Investigating the Potential of Capability-Driven Design and Delivery in an SME Case Study

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Abstract. In many business sectors, competitiveness on an international market is closely linked to the ability to quickly adapt business models and company strategies to changes in the market environment or in customer demands. Capability management is among the approaches which have been proposed as contributions to tackle these challenges. One of the key features is to explicitly capture the delivery context of a business services and to provide mechanisms for configuring or generating its deliver. Among the approaches to capability management is the capability-driven design and delivery (CDD) approach proposed in the EU-FP7 project CaaS. The aim of this paper is to contribute to (1) a better understanding of the potential of CDD and (2) the validation of the CDD approach. The paper addresses these aspects by considering the case of a small and medium-sized enterprise (SME) as an example.

Keywords: Capability modelling · Business potential · SME · Capability management

1 Introduction

In many business sectors, competitiveness on an international market is closely linked to the ability to quickly adapt business models and company strategies to changes in the market environment or in customer demands. In this context, enterprises offering IT-based business services to their customers need a way to quickly adapt both, their business services and the IT-infrastructure for delivering them. Capability management is among the approaches which have been proposed as contributions to tackle these challenges. One of the key features is to explicitly capture the delivery context of a business services and to provide mechanisms for configuring or generating its delivery (see Sect. 2).

Among the approaches to capability management is the capability-driven design and delivery (CDD) approach proposed in the EU-FP7 project CaaS (see Sect. 2.2) which is described in our previous work [16, 17]. So far, work on CDD focused to a large extent on the conceptual and technical aspects of capability modelling and delivery. Validation of the CDD approach has largely been done within the CaaS project only by using the CaaS use case. Furthermore, the suitability of CDD for different target groups has not been investigated in much detail.

The aim of this paper is to contribute to (1) a better understanding of the potential of CDD and (2) the validation of the CDD approach. The paper addresses these aspects by considering the case of a small and medium-sized enterprise (SME) as an example. With the results from this case, we intend to provide the basis for future case studies and to investigate what the potential of CDD for different target groups is, whether there are differences between different target groups and what the reasons for those differences are.

The rest of the paper is structured as follows: Sect. 2 summarizes the background for the work from the area of capability management and presents the main aspects of the CaaS approach to capability design and delivery. Section 3 discusses the case study including interviews and a qualitative content analysis performed in the case. Section 4 discusses threats to validity of our work in Sect. 3. Section 5 summarizes the work and draws conclusions.

2   Background

As a background for the work presented in this paper, this section briefly summarizes work in the area of capability management and the capability design and delivery approach developed in the CaaS project.

2.1   Capability Management

The term capability is used in different areas of business information systems. In the literature there seems to be an agreement about the characteristics of the capability, still there is no generally acceptance of the term. The definitions mainly put the focus on "combination of resources" [5], "capacity to execute an activity" [4], "perform better than competitors" [7] and "possessed ability [12]".

The capabilities must be enablers of competitive advantage; they should help companies to continuously deliver a certain business value in dynamically changing circumstances [8]. They can be perceived from different organizational levels and thus utilized for different purposes. According to [9] performance of an enterprise is the best, when the enterprise maps its capabilities to IT applications. Capabilities as such are directly related to business processes that are affected from the changes in context, such as, regulations, customer preferences and system performance. As companies in rapidly changing environments need to anticipate to these variations and respond to them [6], the affected processes/services need to be adjusted quickly. In other words, adaptations to changes in context can be realized promptly if the required variations to the standard processes have been anticipated and defined in advance and can be instantiated.

In this paper capability is defined as the ability and capacity that enable an enterprise to achieve a business goal in a certain context [15]. Ability refers to the level of available competence, where competence is understood as talent intelligence and disposition, of a subject or enterprise to accomplish a goal; capacity means availability of resources, e.g. money, time, personnel, tools. This definition utilizes the notion of context, thus stresses the need to take variations of the standard processes into consideration. To summarize, capabilities are considered as specific business services delivered to the enterprises in an application context to reach a business goal. In order

to facilitate capability management, we propose business service design explicitly considering delivery context by an approach that supports modelling both, the service as such and the application context.

