Toward Business Domain-Specific eCollaboration: Requirements for Integrated Virtual Cooperation in Product Costing

Full Paper

Diana Lück
Technische Universität Dresden
Chair of Information Systems
Diana.Lueck@mailbox.tu-dresden.de

Christian Leyh
Technische Universität Dresden
Chair of Information Systems
Christian.Leyh@tu-dresden.de

Abstract

In enterprises, limitations of time and place vanish more and more due to virtual collaboration. As a business domain, product costing is characterized by a high demand for communication, coordination, and information exchange. A prior study revealed that virtual cooperation has not been integrated into this particular business area and that there is a need to find ways to enable and support such specific forms of virtual collaboration. To navigate the challenge of integrating virtual cooperation support directly into the core process of a particular business domain we introduce Business Domain-Specific eCollaboration. We present a requirements model for integrated virtual cooperation in product costing derived from expert interviews. It shows what an integrative approach can offer in order to link collaboration support directly into the process of a particular business domain.

Keywords

Integrated virtual cooperation, Business domain-specific eCollaboration, Product costing, Enterprise 2.0.

Motivation

Virtualization affects all areas of our lives. The way in which we communicate and purchase goods, as well as work, is influenced by the ever-changing digital world. The increasing digitalization of work environments can facilitate processes as working together becomes independent of location and teams spread all over the world become less restricted by the limits of time. Especially in business domains characterized by a high demand of information exchange and communication, the relevance of work structures that support such virtual cooperation increases (Riemer et al. 2009).

In product costing, in which the costs of new products whose development cycles have just begun are determined, collaboration is a significant factor of success. As part of managerial accounting, product costing enables companies to calculate the costs that a product generates by considering material and manufacturing costs, their corresponding overhead rates, and overhead costs for administration and distribution. Especially in the discrete manufacturing industry, in which products such as automobiles, electronic devices, and technical equipment are manufactured, early product costing has a tremendous potential to influence costs, since 70% of the costs of goods sold has already been set during product development (Drury 2008; Saaksvuori and Immonen 2004). The costing process involves a multitude of divisions; the financial controlling department has to manage economic aspects, engineering needs to deliver construction-related information, and the sales team has to communicate the results of negotiations with customers and their feedback from the market. Usually, since not all parts of a product are manufactured in-house, information exchange with the procurement department is necessary in order to generate quotes from suppliers for purchasing those parts, while further interaction partners are common in the collaborative process of product costing (Hansen et al. 2009). In a prior investigation of current support for collaboration, we revealed room for improvement. That study showed that generic tools such as email and traditional methods such as meetings and telephone calls are primarily used, but that current support for collaboration remains unsatisfying. Nearly 90% of the total product costing workload consists of collaborative work, which makes the support of these activities essential to ensuring

efficiency throughout the costing process. Data management is often detached from the cooperation process, since using spreadsheet programs such as Microsoft Excel remains highly common. At the same time, integrated support for collaboration in the costing process is missing, and existing eCollaboration solutions cannot adequately support the process. The study also examined former research identifying a research gap and justifying further investigation (Lück and Leyh 2016). Even though collaboration support has undergone an astonishing evolution since the 1980s, especially from a technological perspective (Grudin 1994; McAfee 2006; Riemer et al. 2009), opportunities to cooperate virtually that are connected to the process and daily business tasks appear to be missing. In today's business environments, enterprise 2.0 tools such as blogs and social networks are widespread, but integral approaches have yet to evolve. In response, research has focused on adopting eCollaboration, its success factors, or the impact of its use (Alqahtani et al. 2014; Andriole 2010).

This trend prompts the research approach of Business Domain-Specific eCollaboration in order to navigate the challenge of integrating virtual cooperation support directly into the core process of a particular business domain. In that context, to develop a concept for such a sociotechnical collaboration system, we sought to analyze the requirements of integrated virtual cooperation in product costing. By collecting data in expert interviews, we aimed to analyze what an integrative approach can offer in order to link collaboration support directly into the process of a particular business domain. We chose the domain of product costing, largely given strong feedback on the topic from companies in the domain. To validate the derived requirements, we evaluated the results in light of feedback from product-costing specialists.

