Challenges with Problem Exploration and Validation in the B2B Domain

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Abstract: Developing new products and services, which create value for customers in dynamic business environments, is highly challenging. A deep understanding of potential customers and their problems is required before deciding which features or capabilities to develop. In order to gain a better understanding of the problems it is helpful to engage with potential customers, ask them about their pains and listen closely to what they say. Lean and agile product management approaches provide techniques for exploring problems, revealing the underlying problem-related assumptions, and validating problems. Until now, these methods have been mainly used in Business-to-Consumer (B2C) domains. There is a lack of reported experience and knowledge about challenges when applying problem exploration and validation techniques in the Business-to-Business (B2B) domain. This article presents a case study about a product development effort in a large IT company offering software-intensive products and services in the B2B domain. The objective of the study is to identify the B2B-specific challenges with respect to problem exploration and validation. Results from the case study show that the huge number of various problems and their variations in B2B contexts, partially caused by different company environments, makes it difficult to identify the most relevant problems and to align them with a suitable customer segment. By utilizing an approach that iterates problem exploration and problem validation, it is possible to create a ranked problem list that can support customer segmentation and guide the product development.

Keywords: Product management, Continuous experimentation, Lean Startup, Problem exploration, Problem interview, Problem validation, B2B

1 Introduction

Product innovation and innovation management is gaining increasing importance. The business models of many existing companies are getting closer to the end of their life cycle and need to be replaced. New companies want to conquer existing markets or create new markets with product innovations. With proceeding technological progress such as cloud computing or open-source software in place, the costs for developing products are considerably low. But still most companies fail at launching new innovative products that meet customer needs and deliver business value. Studies reveal product

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failure rates of almost 90 percent [Ge09]. In many cases this is caused by insufficient or even missing problem understanding; instead companies often focus on developing solutions when creating new products. For healthy growth and a strong position within the market a company has to be able to build and establish new products that deliver both customer and business value. To achieve this, it is vital for companies to listen to the market which comprises its current customers, potential new customers and even customers of competitors and therefore apply a rather customer-driven approach [Al17].

It is not the product that matters at first but the problem a customer encounters. This is when a company has to understand the customer’s problems and needs initially in order to build and launch a product successfully. To sustain and grow revenue it is fundamental to have a good understanding of the customer problems and needs. This can be achieved by talking and especially listening to customers thus identifying and validating their most important requirements [Al17].

Methods for identifying and validating customer problems and needs mainly evolved from the Business-to-Consumer (B2C) environment. However companies operating in the Business-to-Business (B2B) domain face additional challenges when managing innovative products. This is due to the long-term nature of the relationship which highly depends on the customer being interested in and attracted by the company and its products. Therefore the company’s success is closely linked to creating and fostering a long-lasting relationship with the customer. This aspect emphasizes the main difference in addressing business customers and engaging with private customers [Za11]. Yet there is hardly any reported experience to be found in literature about problem exploration and validation in B2B environments. Therefore, a case study was conducted to better understand the challenges that occur when exploring and validating customer problems. This is where the present paper ties up: The aim of this paper is to investigate the Business-to-Business specific challenges and problems of problem exploration and validation in the context of product development in a large IT company.

In order to provide an adequate analysis, the paper is structured as follows: At first the selected methods for problem exploration and validation are described followed by the introduction of the corresponding case study which also forms the core of this paper. The case study puts emphasis on the problem exploration and validation in a B2B environment. Therefore, the design as well as the preparation and execution of the study are outlined followed by the analysis, reporting and discussion of the results. The discussion on the topic is followed by a glance at related work on this field of study. A brief summary and an outlook towards further research concludes this paper.

2 Methods for Problem Exploration and Validation

Modern product management refers to providing a value embedded solution that satisfies the customer needs [HH13]. But how can this value be added to a product solution such that the customer recognizes and appreciates it? As stated above, listening to the market
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and thereby its associated customers contributes to identifying and learning from their pains [Ne07]. Holding this knowledge, a potential solution may be developed and be subsequently tested. This course of action is an iterative process accompanied by multiple different techniques [Ma12].