2.2   CaaS Approach to Capability Design and Delivery

Business services are IT-based services which digital enterprises provide for their customers. Business services usually serve specified business goals, they are specified in a model-based way and include service level definitions. In order to ease adaptation of business services to changes in customer processes or other legal environments CDD approach explicitly defines (a) the potential delivery context of a business service (i.e. all contexts in which the business service potentially has to be delivered), (b) the potential variants of the business service for the delivery context and (c) what aspect of the delivery context would require what kind of variation or adaptation of the business service.

The potential delivery context basically consists of a set of parameters or variables, the so called context elements, which characterize the differences in delivery. The combination of all context elements and their possible ranges defines the context set, i.e. the problem space to cover. The potential variants of the business service, which form the solution space, are represented by process variants. Since in many delivery contexts it will be impractical to capture all possible variants, we propose to define patterns for the most frequent variants caused by context elements and to combine and instantiate these patterns to create actual solutions. If no suitable pattern is available, the conventional solution engineering process has to be used. The connection between context elements, patterns and business services has to be captured as transformation or mapping rules. These rules are defined during design time and interpreted during runtime.

The above simplified summary of our approach has been further elaborated by defining meta-model and method components, by specifying a development and delivery environment and by performing feasibility studies. Detailed discussions of meta-model and method components are available in [10] and [16], respectively.

In order to implement the CaaS approach, a capability development and delivery environment was designed, which is currently under development. The main components of the environment are capability design tool, context platform, capability delivery navigation application, as well as capability delivery application. The architecture of the environment is shown in Fig. 1. The main components are illustrated with parallelograms. Functional components are represented in rectangular and they are related to each other as well as to their respective main components. The functional components of the environment are as follows:

- Capability modeling module - provides modeling elements defined in the capability meta-model and models the required capability including business service (e.g. business process model), business goals, context and relations to delivery patterns.
- Pattern composition module - identifies appropriate patterns for capability delivery and composes the patterns together. It supports incorporation of external resources into the composition. If some of the patterns required are not available then the modeling of missing information is supported and new patterns can be proposed and documented.
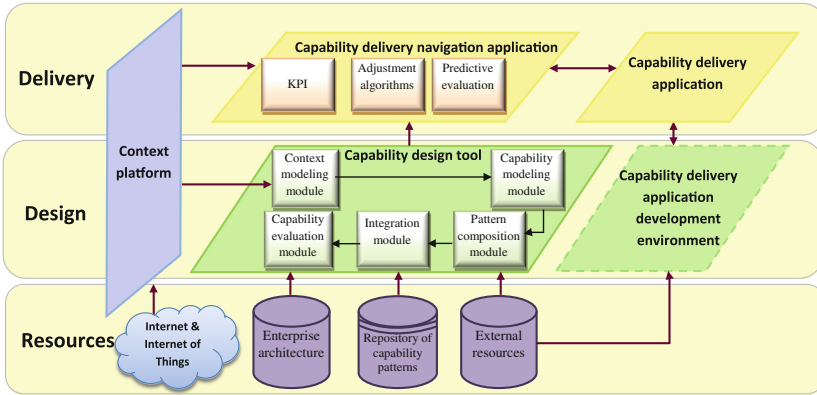
Fig. 1. Components of the capability development environment

- Repository of capability patterns - storage and maintenance of available capability delivery patterns.
- Context platform - captures data from external data sources including sensing hardware and Internet based services such as social networks. It aggregates data and provides these data to subscribers.
- Context modeling module - represents the context data in terms of the capability modeling concepts and provides means for context analysis and amalgamation.
- Capability assessment (evaluation) module - performs assessment of financial and technical feasibility of the proposed capability.
- Capability integration module - generates the capability delivery navigation application, which also incorporates algorithms for capability delivery adjustment.
- Capability delivery navigation application - provides means for monitoring and adjustment of capability delivery. It includes monitoring module for monitoring context and goal KPI, predictive evaluation of capability delivery performance and delivery adjustment algorithms. The capability delivery adjustment algorithms are built-in in the capability delivery navigation application. The algorithms continuously evaluate necessary adjustments and pass capability delivery adjustment commands to the capability delivery application.

