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Developing an MVP in an Established Company: a Case Study

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BACHELOR THESIS

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Abstract

The Minimum Viable Product (MVP) is a widely recognized technique in the startup community. However, its implementation in both start-ups and established companies often lack clarity. This study aims to determine the process for establishing an MVP, considering the perspectives of both customers and the company, in the development of a new system within an established company. The purpose of this review is to establish a systematic approach for determining an MVP in an established company. While previous literature has explored the concept of MVPs, it is necessary to adapt and apply it to the specific context. This case study was conducted as a qualitative research project. Participants were chosen through deliberate sampling, including important individuals from the company and customers with a vested interest in the product. The study location was within the established company where the new system was being developed. Data collection involved questionnaires with the selected participants. The collected data were analyzed using the Kano model. The problem faced was the lack of clarity in determining an MVP for the new system within the established company. The solution involved developing a systematic approach using a feature model and the Kano model. The key resources used in the solution included the expertise of the company's personnel and the input from selected customers. The process involved identifying and visualizing all product features through the feature model, utilizing the Kano model to prioritize the features for the MVP, and creating a roadmap for future development. Key challenges faced included aligning customer needs and company goals. The results of the solution demonstrated the effectiveness of the approach in identifying essential features for the MVP and provided a roadmap for future product development. The completed project highlights the importance of considering both the company's and the customer's perspectives in determining an MVP for a new system within an established company. The systematic approach employed in this case study contributes to the development of an MVP that aligns with customer needs and company goals, providing valuable insights for future projects.

Contents

1 Introduction

In this thesis, we tackle the task of developing a minimum viable product (MVP) within an established company. Section 1.1 provides an overview of the company utilized for conducting the experiment, while section 1.2 describes the situation from which we departed. Finally, in section 1.3, a concise overview of the thesis is presented.

1.1 Mozard

Mozard is the company where the case is situated. Therefore, it is essential to provide a concise overview of Mozard. Mozard is a Netherlands-based company that has developed a comprehensive case management system utilized by municipalities and sub-municipalities. The system is offered both as an on-premise solution and through a Software-as-a-Service (SaaS) model. Presently, Mozard is dedicated to maintaining and enhancing the system, striving to improve various aspects of its product.

1.2 The situation

Currently, within the company Mozard, the document generation system, a subsystem in the case management system, is developed by an external company. However, this product is not precisely what clients require, as it is often overly complex and lacks crucial features. Consequently, they intend to transition to a system that is made by themselves.

In current literature, there are a lot of studies about the minimum viable product (MVP), however, not a lot of papers are showing how to determine such an MVP. Especially for established companies instead of start-up companies

Considering the difficulties associated with transitioning from a software product made by third-party companies to a self-made software product, the primary goal of our research study is to investigate the process of developing a document generation system at Mozard. The specific focus of this study is to employ the MVP methodology to design and develop a viable product that caters to clients who prefer a streamlined feature set.

Furthermore, another objective is to develop a roadmap to implement additional features that are not included in the MVP but are also crucial. This ensures that other clients can transition to the in-house product as well in a later stage.

To accomplish the previously mentioned goals, we have developed the following research question:

> What is an effective process for determining the MVP, considering the perspectives of both customers and the company, in the development of an existing system within an established company?

This study builds upon the research conducted by Lee [1] that utilized the Kano model to determine the MVP for a startup company. The researchers employed two separate questionnaires to obtain

feedback from both the company's standpoint and the customer's standpoint.

We will employ an identical methodology, with a few modifications, and incorporate an alternative use case. Additionally, we will create a roadmap outlining the features that will be developed at a later stage.

1.3 Thesis overview

The remainder of the thesis is structured as follows: Firstly, a review of the related work will be presented. This section will cover the key topics that will be utilized throughout the thesis. Secondly, the methodology that will be employed in this study will be explained. Lastly, the results and conclusions will be discussed.

2 Related Work

In order to understand the context and significance of our research. It is important to explore the research that already has been done surrounding our topic. This section presents an analysis of the relevant literature, providing an overview of the research done by other scholars in the field.

