Panel on the Future of BPM Research/Publications

August 29th 2013, 13.00-13.30

Wil van der Aalst (moderator), Florian Daniel, Jianmin Wang, Barbara Weber (BPM PC chairs 2013), Shazia Sadiq, Pnina Soffer, Hagen Völzer (BPM PC chairs 2014)
Motivation

- For the first time, BPM authors were asked to fill out a questionnaire and most authors did so. There were questions related to the use and availability of software tools and data sets, the BPM use cases addressed in the submitted paper, and the type of paper (e.g., student paper or not). The questionnaire and the author’s answers trigger interesting questions like:
  - Should software and data sets presented in paper be available to reviewers (or even publically available)?
  - How is the distribution of BPM papers over the 20 BPM use cases mentioned in the questionnaire?
  - What use cases are missing? Which use cases deserve more attention and are underrepresented in the conference?
  - How to stimulate submissions from the entire BPM spectrum mentioned in the call for papers?

- The panel is intended to serve as a starting point for a discussion and perhaps even a joint publication/report on the “Future of BPM Research”. See http://wwwis.win.tue.nl/~wvdmaalst/etc/BPM-use-cases-overview.pdf for an initial set of BPM use cases and http://bpm-conference.org/bpt-resource-management/ for the BPM Tool Database initiative.
BPM 2013 Submission Questionnaire
Resources that can be shared

Please provide here optional, additional resources for your submission.

As author of the above contribution, I declare that:

- I agree to share these resources independently of the acceptance of this submission.
- I prefer the resources be shared only in case of acceptance of this submission.
- I do not have any additional resources to share.

Does the paper describe or use software?
- Yes
- No

If so, is the software publically available?
- Yes
- No

If so, provide here the URL where the software can be downloaded:

And here a short description (max 100 words) of the software you would like to share:

Does the paper describe or use data sets?
- Yes
- No

If so, is the data publically available?
- Yes
- No

If so, provide here the URL or DOI where the data can be downloaded:

And here a short description (max 100 words) of the data sets:

Rersion Questionn

Your help to provide the BPM conference series.

BPM use case identification

Indicate which of the following use cases are supported (select at most three use cases):
The use cases are described in detail in the paper "Business Process Management: A Comprehensive Survey", which can be accessed at http://www.wm-wue.de/BPM-use-cases-survey-paper.pdf (just copy and paste this link into the address bar of your browser and hit Enter).

- Design model (DesM)
- Discover model from event data (DiscM)
- Select model from collection (SelM)
- Merge models (MerM)
- Composite model (CompM)
- Design configurable model (DesCM)
- Merge models into configurable model (MerCM)
- Configure configurable model (ConCM)
- Refine model (RefM)
- Enact model (EmM)
- Log event data (LogED)
- Monitor (Mon)
- Adapt while running (AdaWR)
- Analyze performance based on model (ParM)
- Verify model (VerM)
- Check conformance using event data (ConED)
- Analyze performance using event data (PerED)
- Repair model (RepM)
- Extend model (ExtM)
- Improve model (ImpM)

If you are missing some uses cases, here you can list up the use cases not yet covered above:

Should you have any additional feedback you would like to share with us, you can do so here:
Sharing Resources

• Many authors acknowledge the importance of sharing software and data, but …

• Only 29 (25%) actually shared resources
  − 22 unconditional ("I agree to share these resources independently of the acceptance of this submission")
  − 7 conditional ("I prefer the resources be shared only in case of acceptance of this submission")

• For 60 papers the authors either declared "I do not have any additional resources to share" or their papers were not accepted for publication

• 118 – (60+29) = 29 did not respond

Of the 29 papers sharing resources
  − 25 use software tools, 20 are publically available
  − 17 use data sets, 8 are publically available
Not new, also in other communities ...

http://www.publications.parliament.uk/pa/cm201012/cmselect/cmsctech/856/856.pdf

http://www.sigmod2011.org/calls_papers_sigmod_research_repeatability.shtml
Use Cases
Frequency (n=89, 177 use cases)
Top 6 BPM Use Cases

- Design model: (DesM) #25
- Extend model: (ExtM) #17
- Verify model: (VerM) #15
- Discover model from event data: (DiscM) #14
- Improve model: (ImpM) #13
- Refine model: (RefM) #12

Bar chart showing frequency of different terms:
- Adapt while...
- Analyze...
- Compose...
- Design...
- Discover...
- Extend event...
- Log event...
- Merge...
- Refine...
- Select...

