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Abstract. A growing number of software companies nowadays offer their solutions using the SaaS model. The model promises multiple, business-related benefits for these companies; however, existing software companies are forced to redevelop products and reconsider product strategies to address all the aspects of the new SaaS model. The existing literature provides a limited understanding of how product strategies for newly productized SaaS solutions should be developed. In this paper, we report the results of a longitudinal case study of a Finnish B2B software company experiencing a transition towards the SaaS model and developing the initial strategy for its newly productized SaaS solution. We introduce a six-phase process model aligned with the ISPMA SPM framework. Being implemented, the model created an initial shared understanding and vision among stakeholders for their SaaS solution and provided guidance in developing the required product strategy.

Keywords: Product Strategy, Software-as-a-Service, Software Industry, Business-to-Business, Productization, Software Product Management

1 Introduction

Inspired by the success of prominent Software-as-a-Service (SaaS) solutions offered by ambitious startups and tech giants, a growing number of software companies seek to productize their customer-specific software into SaaS solutions. This shift from customer-specific software to standard software products, offered using the cloud-based service model, calls for increased attention to software product management (SPM) [17]. However, quite often, the way processes and practices in companies should be reconsidered is unclear, and companies struggle to cope with these challenges and cannot make the transition coherent and systematic [13].

Software process improvement is defined as "understanding existing processes and changing these processes to increase product quality and/or reduce costs and development time" [15]. Companies look for process improvement approaches to accelerate product development, improve quality, and reduce costs. However, literature indicates that software companies often focus too much on project execution, technologies, and features, while neglecting a sufficient understanding of markets, value, and products

[5]. As a result, products that were developed on time and within budget, but without proper value and market awareness, may not be consumed as well as expected or may fail to satisfy the customers [5].

SPM process improvement has received less focus in academic research than project execution until recently [10]. Maturity matrices and competence models have been developed to gauge the maturity of various SPM processes and practices within companies. An updated standardized product lifecycle, having clear interfaces, milestones, and governance, is identified among the success factors for implementing the product manager role [5]. Core SPM activities with associated processes and practices can be divided into two distinct groups: software product strategy and software product planning [9]. Activities in the software product strategy group are performed to develop and implement a software product strategy, which is defined as a high-level plan that helps companies achieve the vision for their products [11]. The purpose of developing a product strategy is to determine the path to achieving a product vision that describes what the product will be at the end of a certain strategic timeframe [9]. This is an essential step, describing the value that the product will bring to the customers and the vendor. The product strategy defines how the product should evolve over a certain timeframe (often 1 to 5 years, varying based on industry). Product planning converts the strategy into an executable plan that a product team can follow day to day [9]. This study focuses on product strategy practices and processes, omitting product planning activities, such as roadmapping and setting milestones.

The SPM framework developed by the International Software Product Management Association[1] (ISPMA framework) consolidates multiple preceding frameworks and provides a holistic perspective on the product manager role [5, 10]. This framework was employed as a foundation for the development of the proposed process model. The ISPMA framework does not provide ready-made processes to its practitioners [10]. This paper aims to address this gap and design a process that guides the development of a comprehensive software product strategy at a company undergoing the productization of customer-specific software into a B2B SaaS solution. To achieve this goal, the study answers the following research questions:

RQ1: What process could be followed to develop an initial product strategy for a newly productized SaaS solution?

RQ2: How do the B2B and SaaS contexts affect the product strategy development process at the case company?

The rest of the paper is structured as follows. Section 2 provides the theoretical background of the study. Section 3 describes the research approach employed. Section 4 introduces the case company and describes the proposed process model for the initial product strategy development. Section 5 discusses the results of the study by providing answers to the research questions. Section 6 concludes the paper.

[1] https://ispma.org/framework/

2 Background

The transformation of software tailored to the needs of specific customers into a standard software product is usually referred to as productization. Such transformation is driven by recognizing similar needs and wishes of multiple customers [2]. Nowadays, productization is closely related to the cloud computing paradigm. Nowadays, productization is closely related to the cloud computing paradigm. Encouraged by the wide range of benefits, companies try to productize their solutions into SaaS solutions – one of the forms of cloud computing which is defined as "providing a standard software solution to customers as a service over the Internet" [4, 13, 18]. The fast pace of technological innovation forces product managers to make long-lasting and financially impactful decisions about their products in the face of relative uncertainty. Having a clear strategy for several years into the future provides a basis for making those decisions and aligns the stakeholders involved in product development [9].

Several frameworks attempt to define elements of the product strategy, propose maturity phases, and define the competencies needed [9–11]. These include the Scaled Agile Framework (SAFe)[2], the Pragmatic Framework[3], Blackblot Product Manager's Toolkit (PMTK)[4], the ISPMA framework, and the AIPMM framework[5] [10] The frameworks aim to give structure to the SPM discipline, categorize SPM activities and define the responsibilities of software product managers [10]. Additionally, scholars and practitioners offer various tools and techniques for different product strategy components [9, 11]. A comparison of several frameworks applicable to SPM revealed the ISPMA framework to be the most balanced and purely focused on SPM, as opposed to addressing SPM alongside other company functions [10]. The framework is described in literature as the underlying knowledge area framework of the Software Product Management Body of Knowledge (SPMBOK) [5].

