BPM 2011
9th International Conference on Business Process Management

28 August – 2 September, 2011

Campus des Cézeaux
Clermont-Ferrand, France
http://bpm2011.isima.fr/

Conference Program
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Welcome Message from the BPM 2011 General Chairs and Organizing Committee Chair

It is our great pleasure to welcome you to Clermont-Ferrand for the ninth International Conference on Business Process Management- BPM 2011. This year’s edition continues its tradition of being a series that provides the most distinguished forum for presentation and exchange of research results and practical experiences within the field of business process management.

We are looking forward to an exciting scientific program, providing an overview of the most recent trends on all aspects of business process management and discussing original results. BPM 2011 will feature keynotes, research talks, industry presentations, panels, tutorials, demonstrations, and 12 workshops that will present the most critical issues and views in this active research area.

BPM 2011 will take place in Clermont-Ferrand, a medium-sized city located in the heart of Auvergne, one of the most beautiful regions of France: ancient volcanoes, lakes and gorges, historic sites and Romanesque architecture make its wealth. Auvergne is characterized by a diversity of landscape in an area of mountains and valleys, plateaus and plains, which join together to form two of France’s largest Regional Nature Parks: the Volcano Park and the Livradois-Forez Park. The panoramic views from the summit of the Puy de Dome Volcano which gave its name to the “department”, show all the beauty of this land shaped by fire and water.

Preparing for the conference was a team effort. We are very grateful to all the conference committees for putting together a high quality scientific program in the tradition of BPM series. They have done an outstanding job and we thank them sincerely for all their efforts. Many thanks are also due to the local organizing committee for their wonderful work.

We would also like to thank our sponsors for their invaluable support: Gold sponsor - HP; Silver sponsor - Petalslinks; Further sponsors - Michelin, Limagrain and AIR FRANCE, as well as the public sponsors: I3, GDR MACS, INFORSID, Conseil régional du puy-de-dôme, Ville de Clermont-Ferrand, Clermont Communauté, Conseil général du puy-de-dôme, MESR, ED SPI, TIMS, LIMOS, ISIMA, IFMA, Cemagref, Polytech’Clermont, CNRS and the University of Blaise Pascal.

Last but not least, we wish to thank all of the contributors to the conference, the authors of the papers and the speakers, and all the participants.

We hope that you will find the BPM 2011 program interesting in the best tradition of the BPM series. Thank you for your active participation in the conference and welcome to Clermont-Ferrand.

Mohand-Said Hacid,
Farouk Toumani
General Chairs

Michel Schneider
Organizing Committee Chair
Welcome Message from the BPM 2011 Program Committee Chairs

The BPM Conference series provides the most distinguished research forum for researchers and practitioners in all aspects of Business Process Management (BPM) including theory, frameworks, methods, techniques, architectures, systems, and empirical findings. The series has a record of attracting innovative research of highest quality, from a mix of disciplines including computer science, management information science, services computing, services science, and technology management.

BPM 2011 was the ninth conference of the series. It took place from August 30 to September 2, 2011 on the campus des cèzeaux in Clermont-Ferrand, France and was organized by the LIMOS Laboratory of the Blaise Pascal University and CNRS. BPM 2011 attracted 157 research paper submissions, out of which 22 papers were selected for this volume based on a thorough review process (each paper was reviewed by three to four Program Committee members and subject to subsequent discussion among the reviewers). Altogether the research track was extremely competitive with an acceptance rate of less than 14%. Further, this volume contains a paper and two abstracts documenting the invited keynote talks as well as 5 industrial papers (2 invited industrial papers and 3 papers selected out of 14 submissions to the industrial track).

In conjunction with the main conference, 12 international workshops were held on August 28, 2011. The topics of the workshops covered a broad range of BPM-related subjects and stimulated the exchange and discussion of new and innovative ideas. The workshop proceedings are published as a separate volume of Springer’s *Lecture Notes in Business Information Processing* series. Beyond that, the conference also included a doctoral consortium, an industry day, tutorials, panels, and demonstrations.

We want thank everyone who made BPM 2011 a success by generously and voluntarily sharing their knowledge, skills and time: the Conference Committee for providing an excellent environment for the conference, and all other colleagues holding offices. In particular, we want to express our gratitude to the senior, regular and industrial Program Committee members as well as the additional reviewers for devoting their expertise and time to ensure the high quality of the conference scientific program through an extensive review and discussion process. Finally, we are grateful to all the authors who showed their appreciation and support of the conference by submitting their valuable work to it.

Stefanie Rinderle-Ma
Farouk Toumani
Karsten Wolf
Conference Venue

The conference will take place at the Campus des Cézeaux, located about 15 minutes by tram from the city centre of Clermont-Ferrand. The site is also served by buses from the main city points.

The nearest tramway station is «Campus».

From the city center
Take the tram (line A, direction "La Pardieu"), stop at station "Campus".

From central station
From the main station, take the bus (line B, "Royat" direction) until the "Jaude" stop, then the tram (line A, direction "La Pardieu"), stop at station "Campus".

From Aulnat airport
The best way to reach the site of the conference from the airport is to take a taxi (about 20 minutes, 15 euros).
Pôle Commun Map
Worshops and PHD symposium site - from August 28th to August 30th

Ground level
- G018
- G019
- G020
- Auditorium 2
- Auditorium 3
- Toilets
- Main entrance
- Second entrance

First level
- G128
- G129
- G130
- G131
- Auditorium 1
- Toilets
- Second entrance

Ground level
- G006
- G007
- Toilets
- Second entrance

Main entrance
IFMA
Main conference site map - from August 30th to September 2

Auditorium
Blaise Pascal
Auditorium
De Vinci
Auditorium
Curie
Toilets
TCM 016
TCM 002
TCM 003
TCM 004
TCM 005
TCM 006
TCM 007
TCM 008
General Information

Registration Desk Hours
- Sunday, August 28th, 8:00-18:00 (main hall, pôle commun)
- Monday, August, 29th, 8:00-18:00 (main hall, pôle commun)
- Tuesday, August, 30th, 8:00-18:00 (main hall, IFMA)
- Wednesday, August, 31st, 8:00-17:00 (main hall, IFMA)
- Thursday, September 1st, 8:00-18:00 (main hall, IFMA)
- Friday, September 2nd, 8:00-12:00 (main hall, IFMA)

Your Badge
Each badge carries the name and affiliation of the badge holder. Please wear your badge all the times during the conference, including the welcome reception and conference dinner.

Lunches
- Lunches on the August 30th, 31st, September 1st and 2nd are included in the conference registration.
- Lunch on the August 28th is included in the PHD symposium registration.
- Lunch on the August 29th is included in the workshops registration.

Lunches are held in the Restaurant le SAXO at Maison de la Vie Etudiante (c.f. map of the campus).

Conference Banquet Tickets
Delegates will receive their conference banquet ticket at registration. Tickets are to be displayed at the conference banquet. Tickets are available for purchase subject to availability at a cost of 100€.

Internet Access
WiFi Internet access is available for the duration of the conference at the conference venue.

Mobile Phones, Pagers and Laptop Sound
As courtesy to presenters and colleagues Sound, please ensure that all mobile phones, pagers and sound from your laptop are switched off during the sessions.

Urban Public Transport Tickets
Delegates will receive a transportation pass which is valid on all public transport within the city of Clermont-Ferrand during the conference.

Urgent Messages
Urgent messages for delegates can be directed to registration desk. Messages will be held at the registration desk for collection and the recipient will be notified via a notice board.

Volunteers
You may ask Volunteers for help for any questions. They will be happy to help you. You will recognize volunteers from their yellow shirt with the conference name.
Money, Banks, Credit cards
Currency in France is the Euro (€). Bank hours are normally open 9 AM to 5 PM, from Monday to Friday. Visa and Mastercard are the credit cards most used in France. American Express is not accepted everywhere.

Passport/visa
A valid passport is required for entry into France. Please check with your local consulate for specific details of visa requirements from your country.

Electricity power supply
Electricity is supplied throughout the country at 220 V, 50 Hz. Depending on your country, you may need an adapter.

Smoking
Smoking is banned in all public buildings in France including restaurants and bars. The conference site is a non-smoking area.

Taxes
Hotel room tax with state tax is 19.6% for France and food and beverage inside a Hotel is taxed at 5.5%. The majority of purchases are subject to state tax of 19.6%. Taxes are generally included in the purchase price.

Tipping
Tipping is not obligatory in France, even in restaurants or bars - but it’s not frowned upon either. Tipping is left entirely to your discretion, and may be appropriate if you receive excellent service.

Liability
The Conference Organizers shall not be held liable for personal accidents or losses or damage to private property of registered delegates of the Conference. Delegates should make their own arrangements in respect of personal insurance.

Aulnat airport
The best way to reach the airport from the city or the conference venue is to take a taxi (from 10 to 20 minutes, between 10 and 15 euros).

Taxi
- **Allo Taxi Radio**
  9, allée Pierre-de-Fermat. Phone: +33 (0)4 73 19 53 53
  24h/7. Any distance. Free reservation 24/7. All modes of payment welcome.
  [www.allotaxiradio.com](http://www.allotaxiradio.com)
- **Eurotaxis clermontois**
  15, rue du Pré-la-Reine. Phone: +33 (0)4 73 600 600
  24h/7. Any distance. Major Credit Cards and American Express welcome.
- **Taxi 63**
  40, rue Fontgiève. Phone: +33 (0)4 73 315 315
  Any assignement, any distance. Free reservation 24/7. All modes of payment welcome.
Information for Session Chairs and Presenters

Facilities at the Presentation Room
All rooms are equipped with a PC (running Windows) and a video-projector connected to the PC.

Presentation Time
The presentation time allocated to each conference paper is 30 minutes (including questions and answers).

Session Chairs
If you cannot fulfill your duties as a session chair, please ensure that someone else will take your place as the session chair, or contact the Conference Chair to arrange a back-up.

Session chairs are kindly requested to help with the followings:
1. Note the time allocated for each paper in your session. Each paper is allocated 30 minutes (20 minutes for the presentation plus 10 minutes for discussion).
2. Arrive at the room of the session 5 minutes before the session starts and identify each of the speakers for the session.
3. Suggest each speaker to keep corresponding time for discussions (questions and answers), and for transition to the next presentation. If a presentation extends into the time for discussions, please shorten the discussions accordingly or postpone the discussions until after the session.
4. Do not allow presentations or the subsequent discussions to spill beyond the starting time of the next presentation.
5. If the presenter of a paper is absent (no-show), please continue to the next presentation. Please check again at the end of the last presentation whether the no-show shows up. Best efforts have been made to reduce the number of no-shows; however, they may not be eliminated.
6. Each presentation room is equipped with a video projector. If something is not working properly, please contact the volunteer who will be in charge of the room (a volunteer is assigned to each room during the presentations).

Presenters
1. If you are scheduled to present, please ensure your presentation is loaded well in advance of your presentation time. Please visit the registration desk if you have any questions or for further details.
2. Please check your presentation time and room. Please go to the room 5 minutes before the session starts and identify yourself to the session chairs.
3. Note that the time allocated for each paper is 30 minutes (20 minutes for your presentation plus 10 minutes for discussion).
4. When it is your turn to present, please leave corresponding time for discussion (questions and answers), and for transition to the next presentation. If your presentation extends into the time for discussions, discussions on your paper will be shortened by the session chair accordingly or postponed until after the session.
5. Please do not exceed your allocated time. Please follow the instructions of the Session Chairs.

If you cannot find your name in Sessions or if your information is incorrect in the Program Booklet, please contact the Conference Chairs.
Social Events

Welcome buffet dinner
Monday, August 29th, 19:00-22:00
Main hall, Pôle commun, Campus des Cézeaux, AUbière.