2.1 Minimum Viable Product

The MVP is a fundamental concept frequently employed in the Lean startup methodology. In 2016, Lenarduzzi et al. conducted a systematic mapping study on the various definitions of the MVP [2]. This paper provides a comprehensive overview of the various definitions of the MVP and its evolution over time. Among the numerous definitions examined in this study, certain characteristics are recurrently mentioned in many definitions. These characteristics are as follows:

- It allows the product to be deployed [3][4][5]
- Gather early customer feedback [2][5]
- To collect the maximum amount of validated learning about customers with minimum effort [2][6]

The implementation of an MVP is frequently employed in scenarios where a new product or service is being commercialized, with the goal of ensuring that resources expended on development are not wasted and that a viable product is released in a timely manner [7]. The MVP is a valuable tool that can be utilized to effectively target specific customer segments and validate the value and growth assumptions of a product or service [7]. Additionally, it serves as a means to test the company's business model. Through this approach, a company can obtain valuable feedback while minimizing resource expenditure.

2.2 Kano Model

The Kano model is a framework utilized for classifying quality attributes. It involves a well-structured questionnaire consisting of question pairs for each product attribute [8]. One of the questions seeks to ascertain the customer's emotional response in the event of attribute fulfillment, while the other inquires about their feelings when the attribute is not fulfilled [8].

By collating and evaluating the data with the aid of a specialized evaluation table, see Table 1, the outcomes can be categorized for each respondent [1].

		Answer to dysfunctional question				
	Customer requirement	Like	Expect	Neutral	Accept	Dislike
Answer to functional question	Like	Q	A	A	A	O
	Expect	R	I	I	I	M
	Neutral	R	I	I	I	M
	Accept	R	I	I	I	M
	Dislike	R	R	R	R	Q

[A] Attractive
[M] Must-be
[O] One-dimensional
[R] Reverse
[Q] Questionable
[I] Indifferent

Table 1: The Kano method [9]

Presented below is an illustration of the two distinct question types that will be utilized in the experiment.

- Functional: If the document generator system has version control, how do you feel?
- Dysfunctional: If the document generator system has NO version control, how do you feel?

The potential responses to these questions are structured on a 5-point Likert scale, including the following options:

1. I **like** it that way
2. I **expect** it that way
3. I am **neutral**
4. I can **accept** it to be that way
5. I **dislike** it that way

The responses to the functional and dysfunctional questions are consolidated in the table, resulting in the identification of one of the five features. For instance, when a respondent answers the functional question with "Like" and the dysfunctional question with "Dislike", the feature determined from the table is categorized as one-dimensional. The attractive, must-be, and one-dimensional features bear considerable significance for the MVP and the roadmap.

The figure depicted in Figure 1 illustrates the fundamental concept of the Kano Model. The diagram outlines three distinct product features, each possessing its unique characteristics, which are explained as follows:

- The first type is classified as a **must-be** requirement, whereby the customer would experience severe dissatisfaction and refuse to purchase the product if it remains unfulfilled. Nevertheless, the fulfillment of this requirement alone does not guarantee customer satisfaction, as it is expected by the customer [1].

- The second type of requirement is an **attractive** requirement, which, in contrast to the must-be requirement, does not cause any dissatisfaction if unfulfilled. However, once fulfilled, it can generate a high degree of customer satisfaction [1].
- The third requirement type falls under the **one-dimensional** attribute category, which suggests that customer satisfaction is directly proportional to the level of requirement fulfillment [1].

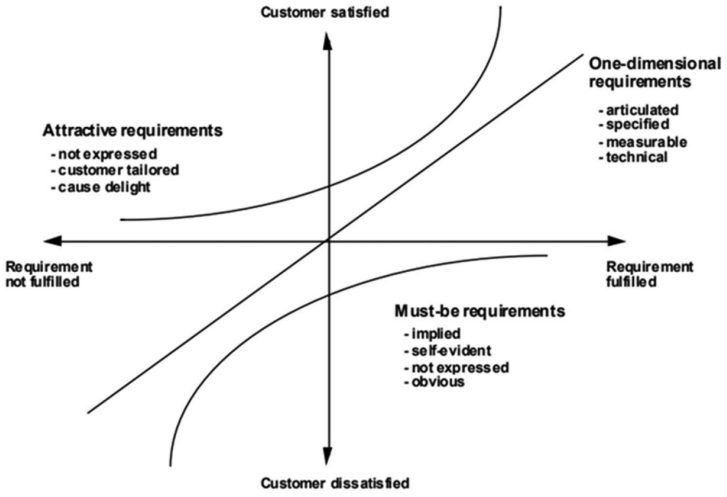

Figure 1: Kano model [10]

The Kano Model is extensively utilized in new product development and quality management to enhance customer satisfaction by employing the model to characterize requirements [11] [12] [13].