To understand the capabilities of collaboration support in product costing, we addressed the following research question:

RQ1: According to the collaborative processes in product costing, what are the cross-sector requirements for integrated virtual cooperation in the domain, and how can they be fulfilled by Business Domain-Specific eCollaboration?

To answer this question, we have structured our paper as follows. After we describe the methodology used for the research project in section 2, we address the requirements analysis by presenting the sample and the requirements model that we developed in section 3. In section 4, we evaluate the model before concluding the paper with a summary and outlook for future work in section 5.

Methodology

This section presents the research methodology used to develop and validate the requirements model for integrated virtual cooperation in the domain of product costing.

To establish an understanding of the collaborative practices in the product-costing process and how it is supported by information technology (IT), we invited experts with diverse business roles and from a variety of industrial sectors to participate in semi-structured interviews. Participants were selected who had a high level of professional experience and who declared specific interest in the topic. Since participants were located internationally, expert interviews were conducted using a web-conferencing solution. During each interview the interviewer introduced himself and explained the research, the purpose and structure of the interview, and how its results would be used. He asked the interviewee to describe his or her professional career and expertise in the field, largely to clarify his or her relation to product costing. The final part of the interview addressed the collaborative process and IT support systems in terms of product costing and asked the interviewee to characterize all steps and their respective participants in the process. Each interviewee was furthermore asked to describe how the process is supported by IT, as well as what shortfalls and means of improvement, if any, are possible.

Following data collection, we conducted a qualitative data analysis in order to identify requirements for integrated virtual cooperation in product costing. We coded and analyzed the interview protocols using AQUAD 7 (Huber 2013). All codings were structured to systematically examine data content. This tool-based approach enabled us to explore the results multidimensionally and derive specific requirements for collaboration in product costing. By grouping and classifying those requirements, we formulated a requirements model that represents the basis for a first approach to enabling Business Domain-Specific eCollaboration.

To evaluate the model, we lastly organized an expert session in which we presented the requirements model to product-costing specialists with extensive expertise in the field who did not participate in the interviews. Participants were asked to rate each requirement on a scale from 0 (*Extremely unimportant*) to 10 (*Extremely important*). We used the results to evaluate the model and prioritize the requirements.

Requirements Analysis

This section presents the results of the semi-structured expert interviews that we conducted regarding collaboration in product costing. Herein, we first characterize the sample of experts and second describe the derived requirements model and introduce each section of the model. Among these sections, P*roduct Cost Monitoring* provides experts with a clear, concise overview of the costing process of calculations; *Costing Workflow* enables them to perform user-initiated, ad hoc task management; *Task Integration* allows data input to be synchronized among IT systems used for product costing; and *Collaboration Groups* support defining the teams and areas that each team should be able to access. Furthermore, we explain the prerequisites for enabling integrated virtual cooperation in product costing.

Sample

In what follows, we present the industries of the experts interviewed and their professional backgrounds, as illustrated in Table 1. We conducted 12 interviews. In two of those interviews, the experts suggested bringing in a colleague to the interview. As a result, we interviewed 14 experts; half of them work in companies in Germany, whereas the other half work in the United States. The expert interviews took place from July to September 2015 and had an average duration of one hour.

Industry	***n***
Automotive	6
Consumer goods	3
High-tech	1
Machine building	4

Role	***n***
IT Expert	5
(Product) Controller	4
Manager	5

Table 1. Industries and Roles of Interviewees

Industries. Product costing is a relevant business domain across diverse industrial sectors. Especially in the discrete manufacturing industry, cost estimations early in product development are crucial. To achieve a cross-sector requirements analysis, we involved experts from four different industries: the automotive, consumer goods, high-tech, and machine building industries.

Professional background. To gain a broad understanding of collaboration in product costing, it was important to interview experts with different perspectives on it based on the role they have in their company. Since our research concerned computer-supported collaboration, the opinion and knowledge of IT experts was of great interest. To establish a connection to the domain under investigation, we interviewed controllers with expertise in product costing. Furthermore, since product costing also encompasses strategic aspects best evaluated by experts in management, we conducted five interviews with managers.