But when creating and delivering value embedded products, risk is an actual incidence that may influence the outcome in some way. Therefore, it is vital to consider the general risks that may impact the aspired solution [JS14]. According to Maurya [Ma12], there are three categories of risks that can be distinguished: product risk (i.e., risk related to getting the product right), customer risk (i.e., risk related to building a path to customers), and market risk (i.e., risk related to building a viable business). One approach to manage these risks properly is to introduce experiments that are organized in staged iterations to ensure continuous and additive learning. Maurya [Ma12] proposes to apply a systematic procedure which is composed of four stages:

Step 1 – Get the problem right: Interview customers to reveal and understand if the assumed problem exists and if it is worth solving.

Step 2 – Specify the solution: With the information of step 1 in place, define a respective solution, visualize it for better understanding and test it by collaborating with customers. The aim of this procedure is to ensure the successful operation of the solution as well as to make sure the pricing model works. In addition, expose potential customers that are willing to buy the product in an early stage.

Step 3 – Validate qualitatively: Now compose the smallest possible solution, i.e. the minimal viable product (MVP) and introduce it to the relevant early adopters. In the first place, this is to find out if the unique selling proposition (UVP) is detected and appreciated.

Step 4 – Verify quantitatively: Improve and refine your product and make it available to a larger group of customers. Test if the product appeals to customers and expose if your business is marketable.

This paper focuses primarily on step one in the B2B context as this is the starting point and a significant milestone for delivering an innovative and value-embedded product. We consider two important methods for problem exploration and validation: (1) assumption mapping and (2) problem interviews with potential customers. These two methods represent several key activities with respect to addressing risks in early product development stages, especially hypotheses identification and prioritization, problem exploration, and problem validation. Despite several other approaches for identifying and validating customer problems, these two were chosen as they serve the special requirements Hewlett Packard Enterprise faces by developing an innovative conferencing and collaboration product. Thereby the assumption mapping method supports stating assumptions evolving from internal experience and helps in structuring the collected thoughts. However, customer problem interviews were conducted to validate these assumptions by extending the group of potential end users across company boundaries and thus receiving accurate feedback.
Assumption Mapping

Assumption mapping is a qualitative technique to identify and deal with complex problems. Bland [Bl17] distinguishes between three types of assumptions:

- **Desirability assumptions** address the problem a customer struggles with as well as the hurdles which prevent him from solving this problem. These assumptions also center on the qualitative and quantitative result the customer wants to obtain.

- **Viability assumptions** concentrate on the channels new customers will be acquired through, the purpose why customers come back to buy products and the corresponding frequency as well as the way value and thus revenue is generated in the long term.

- **Feasibility assumptions** focus on the challenges when building the product such as technical or engineering obstacles, legal and regulatory risks. In addition, the capabilities of the team have to match the requirements in order to be well positioned in a competitive market.

With all these assumptions mapped out they can be allocated in a two-by-two manner. The axes of the coordinate systems are labeled with the attributes important vs. unimportant and known vs. unknown. The assumptions are then pinned to where they apply the most, accompanied by a lot of conversation and healthy discussions throughout the team. The debates are the most important part of the mapping as different points of view create a completely new perspective on the current situation. By looking at the assumption map, most of the time, effort and energy is spent on the upper right quadrant also referred to as the "leap-of-faith assumptions". Based on the assumption map, hypotheses can be created, experiments around these assumptions designed and thus the uncertainty of the general strategy be reduced [Bl17].