Capability delivery application is developed following the process and technologies used by a particular company. The CDD methodology only determines interfaces required for the capability delivery application (CDA) to be able to receive capability delivery adjustment commands from the capability delivery navigation application and to provide the capability delivery performance information.

3   Investigating the Potential of CDD in an SME Case

As a contribution to understanding the potential of capability management and at the same time to validation of the CDD approach, we investigated the case of a small and medium-sized company offering IT-based business services to their customers. More

concrete, we considered the case of SOLVIN AG, Hamburg and Berlin. Solvin is a full-service consulting firm with a wide range of tools, own solutions and methods with a focus on the field of project management. The main question considered in the interviews with Solvin was:

From the perspective of a medium-sized company, what is the potential of the CaaS approach for improving business performance?

This question can be broken down into a number of sub-questions:

- What kind of business services does the company offer?
- How is the delivery of each business service affected by the delivery context?
- Is it possible to make explicit, what context elements relevant for the business services?
- How much efforts and what time frame does it require to adapt a business service to a new delivery context?
- What preconditions does the CDD approach need to fulfill to be applicable in the company regarding (a) methodology, (b) technology, (c) qualification, (d) resources?

The main purpose of the interviews was an external validation of the CDD approach from two perspectives: would the approach be applicable in the enterprise under consideration and, if so, what would be the expected benefits? The development of the CDD approach primarily was based on academic literature and the input from three specific use cases of CaaS industrial partners. By selecting experts from another application domain than the CaaS use cases, we aim to balance theory and practice as well as to add another perspective to the validation of the CDD approach. From a methodical perspective, the aim of the interviews was to collect qualitative data relevant for the above questions which would be analyzed with qualitative content analysis techniques. Thus, the requirements of the analysis technique posed to the data had to be taken into account when designing the process. More concrete, we selected Mayring's [1] approach for conducting qualitative content analysis.

As a preparation for the interviews, a list of questions was developed (open questions), which covered the background of the experts interviewed, business services in general and the process of adapting these services to new delivery contexts in particular. Two interviews were conducted on the same afternoon; one interview was with the manager of the business process outsourcing (BPO) unit, the other one the ramp-up manager for project management services. The BPO unit of Solvin is under development and supposed to offer reporting and planning processes within project management as service to Solvin's clients. The ramp-up manager is in charge of setting up project management services for new clients according to their requirements. The interviews were recorded; additionally the interviewer took notes during the interviews.

Mayring's approach includes 6 steps: step 1 is to decide what material to analyze, which obviously consists of the recordings of the two interviews and the notes taken. The BPO and the ramp-up manager both are experienced in the field of project management and served as consultants for many clients in this area, which included projects in IT, manufacturing industries and process industries. Step 2 is to make explicit how the data collection (i.e. in our case the interviews) was arranged and prepared. The

purpose of this step is to make all factors transparent which could be relevant for interpreting the data. The company Solvin was selected from existing contacts of the researchers involved. As preparation for the interviews, the interviewees received information about the purpose of the interview, general information about CaaS and the CDD approach. This information was given in a 30 min presentation plus 15 min discussion session, which was followed by the interviews. The interview with the BPO manager was 48 min long. The interview with the second expert lasted 56 min.

Step 3 is to make explicit, how the transcription of the material had to be done. The material was analyzed step by step following rules of procedure devising the material into content analytical units. The rules included what IDs to use for the units of different interviews, how to tag content related to the interviewer and content from the interviewees, how to mark comments, etc. Step 4 concerns the subject-reference of the analysis, i.e. that the connection to the concrete subject of the analysis is made sure. Subject-reference was implemented by (a) defining the research questions and their sub-questions in the interview guidelines and (b) using the subjects of these sub-questions as categories during the analysis.