- Frequency on the y-axis:
  - 0
  - 5
  - 10
  - 15
  - 20
  - 25
  - 30
Infrequent Use Cases

- Monitor (Mon) #2
- Design model (DesCM) #4
- Merge models into configurable model (MerCM) #3

Adapt while...
Analyze...
Check...
Compose...
Design...
Discover model...
Enact model...
Extend model...
Log event data...
Merge models...
Monitor (Mon)...
Refine model...
Repair model...
Select model...
Verify model...

Frequency chart

- Adapt while...
- Analyze...
- Check...
- Compose...
- Configure...
- Design...
- Discover model...
- Enact model...
- Extend model...
- Log event data...
- Merge models...
- Monitor (Mon)...
- Refine model...
- Repair model...
- Select model...
- Verify model...
Percentage (n=89, 1.989 use cases pp)
Relative frequency (compared to the analysis of "10 years of BPM conferences")

Example Association Rules and Clusters
(Using Rapid Miner)

[Verify model (VerM), Analyze performance based on model (PerfM)] --> [Design model (DesM)] (confidence: 1.000)
[Design model (DesM), Select model from collection (SelM)] --> [Verify model (VerM)] (confidence: 1.000)
[Verify model (VerM), Select model from collection (SelM)] --> [Design model (DesM)] (confidence: 1.000)
[Verify model (VerM), Merge models (MerM)] --> [Design model (DesM)] (confidence: 1.000)
[Design model (DesM), Adapt while running (AdaWR)] --> [Verify model (VerM)] (confidence: 1.000)
[Verify model (VerM), Adapt while running (AdaWR)] --> [Design model (DesM)] (confidence: 1.000)
[Improve model (ImpM), Analyze performance based on model (PerfM)] --> [Design model (DesM)] (confidence: 1.000)
[Design model (DesM), Analyze performance using event data (PerfED)] --> [Improve model (ImpM)] (confidence: 1.000)
[Improve model (ImpM), Merge models (MerM)] --> [Design model (DesM)] (confidence: 1.000)
[Refine model (RefM), Analyze performance based on model (PerfM)] --> [Design model (DesM)] (confidence: 1.000)
[Design model (DesM), Analyze performance using event data (PerfED)] --> [Refine model (RefM)] (confidence: 1.000)
[Analyze performance based on model (PerfM), Compose model (CompM)] --> [Design model (DesM)] (confidence: 1.000)
[Design model (DesM), Analyze performance using event data (PerfED)] --> [Analyze performance based on model (PerfM)] (confidence: 1.000)
[Analyze performance based on model (PerfM), Merge models (MerM)] --> [Design model (DesM)] (confidence: 1.000)
[Enact model (EnM), Configure configurable model (ConCM)] --> [Design model (DesM)] (confidence: 1.000)
Missing Use Cases (suggested by authors BPM 2013 papers)

- Process simulation
- Event data analysis
- Select relevant portions from a given model
- Model reduction, determine similarity between models, derive possible traces from models, analyze models, mapping models nodes
- Predict performance
- Management issues and empirical studies, Relationship between business strategy and business process, Success factors and measures in BPM, BPM maturity, Case Studies and Experience Reports
- Model based analytics. Using the process model and the traces to generate predictions.
- Identify similarities in process model collections
- Business process verification
- This research is not model-focused: It concerns the evaluation of modeling methods,
- Evaluation of modeling methods
- Multilevel Business Process Discovery, Similarity of Business Processes
- Compliance by design
- Analyze event data (more general use case)
- Event data integration
- Query model
- Predicting process execution (remaining time)
- Process model matching
- Refactoring of Process Models
- Analyze model (e.g. the control flow, data and/or resource perspectives)
- Preprocessing techniques to be applied on event logs
- Change propagation in Choreographies, Change Impact analysis, Propagation risks prediction
Some are subsets or reformulations of existing use cases