Customer Problem Interviews

Talking to customers is a good way to learn quickly about the problems they are currently encountering. By engaging customers one can also experience if and especially how the problem is handled to date. Furthermore structured problem interviews support the validation of the pre-determined assumptions. Maurya [Ma12] proposes the following structure for a problem interview: It starts off with a brief introduction on the setup of the interview followed by the collection of the demographics. Now the context of the problem is to be set by telling a story the interviewee can relate to. In the next step the top problems are explained and thereafter ranked by the interviewee. Afterwards it is all about exploring the stance of the prospects towards the problem by asking how the problem is handled today. This is the part when the interviewer holds back and listens to the narration of the interviewee and observes its facial expressions and gestures. Follow-up questions may be asked for clarification which serve as qualitative add-on information for further problem analysis. This step is fundamental for understanding the problem and validating the provided ranking of the interviewee. A high-level
explanation of the future product as well as gaining the permission to follow up and suggestion of further potential subjects conclude the problem interview. A detailed documentation of each interview supports future research. During the course of action the interview script needs to be reworked several times: checking on the results might lead to narrowing down the problems, refining the group of early adopters and how to address them, as well as gaining awareness of competitive solutions that the product is about to compete with.

3 Case Study

The goal of our case study is to identify Business-to-Business specific challenges of the problem exploration and validation methods assumption mapping and customer problem interviews. The research is conducted in the context of a lean product development project initiated by Hewlett Packard’s acquisition of Aruba Networks in 2015 [CN15]. Under of the umbrella of the newly founded Hewlett Packard Enterprise (HPE) the company offers a portfolio of advanced wireless network technologies but lacks in providing unique, customer-proven products to address future B2B use cases. The project aims at building a product based on location-based wireless technologies which solves real-world customer problems in the context of physical and virtual conferencing and collaboration.

A case study was chosen as a research method in order to investigate the challenges of assumption mapping and customer problem interviews in the B2B field, and to reveal domain specific challenges. Commonly used in psychology, sociology, politics, business and other domains, a case study “allows investigators to retain the holistic and meaningful characteristics of real-life events” [Yi09]. Using a case study as research method allows to increase knowledge and deepens the understanding of problems in reality [Ru12]. Furthermore, it acts as a documentation of why decisions are made in which situations, how they are implemented and finally which results were derived [Sc71]. The applied research process consisted of five main steps [Ru12]: study design, data collection preparation, study execution, data analysis and reporting. In the following chapter the study’s design, the evolution of data collection during the study as well as research execution and results will be presented.

3.1 Study Design and Problem Context

The goal of the product development project is to develop a new and innovative conferencing and collaboration product for organizations. Conferencing is pervading the complete B2B environment including all company sizes, organizational structures and industries. As expected variations due to those factors, a binary differentiation in single- and multi-case studies [El96] is not sufficient and has to be extended by the dimension of analyzed units within the given context. Following the classification of Yin [Yi09] the basic type of the case study is single-case embedded running multiple subunit analysis
within the very same context. This context involved potential B2B customers, meaning all companies using physical and virtual conferencing for their employees. The case selection strategy for subunits is information-oriented by creating paradigms but keeping maximum variation between the following interviewee characteristics that are the subunits [F106]: industry sector, size (enterprise and medium businesses) and customer segment, defined by their job role (e.g. normal users as salesmen or consultants, power user as secretaries, and special users as facility management and administration). Furthermore, conferencing is not a new use case. Nevertheless, to allow open-minded thinking and new innovation, both an inductive and a deductive approach [Ru12] is applied within this research. The case study is limited by the fact that those who perform the study are the same people as those observing and interpreting it and the limited number of cases whose selection is based on the described strategy but is restricted by the willingness and availability of potential interviewees. Additionally, the methods to be applied in the study are chosen by the researchers based on the underlying product development project.

The main objective of formulating and validating assumptions lies in the reduction of the problem context’s complexity [Lo11]. By establishing assumptions in the early stages of product development the danger of designing not-needed, unwanted, or unachievable products is averted and the risks of product development are reduced [PB16]. The focus of this case study is on establishing assumptions in the context of customer problems and needs, i.e. desirability assumptions. In a joint brain-storming session conducted by the research team desirability questions are discussed and amongst others the following assumptions are formulated and identified as “leap-of-faith assumptions” [Bl17]:

- Potential business users struggle with orientation inside their office and have difficulties to find conference rooms.
- Potential business users have problems in detecting the current availability status of conference rooms (e.g. available, reserved, in use).
- Potential business users solve their conference booking problems today using Outlook or Lotus Notes.
- Potential business users want to achieve flexibility, simplicity, and efficiency.
- Potential business users find faults with the provision of room equipment.
- Potential business users are impaired in their meeting quality by airing, temperature, and noise.
- Potential business users find their current booking process inconvenient.
- Potential business users have to use separate tools to order catering or additional equipment.