Welcome Reception at the city hall
Tuesday, August 30th, 19:30-21:30
10, rue Philippe-Marcombes, Clermont-Ferrand

How to go to the city hall from the campus
Take the tramway direction Champratel
Tram stop: Hôtel de Ville
Walk (400m) to the Hôtel de ville (c.f. the map below)
Conference Banquet
Wednesday, August 31st 2011, 17:30-23:00
Château de Parentignat - 63500 Parentignat - phone : 04 73 89 51 10

From the conference venue (IFMA) we will get to Château de Parentignat by buses. The departure will be at 17:40. Please bring your banquet ticket to get access to the banquet. We will return by buses after the banquet.

If your are vegetarian, please let the waiters know so that you can get a vegetarian meal.

Visit
Thursday, September 1st 2011, 19:00-21:00
L'Aventure Michelin, 32 Rue du Clos Four, 63000 Clermont-Ferrand - phone: 04 73 98 60 60

L'Aventure Michelin spreads over two levels of a former industrial space of 2,000m² on the Cataroux site. The original architecture, dating back to the beginning of the 20th century, has been preserved.

L'Aventure Michelin begins with a Micheline railcar and a Bréguet airplane in a restored workshop. The tour consists of 9 spaces with different contents and styles.

Location. L’Aventure Michelin is located in the Montferrand district right next to the Marcel MICHELIN Stadium.

Tram access
Direction: Champratel
Stop: Stade Marcel Michelin Station
About Clermont-Ferrand

From Wikipedia

Clermont-Ferrand sits on the plain of Limagne in the Massif Central and is surrounded by a major industrial area. The city is famous for the chain of volcanoes, the Chaîne des Puys surrounding it. The famous dormant volcano Puy-de-Dôme (10 km from the city) is one of the highest of these and well-known for the telecommunication antennas that sit on its top and are visible from far away.

Clermont-Ferrand is also famous for hosting one of the world's leading international festivals for short films, the Festival du Court Métrage de Clermont-Ferrand, as well as the corporate headquarters of Michelin, the global tire company created more than 100 years ago in the city.

Clermont-Ferrand's most famous public square is place de Jaude, on which stands a grand statue of Vercingetorix sitting imperiously on a horse and holding a glaive. The inscription reads: J'ai pris les armes pour la liberté de tous (English: I took up arms for the liberty of all). This statue was sculpted by Frédéric Bartholdi, who also created the Statue of Liberty.

Recently, Clermont-Ferrand was France's first city to get a new guided light transit system, thereby linking the city's north and south neighbourhoods.

Brief History of Clermont-Ferrand

Clermont ranks among the oldest cities of France. The first known mention was by the Greek geographer Strabo. The city was at that time called Nemessos—a Gaulish word for a sacred forest. It witnessed the famous Battle of Gergovia won by the Gauls led by Vercingetorix over the Romans led by Julius Caesar, in 52 BC. After the Roman conquest, the city was called Augustonemetum, a name which combined its original Gallic name with that of the Emperor Augustus. Its population was estimated at 15000–30000 inhabitants in the 2nd century, making it one of the largest cities of Roman Gaul.

In 848, the city was renamed Clairmont, after the castle Clarus Mons. During this era, it was an episcopal city ruled by its bishop, and it was the starting point of the First Crusade from the Christian world to free Jerusalem from Muslim domination—Pope Urban II preached the crusade there in 1095 at the Council of Clermont. In 1120, to counteract the power of the clergy, the counts of Auvergne founded the city of Montferrand on the model of the new cities of the Midi. In 1551, Clermont became a royal city, and in 1610, the inseparable property of the Crown.

On 15 April, 1630, the Edict of Troyes (the First Edict of Union) forcibly joined the two cities of Clermont and Ferrand. This union was confirmed in 1731 by Louis XV with the Second Edict of Union. At this time Montferrand was no more than a satellite city of Clermont, in which condition it remained until the beginning of the 20th century. Wishing to retain its independence, Montferrand made three demands for independence, in 1789, 1848, and 1863.

In the 20th century, the construction of the Michelin factories and city gardens, which shaped the modern Clermont-Ferrand, definitively reunited Clermont and Montferrand. Today, although the two cities are amalgamated, one may find in Clermont-Ferrand two distinct downtowns, and Montferrand retains a strong identity.
Clermont-Ferrand Points of Interest

Tourist and Convention Office
Place de la Victoire
Tel.: 04 73 98 65 00
Fax: 04 73 90 04 11
Email: tourisme@clermont-fd.com
Website: http://www.clermontferrandtourism.com/

Museums and attractions in Clermont-Ferrand

- **Musée d'Art Roger Quilliot** (Place Louis Deteix, Clermont-Ferrand)
  Superb art museum with sculpture, paintings through the ages
- **Musée Lecoq** (15 rue Bardoux, Clermont-Ferrand)
  An impressive natural history museum
- **Musée Bargoin** (45 rue Ballainvilliers, Clermont-Ferrand)
  Gallo-Roman artefacts to be discovered here
- **L'Aventure MICHELIN** (32 Rue du Clos Four 63000 Clermont-Ferrand)
  L'Aventure Michelin is a new museum dedicated to the history of the Michelin tyre-company. It spreads over two levels of a former industrial space of 2,000 m², on the Cataroux site. The exhibitions are based on different scenes of the past, present and future of the Michelin company. The many interactive modules can be used by visitors to build their own personal experience.
- **Vulcania**
  An interactive multimedia centre which explores volcanoes, the creation of planet Earth, the formation of the solar system.

Clermont-Ferrand Cathedral
At 108 meters tall the Cathedral of Clermont dominates the skyline of the city. Built in the 4th Century out of volcanic stone, the church hosts a variety of festivals and events throughout the year. Guided tours are available.

Montferrand (tram stop Montferrand La Fontaine)
One of the best historically preserved towns in France, urban life is woven from the town’s heritage and its foundation in the 12th century. This town was united with the town of Clermont in 1630, by the edict of Troyes.

The Romanesque churches of Auvergne
The Auvergne is rich in remarkable mediaeval churches, the most famous of which are:

- Basilique Notre Dame du Port (Clermont Ferrand)
- Eglise Saint Austremoine at Issoire (20 km)
- Notre Dame d'Orcival (30 km)
- Eglise de Saint Nectaire (20 km)
- Basilique Saint Julien, Brioude (35 km)
- Abbey and cloisters at Lavaudieu (40 km)
- Cathédrale Notre Dame, le Puy en Velay (120 km)

See also L'Auvergne Romane (http://www.art-roman.net/auvergne/auvergne.htm)
Historic churches and chapels with frescoes and murals
The Abbey at La Chaise Dieu (70 km), with world famous Dance of Death fresco. The small churches and chapels of the Haut Allier (Blassac, Saint Cirgues, Peyrusse, etc.) , many decorated with murals and frescoes.

Dungeons and castles
There are many famous castles to visit in Auvergne; the following are among the more interesting:

**Department of Puy de Dome**
- La Batisse, Saint Saturnin, Murol, Tournoël, Busséol, Cordesses

**Department of Haute Loire**
- Domeyrat (near Brioude), Chavaniac Lafayette, Polignac

**Department of Cantal**
- Val (on the Lac de Bort), Pesteils (near Vic sur Cère)

Lakes
The lakes in Auvergne are due for the most part in volcanic events. Some reservoirs are Lake Aydat, Guery lake (Lakes formed after a lava flow that bar a valley), Lake Chambon (lake resulting from a valley blocked by a volcanic cone) others due to soil subsidence, and others occupy bowl of a crater lake as Serviere.

Other points of interest
- Jonas (near Besse, 20 km). Remains of the mediaeval trogloditic cave dwellings, guided visits.
- Historic working paper mill, the Moulin Richard de Bas, at Ambert (70 km) making paper since the 14th century.
- Allier gorges scenic train trip (50 km), departs from Langeac (train station, SNCF).
- The Pont de Garabit, designed by Gustave Eiffel (visitor centre on A75 motorway south of St Flour, 100 km).
- Salers, traditional old village of the Auvergne uplands (90 km).
Mouth-watering gourmet ideas to choose from on market stalls or shops …

Clermont gastronomy is basically a part of traditional Auvergne cuisine, made from local terroir products. This cuisine dates back to the 19th century, following the widespread use of potatoes and the fattening of pigs. Who has never heard of the fine charcuterie (cooked pork meats) from the Auvergne, truffades and aligots? Auvergne cheeses, five of which are AOP (appellation d’origine protégée / protected designation of origin) enjoy worldwide renown: “Saint-Nectaire, which is the best cheese in the world” in the words of Alexandre Vialatte, as well as Cantal, Salers, Fourme d’Ambert and the Auvergne Blue.

Fruit Paste

The processing of fruit into paste, candied fruit and jam is a more of a specific Clermont speciality. The angelica fields that used to be cultivated in Montferrand are but a distant memory nowadays. Yet the production of fruit paste remains a lively tradition which is exported throughout the world. Clermont-Ferrand dried jam was already famous in the reign of Louis XI. It was the gift that all visiting dignitaries would look forward to receiving. In 1629, Cardinal de Richelieu who was passing through was given six large, attractive coffers containing one hundred and thirty-three pounds of candied apricots. Later, in Vichy, Madame de Sévigné initiated the craze for candied fruit. But the golden age for confectioners was actually the Second Empire, especially thanks to the Duke of Morny. He turned hundreds of hectares into experimental fields for a sugar factory, the current-day Bourdon sugar plant.

Wine

Winemaking began as early as the Gallo-Roman period, grew in importance throughout the Middle Ages and peaked in the 1890s prior to the phylloxera disaster. Considerable effort since has helped revive Auvergne vineyards. Generic Côtes d’Auvergne and vintages such as Boudes, Châteaugay, Corent, Chanturgue, Madargue and Saint-Pourçain in the Bourbonnais are made from gamay and pinot noir grapes for red wine and rosé, and from chardonnay grapes for white wine. In 2009, Saint-Pourçain succeeded in obtaining its very own protected designation of origin (AOP: appellation d’origine protégée).
## Restaurants

### Very good restaurants (classified 1 ★ by the MICHELIN guide)

<table>
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<th>Name</th>
<th>Address</th>
<th>Phone</th>
<th>Range</th>
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</thead>
<tbody>
<tr>
<td>Emmanuel Hodencq</td>
<td>6 Place St-Pierre, 63000 Clermont-Ferrand</td>
<td>+33 473 312 323</td>
<td>40-120€</td>
</tr>
<tr>
<td>Jean-Claude Leclerc</td>
<td>12 rue St-Adjutor, 63000 Clermont-Ferrand</td>
<td>+33 473 364 630</td>
<td>40-80€</td>
</tr>
<tr>
<td>Fleur de Sel</td>
<td>8 rue Abbé Girard, 63000 Clermont-Ferrand</td>
<td>+33 473 903 059</td>
<td>30-80€</td>
</tr>
<tr>
<td>Apicius</td>
<td>16 rue Claussmann, 63000 Clermont-Ferrand</td>
<td>+33 473 911 361</td>
<td>40-80€</td>
</tr>
<tr>
<td>Le Pré Carré</td>
<td>Route de La Baraque, 63830 Durtol</td>
<td>+33 473 192 500</td>
<td>40-80€</td>
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</tbody>
</table>