Requirements Model

The requirements model (Figure 1) derived from the results of the expert interviews consists of four requirement areas: Product Cost Monitoring, Costing Workflow, Task Integration, and Collaboration Groups. Altogether, these four areas contain 18 requirements (i.e., abbreviated *R* in the model) and thereby represent the overall demand for integrated virtual collaboration in product costing.

Also included in the model are three system constraint areas identified from interview data: System Access, System Performance, and System Assistance. These three areas comprise six preconditions to enable IT-based collaboration support (i.e., represented by *C* in the model). In the following, each section of the model is described in detail.

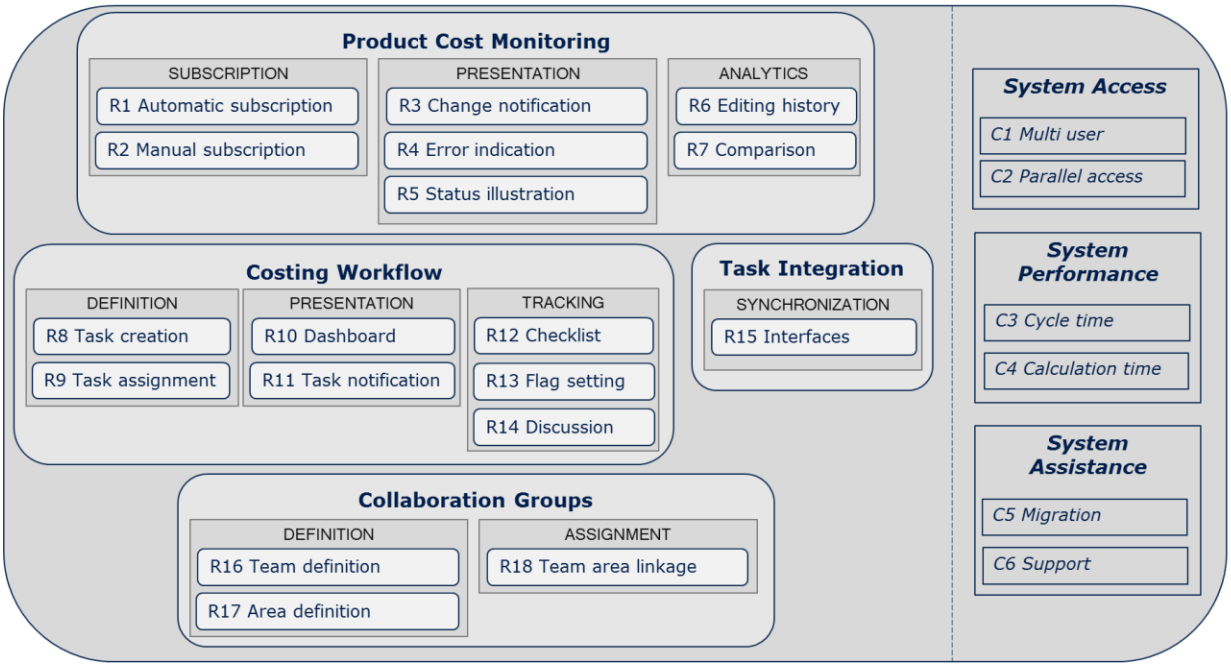

Figure 1. Requirements Model for Collaboration in Product Costing

a) Product Cost Monitoring

Interviews revealed that a central goal of computer-supported cooperation in product costing is to support the collaborative process and assist with tracking its progress. Product Cost Monitoring has to therefore be able to keep participants informed about the status of the costing process. Providing an overview of what tasks have been completed, what has yet to be done, and whether any issues remain unaddressed enables product-costing experts to understand and control the process. To that end, we identified seven requirements, all subdivided into three components.

Subscription. One component of Product Cost Monitoring is the subscription to particular costing objects. To track such objects (e.g., a calculation version), a user should be able to initiate a subscription in the sociotechnical collaboration system, which enables the coordination of costing processes to particular users and consists of two requirements.

R1 Automatic subscription: By automatically subscribing to a costing object—for example, when a new calculation is created—a user can immediately follow all changes made regarding the object. Doing so allows necessary information to be received without any manual effort. The collaboration system has to be able to automatically provide the user with information based on the action performed beforehand, since, for instance, creating a new calculation could trigger an automatic subscription.