The established assumptions are tested and validated or falsified during the customer problem interviews.
3.2 Data Collection

Following the method of Customer Problem Interviews, data is collected in regularly iterated interviews. Hence the study is raising qualitative data in a written format but offers a flexible design that can be adjusted [Ru12]. As required by the method, multiple possible customers (data sources) have to be interviewed which assures research validation by data source triangulation [Ru12]. A semi-structured script is created leading the interview along collecting meta-data, focused questions and space for open-ended explanations through the interviewee [BGM87].

Besides name and contact information, the meta-data contains the interviewee’s industry, job role and company size to classify each interview into the suitable subunit. The interview’s main part covers openly formulated questions regarding the previously described assumptions:

- How is conferencing organized in your company?
- How do you ensure professionally equipped conferencing facilities?
- How do non-local participants get to their conference room?

To drive an inductive approach, a field for any additional information by the interviewee is provided. Through the regularly iterated revision, formal as well as content-related adjustments are made. Based on experience, useful questions and phrases to keep the interview running are provided in the script. Example questions are (based on [Ma12] and [Al14]):

- If you had a magic wand, what would you change?
- Which activities are always required before / after conferencing?
- Why is X [placeholder for a feature the interviewee mentioned] required?

Based on detected possible customer problems, questions regarding catering, room availability and the inappropriate use of rooms are introduced as well. Orientation problems are differentiated between external guests and non-local employees. In the last iteration (about 10% of the interviews) data collection is used for validation only. Therefore, instead of asking for new information, the current results with respect to top problems are polled for prioritization.

3.3 Study Execution and Analysis

During the case study 44 potential business users from 25 enterprises and 15 industry sectors are interviewed about their problems, challenges and experiences with booking and using conference rooms as well as in-door orientation and navigation. The consulted user groups consist of managers, office assistants, sales representatives, consultants, and administrative workers. The interviewees are categorized into three categories: (1) bookers who schedule and organize meetings frequently, (2) users who attend meetings and rarely use the booking system themselves, and (3) bookers and users who do both at a similar rate. During the first round of interviews the interviewees are contacted via e-
mail and instant messaging as first-level contacts. They are asked for suitable referrals, e.g. a manager might propose his or her assistant for additional insights into the company’s room booking process. Second- and third-level contacts are contacted with personalized e-mails which contain the project description and the referral of the mutual first-level contact, suggested time slots and locations for the problem interview. Each interview has a duration between 20 and 40 minutes, whereas the average interview is scheduled for a 30-minute time period.

### 3.4 Ranking of Customer Problems

In order to prioritize customer problems a ranking system with three levels is developed and applied. After finishing all interviews a weighted problem-priority-index is calculated for each problem:

\[
\text{Weighted problem priority index} = \text{number of low priority mentions} \times 1 + \text{number of medium priority mentions} \times 3 + \text{number of high priority mentions} \times 5
\]

Ordering the list of customer problems by the weighted problem-priority-index reveals a ranking of important problems to be addressed as shown in table 1. The maximum value for the weighted problem-priority-index is \(44 \times 5 = 220\) index points.