Step 5 recommends theory-guided analysis of the data, which is supposed to balance fuzziness of qualitative analysis with theoretical stringency. For theory-guidance, we took the state-of-the-art into account during both, formulation of the sub-questions and analysis of the material. Step 6 defines the analysis technique, which in our case was content summary. This attempts to reduce the material in such a way as to preserve the essential content and by abstraction to create a manageable corpus which still reflects the original material. For this the text was paraphrased, afterwards generalized, reduced and assigned to categories mentioned in step 4: a first reduction is achieved by removing paraphrases with the same meaning from the paraphrased text. A second reduction is the result of summarizing similar paraphrases. The categories reflect the aspects needed to answer the research questions. Table 1 illustrates the result of the 2nd reduction step.

For brevity reasons, Table 1 presents only a small part of the result of the 2nd reduction. Out of in total 12 categories represented in the interview questions, we selected "business services", "service delivery" and "context elements" for presentation in this paper. Based on the information collected during the interviews our conclusions regarding the investigated main question are as follows:

(a) What kind of business services does the company offer?

The business services offered by Solvin are supposed to cover typical activities of a project management unit (PMU) for medium-sized and large development or design projects. Examples for the services included are change management (change requests, change tracking, scope change control), plan management (plan documentation, schedule control), cost management (cost planning, cost control, cost reporting), communication management (reporting to stakeholders, documentation platform), quality management (quality planning, documentation of quality control actions) and risk management (risk registers, risk control). Solvin offers to set up the organizational and technical prerequisites for the project management units, to train the staff and to perform the actual management. Future services are supposed to include outsourcing services.

Table 1. Result of the 2nd reduction step (excerpt)

Category #	Category	Statement
C 2	Business services	All a PMU has to do
		Change management and what belongs to it
		Change control, change tracking
		Control schedule, document project plan
		Cost control, cost reporting and planning
		Stakeholder communication
		Reporting, manage documents
		Quality plan and control
		Maintain risk register, document decisions
C 8	Service delivery	Individual solution for every customer
		Platform is configured
		Layout and content of reporting
		Stakeholders
		Periods and time-related constraints
		Work flows
		Integration with enterprise IT
		Resources relevant for project
C 9	Context elements	Checklist for project ramp-up
		Platform configuration partly automatable
		Import from enterprise systems, conversion of format, matching to tables in database
		Supplier changes
		Policy changes
		Some manual adjustments
		Document layouts
		Stakeholder information
		Periods and time frames
		Have to test it

(b) How is the delivery of each business service affected by the delivery context?

Currently, the customer selects the required business services from Solvin's offering and a dedicated technical platform is configured for each customer which makes each PMU solution unique. In addition to the selected services, many possibilities of configuring the solution to the customer demands are offered. These include content and layout of reports, reporting and planning periods, basic work flows (e.g. for reporting), stakeholder involvement, and integration with the enterprise resource planning (e.g. for importing basic information about personnel, cost structures or subcontractors and for exporting information about resource consumption and achieved progress). Furthermore, the deployment environment has to be decided, which currently either is to run the IT-platform and services at the customer's premises or to use Solvin's infrastructure for this purpose.

(c) Is it possible to make explicit, what context elements relevant for the business services?

The interviewees consider it as very useful to think of each new customer as delivery context for their PMU services and to make explicit what defines this context.

They mention an internal check list for ramp-up of solutions for new customers. This check list (which was not available during the interview) would be a source for identifying context elements.

The discussion of potential context elements showed that the interviewees were dividing the elements into (a) context elements affecting the configuration of the PMU solution and requiring manual adjustments, (b) elements affecting the configuration which could be used for automated adjustments and (c) context elements affecting the operations of the PMU solution. Examples for category (a) are document layouts to be adjusted or stakeholder names and addresses. The import of data from existing systems which can be performed as variants of a tool chain belongs to category (b). Category (c) would include supplier information triggering changes in risk register or policy changes leading to changed information supply to stakeholders.

(d) How much efforts and what time frame does it require to adapt a business service to a new delivery context?