2.3 Feature Diagram

A feature represents an observable attribute of a concept that indicates the functionality of a specific aspect of the concept [14]. A feature model aims to depict the concept comprehensively. Such a model becomes particularly crucial when a system is introduced with multiple variation points [14]. In the case of Mozard, these variation points correspond to the features that differ across various customers. A feature model can effectively capture mandatory features, optional features, and alternative features, which may be applicable in the context of Mozard.

A feature diagram consists out of different nodes or boxes, representing individual features, various symbols, and connectors are used to show the relationship between all the features.

3 Method

To determine the appropriate method, we reviewed several papers. One of the notable papers was written by Lee et al. [1], which closely aligned with the method we were seeking. This method consists out of several commendable characteristics. Firstly, it considers both the customers' and companies' perspectives. Secondly, it provides a clear process to follow. Lastly, it employs a multi-class classification approach to categorize the features.

In this research, we will adopt a similar process as described by Lee et al.[1], but with a few modifications. Firstly, we will address a limitation in Lee et al.'s [1] process, where they did not specify how to identify the features that the product can potentially include. In our study, we will utilize a feature diagram, combined with interviews conducted with key stakeholders, to effectively determine these features.

Furthermore, the original process did not provide guidance on how to process the data obtained from the questionnaires. To overcome this, we will calculate the average response from each customer using the responses of multiple respondents and use the information to determine the MVP. Additionally, by analyzing the individual averages of customers separately, we can gain insights into the specific preferences of each customer. Consequently, we can develop a roadmap that gradually incorporates more customers at each step.

In order to address the research question, it is imperative to ascertain the effectiveness of this modified methodology. This approach will be implemented through a comprehensive case study conducted at Mozard Company, followed by a subsequent evaluation.

3.1 Overall process

Before delving into the process of determining the MVP, we will provide a concise overview of each step, offering a brief explanation for clarity. Finally, we will present a graph illustrating the sequential progression of these steps.

The first step in the process is to identify the features of the product. This step is essential to ensure the viability of the features in the subsequent stages.

Next, a questionnaire is created for the clients and the company and will be distributed. The questionnaire for clients will utilize the Kano model, allowing us to categorize features based on their opinion. On the other hand, the questionnaire for the company will ascertain the underlying business model. This evaluation will also employ the Kano model, however, this model is a little bit different from the original model.

Lastly, all the data will be collected and analyzed. Once the feature classification is completed, the MVP can be determined, and a roadmap for potential future development can be established, taking into account the implementation of the MVP.