Product strategy development is a continuous process that spans a product's lifecycle and consists of multiple activities. Defining a coherent process for product strategy activities can be challenging [9]. This leaves product managers charged with developing a strategy for a new product in a perplexing position. They must develop a comprehensive product strategy, considering multiple interrelated aspects, and work closely with Marketing, Sales, and executive management [9]. Formally, according to the ISPMA SPM framework, the product strategy should address the development or evolution of the following eight elements: (1) Positioning and Product Definition, (2) Delivery model and Service strategy, (3) Sourcing, (4) Pricing, (5) Financial Management, (6) Ecosystem management, (7) Legal and IPR management, (8) Performance and Risk management [9].

[2] https://scaledagile.com/what-is-safe/
[3] https://www.pragmaticinstitute.com/framework/
[4] https://www.blackblot.com/methodology
[5] https://aipmm.com

3 Methodology

The research started with the awareness of a problem that became apparent while working with the case company. The company faced challenges in establishing a process for product strategy development while undertaking the productization of customer-specific software into B2B SaaS. The problem can be formulated as follows: "SPM is seen as a continuous activity with many separate tasks, and no formalized process exists to guide product managers in initial strategy development." To propose a process model aimed at supporting the company, we employed a mixed-method research design approach [1] and combined a case study with design science research. This allowed us to analyze the situation in a particular company and develop a design artifact that was successfully adopted by it and could be used by other companies with the same or similar profiles.

Design science research is defined as "the scientific study and creation of artifacts as they are developed and used by people with the goal of solving practical problems of general interest" [7]. The desired outcome is not only a novel artifact itself, but also knowledge about the artifact and its effects on its environment. We followed the design science framework and guidelines proposed by Hevner et al. [6]. During the research process, knowledge about the artifact is accumulated, including the influence of the B2B SaaS context and the productization context on product strategy decisions.

A case study is an integral part of our research in all the main stages. The case study can be classified as an exploratory single case study [12, 16] of a software company that faces the challenge of developing a product strategy for a B2B SaaS product, which is a productized version of a customer-specific software system. The required information on the case was collected through a series of semi-structured interviews, open-ended interviews, workshops, and surveys.

4 Process Model of Product Strategy Development

4.1 Case Description

The case company is a mid-sized Finnish company specializing in the development of situational awareness solutions for chemical, biological, radiological, and nuclear reconnaissance (CBRN), as well as environmental and industrial monitoring. The company has extensive experience in delivering customized solutions for a wide variety of organizations with different needs. The company's focus nowadays is the cloud-based modular software solution, Perception Cloud[6].

The first version of Perception was offered as a standalone vehicle installation in 2016. The system was designed to be installed in a CBRN vehicle to provide awareness to the operators inside. The measurements and status of the detectors were displayed on a desktop client UI, and visual and audio alarms were triggered when CBRN measurements exceeded certain thresholds.

[6] For the sake of anonymity, we used a fabricated name for the product instead of the real one

In 2018, the company started a new vehicle project, with another shelter project on the horizon. It became apparent that splitting the codebase for each new project would not be sustainable long-term. Moreover, many completed features could be reused with enhancements and customizations for the new projects. A new desktop client application was created using a proprietary application model syntax. Using the syntax, it became possible to modify the contents of the client by adding and removing panels, windows, and components. A modular backend architecture allowed adding and removing services based on the project.

Another significant milestone was the creation of the Perception Go mobile app in 2019. The application allowed to pair portable CBRN detectors via Bluetooth and transmit measurement data to the central Perception system in real-time. The desktop client was enhanced to display the locations of smartphones running the app on a map and the readings of CBRN detectors paired to the app. Perception Go was received enthusiastically in the CBRN industry. In 2021, the company developed a web-based version of Perception for a customer. The project served as a learning experience for the upcoming Perception Cloud, including developing new features and a better understanding of customer and user needs.

4.2 Model requirements

While the research started with the aim of solving a functional problem for the case company, the proposed model will be useful to other software organizations wishing to productize their customer-specific offerings and improve SPM practices.

The model itself is primarily a tool that is used to discuss critical decisions, consider crucial details, elicit feedback from stakeholders, and formulate a shared and accepted plan: “the final deliverable is not as valuable as the process you go through to write the documentation” [3]. The following requirements have been identified for the process model.

1. The model should provide direction to product managers in establishing a product strategy.
2. The model should lead to the creation of a product strategy.
3. The resulting strategy should incorporate all eight elements of the product strategy according to the ISPMA framework.
4. The resulting strategy should apply to a B2B SaaS software product.
5. The model should suggest effective methods and tools for strategy development.
6. The model should utilize company resources efficiently by ensuring that only the necessary stakeholders are required to attend certain phases.
7. The resulting strategy should be documented in a single product strategy document, which can be used to communicate the strategy across the organization.

With these requirements, the research aims to ensure that the resulting artifact is helpful to the case company while remaining sufficiently generalizable and applicable outside of the context of said company. Requirements 2, 4, 6, and 7 ensure that the problems of the lack of strategy and limited resources are solved for the case company.