### Good restaurants

<table>
<thead>
<tr>
<th>Name</th>
<th>Address</th>
<th>Phone</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hôtellerie Saint Martin</td>
<td>Allée de Bonneval, 63170 Pérignat les Sarliève</td>
<td>+33 473 798 100</td>
<td>30-60€</td>
</tr>
<tr>
<td>Le Petit Bonneval</td>
<td>Avenue République, 63170 Pérignat les Sarliève</td>
<td>+33 473 791 111</td>
<td>30-60€</td>
</tr>
<tr>
<td>Le Pescalune</td>
<td>19 Rue Jean Jaurès 63170 Pérignat les Sarliève</td>
<td>+33 473 791 122</td>
<td>30-60€</td>
</tr>
<tr>
<td>La Belle Meunière</td>
<td>25 Avenue de la Vallée, Royat</td>
<td>+33 473 358 017</td>
<td>30-60€</td>
</tr>
<tr>
<td>Le Radio</td>
<td>44 Avenue Pierre et Marie Curie, 63400 Chamalières</td>
<td>+33 473 308 783</td>
<td>50-80€</td>
</tr>
<tr>
<td>Brasserie Bath</td>
<td>Marché Saint-Pierre, 63000 Clermont-Ferrand</td>
<td>+33 473 312 322</td>
<td>30-60€</td>
</tr>
<tr>
<td>Amphitryon Capucine</td>
<td>50 rue Fontgiève, 63000 Clermont Ferrand</td>
<td>+33 473 313 839</td>
<td>30-60€</td>
</tr>
<tr>
<td>L’Alambic</td>
<td>6 rue Sainte-Claire, 63000 Clermont</td>
<td>+33 473 361 745</td>
<td>30-60€</td>
</tr>
<tr>
<td>Le Richelieu</td>
<td>44 place de Jaude, 63000 Clermont-Ferrand</td>
<td>+33 473 292 424</td>
<td>20-50€</td>
</tr>
<tr>
<td>Pavillon Lamartine</td>
<td>17 Rue Lamartine, 63000 Clermont-Ferrand</td>
<td>+33 473 93 52 25</td>
<td>30-60€</td>
</tr>
<tr>
<td>L’Odevie</td>
<td>1 rue Eugène Gilbert, 63000 Clermont-Ferrand</td>
<td>+33 473 939 000</td>
<td>20-40€</td>
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### Nice and cheap restaurants

<table>
<thead>
<tr>
<th>Name</th>
<th>Address</th>
<th>Phone</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>D’ici &amp; d’ailleurs</td>
<td>11 place de l'Etoile, 63000, Clermont-Ferrand</td>
<td>+33 473 366 725</td>
<td>15-30€</td>
</tr>
<tr>
<td>Le 24</td>
<td>1 rue Gilbert Morel, 63000, Clermont-Ferrand</td>
<td>+33 473 925 136</td>
<td>15-30€</td>
</tr>
<tr>
<td>Le Patio’Nata</td>
<td>28 rue des Petits Gras, 63000, Clermont-Ferrand</td>
<td>+33 473 379 182</td>
<td>15-30€</td>
</tr>
</tbody>
</table>

### Typical restaurant

<table>
<thead>
<tr>
<th>Name</th>
<th>Address</th>
<th>Phone</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caveau de François</td>
<td>1 rue Tour la Monnaie, 63000 Clermont</td>
<td>+33 473 140 703</td>
<td>30-50€</td>
</tr>
</tbody>
</table>

# Program at Glance

## Sunday, August 28th - PHD Symposium

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>08:00-09:00</td>
<td>Continental Breakfast [Pôle commun (main hall)]</td>
</tr>
<tr>
<td>09:00-09:15</td>
<td>Session 1 - Welcome and Introduction</td>
</tr>
<tr>
<td>09:15-10:45</td>
<td>Session 2 - Student presentations (Moderator: Claude Godart)</td>
</tr>
<tr>
<td>10:45-11:00</td>
<td>Coffee Break [Pôle commun (main hall)]</td>
</tr>
<tr>
<td>11:00-12:30</td>
<td>Session 3- Student Presentations (Moderator: Boualem Benatallah)</td>
</tr>
<tr>
<td>12:30-14:00</td>
<td>Lunch Break [Restaurant le SAXO]</td>
</tr>
<tr>
<td>14:00-15:30</td>
<td>Session 4- Student Presentations (Moderator: Michale Rosemann)</td>
</tr>
<tr>
<td>15:30-15:45</td>
<td>Coffee Break [Pôle commun (main hall)]</td>
</tr>
<tr>
<td>15:45-17:30</td>
<td>Session 4 and Wrap-up</td>
</tr>
<tr>
<td>19:00-22:00</td>
<td>PHD Symposium Dinner</td>
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</table>

## Monday, August 29th - Workshops

<table>
<thead>
<tr>
<th>Time</th>
<th>Pôle Commun</th>
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<tbody>
<tr>
<td>08:00-09:00</td>
<td>Continental Breakfast [Pôle commun (main hall)]</td>
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<tr>
<td>09:00-09:30</td>
<td>Coffee Break [Pôle commun (main hall)]</td>
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<tr>
<td>10:30-11:00</td>
<td>Lunch Break [Restaurant le SAXO]</td>
</tr>
<tr>
<td>12:30-13:00</td>
<td>Coffee Break [Pôle commun (main hall)]</td>
</tr>
<tr>
<td>19:00-22:00</td>
<td>Workshops reception buffet [Pôle commun (main hall)]</td>
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<tr>
<td>Time</td>
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<tr>
<td>08:00-09:00</td>
<td>Continental Breakfast</td>
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<tr>
<td>09:00-09:15</td>
<td>Opening</td>
</tr>
<tr>
<td>09:15-10:30</td>
<td>Keynote 1: Some Thoughts on Behavioral Programming</td>
</tr>
<tr>
<td></td>
<td>Location: Auditorium Blaise Pascal</td>
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<tr>
<td>10:30-11:00</td>
<td>Coffee Break</td>
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<tr>
<td>11:00-12:30</td>
<td><strong>Session 1</strong></td>
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<tr>
<td></td>
<td>Business Process Monitoring</td>
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<tr>
<td>12:30-14:00</td>
<td>Lunch Break</td>
</tr>
<tr>
<td>14:00-15:30</td>
<td><strong>Session 2 A</strong></td>
</tr>
<tr>
<td></td>
<td>Process Querying and Retrieval</td>
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<tr>
<td>15:30-16:00</td>
<td>Coffee Break</td>
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<tr>
<td>16:00-17:30</td>
<td><strong>Session 3</strong></td>
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<tr>
<td></td>
<td>People-Centered Business Processes</td>
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<tr>
<td>17:30-17:35</td>
<td>Presentation of the demonstration program by the demo chairs</td>
</tr>
<tr>
<td>17:30-19:30</td>
<td>Steering committee meeting (SC Members Only)</td>
</tr>
<tr>
<td>19:30-21:30</td>
<td>City Hall reception</td>
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<td></td>
<td><strong>Wednesday, August 31st</strong></td>
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<tr>
<td>08:00-09:15</td>
<td>Continental Breakfast</td>
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<tr>
<td>09:15-10:30</td>
<td>Keynote 2: The Changing Nature of Work: From Structured To Unstructured, From Controlled To Social</td>
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<td></td>
<td>Location: Auditorium Blaise Pascal</td>
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<tr>
<td>10:30-11:00</td>
<td>Coffee Break</td>
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<tr>
<td>11:00-12:30</td>
<td><strong>Session 4</strong></td>
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<td>Demonstrations</td>
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<td></td>
<td><strong>Session 5</strong></td>
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<td></td>
<td>Demonstrations</td>
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<tr>
<td>12:30-14:00</td>
<td>Lunch Break</td>
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<tr>
<td>14:00-15:30</td>
<td><strong>Session 1</strong></td>
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<td>Demonstrations</td>
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<tr>
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<td>Coffee Break</td>
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<tr>
<td>Time</td>
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<tr>
<td>16:00-17:30</td>
<td><strong>Session 6</strong>&lt;br&gt;Process Mining (includes best paper)&lt;br&gt;Location: Auditorium Blaise Pascal&lt;br&gt;Session Chair: Barbara Weber</td>
</tr>
<tr>
<td>17:40-23:00</td>
<td>Conference Banquet&lt;br&gt;(Château de Parentignat)</td>
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<tr>
<td>08:00-09:15</td>
<td>Continental Breakfast&lt;br&gt;IFMA (main hall)</td>
</tr>
<tr>
<td>09:15-10:30</td>
<td>Keynote 3: Automatic Verification of Data-Centric Business Processes&lt;br&gt;Victor Vianu (UC, San Diego, USA)&lt;br&gt;Location: Auditorium Blaise Pascal&lt;br&gt;Session Chair: Michael zur Muehlen</td>
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<tr>
<td>10:30-11:00</td>
<td>Coffee Break&lt;br&gt;IFMA (main hall)</td>
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<tr>
<td>11:00-12:30</td>
<td><strong>Session 7A</strong>&lt;br&gt;Artifact-Centric Business Processes&lt;br&gt;Location: Auditorium Blaise Pascal&lt;br&gt;Session Chair: Peter Dadam</td>
</tr>
<tr>
<td></td>
<td><strong>Session 7B</strong>&lt;br&gt;Industrial track: panel&lt;br&gt;Title: Challenges in Business Process Management: New Frontiers and New Paradigms&lt;br&gt;Location: Auditorium De Vinci&lt;br&gt;Moderator: Francisco Curbera</td>
</tr>
<tr>
<td>12:30-14:00</td>
<td>Lunch Break&lt;br&gt;Restaurant le SAXO</td>
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<tr>
<td>14:00-15:30</td>
<td><strong>Session 8 A</strong>&lt;br&gt;Process Analysis/Error detection&lt;br&gt;Location: Auditorium Blaise Pascal&lt;br&gt;Session Chair: Mathias Weske</td>
</tr>
<tr>
<td></td>
<td><strong>Session 8 B</strong>&lt;br&gt;Industry Track: invited papers&lt;br&gt;Location: Auditorium De Vinci&lt;br&gt;Session Chair: Hamid Reza Motahari-Nezhad</td>
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<tr>
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<td>Coffee Break&lt;br&gt;IFMA (main hall)</td>
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<tr>
<td>16:00-17:30</td>
<td><strong>Session 9</strong>&lt;br&gt;Error correction and Comparison in Business Processes&lt;br&gt;Location: Auditorium Blaise Pascal&lt;br&gt;Session Chair: Hajo Reijsers</td>
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<tr>
<td></td>
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<td></td>
<td>WS-FM Workshop&lt;br&gt;Location: Auditorium Curie</td>
</tr>
<tr>
<td>18:00-19:00</td>
<td>IEEE Task Force on Process Mining Meeting&lt;br&gt;(open for TF members and all interested)&lt;br&gt;Location: TCM008</td>
</tr>
<tr>
<td>19:00-21:00</td>
<td>Visit&lt;br&gt;(L’Aventure Michelin)</td>
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<tr>
<td>20:00-21:00</td>
<td>WS-FM Dinner (for WS-FM participants)</td>
</tr>
<tr>
<td>08:00-09:00</td>
<td>Continental Breakfast&lt;br&gt;IFMA (main hall)</td>
</tr>
<tr>
<td>09:00-10:30</td>
<td>Tutorial 2 : The &quot;Physics&quot; of Notations: A Scientific Approach to Designing Visual Notations for Business Process Modelling&lt;br&gt;Daniel Moody&lt;br&gt;Location: Auditorium Blaise Pascal</td>
</tr>
<tr>
<td></td>
<td>Industry Day (in french)&lt;br&gt;Location: Auditorium De Vinci&lt;br&gt;WS-FM Workshop&lt;br&gt;Location: Auditorium Curie</td>
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<tr>
<td>12:30-14:00</td>
<td>Lunch Break&lt;br&gt;Restaurant le SAXO</td>
</tr>
</tbody>
</table>
Session Contents

Tuesday, August 30th

09:15-10:30  Keynote 1  
Location: Auditorium Blaise Pascal  
Session Chair: Boualem Benatallah

Some Thoughts on Behavioral Programming  
David Harel (Weizmann Institute of Science, Rehovot, Israel)

11:00-12:30  Session 1: Business Process Monitoring  
Location: Auditorium Blaise Pascal  
Session Chair: Florian Daniel