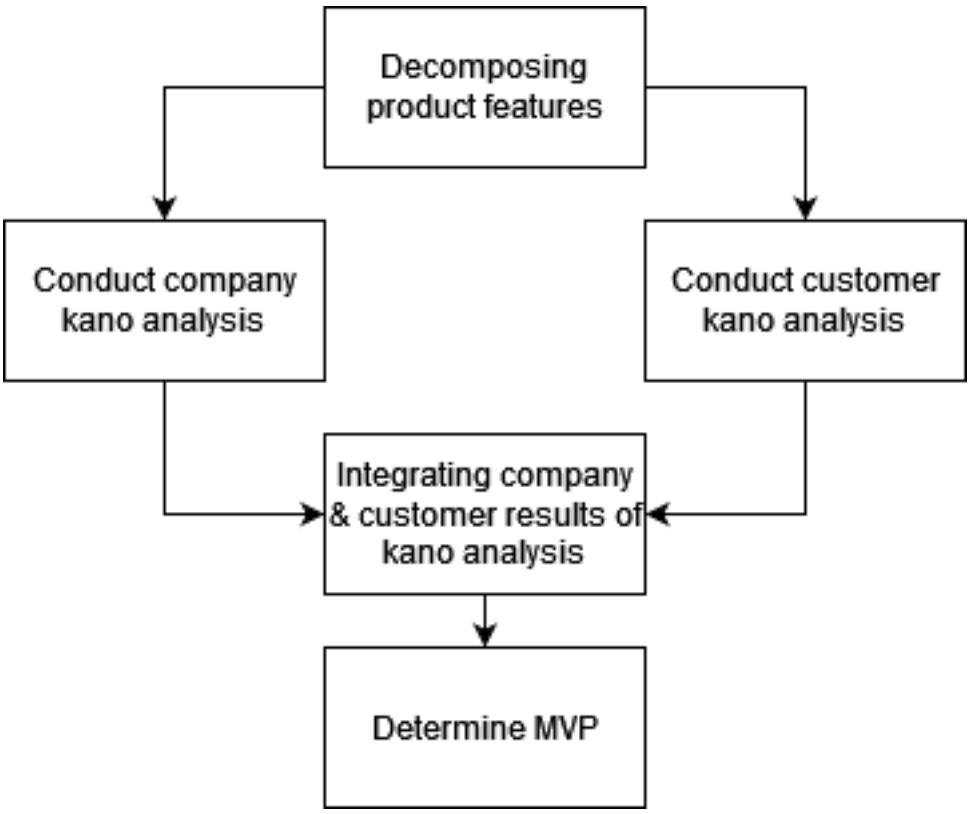

Figure 2: Overall process

3.2 Features

To determine the necessary features, a variety of sources will be utilized. This will make sure that every aspect will be included in the feature sets.

Firstly, an analysis of the current document generation software will be conducted to examine the features used for each template, and the preferences of individual customers can be deduced from this examination, without the need for direct inquiry.

Secondly, previous research conducted by Mozard will be examined. This research encompasses several documents that outline the desired features from the customer's perspective. This approach facilitates a comprehensive understanding of features that may not be readily apparent in the current document generator and may even unveil new features that are not currently available.

Finally, an interview is conducted with the management team of Mozard to determine their requirements for the document generator. This allows for the extraction of additional features based on the insights gained from this discussion.

Including all the results from the other resources, a temporary feature diagram can be conducted, visualizing all the features, providing a holistic overview of the required features, and presenting

them in a visual format to aid the management team of Mozard in understanding the complete set of requirements.

The feature diagram that will be presented is provisional, as a new feature diagram can be created based on the additional information acquired from the research analysis.

3.3 Questionnaire company side

To address the company-related aspects in the questionnaire, a revised Kano model outlined in the research paper authored by Lee et al. [1] will be utilized. This table is specifically authored for the company analysis.

The management team of Mozard, including the CEO, the head project manager, and the customer satisfaction manager, were consulted regarding their perspective on the product's features and their impact on competitive advantage. Their opinion will conclude the results of the company Kano-model analysis.

The first step in the questionnaire is determining the business model for the product. This will be done by asking about the potential success of the product with the implementation or absence of a specific feature. This question will help us determine Mozard's business model for the new product.

The second type of question consists of two types of inquiries, focusing on the competitive advantage and its relation to the implementation or absence of a feature. This question gives us the opportunity to determine if a feature has an influence on the competitive advantage.

The questionnaire for the company holds significant importance in assessing the viability of the business model and competitive advantage. It aims to determine the success of our product based on its equipped or unequipped state, as well as evaluate its competitive advantage in relation to specific features.

To identify the pivotal features of the business model and competitive advantage, we employ a newly developed Kano table proposed by Lee (2021) [1]. This table, shown in Table 3, is specifically tailored for this questionnaire and is used in both the assessment of competitive advantage and the business model. Furthermore, by utilizing Table 4, the outcomes from these assessments are integrated to identify the ultimate characteristics on Mozard's side.