For small projects which use the standard configuration of the PMU solution, it requires just one working day to adapt the business service. For complex projects with specific requirements to import and export of information and to work flows and decision rights to be reflected by the system, this can take up to 2 months. Figures about the average size of adaptation are not available.

(e) What preconditions does the CDD approach need to fulfill to be applicable in the company regarding (a) methodology, (b) technology, (c) qualification, (d) resources?

When judging the potential of the CDD approach, the interviewees had different opinions. The ramp-up manager had his doubts that CDD approach of capability modeling, capability delivery and capability navigation would substantially improve the business service currently offered to Solvin's customers. Context modeling would probably help to raise awareness for improvement potential, but the current target group is used to set-up time and efforts involved in this. Thus, the need for automatic configuration of PMU solutions and for adjustments during delivery for this target group is not very high. The efforts to be spent in further automation would probably not generate enough savings or payback in terms of new customer projects. On the other side, the manager of the BPO unit saw a great potential for the CDD approach when implementing business process outsourcing. This segment of the business is supposed to primarily address a new target group acknowledges the need for professional project management services, but does not want to implement a fully-developed PMU. They are interested in a reliable documentation and reporting processes, a high data quality and procedures compliant to industry standards. Processes will be more standardized and delivery of the business services has a much higher automation potential.

From a methodology perspective, CDD should ideally support the modeling of capabilities, the configuration of the delivery platform for a specific delivery context and the management of capability delivery during runtime. If CDD offers this possibility, Solvin would be open to change the own methodology to the CDD approach, even though this requires investments in qualifying the employees. Solvin is Microsoft solution partner and would clearly like to stay with solutions applicable on a Microsoft platform. Regarding the qualification, the interviewees would expect that the consultants who currently analyze customer requirements and implement the customization

should be able to do the context modeling and configuration. As the BPO unit is under design, the interviewees did not have a firm opinion about the overall process and the resource requirements.

4 Threats to Validity

Research including empirical studies has threats regarding its validity, and so have the interviews performed for investigating the potential of capability management. However, to early identify such threats and to take actions to mitigate the threats can minimize the effect on the findings. Common threats to empirical studies are discussed, for example in [2, 3]. The threats to validity can be divided into four categories: construct validity, internal validity, external validity and conclusion validity. Construct validity is concerned with obtaining the right indicators and measures for the concept being studied. Internal validity primarily is important for explanatory studies with the objective to identify causal relationships. External validity is addressing the question about to which extent the findings in a study can be generalized. Conclusion validity addresses repetition or replication, i.e. that the same result would be found if performing the study again in the same setting.

With respect to construct validity, the following threats were identified and actions taken:

- Selection of participants: The results are highly dependent on the people being interviewed. Only persons experienced in design and development of business services and the use of IT for delivering them will be able to judge suitability and potential of the proposed CDD approach. To obtain a high quality of the sample, only experts having worked in this area for a long time and hence having the required background were selected.
- Reactive bias: A common risk in studies is that the presence of a researcher influences the outcome. Since the selected participants in the study and the research group performing the study have been collaborating for a while, this is not perceived as a large risk. However, as the researchers performing the interviews were part of the team developing the CDD approach there is the risk that the interviewees are biased towards the CDD approach to find evidence for its innovative character. In order to reduce this threat, the interviewees were informed that the new approach can be configured in different ways and the purpose of the study was to test a certain configuration.
- Correct interview data: There is a risk that the questions of the interviewer may be misunderstood or the data may be misinterpreted. In order to minimize this risk, the interview guidelines were double-checked by another researcher to ensure a correct interpretation of the questions by the interviewees. Furthermore, the interviews were documented and recorded, which allowed the researcher to listen to the interview again if portions seemed unclear.

Regarding the internal validity, confounding factors and the ability to inference are the two most important aspects for our work:

- Confounding factors: In many studies, there is a risk that changes detected by measurements or observations are not solely due to the new approach, but also due to confounding factors. Since we only focused on the step from business service to capability and kept all other elements stable, we made all efforts possible to rule out confounding factors as an influence on the interview outcome.
- Ability to make inferences: Another potential threat to internal validity is that the data collected in the interviews did not completely capture the view of the inter-viewees regarding the CDD approach. However, this threat was reduced by breaking down the research question in a sub-questions covering the different aspects of CDD potential. Thus, this threat to validity is considered being under control.