Monitoring Business Constraints with Linear Temporal Logic: An Approach Based on Colored Automata  
Fabrizio Maria Maggi, Marco Montali, Michael Westergaard and Wil Van Der Aalst

Event-based Monitoring of Process Execution Violations  
Matthias Weidlich, Holger Ziekow, Jan Mendling, Oliver Günther, Mathias Weske and Nirmi Desai

Business Entity-Centric Real-Time Performance Monitoring  
Rong Liu, Roman Vaculin, Zhe Shan, Anil Nigam and Frederick Wu

14:00-15:30  Session 2 A: Process Querying and Retrieval  
Location: Auditorium Blaise Pascal  
Session Chair: Remco Dijkman

Towards Efficient Business Process Clustering and Retrieval: Combining Language Modeling and Structure Matching  
Mu Qiao, Rama Akkiraju and Aubrey Rembert

Clone Detection in Repositories of Business Process Models  
Reina Uba, Marlon Dumas, Luciano García-Bañuelos and Marcello La Rosa

A Query Language for Analyzing Business Processes Execution  
Seyed-Mehdi-Reza Beheshti, Boualem Benatallah, Hamid Reza Motahari-Nezhad and Sherif Sakr

14:00-15:30  Session 2 B: Industrial track  
Location: Auditorium De Vinci  
Session Chair: Francisco Curbera

Source Code Partitioning Using Process Mining  
Koki Kato, Tsuyoshi Kanai, and Sanya Uehara

Next Best Step and Expert Recommendation for Collaborative Processes in IT Service Management  
Hamid Reza Motahari Nezhad and Claudio Bartolini

Process Variation Analysis using Empirical Methods – A Case Study  
Heiko Ludwig, Yolanda Rankin, Laura Anderson and Robert Enyedi
16:00-17:30  Session 3 : People-Centered Business Processes  
*Location: Auditorium Blaise Pascal*  
*Session Chair: Samir Tata*

**Stimulating Skill Evolution in Market-based Crowdsourcing**  
Benjamin Satzger, Harald Psaier, Daniel Schall and Schahram Dustdar

**Serving Information Needs In Business Process Consulting**  
Monika Gupta, Debdoott Mukherjee, Senthil Mani, Vibha Singhal Sinha and Saurabh Sinha

**Wiki-based Maturing of Process Descriptions**  
Frank Dengler and Denny Vrandecic

**Self-learning Predictor Aggregation For the Evolution of People-driven Ad-hoc Processes**  
Christoph Dorn, Cesar Marin, Nikolay Mehandjiev and Schahram Dustdar

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**Wednesday, August 31st**

**09:15-10:30  Keynote 2**  
*Location: Auditorium Blaise Pascal*  
*Session Chair: Francisco Curbera*

**The Changing Nature of Work: From Structured To Unstructured, From Controlled To Social**  
Sandy Kemsley (Kemsley Design Ltd., Toronto, Canada)

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11:00-12:30  Tutorial 1  
*Location: Auditorium Blaise Pascal*

**Artifact-centric Modeling of Business Processes and Operations**  
Richard Hull, Roman Vaculin and Jianwen Su

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11:00-12:30  Session 4: Demonstrations  
*Location: TCM002-TCM003-TCM004*

**A Prototype Augmented Reality Collaborative Process Modelling Tool**  
Poppe Erik, Brown Ross, Johnson Daniel and Recker Jan

**Adaptable Pervasive Flows: Towards a More Intelligent Environment**  
Antonio Bucchiarone, Stefan Foll, Klaus Herrmann, Marco Pistore and Heorhi Raik

**BPMModelMasher: Manage Your Process Variants Effectively**  
Sherif Sakr, Emilian Pascalau, Ahmed Awad and Mathias Weske

**Declare: A Tool Suite for Declarative Workflow Modeling and Enactment**  
Michael Westergaard and Fabrizio Maria Maggi

**Making YAWL and SmartPM Interoperate: Managing Highly Dynamic Processes by Exploiting Automatic Adaptation Features**  
Andrea Marrella, Massimo Mecella, Alessandro Russo, Arthur Ter Hofstede and Sebastian Sardina

**Ontomantics overview**  
Philippe Baumann
14:00-15:30 Tutorial 1  
*Location: Auditorium Blaise Pascal*

**Artifact-centric Modeling of Business Processes and Operations**
Richard Hull, Roman Vaculin and Jianwen Su

14:00-15:30 Session 5: Demonstrations  
*Location: TCM005-TCM006-TCM007*

**Barcelona: A design and runtime environment for modeling and execution of artifact-centric business processes**
Terry Heath, Roman Vaculin and Richard Hull

**Collaborative Process Assistant - An introduction of the CoPA prototype**
Thomas Burkhart, Dirk Werth and Peter Loos

**Efficiently Querying Business Process Models with BeehiveZ**
Tao Jin, Jianmin Wang and Lijie Wen

**End-User Focused Service Composition with FormSys Process Designer**
Ingo Weber, Hye-Young Paik and Boualem Benatallah

**Slipstream: A BAM Proof of Concept using Standard Software**
Christian Janiesch, Martin Matzner and Oliver Müller

**Supporting Healthcare Processes with YAWL4Healthcare**
Ronny Mans, Nick Russell and Wil Van Der Aalst

16:00-17:30 Session 6: Process Mining (includes best paper)  
*Location: Auditorium Blaise Pascal*
*Session Chair: Barbara Weber*

**Discovering Characteristics of Stochastic Collections of Process Models**
Kees Van Hee, Marcello La Rosa, Zheng Liu and Natalia Sidorova

**Conformance Checking of Interacting Processes With Overlapping Instances**
Dirk Fahland, Massimiliano De Leoni, Boudewijn Van Dongen and Wil Van Der Aalst

**Simplifying Mined Process Models: An Approach Based on Unfoldings**
Dirk Fahland and Wil Van Der Aalst

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**Thursday, September 1st 2011**

09:15-10:30 Keynote 3  
*Location: Auditorium Blaise Pascal*
*Session Chair: Michael zur Muehlen*

**Automatic Verification of Data-Centric Business Processes**
Victor Vianu (UC, San Diego, USA)
11:00-12:30  Session 7 A  Artifact-Centric Business Processes  
Location: Auditorium Blaise Pascal  
Session Chair: Peter Dadam  
  
**Compliance by design for artifact-centric business processes**  
Niels Lohmann  

**Foundations of Relational Artifacts Verification**  
Babak Bagheri Hariri, Diego Calvanese, Giuseppe De Giacomo, Riccardo De Masellis and Paolo Felli  

**On the equivalence of incremental and fixpoint semantics for business entities with guard-stage-milestone lifecycles**  
Elio Damaggio, Rick Hull and Roman Vaculin  

11:00-12:30  Session 7 B  Industrial track : panel  
Location: Auditorium De Vinci  
  
**Title: Challenges in Business Process Management: New Frontiers and New Paradigms**  
Moderator: Francisco Curbera  
Panelists: Sandy Kemsley (Column2), Mike Marin (IBM), Michael Rosemann (QUT).  

14:00-15:30  Session 8 A : Process Analysis/Error detection  
Location: Auditorium Blaise Pascal  
Session Chair: Mathias Weske  
  
**Better Algorithms for Analyzing and Enacting Declarative Workflow Languages Using LTL**  
Michael Westergaard  

**Maturing process models through analysis of informal work practice**  
Hans Friedrich Witschel, Bo Hu, Uwe Riss, Simon Brander, Barbara Thoenssen, Andreas Martin and Knut Hinkelmann  

**A-Posteriori Detection of Sensor Infrastructure Errors in Correlated Sensor Data and Business Workflows**  
Andreas Wombacher  

14:00-15:30  Session 8 B : Industry Track - invited papers  
Location: Auditorium De Vinci  
Session Chair: Hamid Reza Motahari-Nezhad  
  
**A Blueprint for Event-driven Business Activity Management**  
Christian Janiesch, Martin Matzner and Oliver Müller  

**On Cross-Enterprise Collaboration**  
Lav R. Varshney and Daniel V. Oppenheim  

**BPMS in the Cloud: does it really matter?**  
Matthieu Hug
16:00-17:30  Session 9 : Error correction and Comparison in Business Processes

Location: Auditorium Blaise Pascal
Session Chair: Hajo Reijers

Automated Error Correction of Business Process Models
Mauro Gambini, Marcello La Rosa, Sara Migliorini and Arthur H.M. Ter Hofstede

Behavioral Similarity - A Proper Metric
Matthias Kunze, Matthias Weidlich and Mathias Weske

Compensation of Adapted Service Orchestration Logic in BPEL’n’Aspects
Mirko Sonntag and Dimka Karastoyanova

Friday, September 2nd 2011

09:00-10:30 and 11:00-12:30  Tutorial 2
Location: Auditorium Blaise Pascal

The "Physics" of Notations: A Scientific Approach to Designing Visual Notations for Business Process Modelling
Daniel Moody
Keynote Abstracts

Keynote 1
August 30th 2011, 09:15-10:30
Location: Auditorium Blaise Pascal
Session Chair: Boualem Benatallah

Some Thoughts on Behavioral Programming
David Harel (Weizmann Institute of Science, Rehovot, Israel)

Abstract. The talk starts from a dream/vision paper I published in 2008, whose title, “Can Programming be Liberated, Period?”, is a play on that of John Backus' famous Turing Award Lecture (and paper). I will propose that – or rather ask whether – programming can be made a lot closer to the way we humans think about dynamics, and the way we somehow manage to get others (e.g., our children, our employees, etc.) to do what we have in mind. Technically, the question is whether we can liberate programming from its three main straightjackets: (1) having to directly produce a precise artifact in some language; (2) having actually to produce two separate artifacts (the program and the requirements) and having then to pit one against the other; (3) having to program each piece/part/object of the system separately. The talk will then get a little more technical, providing some evidence of feasibility of the dream, via LSCs and the play-in/play-out approach to scenario-based programming, and its more recent Java variant. The entire body of work around these ideas can be framed as a paradigm, which we call behavioral programming.

Keynote 2
August 31st 2011, 09:15-10:30
Location: Auditorium Blaise Pascal
Session Chair: Francisco Curbera

The Changing Nature of Work: From Structured To Unstructured From Controlled To Social
Sandy Kemsley (Kemsley Design Ltd., Toronto, Canada)

Abstract. Traditional BPM systems perform well with structured processes and controlled interactions between participants. However, most business functions involve both structured processes with ad hoc activities, and can range from top-down delegation to social collaboration. A key trend in business is the increased focus on knowledge worker productivity as the routine work becomes more automated, which has led to fragmentation of the BPM market: in addition to traditional BPM systems, a new breed of adaptive case management (ACM) systems manage unstructured processes, collaboration is taking hold both in process design and runtime environments, and user interfaces are borrowing from social media to put a new face on BPM. But do the differences between structured and unstructured process management, or between authoritarian and collaborative interactions, warrant the use of different types of systems? Or do they just represent different parts of a spectrum of process functionality? How can they best be combined to manage a broad variety of business process types? What types of hybrid process systems will emerge to match these business needs?
Automatic Verification of Data-Centric Business Processes
Victor Vianu (UC, San Diego, USA)

Abstract. Business processes centered around data are increasingly common. Recently, tools have been developed for high-level specification of data-centric business processes. A notable example is IBM's business artifact framework, successfully deployed in practice. Such specification tools not only allow fast prototyping and improved programmer productivity but, as a side effect, provide convenient targets for automatic verification.

In this talk I will present a formal model of data-centric business processes based on business artifacts, and results on automatic verification of such processes. Artifacts are tuples of relevant values, equipped with local state relations and accessing an underlying database. They evolve under the action of a set of services specified by pre-and-post conditions, that correspond to workflow tasks. The verification problem consists in statically checking whether all runs of an artifact system satisfy desirable properties, expressed in an extension of linear-time temporal logic. I will exhibit several classes of specifications and properties that can be automatically verified. The results are quite encouraging and suggest that, unlike arbitrary software systems, significant classes of data-centric business processes may be amenable to automatic verification. This relies on a novel marriage of techniques from the database and computer-aided verification areas.