<table>
<thead>
<tr>
<th>Customer Problem</th>
<th>Weighted Problem Priority Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Room reservations without usage</td>
<td>64</td>
</tr>
<tr>
<td>Shortage of rooms</td>
<td>63</td>
</tr>
<tr>
<td>In-door orientation difficulties</td>
<td>50</td>
</tr>
<tr>
<td>Uncertainty concerning the current room availability</td>
<td>38</td>
</tr>
<tr>
<td>Room usage without reservation</td>
<td>34</td>
</tr>
<tr>
<td>Separate tool for catering</td>
<td>33</td>
</tr>
<tr>
<td>Room equipment unknown</td>
<td>28</td>
</tr>
<tr>
<td>Assistant dependency for room bookings</td>
<td>26</td>
</tr>
<tr>
<td>Sub-process for extra equipment</td>
<td>26</td>
</tr>
</tbody>
</table>

Tab 1: Prioritized problem list ordered by weighted problem-priority-index

In addition to the prioritization of the problems, a great deal of insights such as information about the potential business user’s strategies to deal with or to avoid problems are discovered. For example, a strong correlation is detected between the alleged shortage of rooms and the discrepancy of reservation and usage of rooms. The deviation between the booking system and actual room occupancy occurs especially for recurring appointments since users neglect or forget to cancel their assigned rooms. It becomes apparent that often business users simply fail to find the available rooms within the building. Furthermore, it becomes clear that many enterprises still rely on assistant-
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aided room management and on tracking room occupancy on manual lists apart from the previously identified existing alternatives Outlook and Notes. The interview results show that employees not only have difficulties with in-door but also with on-campus navigation since many enterprises maintain multiple office sites for their employees. For security reasons enterprises demand consistent attendance for external guests and abstain from letting them move freely.

The results of the customer problem interviews are further used for envisioning the possible product features. All solution ideas are assessed on whether they address a high priority problem or vastly contribute to the realization of it. Additionally, the use cases for testing prototypes during customer solution interviews are derived from the prioritized problem list.

4 Research Results

The case study shows several challenges when conducting problem exploration and validation in a B2B-domain. The challenges the research team faced during the conducted case study are related especially to obtaining a representative group of potential users and early adopters due to the huge number of variations in the business environments. In consequence, it is also highly challenging to compare and prioritize customer problems. Table 2 sketches these B2B-specific challenges and how they were addressed by the research team during the case study.

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Solution Approaches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obtaining a representative group of potential users for the customer problem interviews</td>
<td>A non-representative group of potential users is chosen for the first interviews. Further potential interviewees are acquired through referrals and suggestions from interviewees and selected based on their suitability.</td>
</tr>
<tr>
<td>Identifying the group of early adopters within the enterprise</td>
<td>Early adopters are defined as those users who benefit most from the new product. Thus, assistants are identified as early adopters for all booking functionalities; whereas new hires and non-local employees are identified as early adopters for all in-door navigation functionalities.</td>
</tr>
<tr>
<td>Prioritizing problems with qualitative customer feedback</td>
<td>Interviewees are explicitly asked for their assessment of the relevance of their mentioned problems. Comparability is ensured by introducing the weighted problem-priority-index and a careful consideration of the different contexts.</td>
</tr>
</tbody>
</table>

Tab 2: Challenges and solution approaches during problem exploration and validation

Based on the experiences from this study the following initial guidelines for running problem exploration and validation in a B2B environment are derived. They address
possible problems which lead to insufficient understanding of customer problems or misinterpretation of interview results as we had to learn along our case study.

**Choose the right interviewees:** Steve Blank’s quote “Get out of the building” on customer development [Ma12] has been proven as highly recommendable also for building B2B products. Starting the first interviews on colleagues was a good learning experience on how to run interviews, but generated only limited valuable insights. People in the same company using the same tools in the same way have similar problems. It is necessary to go out and find external interviewees.

**Ask your interview partners for referrals:** Most people have private or business contacts into other companies which provides the opportunity to stretch a large network of diverse interview partners. For example, in this case study a referral chain starting from an average useful interview (medium business with little conferencing) into two very informative interviews with employees from enterprise sales and engineering companies is used.

**Understand your interviewee’s characteristics:** Whereas in consumer business customers (i.e., people who pay) and users are typically the same, in B2B environments these are roles of different people with complicated relations. Within the user role, a lot of additional differentiations occur regarding the product usage and therefore expectations. Company structure and characteristics are influential as well. When choosing interviewees to conduct the study, it is critical to understand those variations to either focus on one of those subgroups or to be able to separate them during the analysis. As an example, it is recognized that employees in medium-sized companies have other problem priorities than those in large enterprises, as conferencing does not play a big role in their company.