		Dysfunctional form (if this function is not equipped)				
		Strongly Agree	Agree	Neutral	Not agree	Strongly Not agree
Functional form (if this function is equipped)	Strongly Agree	Q	Q	Type 3) Acceptable	Type 2) Critical	Type 1) Urgent
	Agree	R	I			
	Neutral	R	I			
	Not agree	R	I	I	I	Q
	Strongly Not agree	R	R	R	R	Q

Figure 3: Revised Kano evaluation table [1]

The outcome using these tables will result in three kinds of must-be features: (1) *key business enabler*, (2) *suggestive guides*, and (3) *candidate players*, this is done according to the level of urgency and priority of each feature. The types of must-be features are defined as follows:

- *Key business enabler:* When a feature is urgent, irrespective of the outcome of the competitive advantage test, it is referred to as a crucial business enabler. Given that the primary objective of an MVP is also to assess the validity of the business model, a key business enabler holds significant importance in the context of the MVP.
- *Suggestive guides:* When a feature is not essential for the business model but holds significant urgency for maintaining a competitive advantage, it is referred to as a suggestive guide. features falling within this category may not directly shape the business model, yet they play a crucial role in contributing to the differentiation of services and products. Therefore, it is imperative to consider these factors when determining the MVP.
- *Candidate players:* When the significance of a feature for both the business model and the competitive advantage is not immediate, it falls into a category where it becomes a potential candidate for the MVP. As these characteristics are not explicitly defined as requirements for an MVP, features in this category are considered viable contenders for inclusion in the MVP.

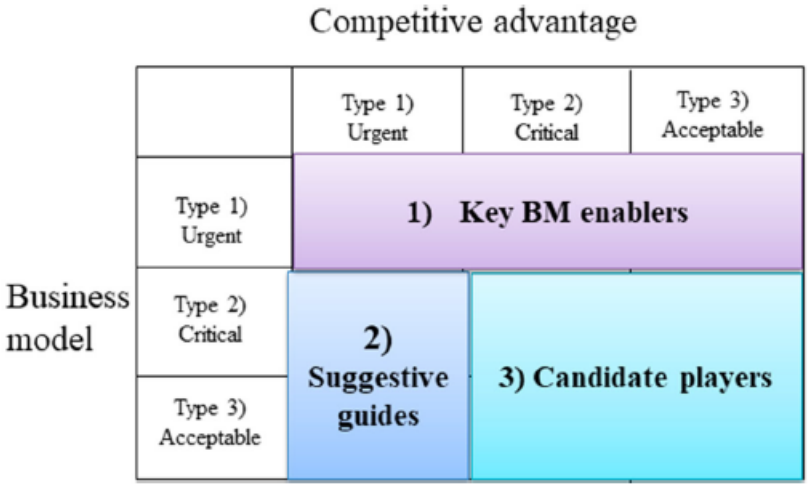

Figure 4: Integrated results for company-side Kano model analysis

3.4 Questionnaire customer side

The existing customers who are currently utilizing the documentation tool, as well as customers who express an interest in using such a tool, will be invited to complete a questionnaire regarding the product's features. The questionnaire will comprise two types of questions for each feature. The first type of question will inquire about the customers' perception of the feature being implemented in the product, while the second type will address their perception if the feature is not implemented.

The objective is to collect the must-be and one-dimensional requirements, along with the level of attractiveness associated with each one-dimensional requirement.

For Mozard, it is possible to identify must-be and one-dimensional requirements separately for each customer. This approach offers the flexibility to initially target a select group of customers and gradually incorporate others in subsequent phases of product development.

3.5 Analysis

To analyze the results obtained from the questionnaires, a customized feature set will be created. This feature set will prioritize the "must-be" features while also the most important one-dimensional features in the MVP. Additionally, any low-important one-dimensional feature and any attractive features will be added to the list of potential product implementations, and a product roadmap will be created to showcase the planned features to the customer.

The process of creating a feature set for each customer involves carefully analyzing the responses to the questionnaire and identifying the specific features that are most important to each individual customer. This analysis will also take into account the relative importance of each feature, as determined by the Kano model, to ensure that the most critical features are prioritized in the feature set.

The development of an MVP will prioritize the integration of essential features as identified by the customers. By incorporating these features into the MVP, we aim to maximize customer value while ensuring a prompt and efficient product launch. Additionally, we will consider including features that hold significance for the company's management team and possess a certain level of appeal to the customers.