This talk is based on joint work with Alin Deutsch, Elio Damaggio, Richard Hull, and Fabio Patrizi.
Artifact-centric Modeling of Business Processes and Operations
Richard Hull, Roman Vaculin and Jianwen Su

Abstract. A promising approach to managing business operations is based on business artifacts, a.k.a. business entities (with lifecycles). These are key conceptual entities that are central to guiding the operations of a business, and whose content changes as they move through those operations. Compared to many traditional activity-centric BPM approaches, the business artifact-centric approach considers data as an integral part of business processes. The artifact approach has strong similarities with case management, but has been applied to a much broader range of business applications, and in ways atypical for case management.

In the artifact-centric approach the main focus is on identifying and defining the key business artifacts (for example, a purchase order in an ordering system) and modeling the business process as interactions of these key business artifacts. Fundamentally, an artifact type includes both an information model that captures, in either materialized or virtual form, all of the business-relevant data about entities of that type, and a lifecycle model, that specifies the possible ways an entity of that type might progress through the business by responding to events and invoking services, including human activities. Intuitively, an artifact instance of a particular type is a complex data entity which is identified by a unique identifier, and which can evolve over time, i.e., some values of its attributes may be modified. The particular evolutions of the artifact instance over time are governed by the lifecycle of the artifact type.

The goal of this tutorial is to introduce the business artifact paradigm, to give an overview of the various approaches to modeling of artifact centric business processes, present some recent research activities and results related to activity-centric paradigm, and to position artifacts vis-a-vis other BPM approaches. The tutorial will include discussion of different approaches to artifacts, including finite state machine based lifecycles, the declarative Guard-Stage- Milestone (GSM) lifecycles, and the work on artifact foundations using Conjunctive Artifact-centric Services. Also discussed will be the ArtiFlow model, which is being used to develop a logical theory of optimization for artifact systems.
The “Physics” of Notations: A Scientific Approach to Designing Visual Notations for Business Process Modelling

Daniel Moody

Abstract. Visual notations form an integral part of the “language” of BPM practice: virtually all business process modelling notations use diagrams as the primary basis for documenting and communicating business processes. Diagrams play a particularly critical role in communicating with business stakeholders (end users and customers), as they are widely believed to convey information more effectively to non-technical people than text. Currently, BPM visual notations are designed in an ad hoc and unscientific manner. Decisions about graphic representation are typically made in a subjective way, without reference to theory or empirical evidence, or justifications of any kind (design rationale). The majority of effort is spent designing the semantics of notations (what constructs to include and what they mean), with the design of visual syntax (how to visually represent these constructs) taking place largely as an after-thought.

While BPM now has mature methods for evaluating and designing semantics of notations (e.g. ontological analysis, formal semantics), equivalent methods for visual syntax are notably absent. Currently, in evaluating, comparing and constructing visual notations, we have little to go on but intuition and rule of thumb: we have neither theory nor a systematic body of empirical evidence to guide us.

The aim of this tutorial is to establish a scientific basis for visual notation design, to help it progress from a “craft” (as it currently exists) to a design discipline. It defines a set of principles for designing cognitively effective visual notations (summarised below): notations that are optimised for human communication and problem solving. The principles have been successfully used to evaluate and improve several modelling notations as well as to design visual notations from first principles.

Importantly, the principles are evidence-based: they are not based on common sense and experience but on theory and empirical evidence from a wide range of fields. They also rest on an explicit theory of how visual notations communicate: only by understanding how and why visual notations communicate can we improve their ability to communicate. The principles provide a scientific basis for evaluating, comparing and constructing visual notations, which has previously been lacking in the BPM field. A range of examples (both exemplars and counter-exemplars) are used to illustrate the principles, including some of the leading BPM notations in practice.
Paper Abstracts

Tuesday, August 30th

11:00-12:30  Session 1: Business Process Monitoring

Location: Auditorium Blaise Pascal
Session Chair: Florian Daniel

Monitoring Business Constraints with Linear Temporal Logic: An Approach Based on Colored Automata
Fabrizio Maria Maggi, Marco Montali, Michael Westergaard and Wil Van Der Aalst

Abstract. Today’s information systems record real-time information about business processes. This enables the monitoring of business constraints at runtime. In this paper, we present a novel runtime verification framework based on linear temporal logic and colored automata. The framework continuously verifies compliance with respect to a predefined constraint model. Our approach is able to provide meaningful diagnostics even after a constraint is violated. This is important as in reality people and organizations will deviate and in many situations it is not desirable or even impossible to circumvent constraint violations. As demonstrated in this paper, there are several approaches to recover after the first constraint violation. Traditional approaches that simply check constraints are unable to recover after the first violation and still foresee (inevitable) future violations. The framework has been implemented in the process mining tool ProM.

Event-based Monitoring of Process Execution Violations
Matthias Weidlich, Holger Ziekow, Jan Mendling, Oliver Günther, Mathias Weske and Nirmit Desai

Abstract. Process-aware information systems support business operations as they are typically defined in a normative process model. Often these systems do not directly execute the process model, but provide the flexibility to deviate from the normative model. This paper proposes a method for monitoring control-flow deviations during process execution. Our contribution is a formal technique to derive monitoring queries from a process model, such that they can be directly used in a complex event processing environment. Furthermore, we also introduce an approach to filter and aggregate query results to provide compact feedback on deviations. Our techniques is applied in a case study within the IT service industry.

Business Artifact-Centric Modeling for Real-Time Performance Monitoring
Rong Liu, Roman Vaculín, Zhe Shan, Anil Nigam and Frederick Wu

Abstract. In activity-centric process paradigm, developing effective and efficient performance models is a hard and laborious problem with many challenges mainly because of the fragmented nature of this paradigm. In this paper, we propose a novel approach to performance monitoring based on business artifact-centric process paradigm. Business artifacts provide an appropriate base for explicit modeling of monitoring contexts. We develop a model-driven two-phase methodology for designing real-time monitoring models. This methodology allows domain experts or business users to focus on defining metric and KPI requirements while the detailed technical specification of monitoring models can be automatically generated from the requirements and underlying business artifacts. This approach dramatically simplifies design of monitoring models and also increases the understandability of monitoring results.
Towards Efficient Business Process Clustering and Retrieval: Combining Language Modeling and Structure Matching
Mu Qiao, Rama Akkiraju and Aubrey Rembert

Abstract. Large organizations tend to have hundreds of business processes. Discovering and understanding similarities among business processes can be useful to organizations for a number of reasons including better overall process management and maintenance. In this paper we present a novel and efficient approach to cluster and retrieve business processes. A given set of business processes are clustered based on their underlying topic, structure and semantic similarities. In addition, given a query business process, top k most similar processes are retrieved based on clustering results. In this work, we bring together two not well connected schools of work: statistical language modeling and structure matching and combine them in a novel way. Our approach takes into account both high-level topic information that can be collected from process description documents and keywords as well as detailed structural features such as process control flows in finding similarities among business processes. This ability to work with processes that may not always have formal control flows is particularly useful in dealing with real-world business processes which are not always described formally. We developed a system to implement our approach and evaluated it on several collections of industry best practice processes and real-world business processes at a large IT service company that are described at varied levels of formalisms. Our experimental results reveal that the combined language modeling and structure matching based retrieval outperforms structure-matching-only techniques in both mean average precision and running time measures.

Clone Detection in Repositories of Business Process Models
Reina Uba, Marlon Dumas, Luciano García-Bañuelos and Marcello La Rosa

Abstract. Over time, process model repositories tend to accumulate duplicate fragments (also called clones) as new process models are created or extended by copying and merging fragments from other models. This phenomenon calls for methods to detect clones in process models, so that these clones can be refactored as separate subprocesses in order to improve maintainability. This paper presents an indexing structure to support the fast detection of clones in large process model repositories. The proposed index is based on a novel combination of a method for process model decomposition (specifically the Refined Process Structure Tree), with established graph canonization and string matching techniques. Experiments show that the algorithm scales to repositories with hundreds of models. The experimental results also show that a significant number of non-trivial clones can be found in process model repositories taken from industrial practice.

A Query Language for Analyzing Business Processes Execution
Seyed-Mehdi-Reza Beheshti, Boualem Benatallah, Hamid Reza Motahari-Nezhad and Sherif Sakr

Abstract. The execution of a business process (BP) in today’s enterprises may involve a workflow and multiple IT systems and services. Often no complete, up-to-date documentation of the model or correlation information of process events exist. Understanding the execution of a BP in terms of its scope and details is challenging specially as it is subjective: depends on the perspective of the person looking at BP execution. We present a framework, simple abstractions
and a language for the explorative querying and understanding of BP execution from various user perspectives. We propose a query language for analyzing event logs of process-related systems based on the two concepts of folders and paths, which enable an analyst to group related events in the logs or find paths among events. Folders and paths can be stored to be used in follow-on analysis. We have implemented the proposed techniques and the language, FPSPARQL, by extending SPARQL graph query language. We present the evaluation results on the performance and the quality of the results using a number of process event logs.

14:00-15:30  Session 2 B: Industrial track
Location: Auditorium De Vinci
Session Chair: Francisco Curbera

Source Code Partitioning Using Process Mining
Koki Kato, Tsuyoshi Kanai, and Sanya Uehara

Abstract. Software maintenance of business application software such as adding new functions and anti-aging should be performed cost-effectively. Information such as grouping of business activities that are executed as a unit, source code which corresponds to the activities, and the execution volume of the activities is useful for deciding on what areas of business application software to invest in, and prioritizing maintenance requests.

We propose a new method which extracts such information using the BPM-E process mining tool we have developed. The method was applied to in-house business systems; the results showed that the method successfully extracted the grouping of events, but that there are accuracy issues in associating events with source code.

Next Best Step and Expert Recommendation for Collaborative Processes in IT Service Management
Hamid Reza Motahari Nezhad and Claudio Bartolini

Abstract. IT service management processes are people intensive and collaborative by nature. There is an emerging trend in IT service management applications, moving away from rigid process orchestration to the leveraging of collaboration technologies. An interesting consequence is that staff can collaboratively define customized and ad-hoc step flows, consisting of the sequence of activities necessary to handle each particular case. Capturing and sharing the knowledge of how previous similar cases have been resolved becomes useful in recommending what steps to take and what experts to consult to handle a new case effectively. We present an approach and a tool that analyzes previous IT case resolutions in order to recommend the best next steps to handle a new case, including recommendations on the experts to invite to help with resolution of the case. Our early evaluation results indicate that this approach shows significant improvement for making recommendations over using only process models discovered from log traces.

Process Variation Analysis using Empirical Methods – A Case Study
Heiko Ludwig, Yolanda Rankin, Laura Anderson and Robert Enyedi

Abstract. Large organizations often weigh the trade-offs of standardization versus customization of business processes. Standardization of processes results in cost reduction due to the focus on one process management system, one set of applications supporting it, and one set of process specifications and instructions to maintain and support. On the other hand, specific requirements for different business units, e.g., for a particular country or customer, often require several business processes variants to be implemented. When introducing a standardized process an organization has to identify how processes have been conducted in the past, identify variations and adjudicate which variations are necessary and which can be eliminated. This paper outlines a method of identifying process variations and demonstrates its application in a case study.
**Stimulating Skill Evolution in Market-based Crowdsourcing**
Benjamin Satzger, Harald Psaier, Daniel Schall and Schahram Dustdar

*Abstract.* Crowdsourcing has emerged as an important paradigm in human problem-solving techniques on the Web. One application of crowdsourcing is to outsource certain tasks to the crowd that are difficult to implement in software. Another potential benefit of crowdsourcing is the on-demand allocation of a flexible workforce. Businesses may outsource tasks to the crowd based on temporary workload variations. A major challenge in crowdsourcing is to guarantee high-quality processing of tasks. We present a novel crowdsourcing marketplace that matches tasks to suitable workers based on auctions. The key to ensuring high quality lies in skilled members whose capabilities can be estimated correctly. We present a novel auction mechanism for skill evolution that helps to correctly estimate workers and to evolve skills that are needed. Evaluations show that this leads to improved crowdsourcing.