R2 Manual subscription: In the case that additional objects are relevant for a user, they have to be manually selectable and follow related changes. Since interviewees requested a user-centered approach for the collaboration system, the monitoring capabilities need to provide that flexibility.

Presentation. To make users aware of the progress status of the costing process, it was underscored that its progress plays an important role in the integrated virtual cooperation support for product costing and how Product Cost Monitoring is presented. By giving users information about the exact progress, coordination is facilitated, system-based monitoring is enabled, and controlling is accelerated. More specifically, we identified three requirements for the presentation component.

R3 Change notification: To inform users about new input and changes regarding an object, a notification service is required. The possibility of being notified whenever something is altered enables users subscribed to the object to be informed immediately. The function also has to provide the possibility of approving or declining changes, and notifications must be configurable—for example, in terms of being switched on and off, allowing email forwarding, and receiving hourly, daily, or weekly alerts.

R4 Error indication: The collaboration system has to provide consistency checks regarding content that influences the collaboration process. By indicating missing data input or incorrect data, the costing process can be accelerated since costing participants are able to take immediate action.

R5 Status illustration: As a key requirement, the sociotechnical system has to provide exact insight regarding the status of costing objects. By providing an overview of the entire costing process—that is, by showing open tasks, illustrating actions in progress, and displaying who is workings on those actions—the comprehension of the process can be strengthened and its coordination improved.

Analytics. Sophisticated Product Cost Monitoring moreover has to provide analytical functionality. The interview results show that collaboration is also influenced by the results of product costing analysis, which have to be embedded directly into collaboration support.

R6 Editing history: This requirement encompasses the demonstration of the history of changes to the costing object. It also enables the analysis of how modifications have influenced cost calculations and who carried them out.

R7 Comparison: Being able to compare costing objects—for example, a product version evaluated from an engineering perspective and one from a financial controlling perspective—allows users to derive reasons for discrepancies and draw conclusions about additional estimation decisions in the costing process.

b) Costing Workflow

Interview results showed that to collaborate virtually in product costing, every user has to be able to participate in a user-initiated ad hoc workflow. This Costing Workflow serves as a flexible tool for coordinating tasks, the statuses of which are summarized in Product Cost Monitoring. More specifically, it needs to address the following seven requirements.

Definition. To satisfy the demand for greater flexibility in executing collaborative tasks, the Costing Workflow has to provide capabilities that let users define necessary steps instead of imposing a predefined workflow.

R8 Task creation: To set up necessary work steps, the creation of tasks has to be part of the Costing Workflow. Users can define activities that participants in the costing process need to execute, and it is crucial to link those tasks directly to the costing object—for example, to an item of a calculation version—in order to create a direct link to the data source. When creating a task, it is necessary to specify additional attributes such as deadlines, dependencies on other tasks, or uploaded file appendices.

R9 Task assignment: To manage who should execute which activity, the collaboration system needs to enable users to assign tasks to participants in the costing process. This user-centric approach allows members themselves to coordinate, which further enables them to manage the execution in a highly flexible manner.

Presentation. To establish an understanding of what specific actions each user has to perform, the Costing Workflow needs to have a presentation layer. The system has to inform participants about the tasks that they have to complete and create awareness about the workload that remains.

R10 Dashboard: To present the necessary activities that a user has to engage, it is necessary to have a dashboard that displays all of the tasks in a clear arrangement.

R11 Task notification: When a task is assigned to someone, he or she needs to have the opportunity to be notified of the new work inquiry. These kinds of notification also have to be configurable in terms of being switched on and off, allowing email forwarding, and appearing in hourly, daily, or weekly alerts.

Tracking. Regarding the Costing Workflow, experts interviewed also reported requiring a tracking function in order to automate and facilitate necessary steps in the process of generating cost estimations.

R12 Checklist: To run approval processes and any other kind of predefined activity sequences, a checklist feature is required. Creating such checklists allows particular steps that should be coordinated in the collaboration system to be automatically initiated.

R13 Flag setting: By being afforded the opportunity to set markers, participants can immediately inform other participants about particular statuses—for example, by setting a flag to mark a calculation

version that is ready for review. The flags that a community wants to use can be defined individually in order to provide the flexibility necessary in the collaborative process. Such flags can be combined with *R12 Checklist*—for instance, to initiate a checklist after a particular flag is set.