A potential threat of the study regarding external validity is of course that the actual interviews have been conducted with only two participants from the field. It will be part of the future work, to conduct a study with more participants and with members from other industry and academic contexts.

With respect to conclusion validity, interpretation of data is most critical, i.e. the outcome of the study potentially could be affected by the interpretation of the researcher. To minimize this threat, the study design includes capturing the relevant aspects by different interview questions, i.e. to conduct triangulation to check the correctness of the findings. Furthermore, another risk could be that the interpretation of the data depends on the researcher and is not traceable. To reduce the risk the data collection and interpretation was performed according to Mayring's approach (see Sect. 3). Further-more, the results were discussed with other researchers and validated by them.

In summary, actions have been taken to mitigate the risks identified, which from our perspective results in an appropriate confidence level regarding construct and internal validity. Future work (i.e. an extension of the study) will contribute to increasing the confidence level regarding external validity and also conclusion validity.

5   Conclusion and Outlook

In order to investigate the potential of capability-driven design and development, this paper conducted and analysed two interviews with representatives from an SME providing project management services to their clients. The interviews were also expected to contribute to validation of the CDD approach with respect to its suitability and usefulness for enterprises that are not in CaaS project. The overall conclusions to be drawn for the specific case of Solvin are:

- The basic concept of reaching a new productivity level for business services by making their delivery context explicit and designing adaptation possibilities during delivery was considered as very promising.
- For highly individualized business services with a substantial share of manual configuration needs, the CDD approach was considered as less suitable.
- The usefulness of the CDD approach for BPO was confirmed. Solvin would be willing to explore the use of the CDD approach and tools.

- There is an openness to change the own methodology to the CDD approach, even if this requires investments in qualifying the employees.
- Compatibility to technical platforms established in the enterprise is a success criterion.
- It is difficult to calculate the benefits of CDD, as the required figures regarding average project size and distribution of efforts are not available.

As already discussed in Sect. 4, the above findings cannot be generalized for all small and medium-sized enterprises but rather form a starting point for future studies. With the Solvin case, this paper provides a first indication as where the potentials of CDD can be expected and what aspects to take into account when further developing the approach. The implications can be summarized in a hypothesis as follows:

Adoption and successful implementation of the CDD approach in an SME depends on (1) the existence of business services (potentially) offered in different contexts, (2) compatibility to established technical platforms and (3) the willingness to modify the internal methodology for business service design and delivery of the SME under consideration.

Future work will have to consist of more case studies to support or falsify the hypothesis. With respect to their design, these future studies should use the same research questions and to some extent the same study design in order to cater for comparability of the results.

Furthermore, people experienced in IT service management tend to compare the CDD approach with service management approaches, as for example with ITIL [18]. This subject was also raised by Solvin during the 30 min presentation before the interviews (see Sect. 3), but it was not addressed in the interviews as such. Although CDD has a focus on business services of an enterprise and engineering aspects of the services whereas ITIL has a focus on IT-infrastructure services, there seem to be intersections, e.g. when it comes to service design. Future work should investigate the conceptual and process-oriented intersections between CDD and ITIL.

References

1. Mayring, P.: Qualitative content analysis. Forum Qual. Soc. Res. **1**(2), Art. 20 (2000). http://nbn-resolving.de/urn:nbn:de:0114-fqs0002204
2. Wohlin, C., Runeson, P., Host, M., Ohlsson, C., Regnell, B., Wesslén, A.: Experimentation in Software Engineering: an Introduction. Kluver Academic Publishers, Boston (2000)
3. Yin, R.K.: Case Study Research: Design and Methods. Applied Social Research Methods Series, vol. 5, 3rd edn. Sage Publications Inc., Thousand Oaks (2002)
4. Jiang, Y., Zhao, J.: An empirical research of the forming process of firm inter-organizational e-business capability: based on the supply chain processes. In: 2010 2nd International Conference on Information Science and Engineering (ICISE), pp. 2603–2606 (2010)
5. Antunes, G., Barateiro, J., Becker, C., et al.: Modeling contextual concerns in enterprise architecture. In: 2011 15th IEEE International Enterprise Distributed Object Computing Conference Workshops (EDOCW), pp. 3–10 (2011)