**Serving Information Needs In Business Process Consulting**
Monika Gupta, Debdoot Mukherjee, Senthil Mani, Vibha Singhal Sinha and Saurabh Sinha

*Abstract.* Business Process Consulting is a knowledge-intensive activity that requires consultants to be aware of all available process variants and best practices to implement the most effective business transformation. Typically, during a business-consulting engagement, a large amount of unstructured documentation is produced that captures not only the processes implemented, but also information such as the requirements addressed, the business benefits realized, and the organizational changes impacted. Consulting organizations archive these documents in internal knowledge repositories to leverage the information in future engagements. Our analysis of one such repository in the IBM Global Services’ SAP practice indicates that although there is tremendous scope for information reuse, the true potential of reuse is not being fully realized using existing search technology. We present a novel search technique to serve the information needs of consultants as they script various pieces of design information. The proposed system auto-formulates fat semantic queries based on the context of the design activity and runs the queries on a semi-structured knowledge repository to return a ranked set of search results. Our empirical studies show that our approach can outperform - often, significantly - a conventional keyword-based search technique in terms of both relevance and precision of search results.

**Wiki-based Maturing of Process Descriptions**
Frank Dengler and Denny Vrandecic

*Abstract.* Traditional process elicitation methods are expensive and time consuming. Recently, a trend toward collaborative, user-centric, online business process modeling can be observed. Current social software approaches, satisfying such a collaborative modeling, mostly focus on the graphical development of processes and do not consider existing textual process description like HowTos or guidelines. We address this issue by combining graphical process modeling techniques with a wiki-based light-weight knowledge capturing approach and a background semantic knowledge base. Our approach enables the collaborative maturing of process descriptions with a graphical representation, formal semantic annotations, and natural language. Existing textual process descriptions can be translated into graphical descriptions and formal semantic annotations. Thus, the textual and graphical process descriptions are made explicit and can be further processed. As a result, we provide a holistic approach for collaborative process development that is designed to foster knowledge reuse and maturing within the system.
Self-learning Predictor Aggregation For the Evolution of People-driven Ad-hoc Processes
Christoph Dorn, Cesar Marin, Nikolay Mehandjiev and Schahram Dustdar

Abstract. Contemporary organisational processes evolve with people’s skills and changing business environments. For instance, process documents vary with respect to their structure and occurrence in the process. Supporting users in such settings requires sophisticated learning mechanisms using a range of inputs overlooked by current dynamic process systems. We argue that analysing a document’s semantics is of uttermost importance to identify the most appropriate activity which should be carried out next. For a system to reliably recommend the next steps suitable for its user, it should consider both the process structure and the involved documents’ semantics. Here we propose a self-learning mechanism which dynamically aggregates a process-based document prediction with a semantic analysis of documents. We present a set of experiments testing the prediction accuracy of the approaches individually then compare them with the aggregated mechanism showing a better accuracy.

Wednesday, August 31st

16:00-17:30 Session 6: Process Mining (includes best paper)
Location: Auditorium Blaise Pascal
Session Chair: Barbara Weber

Discovering Characteristics of Stochastic Collections of Process Models
Kees Van Hee, Marcello La Rosa, Zheng Liu and Natalia Sidorova

Abstract. Process models in organizational collections are typically created by the same team and using the same conventions. As such, these models share many characteristic features like size range, type and frequency of errors. In most cases merely small samples of these collections are available due to e.g. the sensitive information they contain. Because of their sizes, these samples may not provide an accurate representation of the characteristics of the originating collection. This paper deals with the problem of constructing collections of process models from small samples of a collection, with the purpose to estimate the characteristics of this collection. Given a small sample of process models drawn from a real-life collection, we mine a set of generation parameters that we use to generate arbitrarily-large collections that feature the same characteristics of the original collection. In this way we can estimate the characteristics of the original collection on the generated collections. We extensively evaluate the quality of our technique on various sample datasets drawn from both research and industry.

Conformance Checking of Interacting Processes With Overlapping Instances
Dirk Fahland, Massimiliano De Leoni, Boudewijn Van Dongen and Wil Van Der Aalst

Abstract. The usefulness of process models (e.g., for analysis, improvement, or execution) strongly depends on their ability to describe reality. Conformance checking is a technique to validate how good a given process model describes recorded executions of the actual process. Recently, artifacts have been proposed as a paradigm to capture dynamic, and inter-organizational processes in a more natural way. Artifact-centric processes drop several restrictions and assumptions of classical processes. In particular, process instances cannot be considered in isolation as instances in artifact-centric processes may overlap and interact with each other. This significantly complicates conformance checking; the entanglement of different instances complicates the quantification and diagnosis of misalignments. This paper is the first paper to address this problem. We show how conformance checking of artifact-centric processes can be decomposed into a set of smaller problems that can be analyzed using conventional techniques.
Simplifying Mined Process Models: An Approach Based on Unfoldings
Dirk Fahland and Wil Van Der Aalst

Abstract. Process models discovered using process mining tend to be complex and have problems balancing between overfitting and underfitting. Overfitting models are not general enough while underfitting models allow for too much behavior. This paper presents a post-processing approach to simplify discovered process models while controlling the balance between overfitting and underfitting. The discovered process model, expressed in terms of a Petri net, is unfolded into a branching process using the event log. Subsequently, the resulting branching process is folded into a simpler process model capturing the desired behavior.

Thursday, September 1st 2011

11:00-12:30 Session 7A Artifact-Centric Business Processes
Location: Auditorium Blaise Pascal
Session Chair: Peter Dadam

Compliance by design for artifact-centric business processes
Niels Lohmann

Abstract. Compliance to legal regulations, internal policies, or best practices is becoming a more and more important aspect in business processes management. Compliance requirements are usually formulated in a set of rules that can be checked during or after the execution of the business process, called compliance by detection. If noncompliant behavior is detected, the business process needs to be redesigned. Alternatively, the rules can be already taken into account while modeling the business process to result in a business process that is compliant by design. This technique has the advantage that a subsequent verification of compliance is not required. This paper focuses on compliance by design and employs an artifact-centric approach. In this school of thought, business processes are not described as a sequence of tasks to be performed (i.e., imperatively), but from the point of view of the artifacts that are manipulated during the process (i.e., declaratively). We extend the artifact-centric approach to model compliance rules and show how compliant business processes can be synthesized automatically.

Foundations of Relational Artifacts Verification
Babak Bagheri Hariri, Diego Calvanese, Giuseppe De Giacomo, Riccardo De Masellis and Paolo Felli

Abstract. Artifacts are entities characterized by data of interest (constituting the state of the artifact) in a given business application, and a lifecycle, which constrains the artifact’s possible evolutions. In this paper we study relational artifacts, where data are represented by a full fledged relational database, and the lifecycle is described by a temporal/dynamic formula expressed in μ-calculus. We then consider business processes, modeled as a set of condition/action rules, in which the execution of actions (aka tasks, or atomic services) results in new artifact states. We study conformance of such processes wrt the artifact lifecycle as well as verification of temporal/dynamic properties expressed in μ-calculus. Notice that such systems are infinite-state in general, hence undecidable. However, inspired by recent literature on database dependencies developed for data exchange, we present a natural restriction that makes such systems finite-state, and the above problems decidable.

On the equivalence of incremental and fixpoint semantics for business entities with guard-stage-milestone lifecycles
Elio Damaggio, Rick Hull and Roman Vaculin

Abstract. Business artifacts (BAs, or artifacts) are used to model conceptual entities that are central to guiding the operations of a business, and whose content changes as they move through
those operations. The recently introduced Guard-Stage-Milestone (GSM) meta-model for artifact lifecycles is declarative in nature, and allows concurrent execution of long-running (possibly human-executed) activities. Modularity is incorporated through the use of hierarchical clustering of activities. The GSM operational semantics is based on a variant of Event-Condition-Action (ECA) rules, which are used to control the start and termination of individual and composite activities. This paper introduces, in an abstract setting, three different and provably equivalent formulations of the GSM operational semantics. The semantics is specified in terms of how a single external event is incorporated into the current “snapshot” (i.e. full description) of a running execution of an artifact model. The “incremental” formulation corresponds to the sequential application of the ECA-like rules in response to the event; the “fixpoint” formulation characterizes the mathematical properties of pairs of snapshots corresponding to the full impact of incorporating the event; and the “closed- form” formulation captures the fixpoint one in terms of first-order logic. The paper introduces a formally specified well-formedness condition on GSM models that guarantees the equivalence of the three formulations while permitting all of the commonly arising patterns for using GSM constructs to model business operations.

14:00-15:30  Session 8 A: Process Analysis/Error detection
Location: Auditorium Blaise Pascal
Session Chair: Mathias Weske

Better Algorithms for Analyzing and Enacting Declarative Workflow Languages Using LTL
Michael Westergaard

Abstract. Declarative workflow languages are easy for humans to understand and use for specifications, but difficult for computers to check for consistency and use for enactment. Therefore, declarative languages need to be translated to something a computer can handle. One approach is to translate the declarative language to linear temporal logic (LTL), which can be translated to finite automata. While computers are very good at handling finite automata, the translation itself is often a road block as it may take time exponential in the size of the input. Here, we present algorithms for doing this translation much more efficiently (around a factor of 10,000 times faster and handling 10 times larger systems on a standard computer), making declarative specifications scale to realistic settings.

Refining process models through the analysis of informal work practice
Simon Brander, Knut Hinkelmann, Bo Hu, Andreas Martin, Uwe V. Riss, Barbara Thönssen, Hans Friedrich Witschel

Abstract. The work presented in this paper explores the potential of leveraging the traces of informal work and collaboration in order to improve business processes over time. As process executions often differ from the original design due to individual preferences, skills or competencies and exceptions, we propose methods to analyse personal preferences of work, such as email communication and personal task execution in a task management application. Outcome of these methods is the detection of internal substructures (subtasks or branches) of activities on the one hand and the recommendation of resources to be used in activities on the other hand, leading to the improvement of business process models. Our first results show that even though human intervention is still required to operationalise these insights it is indeed possible to derive interesting and new insights about business processes from traces of informal work and infer suggestions for process model changes.
A-Posteriori Detection of Sensor Infrastructure Errors in Correlated Sensor Data and Business Workflows
Andreas Wombacher

Abstract. Some physical objects are influenced by business workflows and are observed by sensors. Since both sensor infrastructures and business workflows must deal with imprecise information, the correlation of sensor data and business workflow data related to physical objects might be used a-posteriori to determine the source of the imprecision. In this paper, an information theory based approach is presented to distinguish sensor infrastructure errors from inhomogeneous business workflows. This approach can be applied on detecting imprecisions in the sensor infrastructure, like e.g. sensor errors or changes of the sensor infrastructure deployment.

14:00-15:30  Session 8 B: Industry Track - invited papers
Location: Auditorium De Vinci
Session Chair: Hamid Reza Motahari-Nezhad

A Blueprint for Event-driven Business Activity Management
Christian Janiesch, Martin Matzner and Oliver Müller

Abstract. Timely insight into a company’s business processes is of great importance for operational efficiency. However, still today companies struggle with the inflexibility of monitoring solutions and reacting to process information on time. We review the current state of the art of business process management and analytics and put it in relation to complex event processing to explore process data. Following the tri-partition in complex event processing of event producer, processor, and consumer, we develop an architecture for event-driven business activity management which is capable of delivering blueprints for flexible business activity monitoring as well as closed loop action to manage the full circle of automated insight to action. We close with a discussion of future research directions.

