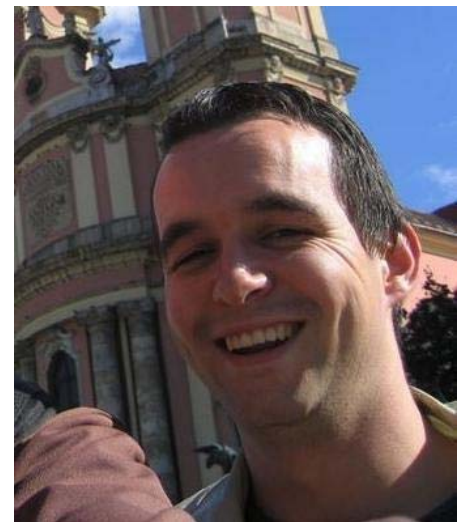
Finding an appropriate accommodation was not easy, since most landlords were only interested in renting their place for at least a year. Fortunately, Peter found an apartment (70 m<sup>2</sup>) in the heart of Pest a week before we left the Netherlands. This was a perfect location with everything within a few minutes from our apartment. For Dutch standards the apartment was really affordable.

### **Local experiences**

Budapest is a real crowded and swarming city (20% of the Hungarian population lives there!!) with beautiful architectural buildings, mostly dating from the Austrian Hungarian Empire.

The Hungarian language (Magyar) was really difficult to understand and, especially in the beginning, this resulted in remarkable scenes, such as shouting cashiers while our intention was only to buy a metro ticket. The Hungarian cuisine is very fond of sour cream and paprika. We could tackle the kilos of paprika they put on top of the meat, but we tried to avoid the sour cream as much as possible.

Overall, Budapest was a magnificent place with lots of nice places and people. We consider the experience we gathered during our stay invaluable.



## **TM people Pages**

De afgelopen maanden is gewerkt aan een nieuwe (web)applicatie medewerkerpagina's voor de faculteit TM. De naam voor de nieuwe applicatie is TM People Pages, met per persoon de volgende gegevens:

1. persoonlijke gegevens;
2. het onderwijs wat verzorgd wordt;
3. een publicatielijst;
4. verder is het b.v. mogelijk een biografie en Curriculum Vitae op te nemen.

De url is [https://venus.tue.nl/pp-cgi/pp\\_medewerkers.opl](https://venus.tue.nl/pp-cgi/pp_medewerkers.opl) (ook bereikbaar via [www.tm.tue.nl](http://www.tm.tue.nl))

## Onderwijskwaliteit

Kwaliteit van onderwijs is niet alleen een hot issue op in het lager en middelbaar onderwijs. Ook in het hoger onderwijs wordt hier steeds explicieter aandacht aan besteed. Als onderdeel van de drive van de overheid om Nederland als kennisland te profileren worden alle hoger onderwijs opleidingen regelmatig gevisiteerd door een externe instantie.

Het resultaat van de laatste visitatie was positief voor de opleiding Technische Bedrijfskunde. De opleiding is zondermeer goed beoordeeld en de visiterende instantie was ook tevreden over het in gebruik zijnde kwaliteitssysteem.

Een mogelijke reactie hierop is te zeggen dat we goed zitten tot de volgende visitatie in 2011 en voorlopig op onze lauweren kunnen gaan rusten.

Een andere mogelijke reactie is zich te realiseren dat stilstand op kwaliteitsgebied gelijk staat aan achteruitgang, of, zoals andere Eindhovenaren wel eens zeggen: "Lets do things better".

We hebben dus voor de tweede optie gekozen: het aanpassen en waar

mogelijk verbeteren van het onderwijs kwaliteitssysteem van de opleiding zodanig dat:

- onderwijskwaliteit continu punt van aandacht blijft,
- de discussie over onderwijsverbetering wordt gestimuleerd, en
- we streven naar continue verbetering.