Requirements 1, 3, and 5 ensure that the artifact is developed according to the established knowledge base and may provide guidance to SPM practitioners in companies of the similar profile.

4.3 Model structure

The proposed process model for initial product strategy development supporting the productization of customer-specific software is depicted in Error! Reference source not found.. The boxes at the center of the model are the eight elements of product strategy according to the ISPMA framework. The bubbles around the boxes indicate the phases of the process model. The dashed arrows from each bubble to the next indicate the order in which the phases should be executed.

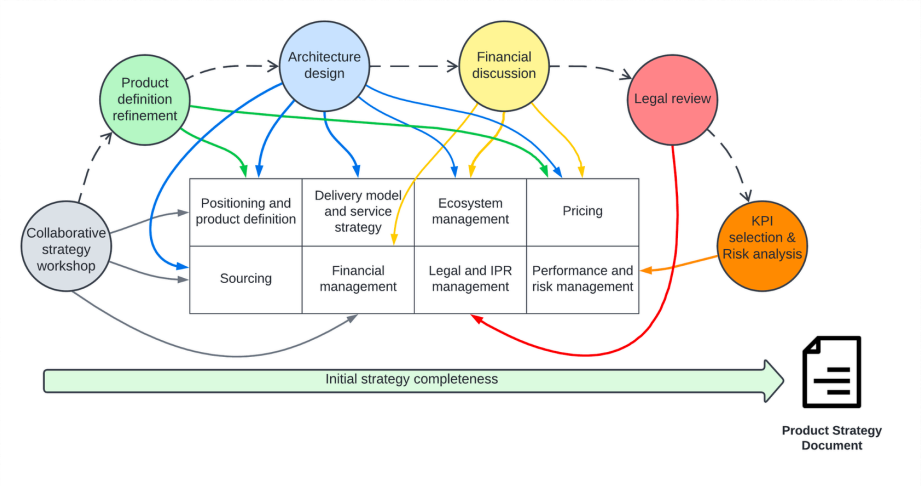

Fig. 1. Proposed Process Model of Product Strategy Development

Each bubble is linked to one or more elements of product strategy. Each bubble and its arrows are color-coded to simplify the visual comprehension of the model. The process model is described in more detail in **Table 1**. For each phase, the key questions that need to be answered are specified, alongside the recommended tools and the strategy elements impacted during the phase.

Table 1. Phases of the Process Model

Questions	Tools	Strategy Elements
Phase 1: Collaborative Strategy Workshop		
1. What is the motivation to create the product? What positive change will it bring? 2. Who are the target users? What are the market segments? 3. What problem will the product solve? 4. What is the product? What makes it stand out?	Product Vision Board Problem and position statement template	Positioning and product definition Sourcing

5. How will the product benefit the company? What are the business goals? 6. Who are the competitors? What are their strengths and weaknesses? 7. How will the product be monetized? 8. What are the main cost factors in developing, marketing, and selling the product? 9. How will the product be marketed and sold? What channels are needed to reach customers?		Financial management
Phase 2: Product definition refinement		
1. What features will the product include? What quality attributes will the product possess? 2. How will the product compare to the competition in terms of functionality, user experience, and quality? 3. Does the product offer some feature or attribute that currently does not exist in the market?	Blue Ocean Strategy Canvas Blue Ocean Eliminate-Reduce-Raise-Create Grid	Positioning and product definition Pricing
Phase 3: Architecture design		
1. What is the defining technology for the software product? What technology enables our competitive edge and market differentiation over time? 2. What is the offering architecture? Meaning, what are the separately priced components of the product? 3. What is the tailorability architecture? Meaning: a. How configurable do we want the software to be? What parameters are configurable? b. How composable do we want the software to be? What components can be added or removed? c. How customizable do we want the software to be? 4. What is our desired place in the software ecosystem? a. What organizations could we partner with? b. What external systems could we integrate? Could we provide a way for third parties to integrate into our software? 5. What is the business architecture? a. What is the domain model of the new software? b. What business processes need to be created to support the new product?	UML Domain Model BPMN business process models	Positioning and product definition Delivery model and service strategy Ecosystem management Pricing Sourcing
Phase 4: Financial discussion		
1. Is there any reason to choose cost-based or competitor-based pricing over value-based pricing? 2. What is the upper pricing bound? What is the maximum value the product has for customers? 3. What is the lower pricing bound? What are the fixed and variable costs for the product? 4. Are there any reasons to charge less than the maximum value? 5. What will the pricing structure be for the product? What combination of freemium, consumption-based, and tiered pricing can the product have? Is a perpetual license an option?	Accion pricing framework	Pricing Financial management

Phase 5: Legal review		
1. Contracts. Who is responsible for formulating service contracts in the organization? What are the terms of the service-level agreement (SLA)? Does the organization have templates for such SLAs? Can any existing SLAs be reused? 2. IPR protection. How will the company protect the intellectual property rights related to the product? Does the company have patents or trademarks that apply to the product? Should the company obtain new trademarks or patents for the product? 3. Open-source. What open-source components may be used when developing and running the software? What are the distribution licenses for those components? Are there any restrictions or caveats? 4. Data protection. Who is responsible for formulating the privacy policy within the organization? What are the terms of the policy? Does the organization have templates for such policies? Can any existing policies be reused?	Checklist of legal aspects to review	Legal and IPR management
Phase 6: KPI selection and Risk analysis		
1. What are the business goals of the company? How can they be measured? What targets should we set for those goals? 2. What financial, customer, product, process, and people KPIs should we track to achieve the business goals? How should those KPIs be measured? 3. What elements of the overall product strategy are we least certain about?	Balanced Product Scorecard "Digital Red Dot Game"	Performance and Risk management

4.4 Model implementation

The proposed process model was implemented at a case company during the period between April and July 2022. **Table 2** summarizes strategy development activities performed at the case company according to the model. The product manager participated in every session and is therefore not mentioned explicitly in the participants column.