On Cross-Enterprise Collaboration
Lav R. Varshney and Daniel V. Oppenheim

Abstract. Globalization, specialization, and rapid innovation are changing several aspects of business operations. Many large organizations that were once self-sufficient and that could dictate processes to partners and suppliers are now finding this model difficult to sustain. In the emerging model of global service delivery several competing service providers must work collaboratively to develop business solutions, either hierarchically or as peers. Overall project failures, uncontrollable delays, and significant financial losses have been observed in many global service delivery projects, indicating the importance of finding new ways to better support cross-enterprise work. This paper puts forth directions to explore the management and coordination of complex end-to-end processes carried out collaboratively by several organizations.

16:00-17:30  Session 9: Error correction and Comparison in Business Processes
Location: Auditorium Blaise Pascal
Session Chair: Hajo Reijers

Automated Error Correction of Business Process Models
Mauro Gambini, Marcello La Rosa, Sara Migliorini and Arthur H.M. Ter Hofstede

Abstract. As order dependencies between process tasks can get complex, it is easy to make mistakes in process model design, especially behavioral ones such as deadlocks. Notions such as
soundness formalize behavioral errors and tools exist that can identify such errors. However these tools do not provide assistance with the correction of the process models. Error correction can be very challenging as the intentions of the process modeler are not known and there may be many ways in which an error can be corrected. We present a novel technique for automatic error correction in process models based on simulated annealing. Via this technique a number of process model alternatives are identified that resolve one or more errors in the original model. The technique is implemented and validated on a sample of industrial process models. The tests show that at least one sound solution can be found for each input model within a reasonable response time.

**Behavioral Similarity - A Proper Metric**
Matthias Kunze, Matthias Weidlich and Mathias Weske

*Abstract.* With the increasing influence of Business Process Management, large process model repositories emerged in enterprises and public administrations. Their effective utilization requires meaningful and efficient capabilities to search for models that go beyond text based search or folder navigation, e.g., by similarity. Existing measures for process model similarity are often not applicable for efficient similarity search, as they lack metric features. In this paper, we introduce a proper metric to quantify process similarity based on behavioral profiles. It is grounded in the Jaccard coefficient and leverages behavioral relations between pairs of process model activities. The metric is successfully evaluated towards its approximation of human similarity assessment.

**Compensation of Adapted Service Orchestration Logic in BPEL’n’Aspects**
Mirko Sonntag and Dimka Karastoyanova

*Abstract.* BPEL’n’Aspects is a non-intrusive mechanism for adaptation of control flow of BPEL processes based on the AOP paradigm. It relies on Web service standards to weave process activities in terms of aspects into BPEL processes. This paper is a logical continuation of the BPEL’n’Aspects approach. Its main objective is to enable compensation of weaved-in Web service invocations (activities) in a straightforward manner. We present (1) requirements on a mechanism for compensation of weaved-in process activities; (2) the corresponding concepts and mechanisms to meet these requirements; (3) an example scenario to show the applicability of the approach; and (4) a prototypical implementation to prove the feasibility of the solution. This work represents an improvement in the applicability of this particular adaptation approach since processes in production need the means to compensate actions that are included into processes as result of an adaptation step, too. The concept is generic and hence can also be used by other approaches that adapt control flow.
Demo Abstracts

Wednesday, August 31st

11:00-12:30  Session 4: Demonstrations
Location: TCM002-TCM003-TCM004

A Prototype Augmented Reality Collaborative Process Modelling Tool
Poppe Erik, Brown Ross, Johnson Daniel and Recker Jan

Abstract. Identifying, modelling and documenting business processes usually requires the collaboration of many stakeholders that may be spread across companies in inter-organizational business settings. While there are many process modelling tools available, the support they provide for remote collaboration is still limited. This demonstration showcases a novel prototype application that implements collaborative virtual environment and augmented reality technologies to improve remote collaborative process modelling, with an aim to assisting common collaboration tasks by providing an increased sense of immersion in an intuitive shared work and task space. Our tool is easily deployed using open source software, and commodity hardware, and is expected to assist with saving money on travel costs for large scale process modelling projects covering national and international centres within an enterprise.

Adaptable Pervasive Flows: Towards a More Intelligent Environment
Antonio Bucchiarone, Stefan Foll, Klaus Herrmann, Marco Pistore and Heorhi Raik

Abstract. Adaptable Pervasive Flows (short: flows) are a novel workflow-based paradigm for the design of pervasive applications, where dynamic workflows situated in the real world are able to modify their execution in order to adapt to changes in their environment. In this paper, we present the ALLOW software framework we have developed to manage the adaptation and distribution of pervasive flows. We have applied the framework to a case study from the domain of logistics to demonstrate the benefits and feasibility of our approach to handle highly complex and dynamic real-world processes.

BPModelMasher: Manage Your Process Variants Effectively
Sherif Sakr, Emilian Pascalau, Ahmed Awad and Mathias Weske

Abstract. Nowadays, modern organizations build large repositories of process models to describe and document their daily business operations. One reason for the large number of process models is the need to adapt with different business contexts, i.e. process variants. Automated maintenance of the consistency between process variants is an important goal that saves the time and efforts of process modelers. We present a query-based approach to maintain consistency among process variants called BPModelMasher. In particular, we maintain the link between the variant process models by process model views. These views are defined using BPMN-Q, a visual query language for process models. Dynamic evaluation for the defined queries of the process views guarantee that the process modeler is able to get up-to-date and consistent status of the process model. In addition, our view-based approach allows building multiple configurations for a holistic view of related variants of the same process model. The conceptual results are illustrated with a real-world sample process on customer service from eBay.

Declare: A Tool Suite for Declarative Workflow Modeling and Enactment
Michael Westergaard and Fabrizio Maria Maggi

Abstract. Declare adheres to the declarative workflow modeling paradigm, where, instead of modeling allowed behavior and explicit choices, users model disallowed behavior. This makes it easier to model loosely structured processes. Without appropriate precautions, however, users are...
less supported in choosing which actions lead to the desired end-result. The goal of Declare is to ensure flexibility when modeling loosely structured processes and, at the same time, to provide support for decision making during the execution.

Declare consists of a Designer component for creating and verifying models, a framework which acts as a server for enacting models, and a Worklist, which allows users to see and pick tasks to perform. Declare can act as a client of the operational support service in ProM, which makes it possible to guide users towards desired goals, to obtain statistics about an executed process, and to monitor a running case. In addition to this, a ProM plug-in has been also implemented that allows for the discovery of Declare models from logs.

**Making YAWL and SmartPM Interoperate: Managing Highly Dynamic Processes by Exploiting Automatic Adaptation Features**

Andrea Marrella, Massimo Mecella, Alessandro Russo, Arthur Ter Hofstede and Sebastian Sardina

**Abstract.** In the last years, the trade-off between flexibility and support has become a leading issue in workflow technology. In this paper we show how an imperative modeling approach used to define stable and well-understood processes can be complemented by a modeling approach that enables automatic process adaptation and exploits planning techniques to deal with environmental changes and exceptions that may occur during process execution. To this end, we designed and implemented a Custom Service that allows the Yawl execution environment to delegate the execution of subprocesses and activities to the SmartPM execution environment, which is able to automatically adapt a process to deal with emerging changes and exceptions. We demonstrate the feasibility and validity of the approach by showing the design and execution of an emergency management process defined for train derailments.

**Ontomantics overview**

Philippe Baumann

**Abstract.** Ontomantics is an innovative software publisher established in Orléans France. Ontomantics product as a platform as a service enables users to automate complex business processes in a seamless way without code. The demo shows an overview of the platform highlighting technical differentiators and integrated features aimed to business process mapping, advanced interfaces, rule based business logic, repository architecture focusing on ease of use.

**14:00-15:30  Session 5: Demonstrations**

*Location: TCM005-TCM006-TCM007*

**Barcelona: A design and runtime environment for modeling and execution of artifact-centric business processes**

Terry Heath, Roman Vaculin and Richard Hull

**Abstract.** A promising approach to managing business operations is based on business artifacts, a.k.a. business entities (with lifecycles). These are key conceptual entities that are central to guiding the operations of a business, and whose content changes as they move through those operations. In the artifact-centric approach the main focus is on identifying and defining the key business artifacts (for example, a purchase order in an ordering system) and modeling the business process as interactions of these key business artifacts. Fundamentally, an artifact type includes both an information model that captures, in either materialized or virtual form, all of the business-relevant data about entities of that type, and a lifecycle model, that specifies the possible ways an entity of that type might progress through the business by responding to events and invoking services, including human activities. Intuitively, an artifact instance of a particular type is a complex data entity which is identified by a unique identifier, and which can evolve
over time, i.e., some values of its attributes may be modified. The particular evolutions of the artifact instance over time are governed by the lifecycle of the artifact type.

The goal of this demonstration is to present the Barcelona SW environment for modeling and execution of artifact-centric business processes. Barcelona environment has three essential components: (1) the Barcelona server provides back-end functionalities needed for both design and execution of artifact-centric business processes; (2) the Barcelona design editor is a lightweight web browser application covering most aspects solution designers need when developing artifact-centric systems; (3) the Barcelona default runtime GUI is a web browser based tool intended for execution and testing of artifact centric applications. The Barcelona environment is fully model-driven and is therefore extremely useful for rapid development and prototyping. Specifically, the business operations model (BOM) of the actual artifact-centric system is created by the design editor component, and it is used directly for deployment and execution by the execution engine. Also, the runtime GUI is dynamically rendered completely based fully on the BOM of the particular artifact-centric application. In the demonstration we will introduce all major aspects of the Barcelona environment and we will illustrate them on modeling an example of a real-life project, the fixed-price contracting business process.

Collaborative Process Assistant - An introduction of the CoPA prototype
Thomas Burkhart, Dirk Werth and Peter Loos

Abstract. The Collaborative Process Assistant (CoPA) represents a flexible process support system tailored for Small and Medium-sized Enterprises (SMEs). Utilizing the large impact of e-mail communication for today’s businesses, CoPA turns the existing e-mail system into a structured process management framework. Each incoming e-mail is autonomously matched to the corresponding business process and enhanced by proactive annotations. These context-sensitive annotations include recommendations for the most suitable following process steps. An underlying, self-adjusting recommendation model ensures most appropriate recommendations by observing the actual user behavior.

Efficiently Querying Business Process Models with BeehiveZ
Tao Jin, Jianmin Wang and Lijie Wen

Abstract. The technology of business process management is being more widely used, and there are more and more business process models. In this demonstration, we show how to query a large number of models efficiently with BeehiveZ. Four types of queries are all supported in BeehiveZ, i.e. exact query based on structure, similarity query based on structure, exact query based on behavior, similarity query based on behavior. BeehiveZ provides different indexes to facilitate the efficient query processing of different types of queries. To make BeehiveZ more applicable, label similarity is considered.