Dit alles onder de randvoorwaarde dat het enerzijds zichtbaar en aantoonbaar gebeurt (zodat belanghebbenden de discussie kunnen volgen en visiterende instanties kunnen zien wat we doen) en anderzijds we niet verzanden in zinloze bureaucratische procedures (zoals onze Eindhovense vrienden zeggen: "Sense en simplicity").

Een consequentie hiervan is dat capaciteitsgroepen meer dan voorheen aangesproken worden op de kwaliteit van het verzorgde onderwijs. Om hier op in te springen heeft de capaciteitsgroep IS een eenvoudig kwaliteitssysteem opgezet wat is gebaseerd op twee soorten cycli.

De eerste vindt plaats per vak. Op basis van resultaten van studentenquêtes, eigen evaluaties van vorige versies, nieuwe

ontwikkelingen op het vakgebied en nieuwe ideeën t.a.v. onderwijsverzorging wordt per vak een actieplan opgesteld. Op basis van dit plan wordt het vak aangepast en vervolgens wordt het onderwijs uitgevoerd. Achteraf wordt het geëvalueerd, eerst door de deelnemende studenten, die een enquête invullen en vervolgens door de betrokken docenten. Dit kan weer dienen als start voor de volgende cyclus.

Naast deze cyclus op vakniveau wordt jaarlijks een tweede cyclus op capaciteitsgroep niveau uitgevoerd, met als kern een bijeenkomst waarin de vakevaluaties van alle vakken worden besproken, in wordt gegaan op de samenhang tussen de afzonderlijke vakken, en ideeën rondom mogelijke andere benaderingen van onderwijs worden besproken. Resultaat van deze bijeenkomst is een bijgewerkt overzicht van de inhoudelijke samenhang tussen de verschillende vakken.

Het is de bedoeling dat deze twee cycli samen leiden tot het ontstaan en de toepassing van verbeterde inzichten in de manier waarop kwalitatief goed onderwijs kan worden gegeven.

## Tiese Barrell wint Bakkenist-prijs voor zijn afstudeerwerk



Tiese Barrell heeft binnen IS een interne afstudeeropdracht uitgevoerd op het gebied van architecturen voor e-business systems, begeleid door Paul Grefen en Hajo Reijers. Hij is op 12 augustus jongstleden afgestudeerd op een scriptie met de titel "Rich E-Services - Leveraging Service Oriented

Architectures for Conducting Electronic Business with Rich Internet Applications".

Hij heeft met een sterk modelgedreven aanpak een complexe architectuur van een e-business systeem ontworpen en gedocumenteerd. Het ontwerp is gekoppeld aan software-ontwikkeling in de praktijk binnen een bedrijf (waar de modelgedreven aanpak zeker niet tot de standaardpraktijk behoort). Als zodanig is hij op excellente wijze geslaagd in het slaan van een brug tussen eisen vanuit de bedrijfskunde en oplossingen vanuit de informatica. Het afstudeerproject is duidelijk in lijn met onderzoek dat binnen de leerstoel ICT Architectures plaatsvindt, zowel waar het de architectuurgebaseerde benadering betreft, waar het applicatiedomein e-business betreft, alsook in de toepassing van web-technologie bij de realisatie. Het

afstudeerproject heeft na afronding een interactieve demonstrator achter gelaten die binnen de context van het digitale laboratorium van de capaciteitsgroep gebruikt zal worden.

Op basis van de goede kwaliteit van zijn werk en de getoonde inzet heeft Tiese van de capaciteitsgroep IS een beoordeling '9' en een afstudeerbonus plus certificaat ontvangen. Daarnaast is Tiese voorgedragen voor de Bakkenist-prijs van de Koninklijke Hollandsche Maatschappij der Wetenschappen. Recent werd bekend dat Tiese inderdaad de Bakkenist-prijs gewonnen heeft, waaraan een geldbedrag van EUR 10.000 is gekoppeld. Deze prijs is in November aan hem uitgereikt tijdens een feestelijke bijeenkomst in Haarlem. De capaciteitsgroep IS feliciteert Tiese van harte!