BPTrends ARTICLE

Teaching BPM as a MOOC
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The way education is facilitated has undergone rapid changes in the last two decades. New forms of teaching and learning have emerged that make use of the Internet as a platform. Different formats have been developed, including computer-based training, eLearning, blended learning, distant education and online learning. In essence, these formats highlight that new media have always sparked new ideas on how to disseminate information and knowledge. In this way, these formats extend the discussions of the last century on how we can effectively use radio, television, computers and eventually the Internet for education purposes [1].

One of the most recent formats is the MOOC – an abbreviation for Massive Open Online Course. The essential idea of a MOOC is that people can openly register and participate in a focused learning experience via the Internet. In this way, Web technology transcends the boundaries of classroom teaching and lifts it towards a potentially unlimited number of participants [2]. MOOCs also aim to make the best use of what Web technology has to offer. Therefore, teaching is typically organized in short video segments with complementary reading material, quizzes and problem solving tasks. MOOC students can interact with co-students, teaching assistants and professors via user forums.

BPM-related topics have already been the subject of MOOCs in the last couple of years, including process modelling and process mining. However, a comprehensive coverage of the BPM lifecycle has been missing so far. We believe that there is a strong need to raise wider awareness with students and business professionals about the benefits that full-lifecycle BPM can bring to any organization. This belief motivated us to team up to shape a full-lifecycle BPM MOOC in cooperation with Queensland University of Technology in Brisbane, Australia – home to one of the largest and most established research concentrations in the field of BPM.

This Article gives an overview of the MOOC and sheds some light into its production. You are welcome to register for the first delivery of this MOOC, starting on 12 October. Registration is open: https://moocs.qut.edu.au/learn/fundamentals-of-bpm-october-2015.

Overview of the course

The core content of the MOOC is drawn from our textbook "Fundamentals of Business Process Management" [3], adopted in over 100 educational institutions worldwide, and from which the MOOC also takes the name. It is structured into six weeks, plus an initial orientation week and a final week to complete the assessment items. The content is provided through a series of short video segments (2-4min each), interspersed with explanatory text (e.g. definitions, examples), figures, interactive problem-solving tasks (with a solution generally also offered as a video) and interviews with thought leaders in the field of BPM. The screenshot of one of the lectures in Figure 1 gives a sneak preview of the look-and-feel of the MOOC.

The video segments are organized into topics, for example there is one topic on "Qualitative Process Analysis" and another one on "Quantitative Process Analysis", with every two topics grouped thematically in a weekly theme, e.g. the theme "Process Analysis" groups the two topics on qualitative and quantitative process analysis. Each topic is wrapped-up by a summary and a list of further readings and resources for those who want to know more. Themes and topics follow the phases of the BPM lifecycle, as shown in Fig. 2.

Fig. 1. Screenshot of a segment of the qualitative process analysis topic

In the first week (theme = "Process Identification"), we introduce BPM by talking about the role of processes within modern organizations, the structure of a BPM project and the benefits that BPM can yield to an organization. In the second topic of Week 1, we show practical techniques to identify business processes within an organization, study their boundaries and interrelations, and prioritize their management using different criteria. For example, we show how to build process architectures and value chains. This week also includes an interview with Michael Rosemann on strategic BPM.
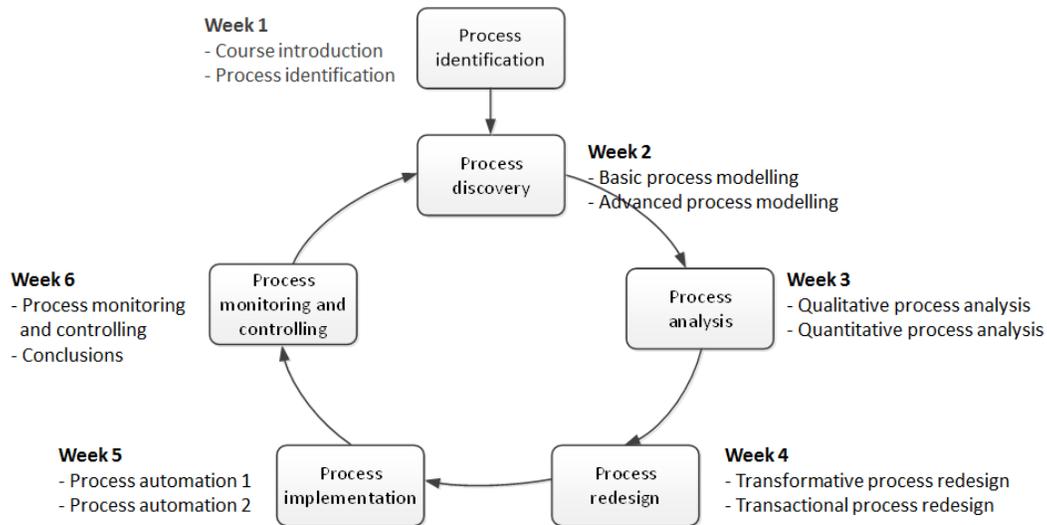
Fig. 2. Course structure overlaid over the BPM lifecycle

In Week 2 ("Process Discovery"), we focus on creating an understanding of the 'as is' business process via process modelling. We divide this theme into two topics: (i) "Basic process modelling", where we introduce the BPMN language and show how to model simple business scenarios using the basic routing constructs; and (ii) "Advanced process modelling" where we focus on events, exception handling and other advanced BPMN constructs.