End-User Focused Service Composition with FormSys Process Designer
Ingo Weber, Hye-Young Paik and Boualem Benatallah

Abstract. Using traditional methods, it is often not cost effective to automate business processes which affect a small number of people and/or change frequently. In this demonstration, we present an end-user focused service composition environment to allow users with little technical knowledge to encode idiosyncratic, repetitive business processes themselves. The novel tool enables end-users to model and deploy such processes as Web service compositions, from design to execution. The approach is based on end-user friendly service naming, a graphical paradigm for scripting, a targeted restriction of control flow expressivity, and data flow verification and optimization. A Web-based, end-user focused service composition prototype has been developed, including a transformation of process models to WSBPEL for execution; a demonstration video is available. Using the prototype, a proof-of-concept evaluation is conducted with use case processes from the financial data analysis domain.
Slipstream: A BAM Proof of Concept using Standard Software
Christian Janiesch, Martin Matzner and Oliver Müller

Abstract. Many BPM system are lacking sophisticated capabilities to monitor and analyze log data. Business Activity Monitoring (BAM) or Process Mining tools instead are limited to pure monitoring and notification functions and are not able to actually take action on a business process. It would require hardwiring systems of these two kinds to each other to achieve end-to-end insight to action. However, this would make it e.g. difficult to extend the architecture to a network of interacting BPM systems. Against this background, we propose to apply the concept of Complex Event Processing (CEP) to BPM systems to allow for monitoring and active control of business processes. CEP, in general, comprises a set of techniques for making sense of the behavior of a monitored system by deriving higher-level knowledge from lower-level system events in a timely and online fashion. We present a proof of concept in which BPM and CEP systems are integrated in a closed monitoring and control loop through the exchange of (complex) events. Besides realizing this monitoring and control loop, the event-driven architecture offers a number of further advantages: real-time processing, loose coupling, and scalability.

Supporting Healthcare Processes with YAWL4Healthcare
Ronny Mans, Nick Russell and Wil Van Der Aalst

Abstract. In healthcare, processes concerning the diagnosis and treatment of patients can be best characterized as weakly-connected interacting light-weight workflows where tasks reside at different levels of granularity. Moreover, in hospitals many workitems are linked with appointments. To date, Workflow Management Systems (WfMSs) fall short in supporting healthcare processes as no scheduling support and inter-workflow support is offered. To address these problems, we present the YAWL4Healthcare WfMS which supports the seamless integration of unscheduled (flow) and scheduled (schedule) tasks and which allows for dividing complex entangled processes into simple autonomous fragments that may cope with different levels of granularity. Note that our system has been realized by adding significant extensions to the open-source YAWL WfMS.
<table>
<thead>
<tr>
<th>Time</th>
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| 08:00-09:00| Continental Breakfast  
Pôle commun (main hall)                  |
| 09:00-9:15 | Welcome and Introduction                                             |
| 09:15-9:25 | Welcome and overview                                                 |
| 09:15-9:25 | Student presentations (Moderator: Claude Godart)                     |
| 09:25-10:05| A Query Language Enabling Inter-organizational Business Process Mining for EDIFACT Documents: Robert Engel |
| 10:05-10:45| Modelling approach based declarative language: Mohamed Said Mehdi Mendjel |
| 10:45-11:00| Coffee Break  
Pôle commun (main hall)                                |
| 11:00-11:10| Session Overview                                                      |
| 11:50 –12:30| Assessing and improving the maturity of cross-organizational business processes: Amy Van Looy |
| 12:30-14:00| Lunch Break  
Restaurant le SAXO                                            |
| 14:00-14:10| Session Overview                                                      |
| 14:10-14:50| BPM and the employee: do they serve each other?: Willem Mertens       |
| 14:50-15:30| Culture in Business Process Management: Theresa Sinnl                 |
| 15:30-15:45| Coffee Break  
Pôle commun (main hall)                                |
| 15:45-16:25| In the eye of the beholder: Customer-orientated Process Management through Blueprinting: Michael Hewing |
| 16:25-17:15| Discussion                                                            |
| 17:15-17:30| Wrap-up                                                              |
| 19:00-22:00| PHD Symposium Dinner                                                  |
Workshops

7th International Workshop on Business Process Design (BPD 2011)
Organized by Marta Indulska, Michael Rosemann and Michael zur Muehlen.
The 7th International Workshop on Business Process Design (BPD2011) is focused on the design, innovation, evaluation and comparison of process improvement techniques and tools. Its aim is to provide a forum for discussions of current research dedicated to process improvement to comprehensively cover process enhancement approaches such as, for example, TRIZ, reference (best practice) models, process innovation or resource-based approaches to process improvement, and to contribute to the lacking process improvement body of knowledge. The workshop welcomes diversity in the underlying research methodologies and welcomes papers along the entire Design Science-Behavioral Science continuum.
More info at http://www.bpd-workshops.com/

7th International Workshop on Business Process Intelligence (BPI 2011)
Organized by Boudewijn van Dongen, Diogo Ferreira and Barbara Weber.
Business Process Intelligence (BPI) is an area that is quickly gaining interest and importance in industry and research. BPI refers to the application of various measurement and analysis techniques in the area of BPM. BPI aims to bring together practitioners and researchers from different communities such as BPM, information systems research, business administration, software engineering, artificial intelligence, process and data mining. Goal of BPI is to provide a better understanding of techniques and algorithms to support a company's processes at build-time and the way they are handled at run-time. BPI aims at discussing ongoing research and sharing practical experiences.

4th International Workshop on Business Process Management and Social Software (BPMS2 2011)
Organized by Selmin Nurcan and Rainer Schmidt.
More and more enterprises regard social software as a means for further improvement of their business processes and business models. The goal of the workshop is to promote the integration of business process management with social software and to enlarge the community pursuing the theme. The objective of the workshop is to explore how social software interacts with business process management, how business process management has to change to comply with weak ties, social production, egalitarianism and mutual service, and how business processes may profit from these principles.
More info at http://www.bpms2.org/

2nd International Workshop on Cross Enterprise Collaboration (CEC 2011)
Organized by Daniel Oppenheim, Francisco Curbera, Frank Leymann, Dimka Karastoyanova, Alex Norta and Lav R. Varshney.
Globalization, specialization, and rapid innovation are changing several aspects of business operations. In the emerging model of global service delivery several competing service providers must work collaboratively to develop business solutions, either hierarchically or as peers. As such, it is important to find new ways to better support cross-enterprise work. This workshop explores the management, coordination, and optimization of complex end-to-end processes carried out collaboratively by people across enterprise boundaries. The goal of this workshop is to foster research in the emerging area of cross enterprise collaboration.
Organized by Bela Mutschler, Jan Recker and Roel Wieringa.
From the introduction of empirical research methods such as experimental or case study methods into BPM (as well as into the development of process-aware information systems), we expect more valid, quantitative or qualitative data on the various aspects and effects of BPM technology. Our ER-BPM 2011 workshop addresses this demand and seeks to stimulate empirical research that can contribute to a better understanding of the problems, challenges and existing solutions in the BPM field. The workshop shall provide an interdisciplinary forum for both researchers and practitioners to improve the understanding of BPM-specific requirements, methods and theories, tools and techniques.

5th International Workshop on Event-driven Business Process Management (edBPM 2011)
Organized by Nenad Stojanovic, Opher Etzion, Adrian Paschke and Christian Janiesch.
The recently coined term "Event-Driven Business Process Management" (EDBPM) is nowadays an enhancement of Business Process Management (BPM) by new concepts of Service Oriented Architecture (SOA), Event Driven Architecture (EDA), Software as a Service (SaaS), Business Activity Monitoring (BAM) and Complex Event Processing (CEP). edBPM11 will continue the work of previous edBPM workshops in exchanging novel ideas, methods, tools and solutions for the event-driven BPM, with the main goal to connect research and industry in better understanding what can be done from the research point of view and what is the need from the industry/business point of view.
More info at http://icep-edbpm11.fzi.de/

1st International Workshop on Process Model Collections (PMC 2011)
Organized by Hajo Reijers, Marcello La Rosa and Remco Dijkman.
This workshop aims to attract novel research in the area of business process model collections. Conceptual, technical and application-oriented contributions are sought. Conceptual work relates to the design of approaches for the management of process model collections. Technical work concerns solutions to operationalize the management, and facilitate the maintenance, of content in process model repositories. It also concerns software aspects related to process model repositories such as version management, efficient storage, querying and retrieval of process models. Finally, interest is also devoted to application papers describing case studies with, or empirical evaluations of, industrial process model collections and reference process models.
More info at http://www.processcollections.org/

Organized by Nejib Ben Hadj-Alouane, Ramzi Hammami, Samir Tata and Moez Yeddes.
This workshop deals with problems related to the design and optimization of global logistics systems, from a business process management perspective. It is dedicated to exploring and mastering the tools needed for operating, reconfiguring and, in general, making decisions within logistics-based systems, in order to provide the customers and system users with the greatest possible value. Our aim for this workshop, in the long term, is to serve as a bridge between the business process research community and the logistics research community. In the short term, we shall accept papers from the logistics community that expose and solve operations and reconfigurations problems, not necessarily based on business models.
More info at http://events.telecom-sudparis.eu/pals
4th International Workshop on Process-Oriented Information Systems in Healthcare (ProHealth 2011)
Organized by Organized by Mor Peleg, Richard Lenz and Manfred Reichert.
Healthcare organizations are facing the challenge of delivering high-quality affordable services to
their patients at affordable costs. To help support this challenge, medical Informatics research offers
formalisms for developing clinical guideline-based decision-support systems. On the other hand,
business process management offers IT support for healthcare processes using workflow
technology. By integrating aspects from these approaches, there is hope for achieving better
healthcare process support. The potential and the limitations of IT support for healthcare processes
are the focus of the fourth ProHealth workshop. ProHealth provides a forum wherein challenges,
paradigms, and tools for optimized process support in healthcare are debated.
More info at http://www.uni-ulm.de/in/prohealth-11.html

2nd International Workshop on Reuse in Business Process Management (rBPM 2011)
Organized by Marcelo Fantinato, Maria Beatriz Felgar de Toledo, Itana Maria de Souza Gimenes,
Lucinéia Heloísa Thom and Cirano Iochpe.
In order to increase dynamism and competitiveness for organizations, BPM can benefit from reuse
approaches and techniques at several stages of business process life cycle. This workshop will be
dedicated to explore any type of reuse in the BPM domain. It will be a forum to discuss systematic
reuse applied to BPM at its various levels: the basic service-oriented foundation level; the service
composition level; the management and monitoring upper level; and, the Quality of Service and
semantics orthogonal level.
More info at http://www.each.usp.br/rbpm/2011/

2nd International Workshop on Traceability and Compliance of Semi-Structured Processes
(TC4SP 2011)
Organized by Francisco Curbera, Frank Leymann, Hamid Motahari Nezhad and Beth Plale.
Semi-structured processes are business or scientific processes whose lifecycle is not fully driven by
a formal process model and a business process management system (BPMS). Semi-structured
processes do not benefit from the advantages provided by BPMSs, but have the same need for
transparency, monitoring, compliance management and root cause analysis capabilities as fully
structured processes. The workshop bring together practitioners and researchers from different
communities – such as business process management, scientific workflow, complex event and
compliance monitoring, data and process mining – who share an interest in semi-structured
processes.
More info at http://cgi.cs.indiana.edu/~dsiweb/tc4sp11/index.html

1st International Workshop on Workflow Security Audit and Certification (WfSAC 2011)
Organized by Rafael Accorsi and Wil van der Aalst.
Despite the growing demand for compliant business processes, security and privacy incidents
caused by flawed workflow specifications are still soaring. Certification as a means to identify and
remediate potential weak spots at design time, and auditing to detect violations happening at
runtime are essential instruments to achieve reliably secure process-aware information systems.
WfSAC brings together researchers working on innovative, well-founded methods for workflow
security audit and certification and industry applying these methods in practical cases.
More info at http://www.telematik.uni-freiburg.de/wfsac
Co-located workshop : WS-FM workshop

8th International Workshop on Web Services and Formal Methods (WS-FM'11)
The aim of the WS-FM workshop series is to bring together researchers working on SOC, cloud computing and formal methods in order to catalyze fruitful collaboration. The scope of the workshop is not only limited to technological aspects. In fact, the WS-FM series has a strong tradition of attracting submissions on formal approaches to enterprise systems modeling in general, and business process modeling in particular. Potentially, this could have a significant impact on the on-going standardization efforts for SOC and cloud computing technologies.
More info at http://www.itu.dk/wsfm2011/
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