Table 2. Model implementation schedule at the case company

Phase	Date	Participants
Collaborative Strategy Workshop	April 27th, 2022	Chief Operating Officer, Chief Technical Officer, Project Manager, Sales Representative
Product definition refinement	May 23rd, 2022	Project Manager and Sales Representative
Architecture design – session 1	June 1st, 2022	CTO and Software Engineer
Architecture design – session 2	June 7th, 2022	CTO and Software Engineer
Financial discussion	July 7th, 2022	Project Manager and Sales Representative

Phase	Date	Participants
Legal review – data protection discussion	July 11th, 2022	Data Protection Officer
Legal review – open-source check-up	July 23rd, 2022	Done independently
Legal review - Contract discussion & IPR protection check-up	July 29th, 2022	Chief Operating Officer
KPI selection & risk analysis	July 24th, 2022	Chief Operating Officer, Chief Technical Officer, Project Manager, Sales Representative

Phase 1. The first step of the proposed process model was the collaborative strategy workshop. The COO and CTO of the company, as well as a project manager and a sales representative, were present in the meeting with the product managers. The discussion was structured using the Product Vision Board tool [11]. After each section of the board was introduced, participants were requested to share their ideas related to the section. The sections of the board were followed in this order: target group, needs, product, business goals, competitors, revenue streams, cost factors, and channels. After the meeting, the product managers summarized the discussion using a Problem and position statement template (see **Table 3**).

Table 3. Problem and position statement for Perception Cloud

Problem statement	
the problem of	lack of complete vision of the operational picture during a CBRN incident
affects	civil defense, emergency services, and first responders
the impact of which is	increased delay in response to incidents and increased harm to the wellbeing and lives of victims
a successful solution	unifies data from multiple types of CBRN detectors to provide a comprehensive operational picture to decision makers, reducing the time necessary to make informed decisions that save lives.
Position statement	
for	civil defense members, emergency services, first responders, as well as border control and customs officials
who	respond to a CBRN incident to reduce the hazard and avoid harm to the population in the area of incident
the	Perception Cloud solution
that	provides a centralized interface to view the collected measurements of a variety of CBRN detection devices
unlike	the current approach of manually collecting and correlating data from multiple CBRN detection devices
our product	reduces response time to CBRN incidents by supporting informed decision-making based on a comprehensive operational picture.

The participants agreed that the main business goal for the product is to unlock a new revenue source. The product will also simplify installation compared to an on-premises solution, thus reducing some of the customer acquisition costs. Several possible com-

petitor products were identified. The revenue stream will come from recurring subscriptions. It was agreed that the product should be modular, with extra features available at extra cost. It is possible that for certain customers, the software will have to be extended with specific features and integrations, and the development of such custom modules can be billed separately as a professional software service. The main cost factor will be the development effort. Outsourcing customer support was agreed upon as a possibility. The company will utilize existing channels to reach customers, including expos, magazine ads, and private demonstrations.

Phase 2. The next phase of the process model involved product definition refinement. A project manager and a sales representative were present in the meeting with the product manager. The purpose of the phase is to advance the product definition. The new product is compared to existing market offerings to determine what features or attributes can be created, improved, reduced, or eliminated compared to competitor offerings. The phase is structured around the Strategy Canvas and the ERRC Grid from the Blue Ocean toolkit [8]. In preparation for this phase, the product manager studied competitor products to determine the features and quality attributes offered. The product manager also considered the existing customer-specific Perception system. The manager made a list of competing factors and added them to a Strategy Canvas template.

The product manager started the meeting by introducing the Strategy Canvas tool. The group went through each category and estimated the industry offering and the desired product offering. The product manager asked the participants whether any relevant categories were missing from the list and whether some could be eliminated from the new product or offered at a reduced level. The product manager also elicited possible new categories. During the meeting, several categories were eliminated, and several new ones were added (see **Fig. 2**). The red line in **Fig. 2** represents the current value offered to buyers in the market space – the industry value curve [8, 11]. As established during the collaborative strategy workshop, the core purpose of the Perception Cloud product is to offer a comprehensive operational picture to enable informed decision-making quickly. Therefore, features related to real-time measurement communication and displaying were prioritized over features concerning the post-factum analysis of the data.