R14 Discussion: Virtual cooperation is also characterized by the capacity to communicate electronically, and interview results seconded that an integrated communication tool is necessary. Writing notes, leaving comments, and exchanging messages are all part of this subcomponent of the Costing Workflow. Again, the integrative aspect is of great importance since the subject of a discussion needs to be directly linked in the communication process, which can be achieved by coupling the discussion and its data reference—for instance, information about the price of a particular cost item that participants want to exchange.

c) Task Integration

This third requirement area encompasses experts' concerns with the interoperability of IT systems used in product costing. To obtain necessary data, it is common that several other IT sources are used in addition to the calculation system.

Synchronization. Relevant data need to be synchronized among the different IT systems in order to avoid manual data input and inconsistencies in cost estimations.

R15 Interfaces: To automatically coordinate all data input and reduce manual effort, interfaces that connect the relevant IT systems need to be established, specifically ones that manage data exchange when participants insert data in sources other than the calculation system. Typically, such input occurs when information is requested by procurement or sales and often when customer or supplier relationship management systems are used.

d) Collaboration Groups

Collaboration Groups authorize the collaboration system and make it accessible. They are moreover needed to administer the costing process team and the areas that team members can access.

Definition. To determine who can collaborate in the system and what users are allowed to access, collaboration groups with the participating teams and different access areas need to be defined.

R16 Team definition: To specify who should be allowed to collaborate in the costing process, teams have to be generated that allow member assignment. Team definition also has to cope with absences (e.g., on holidays) and vacation substitutes. Defining the participating teams and their members is the basis for task assignment.

R17 Area definition: Defining areas enables users to specify objects that should be accessible (e.g., price objects or calculations for specific products). Determining those different areas allows users to control which objects can be accessed via the sociotechnical collaboration system.

Assignment. To define who should have access to an area, users have to have the opportunity to perform assignments.

R18 Team area linkage: When a team is linked to an area defined ahead of time, team members have access to that area. Team area linkage allows the specification of areas to which users should have access.

e) System Constraints

We identified necessary preconditions for enabling integrated virtual cooperation in product costing. Since the integrative focus is the key aspect of Business Domain-Specific eCollaboration, the following six prerequisites apply to the collaboration support system, as well as to the software used for estimating product costs.

System Access. System accessibility is a prerequisite for using its full capabilities. Simply put, without access to the system, a user cannot use it.

C1 Multi user: One constraint upon the collaboration support of product costing is the provision of multi user access, meaning that every participant who needs to use the system can access. In

interviews, experts reported that if only particular persons with crucial roles in the costing process can use the system, then integrated virtual collaboration would be impossible. On the contrary, everybody should be included, because otherwise external means of collaboration will be used. As such, the benefit of a sociotechnical collaboration system would remain unused.

C2 Parallel access: To work simultaneously—for example, in making a calculation—parallel access to the system and costing objects is required. Only if users can work on an object (e.g., a calculation version) in parallel the costing process can be optimally accelerated and supported.

System Performance. Another precondition for virtually executing product costing is system performance. Time restrictions disrupt the costing process and slow it down, since users have to wait for results in order to proceed to the next step.

C3 Cycle time: The duration of the entire collaborative process is a key factor, since current cycles often depend on batch jobs performed on weekends due to performance restrictions or manual data upload, which invariably interrupts the entire process. These cycle times need to be scheduled and coordinated according to the cost estimation activities of participants.

C4 Calculation time: Cost calculation can become very extensive. Often, these structures exceed 100,000 items, and the calculation of the total costs usually takes a long time due to a calculation's dependencies and the different overhead rates that have to be calculated and added to the estimation results. These calculation times influence the costing process because the results are often not immediately provided. Computation resources are also required not to decelerate those operational procedures.

System Assistance. Interviewed experts reported that a major asset of a standardized collaboration system is the assistance it allows, since professionals have expertise regarding system implementation and operation.

C5 Migration: The challenge of migrating to a new system requires assistance with implementing the system itself, as well as with new virtual collaborative processes.

C6 Support: Since training and user support are essential to operating a system successfully, the experts requested functions that could offer such support.