In Week 3 ("Process Analysis"), we expose a variety of techniques to analyse the performance of business processes. The first topic, "Qualitative process analysis" illustrates techniques such as value-added analysis, waste analysis and root-cause analysis. As part of this topic, we also discuss techniques such as issue register, Pareto analysis and PICK charts to categorize and prioritize issues on the basis of their impact. In the second topic of this week, "Qualitative process analysis", we focus on performance measures, and show how to derive these measures via flow analysis and simulation techniques.

In Week 4 ("Process Redesign"), we present techniques to identify and evaluate different opportunities for process improvement on the basis of the analysis results, leading to a 'to be' process model in BPMN. We present two different approaches for process improvement (each being the focus of one topic). In "Transformative process redesign" we discuss the principles of Business Process Reengineering as an example of an analytical approach associated with radical process change, and present a more creative approach to process redesign, namely the Process Model Canvas. In "Transactional process redesign", we illustrate a set of heuristics for incremental (i.e. transactional) process improvement. This week concludes with an interview with Michael Rosemann on business process innovation.

In Week 5 ("Process implementation"), we focus on process automation. In the first topic, we illustrate a stepwise method to convert a 'to be' process model in BPMN (which is conceptual in nature) into its executable counterpart, i.e. a model that can be interpreted by a BPM system. In the second topic, we show how this can be achieved in the context of a concrete BPM system.

Finally, in Week 6 ("Process monitoring and controlling") we show how to use process execution data to measure to what extent a redesigned process, once executed, meets the expected performance targets. In the first topic, we present different types of dashboards as well as process mining as a family of techniques to extract insights from business process event logs. Specifically, we discuss techniques for automatically discovering a process model from an event log, techniques for measuring process performance, for identifying non-conformance issues, for mining process variants and detecting deviant behaviour. The second topic of this week concludes the course with a recap and a look beyond the BPM lifecycle, including guest appearances by Wil van der Aalst and Michael Rosemann on the future of process mining, and more generally, of BPM.

The course is punctuated by real-life case studies to illustrate the practical application of the presented methods. Participants are able to exercise their skills using concrete tools, including Signavio (for BPMN process modelling), BIMP (for process simulation), Bizagi BPM Suite (process automation) and Fluxicon Disco (process monitoring and mining).

Participants will be able to assess their progress via online quizzes at the end of each week, plus an optional project, which allows them to apply the knowledge and skills acquired week by week holistically, using a business problem inspired by a real-life scenario. The quizzes have different formats, ranging from traditional multiple-choice questions to more interactive visual maps, where learners have to point to specific parts of a figure (e.g. identifying the exact point in a process model where there are issues). The project is peer-assessed by the course participants against a list of marking criteria. Achieving a score of 50% in the weekly quizzes will grant a certificate of participation issued by the Queensland University of Technology. Further, a certificate of achievement can be obtained by passing a final online exam, in the form of a comprehensive set of quizzes on the content of the entire course.

The course is designed for busy people. Participants can consume the content at their own pace. The content of one week is designed to be consumed in 2 to 4 hours depending on whether participants engage in the project or not. The course does not assume any prior background in the field of BPM. We have made every effort to ensure that the course is accessible to beginners, while at the same time covering some advanced topics that may be of interest to participants already familiar with the field.

Behind the scenes

The initial idea of producing this MOOC dates back from October 2014. After producing an initial design of the content end of 2014, we proceeded to our first recordings on "green background" in January 2015. These recordings were followed with subsequent recordings throughout the first half of 2015, distributed across Brisbane, Tartu, Vienna and Amsterdam, due to the geographic distribution of the instructors.

When we were completing the video recordings, we thought that the bulk of the work was done. But to our surprise, the detailed design and production of the MOOC was the subject of relentless effort between April and September. We were taken aback by the number of stakeholders involved in the detailed design and production. In addition to our own input, the production has involved teaching assistants, multimedia developers, learning and graphic designers, video editors, a marketing consultant and a project manager. We could not initially imagine that a MOOC of this type involves about two person-years of effort and a budget well into the six digits of

     4   www.bptrends.com

dollars, even when the course content is already scoped and has been the subject of a book. Every topic has undergone careful storyboarding, with the aim of finding a suitable mix between short video lectures, textual explanations and interactive tasks, so that the widest possible range of participants can consume the content at their own pace and at their chosen level of detail, through active engagement.