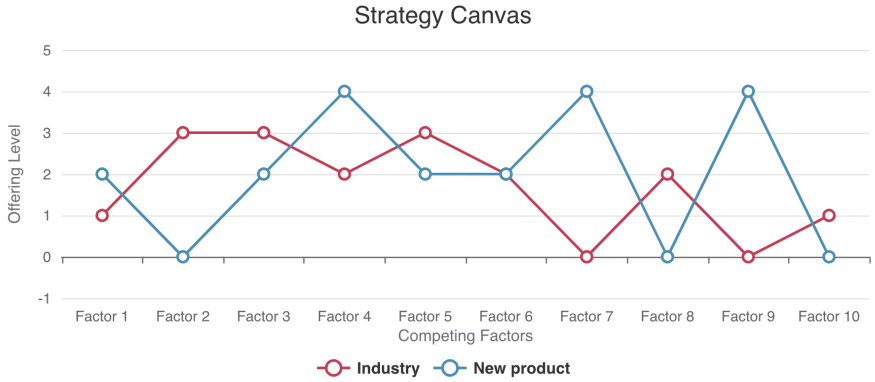

Fig. 2. Strategy Canvas at the end of the meeting

After the meeting, the product manager sorted the factors by their score from low to high. This combines the Strategy Canvas with the ERRC grid (see **Fig. 3**). The top right corner in **Fig. 3** indicates the potential Blue Ocean for the product – competing factors that are offered by the product at an excellent level and not offered by the industry at all. For Perception Cloud, one factor was identified that is currently not offered by the competition at all, indicating a new opportunity.

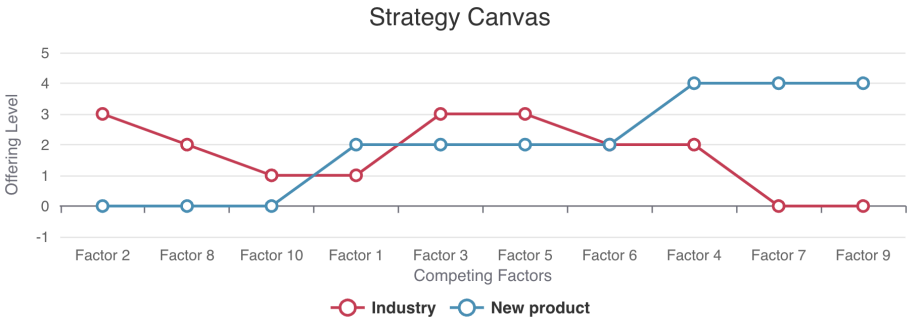

Fig. 3. Strategy Canvas combined with ERRC Grid

Phase 3. During this phase, the initial architecture design was done. The phase is split into two meetings where the offering architecture, business architecture, and tailorability architecture were discussed. The place of the product in software ecosystems is touched upon. The CTO and a software engineer participated in both meetings with the product manager. In the first meeting, overall architecture considerations, the offering architecture, and the place in the software ecosystem were discussed.

It was decided that the Perception Cloud product must be configurable and composable to have broad appeal in the target market. Customers should be able to configure, at minimum, the alarm limits for their detection equipment. Composability should be a major focus. The product shall support multiple separately priced plugins. Competing factors from the product definition refinement phase were discussed as possible plugins. Unique customer requests could be addressed by developing custom plugins. The company would seek to generalize such plugins to reuse them with other customers.

The company also wants to grow its role within the ecosystems of CBRN detector manufacturers and software providers. The company could make it easier for willing manufacturers to integrate devices into Perception Cloud by providing open APIs. APIs could also be created for third parties to make plugins, but this open-source plugin ecosystem will not be implemented in the early versions. At the end of the meeting, the overall architecture and technical constraints were discussed, with several open-source technologies agreed upon.

Based on this preliminary discussion, the product manager prepared a domain model for the new product and relevant business process models in BPMN. These models were presented in the second meeting of the phase to elicit further discussion and refine the strategy.

Phase 4. This phase was devoted to the financial discussion. The Accion pricing framework was followed[7]. Four questions about pricing needed to be answered as part of the discussion: (1) What is the upper bound? (2) What is the lower bound? (3) What are the reasons to charge less than the maximum value? (4) How to structure the pricing model as a compromise between the upper and lower bounds?

Based on the discussion, the product manager prepared a mockup of a pricing page for the new SaaS product. This page was presented to the stakeholders for feedback and approval. Based on the feedback, a second draft of the pricing page was made and accepted as the initial pricing structure for the product.

Phase 5. The legal review phase of the process model consists of discussing four legal aspects: contracts, IPR protection, open source, and data protection. The product manager held a one-on-one discussion with a Data Protection Officer (DPO). The product manager started the meeting by explaining the strategy so far, primarily focusing on aspects that may involve personal data processing. The product manager asked the DPO what existing templates could be reused and what documents needed to be created to ensure compliance with GDPR. The DPO proposed documenting all types of personal data processed in Perception Cloud, data retention policies, and transfers outside EEA. A Data Processing Agreement needs to be created and appended to the service-level agreement for the product.

The open-source check-up was carried out independently. The product manager checked the licenses of open-source components selected for the product during the architecture design phase and found no restrictions. The contract and IPR protection discussions were conducted together, in a one-on-one meeting with the COO. It was agreed that the company should purchase trademarks for the product. However, obtaining patents was deemed unnecessary at this point. Obtaining a patent comes at a high cost, which increases with the geographical scope of the patent. Both trademarks and patents can be purchased via the Finnish Patent and Registration Office.