The formulated requirements model is a first proposal for collaboration support in product costing that addresses Business Domain-Specific eCollaboration. With its 18 requirements classified in four components and the six constraints constituting three areas of precondition, the model serves as a basis for the design of such a sociotechnical collaboration solution and reflects an answer to the research question. To validate the requirements model, we performed an evaluation, as described in the following section.

Evaluation

This section describes the results of the expert session in which we presented the requirements model to several product-costing experts. Herein, we first characterize participants in the session and later explain the results of the model assessment and clarify conclusions that we could draw regarding the validation of the requirements model.

Sample

The expert session was held with 11 product-costing specialists in December 2015. We selected only experts with long-term experience who indicated a professional interest in the topic. In the session, we presented the requirements model for integrated virtual cooperation in product costing for participants to evaluate, which took approximately 1.5 hours.

None of the participants was involved in the expert interviews in order to ensure that nobody who suggested requirements in the interviews assessed them as well. Since product costing is relevant especially for companies from the automotive and machine-building industries, we conducted an evaluation with experts from three automotive and two machine-building companies (Table 2). All participants were from Germany. Most experts had a professional background in financial controlling

since we focused on letting end-users assess the system requirements. To ensure diversity, we also had three managers and an IT expert in the session.

Industry	Companies (*n*)	Experts (*n*)
Automotive	3	8
Machine building	2	3

Role	Experts (*n*)
IT Expert	1
(Product) Controller	7
Manager	3

Table 2. Industries and Roles of Evaluation Participants

Model Assessment

After presenting and explaining the requirements model, we initiated a round of feedback. All experts agreed to the structure of the model, its requirement areas, and their subdivisions, and nobody indicated that any additional requirement area was missing. Table 3 illustrates the mean values of the evaluation results for all requirements and constraints of the model. Each of those constructs was rated on a scale from 0 (*Extremely unimportant*)—that is, irrelevant for integrated virtual cooperation in product costing—to 10 (*Extremely important*), meaning that it is essential to the collaboration support in the costing process. Since all experts had a similar professional background, we decided that it was unnecessary to weight the ratings of different participants.

As the requirement area with the highest average rating (7.88), *Costing Workflow* enables the implementation of a clear, structured, user-driven collaboration process. The Dashboard (R10) was deemed the most important requirement, given its centrality for every user in understanding what activities need to be done. In favor of this concept, experts readily specified details for task creation (R8) with additional attributes, such as deadlines and the definition of dependencies. The tracking functions received positive feedback as well, as recognizable from the ratings (e.g., 8.64 for R13 Flag setting). Experts classified *Product Cost Monitoring* (average rating: 7.30) as an excellent means to supervise the entire product-costing process. They described current monitoring as a major problem due to the different communication tools in use. As an antidote to poor coordination, a decent support system would be of great use. Although the analytical functions presented would be a great plus (e.g., 7.91 for R6 Editing history), they are not the first hurdle to overcome, as participants mentioned. *Task Integration* was revealed to be a complex requirement area, for IT systems involved in product costing can differ from company to company. The great need for such an integrative approach to prevent inconsistency in data and reduce manual data input is stressed by Task Integration's high rating of 8.64. Experts agreed that the Collaboration Groups as a basis for an integrative collaboration system can be kept simple. The ratings for these requirements were therefore moderate (5.82–7.36). *Collaboration Groups* are needed to reproduce organizational product-costing structures and represent rights to access. As discussed, it would be sufficient to reflect authorizations represented in the system that is used to work on cost estimations. Therefore, no adaption of the capabilities of access structures are necessary. Commonly suggested as a requirement for collaboration was the visualization of participating members in the system, which would provide an opportunity for everybody to see who is involved, who could be contacted, or who could be assigned to a particular task. Doing so affords the chance to establish more transparency in the collaboration process.

Experts also confirmed the constraints of our requirements model, which highlights the importance of system-related preconditions. More specifically, System Assistance (average rating: 7.68) is followed by System Access (average rating: 6.41). By comparison, the performance of the system (average rating: 5.95) was deemed less relevant for integrated virtual cooperation.