- Process simulation (PerfM)
- Event data analysis (LogED, PerfED)
- Select relevant portions from a given model
- Model reduction, determine similarity between models, derive possible traces from models, analyze models, mapping models nodes
- Predict performance
- Management issues and empirical studies, Relationship between business strategy and business process, Success factors and measures in BPM, BPM maturity, Case Studies and Experience Reports
- Model based analytics (PerfM). Using the process model and the traces to generate predictions.
- Identify similarities in process model collections
- Business process verification (VerM)
- This research is not model-focused: It concerns the evaluation of modeling methods,
- Evaluation of modeling methods
- Multilevel Business Process Discovery (DiscM), Similarity of Business Processes
- Compliance by design (DesM)
- Analyze event data (LogED, PerfED)
- Event data integration
- Query model
- Predicting process execution (remaining time) (PerfED)
- Process model matching (SelM)
- Refactoring of Process Models
- Analyze model (e.g. the control flow, data and/or resource perspectives)
- Preprocessing techniques to be applied on event logs (LogED)
- Change propagation in Choreographies, Change Impact analysis, Propagation risks prediction
Others trigger questions such as:

• Initial set seems to have a model-bias. If so, what BPM use cases need to be added to avoid such a bias?
• More use cases related to management and organizational aspects? Please provide suggestions.
• Prediction/recommendation as a special use case (now under PerfED and ImpM)?
• Use cases related to the development of the discipline itself (e.g., BPM Maturity)?
• Domain-specific use cases or special use cases for case studies? (Don't think so.)
Discussion
Should software and data sets presented in papers be available to reviewers?

Part of review criteria?

Available to all?
Which BPM Use Cases are missing, in the initial set, in BPM research in general?
Next Steps
Possible Next Steps (1/2)

• This panel is just the starting point!
• Sharing of resources:
  - Tools for BPM page (http://bpm-conference.org/bpt-resource-management/)
  - Similar effort for data sets?
  - How to reward openness and willingness to share without excluding certain types of research (management oriented or commercial)?
  - SC would not like to enforce this at this stage in any way, but provide positive incentives.
Possible Next Steps (2/2)

- Use Case Questionnaire was a one-time experiment.
- BPM Use Cases
  - How to refine/extend/modify the existing set of use cases?
  - Who is interested in forming a working group?
  - Special issue of the BISE (Business & Information Systems Engineering) journal by Springer on the BPM Use Cases. Who wants to contribute?
Appendix

20 BPM Use Cases

initial set presented at BPM 2012 in Tallinn

20 BPM Use Cases

- Use cases to obtain a model [1-5]
- Use cases to obtain a configurable model [6-8]
- Use cases related to enactment [9-13]
- Use cases for model-only-based analysis [14-15]
- Use cases for log&model-based analysis [16-17]
- Use cases to repair, extend or improve process models [18-20]

Notation:

- Human
- Model
- Configurable model
- Information system
- Event data
- Diagnostics

D = Descriptive
N = Normative
E = Executable
Use Case 1:
Design model (DesM)
Use Case 2: Discover model from event data (DiscM)
Use Case 3:
Select model from collection (SelM)
Use Case 4: Merge models (MerM)
Use Case 5: Compose model (CompM)
Use Case 6: Design configurable model (DesCM)
Use Case 7: Merge models into configurable model (MerCM)

merge models into configurable model (MerCM)

variant 1

variant 2
Use Case 8: Configure configurable model (ConCM)

configure configurable model

(ConCM)
Use Case 9: Refine model (RefM)
Use Case 10: Enact model (EnM)
Use Case 11: Log event data (LogED)

log event data
(LogED)
Use Case 12: Monitor (Mon)
Use Case 13: Adapt while running (AdaWR)
Use Case 14: Analyze performance based on model (PerfM)

analyze performance based on model (PerfM)
Use Case 15: Verify model (VerM)
Use Case 16: Check conformance using event data (ConfED)
Use Case 17: Analyze performance using event data (PerfED)
Use Case 18: Repair model (RepM)
Use Case 19: Extend model (ExtM)

timestamps in the event log can be used to analyze waiting times in-between activities.

resource information in the event log can be used for social network analysis, role discovery, and performance analysis.

attributes in the event log can be used for decision point analysis.

check="OK" and report="Approved"
Use Case 20: Improve model (ImpM)
Overview Use Cases

- Use cases to obtain a model [1-5]
- Use cases to obtain a configurable model [6-8]
- Use cases related to enactment [9-13]
- Use cases for model-only-based analysis [14-15]
- Use cases for log&model-based analysis [16-17]
- Use cases to repair, extend or improve process models [18-20]
enactment is broad topic

not surprising

surprising focus on verification

weakness: topics related to process improvement and performance analysis score low

289 papers, 367 tags
More Information

• BPM Conference: http://www.bpm-conference.org/