Phase 6. In the final phase, KPIs were selected. The product manager used the Balanced Product Scorecard, as well as a list of sample KPIs. The selected KPIs were added to the product strategy document and sent to the stakeholders from executive management, Development, and Sales. The participants were asked to comment on the product strategy overall, including the KPIs. The participants were also requested to participate in a "Digital Red Dot Game" and mark three statements or strategy elements that they were least confident about. The "Red Dot Game" is a risk identification and prioritization method where each stakeholder is asked to place a total of three red dots next to the segments or statements in the strategy that they are least sure about [11].

The product strategy document was reviewed and approved by the selected stakeholders. The KPI selection was also approved, but an important issue was raised regarding the selected targets for the business goals. Increasing annual revenue by 5% to 10% was deemed unrealistic. Now, the annual revenue of the company is tied to the number of contracts obtained for professional software services and the delivery of

[7] https://content.accion.org/wp-content/uploads/2018/08/Pricing-Your-SaaS-Product.pdf

these services, which varies each year. The goal for the new SaaS is to provide a steady and growing source of revenue, but comparing it to the overall company revenue will not provide a meaningful measure of success. A long-term average of the annual Perception revenue was suggested as one possible point of comparison, but no decision was made. Selecting the proper target for the financial success of the product thus requires further consideration.

4.5 Model Evaluation

The case study described above could be considered a weak form of evaluation, suitable to present the artifact convincingly and vividly [7]. All phases of the model implementation were documented, including the meeting minutes and observations of participant behaviour. This documentation was used to develop coherent product strategy that meets all the requirements defined in Section 4.2. Additionally, a survey was used to collect feedback from the process model implementation participants. Collected feedback and the successfully developed strategy indicate the overall validity of the proposed process model.

For the 1st requirement, the process model guided the product manager in creating the product strategy. However, the process model was designed with the case company in mind. Because of this, there is a risk of "over-fitting" the model to the case company's processes and organizational structure. Independent implementation of the process could test whether the model is generalizable and illustrate how the model can be generalized further.

Regarding the 2nd requirement, the proposed process model produced an initial product strategy for the case company. The strategy was reviewed and approved by company stakeholders, creating alignment around the vision and priorities for the product. The strategy solidified and developed the productization ideas that had been suggested by various company stakeholders over the years but remained unrealized until now.

For the 3rd requirement, the strategy covered all the elements of product strategy as classified by the ISPMA framework.

To address the 4th and the 5th requirements, the recommendations in the process model were based on the academic and practitioner literature aimed at B2B SaaS. The process model produced a product strategy for the B2B SaaS product. Most steps and suggested tools also apply to licensed software products and hybrid models. Pricing and legal aspects, however, are tied to the SaaS nature of the product. The legal discussion was focused on the contract contents specific to SaaS (i.e., SLA) and the data protection concepts applicable for delivering a service over a network (i.e., the data controller and the data processor). An elaboration of the financial discussion and legal review phases can make the process model more applicable to products other than SaaS.

The Accion framework – the tool selected for the pricing discussion – helped quickly explain the SaaS pricing concepts and best practices to the stakeholders that were not used to managing pricing decisions. The tool helped select the value metrics and the price structure for the new product. The participants, however, could not determine an upper bound that could be charged to customers. The BSC tool alone resulted in a non-systematic KPI selection process, and the paper recommends a further study of rigorous

step-by-step KPI selection methodologies. Nonetheless, the Accion framework and the BSC produced a useful starting point for further strategy work and illustrated which areas are well-understood and which need to be developed further.

Considering the 6th requirement, the selection of attendees for each phase was not fully systematic and relied on a tacit knowledge of the situation in the company. A generic stakeholder selection approach can complement the process model. For example, the Power-Interest Grid can be employed to determine the most influential participants [11]. RACI matrices can also be developed to map the responsibilities of the available stakeholders. The recommendations can also be adjusted depending on the size of the organization.

For the 7th requirement, the strategy was defined in a single document shared with stakeholders for feedback. The process model does not enforce a template for this document, allowing each product manager to define it in a way that fits their company best.

A questionnaire was created and shared with participants in the strategy development process. All 6 stakeholders who participated in the strategy development process responded to the questionnaire. All respondents agreed or strongly agreed that their understanding of the product improved after participating in the sessions (4 agreed, 2 strongly agreed). All 6 respondents agreed that their expertise and contributions influenced the results of the sessions, and they feel more confident in the product's success after attending the sessions (5 agreed, 1 strongly agreed). None of the participants thought the sessions they attended were too long (4 disagreed, 2 strongly disagreed), nor felt they had nothing to contribute (5 disagreed, 1 strongly disagreed).

In the open feedback section, the process model was commended as “good work”, even “excellent work”, and a “well arranged, well thought and professional take on the process”. One respondent was glad that a strategy for the product was finally created: “This has been much-needed clarification of Perception product strategy for SaaS service provision”. Another respondent praised the “well prepared sessions with clear agenda”. Finally, one of the respondents liked the way the materials were prepared, and the way the product manager had a vision on how to move the discussion forward, especially given the fact that most participants did not prepare before attending the meetings.