A closer look at requirements with the lowest ratings shows that none of the constructs has a rating <5. As the middle of the scale, a rating of five would mean that the experts viewed the requirement to be neither very important nor irrelevant. In short, it would mean a neutral assessment. Since every rating on average was is >5, all constructs of our model have significance for integrated virtual cooperation in product costing. The top five ratings are distributed over the requirements of the Costing Workflow (8.82 for R10 Dashboard; 8.64 for R13 Flag setting), Product Cost Monitoring (8.64 for R4 Error indication; 8.27 for R5 Status illustration), and Task Integration (8.64 for R15 Interfaces), which underscores that only the combination of these areas can adequately support the collaborative process in product costing.

Requirement			Average rating
Product Cost Monitoring	R1	Automatic subscription	6.55
	R2	Manual subscription	7.00
	R3	Change notification	6.64
	R4	Error indication	8.64
	R5	Status illustration	8.27
	R6	Editing history	7.91
	R7	Comparison	6.09
Costing Workflow	R8	Task creation	8.18
	R9	Task assignment	8.18
	R10	Dashboard	8.82
	R11	Task notification	7.73
	R12	Checklist	7.73
	R13	Flag setting	8.64
	R14	Discussion	5.91
Task Integration	R15	Interfaces	8.64
Collaboration Groups	R16	Team definition	7.36
	R17	Area definition	7.00
	R18	Team area linkage	5.82
System Access	*C1*	*Multi user*	6.55
	C2	*Parallel access*	6.27
System Performance	*C3*	*Cycle time*	5.82
	C4	*Calculation time*	6.09
System Assistance	*C5*	*Migration*	7.64
	C6	*Support*	7.73

Table 3. Results of Model Assessment

On the whole, experts at several companies in different relevant industries described the requirements model that we established for integrated virtual cooperation in product costing to be satisfactory. No changes to the model were deemed necessary, and the modular composition was evaluated to be very positive. The holistic approach to Business Domain-Specific eCollaboration also received excellent feedback. With such a solid foundation for the following steps in our research, we now plan to advance in our project. Not only does the requirements model serve as a foundation for the future design and development of a sociotechnical collaboration system, but also allows us to consider how to prioritize the stated requirements.

Summary and Outlook

Entrepreneurial cooperation plays an important role both in companies and beyond their borders. In a world where life increasingly crosses over into virtuality, enterprises need to adapt and keep pace. In that context, we investigated product costing as a collaborative business field with a variety of participating divisions and external partners involved in the costing process. Since practice has stressed unsatisfying support with collaboration and literature showed insufficient investigation (Lück and Leyh 2016), we proposed Business Domain-Specific eCollaboration that can enable integrative virtual cooperation, based on connections among daily work routines, data sources, and the collaborative needs of a specific business domain.

To collect data for a requirements analysis regarding integrated virtual cooperation support in the domain of product costing, we conducted expert interviews and formulated a requirements model to encompass the different areas of demand for such a collaborative solution. In so doing, we substantiated a first approach to Business Domain-Specific eCollaboration. Our requirements model is subdivided into several

areas, including Product Cost Monitoring as a tool to give overall status overviews, Costing Workflow to initiate work sequences in a flexible and user-centric manner, Task Integration to synchronize data input from various IT systems in the collaborative process, and Collaboration Groups to organize access and authorization management. In the requirements analysis, we also identified prerequisites that form the basis of the implementation of IT-based collaboration support in product costing. Those constraints concern the access to, performance of, and assistance with the systems used. The proposed requirements model was evaluated in an expert session with 11 product-costing specialists, in which the model was generally accepted. That same model constitutes the research contribution of this paper. We furthermore verified the relevance of the 18 requirements in an evaluation, the results of which can be used to prioritize user requirements.

A next step should be to conceptualize the design of the sociotechnical collaboration system and to discover how to integrate such a tool into common information system landscapes. Accordingly, the goal is to implement a prototype that can be presented to future users for comparing the former collaboration process with new opportunities for cooperating in product costing. Among issues that remain unclarified, we need to know how to ensure that constraints applied in calculation software are also fulfilled. In that sense, this project has served to introduce a first use case of Business Domain-Specific eCollaboration that should enable the integration of virtual cooperation directly into the core processes of specific business domains and their characteristics.

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