6. Eriksson, T.: Processes, antecedents and outcomes of dynamic capabilities. Scandinavian Journal of Management (2013). doi:10.1016/j.scaman.2013.05.001

7. Boonpattarakan, A.: Model of thai Small and medium sized enterprises' organizational capabilities: review and verification. JMR **4**(3), 15 (2012). doi:10.5296/jmr.v4i3.1557

8. Stirna, J., Grabis, J., Henkel, M., Zdravkovic, J.: Capability driven development – an approach to support evolving organizations. In: Sandkuhl, K., Seigerroth, U., Stirna, J. (eds.) PoEM 2012. LNBIP, vol. 134, pp. 117–131. Springer, Heidelberg (2012)

9. Chen, J., Tsou, H.: Performance effects of 5IT6 capability, service process innovation, and the mediating role of customer service. J. Eng. Tech. Manage. **29**(1), 71–94 (2012). doi:10.1016/j.jengtecman.2011.09.007

10. Zdravkovic, J., Stirna, J., Henkel, M., Grabis, J.: Modeling business capabilities and context dependent delivery by cloud services. In: Salinesi, C., Norrie, M.C., Pastor, Ó. (eds.) CAiSE 2013. LNCS, vol. 7908, pp. 369–383. Springer, Heidelberg (2013)

11. Wirtz, B.W.: Business Model Management. Design - Instruments - Success Factors, 1st edn. Gabler, Wiesbaden (2011)

12. Brézillon, P., Cavalcanti, M.: Modeling and using context. Knowl. Eng. Rev. **13**(2), 185–194 (1998). doi:10.1017/S0269888998004044

13. Zott, C., Amit, R.: Designing your future business model: an activity system perspective. Long Range Plan. **43**, 216–226 (2010)

14. Sandkuhl, K., Stirna, J., Persson, A., Wißotzki, M.: Enterprise Modeling: Tackling Business Challenges with the 4EM Method. The Enterprise Engineering Series. Springer, Heidelberg (2014). ISBN 978-3662437247

15. Bērziša, S., Bravos, G., Gonzalez Cardona, T., Czubayko, U., España, S., Grabis, J., Henkel, M., Jokste, L., Kampars, J., Koc, H., Kuhr, J., Llorca, C., Loucopoulos, P., Juanes Pascual, R., Sandkuhl, K., Simic, H., Stirna, J., Zdravkovic, J.: Deliverable 1.4: Requirements specification for CDD, CaaS – Capability as a Service for Digital Enterprises, FP7 project no 611351, Riga Technical University, Latvia (2014)

16. Sandkuhl, K., Koç, H., Stirna, J.: Context-aware business services: technological Support for business and IT-alignment. In: Abramowicz, W., Kokkinaki, A. (eds.) BIS 2014 Workshops. LNBIP, vol. 183, pp. 190–201. Springer, Heidelberg (2014)

17. Bērziša, S., Bravos, G., Gonzalez Cardona, T., Czubayko, U., España, S., Grabis, J., Henkel, M., Jokste, L., Kampars, J., Koç, H., Kuhr, J.-C., Llorca, C., Loucopoulos, P., Juanes Pascual, R., Pastor, O., Sandkuhl, K., Simic, H., Stirna, J., Zdravkovic, J.: Capability driven development: an approach to designing digital enterprises. Bus. Info. Syst. Eng. (BISE) **57**(1), 15–25 (2015). doi:10.1007/s12599-014-0362-0

18. Office of Government Commerce: The Official Introduction to the ITIL Service Lifecycle, 2007th edn. The Stationery Office, London (2007)