**Don’t trust your interviewee’s perception - use validation:** For sure, most interviewees try to tell the truth. But when it comes to problem prioritization, people are misled by their perception and provide a very subjective ranking when asked. Therefore, it is recommended to use additional factors to estimate a discussed problem’s priority. For example, if a problem barely occurs, and only affects a small number of people or there is no alternative solution, the problem is not important even if the interviewee thinks it is.

Additionally, a validation phase at the end of the study’s execution is recommended, in which the final results are crosschecked with new, unbiased interviewees.

5 **Discussion**

This paper and its underlying case study show that lean product management methods, especially problem exploration and validation methods, can be used for Business-to-Business environments. Challenges arise especially around identifying and accessing
potential customers and early adopters as well as around problem prioritization. The 
challenges are due to the many different business contexts that exist and complex and 
sophisticated role models in B2B environments. The study results are limited by the 
scope of the project under study. In terms of generalizability, the characteristics of the 
case company, the domain, and the product need to be carefully analyzed before 
transferring results to other contexts. Threads to internal and external validity are 
addressed by data source triangulation and researcher triangulation with respect to 
accuracy checking. The results of an interview were reviewed with the other researchers 
that are not involved in conducting this interview. Nonetheless, the roles of the 
researches as observers and interviewers are mixed throughout the case study and were 
not strictly separated. We hope that the results contribute to a better understanding of the 
specific B2B challenges of problem exploration and validation and will be enriched with 

6 Related Work

Related research on problem exploration and validation in B2B product management 
mainly confirms the results as the following examples state.

Nirwan and Dhewanto [ND15] present a case study on implementing the complete lean 
startup methodology in an Indonesian B2B startup. When running their problem 
interviews, they noticed that it is quite difficult to identify suitable customers as early 
adopters within the few number of possible B2B customers. The interaction with 
customers was quite challenging due to the customer’s initial low priority on scheduling 
the interviews as they might not expect any advantages for their business from 
participating in this research. Furthermore, they struggled in iterating fast due to the 
regulations and administrative work required by their product.

Rissanen and Münch [RM15] investigated continuous experimentation on B2B 
customers. In their study, “almost 100% of the completed features have been determined 
by the customer”, so product development is fully led by the customer. Hence many B2B 
customers might even expect this proceeding whereas consumers do not. They also 
perceived challenges in rapidly iterating software releases as deployments into 
production systems should not imply downtime during working hours. Frequently 
changing user interfaces resulted in dissatisfaction due to the disturbed work routine. 
The customers’ user acceptance testing which is required for productive systems could 
not follow the iteration speed.

Due to Croll and Yoskovith [CY13] B2B startups can adapt lean product management 
methods but have to face significant differences. Croll and Yoskovith see companies’ 
buyers as regulated and formal which is challenging for product development and sales 
teams. Furthermore, they consider a higher competition with legacy and incumbent 
products in B2B environments.
Conclusion

Both this and related research shows that customer-focused product development in the early stages faces various B2B-specific challenges but does not require new techniques. By utilizing an approach that iterates problem exploration and problem validation, it is possible to address these challenges in the case study. Based on the experiences of the case study, initial guidelines for conducting and reasoning about problem interviews are identified. However, there is space for further research: to complement the research results, the application of additional problem exploration and validation methods in similar and other B2B contexts might provide new insights. Besides that, a research extension on further product management steps is possible, e.g., prototype testing based on transforming identified problems into features of minimum viable products. Finally, more advanced ideas for problem exploration and validation could be considered, e.g. based on questions like the following: Is data-driven problem exploration possible by saving time and money and does it create the same valuable insights as personal interviews? How can problem exploration be realized when “customers” are autonomous machines or artificial intelligence? This might lead to new interesting research avenues.

References

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