The collected feedback shows that the participants better understood the product and its strategy after participating in the sessions, contributed with their expertise, and did not waste their time. Moreover, those who shared open feedback indicated they were happy with the resulting strategy.

5 Discussion

The prime goal of this study was to design a process that develops a comprehensive product strategy for a company undergoing the productization of customer-specific software into B2B SaaS. This aim is reflected in the two research questions being addressed.

5.1 What process could be followed to develop an initial product strategy for a newly productized SaaS solution?

The proposed process model for initial product strategy development is grounded in the established ISPMA SPM framework and consists of six phases: (1) Collaborative strategy workshop, (2) Product definition refinement, (3) Architecture design, (4) Financial discussion, (5) Legal review, and (6) KPI selection and Risk analysis. During each phase, one or several elements of the product strategy were discussed and refined. The results were combined into a product strategy document, which was evaluated by the key stakeholders in the company.

The evaluation showed the model to be an efficient tool for product strategy development within the productization context of the case company. It resulted in a detailed product strategy that aligned multiple company stakeholders regarding the direction of the new product. The participants of the process felt their time and expertise were used efficiently, and the company approved the resulting product strategy document.

However, a review by an SPM expert revealed limitations in the applicability of the process model for brand new B2B SaaS product development outside the productization context. At the case company, there was an initial understanding of the market requirement, which would be satisfied by the new product and a general idea of the features that the product would offer. This helped follow the strategy development linearly. Brand new product development calls for iterative approaches involving extensive learning and prototyping, and the model could be enhanced by emphasizing this need for iteration.

Especially during the product definition refinement phase, it can be helpful for product managers to have some experience in the product or market domain. This helps evaluate competing products and existing software to create a list of competing factors for the industry value curve. However, this is not a requirement, and most phases can be executed without deep domain experience. Incidentally, it would be natural to expect that a manager assigned to a product in a certain domain has some relevant experience in the area, or the means to acquire it.

The process model suggested and demonstrated the usefulness of several tools that SPM and software business practitioners recommended, including Product Vision Board, Strategy Canvas, Accion Pricing Framework, Balanced Product Scorecard, and "Digital Red Dot Game." The study also suggested software engineering and business modelling tools – the domain model and BPMN business process models – to be used in the context of SPM. Testing the applicability of practitioner tools allows the incorporation of new tools into the knowledge base if they prove to be efficient. The demonstrated usefulness of these tools in an academic context contributes to developing a reliable SPM toolkit.

5.2 How do the B2B and SaaS contexts affect the product strategy development process at the case company?

The primary influence of the B2B and SaaS contexts is on the delivery model, tailorability architecture, pricing, legal, and performance management aspects of the product

strategy. The impact on the delivery model is self-evident, since SaaS is a specific delivery model that requires the product to be offered on demand over a network, supporting scalability and multi-tenancy. The B2B SaaS context calls for the tailorability architecture to incorporate configurability and composability of the software. In the B2B area, customers often require customization to specific business needs, but the multi-tenant SaaS model does not allow to freely customize the software for one customer without impacting others. Companies customizing their SaaS software products for customers that request it embark on a dangerous route that might negate the benefits of the SaaS delivery model and lead to isolated codebases for each customer. Focusing on a composable architecture and giving the customer configuration options to personalize their experience is the recommended approach for B2B SaaS vendors.

SaaS pricing is a complex area of research. At least 13 pricing frameworks can be identified, with sometimes confusing recommendations [14]. Regardless of the specific framework, the pricing model for SaaS products is subscription-based – companies pay for the right to use the software on a recurring basis. The subscription fee incorporates all or most product-related services, including maintenance, customer support, and data storage. The pricing approach recommended for all types of software, including B2B SaaS, is value-based, not market-based or cost-based [9]. In certain cases (e.g., when entering a mature market or aiming to undercut competitors), it is still necessary to understand the price offered by the competitors. In the B2B area this can be a challenge, as some vendors ask potential clients to contact their own sales departments to check the price.

In legal management, the B2B SaaS context determines the type of contract offered to customers and the data protection measures that need to be taken. A SaaS contract can be signed with individual customers but is often provided in the form of standard terms and conditions. The contract includes an SLA, which may clarify the functional scope, availability commitment, backup policies, and vendor liability should the terms be breached. Advanced data protection regulation, such as GDPR, also imposes restrictions on B2B SaaS software vendors, who host the server infrastructure where personal data may be stored and processed. In GDPR terms, the B2B SaaS vendor can make a Data Processing Agreement with customers, which describes the types of data processed and the legal basis for processing the data. As countries worldwide follow in the footsteps of GDPR, all B2B SaaS vendors must understand their regional data protection regulations.

In the performance management area, the process model recommends a balanced approach to KPI selection – considering the financial, customer, product and process, and people perspectives. However, most of the KPIs selected at the case company are focused on revenue, customer lifetime value, and monitoring customer activity to ensure retention and decrease the churn rate, another influence of the B2B SaaS context.