We believe the end result is worth the candle and we hope you will share this opinion with us after taking the MOOC.

Acknowledgments

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References

1.   Mayer, R.E. *Multimedia learning.* 2nd Edition. Cambridge university press, 2009.
2.   https://en.wikipedia.org/wiki/Massive_open_online_course.
3.   Dumas, M., La Rosa, M., Mendling, J., Reijers, H.A. *Fundamentals of Business Process Management*, Springer, 2013.

About the Authors

Marlon Dumas is Professor of Software Engineering at University of Tartu, Estonia where he leads a team of 20+ researchers focused on BPM. Prior to this appointment, he was faculty member at Queensland University of Technology and visiting researcher at SAP Research, Australia, where he led several industrial research projects. Marlon has co-inventor of seven granted US/EU patents and co-author of 200+ publications in the fields of BPM and Service-Oriented Architectures. He is co-editor of the textbook "Process-Aware Information Systems" (2005) and co-author of "Fundamentals of Business Process Management" (2013).
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Marcello La Rosa is Professor and the Academic Director for corporate programs and partnerships at the Information Systems school of the Queensland University of Technology (QUT), and Principal Researcher at NICTA, Brisbane, Australia. His research interests span different BPM areas, including process consolidation, mining and automation, in which he published over 80 papers. He leads the Apromore initiative (www.apromore.org) – a strategic collaboration between various universities for the development of an advanced process model repository, and coordinates QUT's professional training program on BPM (www.bpm-training.com). Marcello has taught BPM to practitioners and students in Australia for ten years. Based on this experience, he co-authored "Fundamentals of Business Process

Management" – the first, comprehensive textbook on BPM, which has influenced the curriculum of over 100 universities in the world.

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Jan Mendling is a Full Professor with the Institute for Information Business at Wirtschaftsuniversität Wien (WU Vienna), Austria. He has published more than 250 research papers and articles, among others on BPM and information systems. He is member of the editorial board of five international journals, member of the board of the Austrian Society for Process Management (http://prozesse.at), one of the founders of the Berlin BPM Community of Practice (http://www.bpmb.de), organizer of several academic events on process management, and member of the IEEE Task Force on Process Mining. His PhD thesis has won the Heinz-Zemanek-Award of the Austrian Computer Society and the German Targion-Award for dissertations in the area of strategic information management.

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Hajo A. Reijers holds the chair of Business Informatics at VU University Amsterdam. He is also a part-time, full professor at Eindhoven University of Technology. His research focus is on business process redesign, workflow management technology, and conceptual modelling. On these and other topics, he published over 150 papers in academic journals and professional outlets. Hajo is alo the managing director of the European BPM Round Table (www.bpmroundtable.eu) and one of the founders of the Dutch BPM Round Table. Previously, he worked as a management consultant in the BPM field and as head of BPM research at Lexmark. Based on his experiences of researcher and consultant in the field of BPM, he contributed to the "Fundamentals of Business Process Management" textbook.

His research and publications can be accessed at http://www.reijers.com. The best way to contact Hajo is via email (h.a.reijers@vu.nl).

Appendix: Outline of the Course

Theme 1: Introduction and Identification (Week 1)	Presenters
Topic 1 – Introduction Including, e.g., what is a process, what is BPM and the BPM lifecycle	Marcello and Marlon
Topic 2 – Process Identification Including, e.g., process architecture, value chains and process portfolio	Marcello
Theme 2: Discovery (Week 2)	
Topic 3 – Process Modeling 1 Including, e.g., purpose of modeling and basic BPMN	Marcello
Topic 4 – Process Modeling 2 Including, e.g., process decomposition, events, and quality assurance	Marcello

Theme 3: Analysis (Week 3)	
Topic 5 – Process Analysis 1 Including, e.g., value-added analysis and root cause analysis	Marlon
Topic 6 – Process Analysis 2 Including, e.g., performance measures, flow analysis and simulation	Marlon
Theme 4: Redesign (Week 4)	
Topic 7 – Process Redesign 1 Including, e.g., redesign approaches and process re-engineering	Marlon and Hajo
Topic 8 – Process Redesign 2 Including, e.g., redesign heuristics and redesign examples	Marlon
Theme 5: Automation (Week 5)	
Topic 9 – Process Automation 1 Including, e.g., a stepwise method to automation	Marcello
Topic 10 – Process Automation 2 Including, e.g., architecture of a BPMS	Marlon
Theme 6: Monitoring and Conclusions (Week 6)	
Topic 11 – Process Monitoring and Controlling Including, e.g., process mining, discovery and deviance analysis	Marcello and Jan
Topic 12 – Closing Including, e.g., beyond the BPM lifecycle	Marlon and Marcello