6 Conclusions

The paper proposes a process model for initial product strategy development for newly productized SaaS solutions. The proposed model consists of the following six phases:

(1) Collaborative strategy workshop, (2) Product definition refinement, (3) Architecture design, (4) Financial discussion, (5) Legal review, and (6) KPI selection and Risk analysis. During each phase, one or several elements of software product strategy are developed and refined. The process model was implemented at a Finnish B2B software company, which is productizing its customer-specific system into a B2B SaaS solution. Following the steps of the proposed model allowed the company to develop an initial software product strategy for the SaaS solution and establish a shared understanding and an alignment between company stakeholders. The case company adopted the developed initial product strategy; various strategy elements will be revisited when more information becomes available and certain decisions change. The successful implementation of the process model at the case company calls for further testing of the model at other companies undergoing productization.

This study implies that the process model may provide prescriptive knowledge for developing initial product strategies for B2B SaaS, at least in the context of productization. This context implies that a company may know what the product should be and what the market is, based on experience in providing professional software services to that market. Product managers may use the model to introduce SPM practices in their organizations, which can be unaware of the state-of-the-art SPM practices that would benefit them immensely. The model proposed in this study could act as a template, and the described implementation of the model at the case company could serve as an example of its application. Following the process model, product managers can produce a strategy that addresses, in some capacity, all the product strategy knowledge areas, with no relevant aspects being overlooked during strategy design.

The process model was developed with the case company and its productized SaaS solution in mind, which might affect its generalization. The linear structure of the proposed model worked for the case company, which had an initial understanding of the market for the product and the functionality it may offer in the SaaS version. However, it is a limitation preventing the use of the model for new product development outside of the productization context. In the cases when the product and the market are entirely unknown at the beginning of the process, it is necessary to iterate and experiment, rapidly moving back and forth across the process and executing strategy design activities in a different order and in an ad hoc fashion. A possible future modification of the model that emphasizes iteration could make it more applicable for brand new product development outside the productization context.

Another limitation of the process is that it addresses some of the elements of product strategy to a lesser extent. In particular, the area of Financial Management is limited to the business model's revenue sources and cost factors. A business plan or cost management aspects are not yet addressed. The study calls for further development and testing of the process model and the continuous refinement of its phases. In the sphere of pricing and financial management, cross-disciplinary research with scholars of management and finance could further advance the model. A comprehensive toolkit for product strategy development can also be created.

References

1. Anguera, M.T. et al.: Revisiting the difference between mixed methods and multimethods: Is it all in the name? Quality & Quantity 2018 52:6. 52, 6, 2757–2770 (2018). https://doi.org/10.1007/S11135-018-0700-2.
2. Artz, P. et al.: Productization: Transforming from developing customer-specific software to product software. In: International Conference on Software Business (ICSOB). pp. 90–102 Springer Verlag (2010).
3. Bavaro, J., McDowell, G.L.: Cracking the PM Career: The Skills, Frameworks, and Practices to Become a Great Product Manager. CareerCup (2021).
4. Buxmann, P. et al.: The software industry: Economic principles, strategies, perspectives. Springer Berlin Heidelberg, Berlin, Heidelberg (2013).
5. Ebert, C., Brinkkemper, S.: Software product management – An industry evaluation. Journal of Systems and Software. 95, 10–18 (2014).
6. Hevner, A. et al.: Design science in information systems research. MIS Quarterly. 28, 1, 75 (2004).
7. Johannesson, P., Perjons, E.: An Introduction to Design Science. Springer International Publishing (2021). https://doi.org/10.1007/978-3-030-78132-3.
8. Kim, W., Mauborgne, R.: Blue ocean strategy, expanded edition: How to create uncontested market space and make the competition irrelevant. (2014).
9. Kittlaus, H.-B.: Software Product Management: The ISPMA®-Compliant Study Guide and Handbook. Springer, Berlin, Heidelberg (2022).
10. Paajoki, A.: Best practices for and benefits from implementing ISPMA's SPM framework. University of Jyväskylä (2020).
11. Pichler, R.: Strategize: product strategy and product roadmap practices for the digital age. (2016).
12. Runeson, P. et al.: Case Study Research in Software Engineering: Guidelines and Examples. John Wiley & Sons, Inc. (2012).
13. Saltan, A., Seffah, A.: Engineering and business aspects of SaaS model adoption: Insights from a mapping study. In: CEUR Workshop Proceedings. (2018).
14. Saltan, A., Smolander, K.: Bridging the state-of-the-art and the state-of-the-practice of SaaS pricing: A multivocal literature review. Inf Softw Technol. 133, (2021). https://doi.org/10.1016/j.infsof.2021.106510.
15. Sommerville, I.: Software Engineering. Pearson Education Limited (2015).
16. Yin, R.: Case study research: Design and methods. (2009).
17. Yrjönkoski, T.: How to support transformation from on-premise products to SaaS?: Position paper for future research. In: Proceedings of International Workshop on Software- intensive Business: Start-ups, Ecosystems and Platforms . pp. 144–157 (2018).
18. Yrjönkoski, T., Systä, K.: Productization levels towards whole product in SaaS business. Proceedings of the 2nd ACM SIGSOFT International Workshop on Software-Intensive Business: Start-ups, Platforms, and Ecosystems. 42–47 (2019).