The outcomes of this analysis include an MVP and a product roadmap for each customer. However, since the product is likely an iterative one that can be developed step by step, it is advisable for the company to initially incorporate customers who require the fewest features. Over time, the product can be expanded to include more customers while incorporating their feedback. This approach ensures early feedback from customers already using the product and also generates income from it.

3.6 Case study

To validate the efficacy of this method, we will conduct an experimental case study. In order to qualify as a case study, this research must meet specific criteria, as outlined by Perry et al. [15]. The following criteria should be considered:

- The research questions should be clearly defined from the outset of the study.
- Data must be collected in a well-planned and consistent manner.
- Inferences drawn from the data should address the research questions.
- The study should explore a particular phenomenon or provide an explanation, description, or causal analysis of it.
- Potential threats to validity should be systematically addressed.

All of these criteria are met within the context of our study. Prior to commencing the entire study, the research questions were established. Data will be gathered through structured questionnaires, ensuring a systematic and consistent approach. Through the analysis of this data, we will be capable of evaluating the effectiveness of the method and generating insights that address the research questions. Additionally, this research will explore the process of determining a Minimum Viable Product (MVP), while also considering potential threats to validity.

4 Experiment

The approach described in the preceding chapter 3 will be applied to the specific case discussed in the introduction 1. This case is about Mozard who wants to make a new document generator system by themself.

A document generation system is a platform utilized for the purpose of creating documents through the utilization of templates and variables. These variables can be sourced from various locations. For instance, in the case of Mozard, such variables can be retrieved from the case management system. Additionally, the variables may also originate from a worker who requires a document to be filled in.

Initially, the features were identified following the methodology described in 3.2. The results are presented in Table 2 and visually represented in Figure 5 through a feature diagram. This diagram displays a selection of optional and mandatory features determined based on the interview conducted with Mozard. However, it is important to note that this analysis serves as a preliminary preview of the feature diagram, which will be further refined and utilized in later stages of the research.

F1	Version control for the documents and templates
F2	Check-in and check-out for documents and template
F3	Central Storage
F4	Intelligent search functionality
F5	At least one Gigabyte support for files
F6	Authorisation system with different roles
F7	Insight to quantitative information
F8	Math module in the template
F9	Digital signature
F10	Possibility to import case details and use them in templates
F11	Decision trees (Possibility to show questions based on an answer)
F12	Can add metadata to templates or documents
F13	Components (Possibility to reuse sets of template features in multiple templates
F14	Group feature (feature to add rows to tables)
F15	Text question (a question where the answer consists of text)
F16	Selection question (a question where the answer consists of a choice from a list)
F17	Date question (a question where the answer consists of a date)

Table 2: Features for document generator

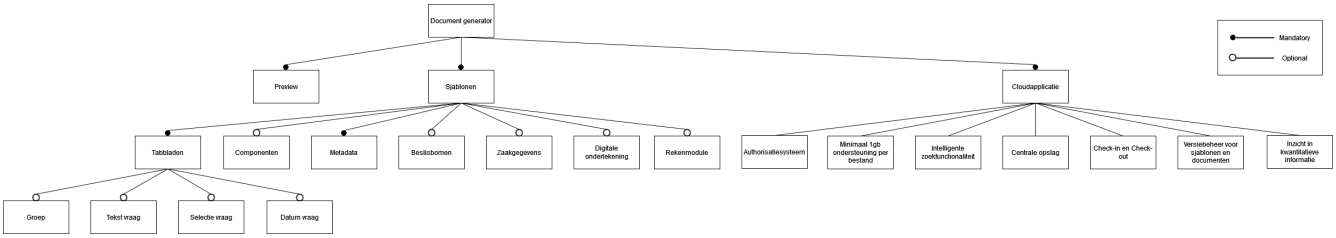

Figure 5: Feature diagram

In continuation of the paper, we will employ the index name of the feature to improve readability and coherence.
Following the identification of features, we developed two types of questionnaires: one for customers and another for Mozard. Both questionnaires are included in the appendix section (A). The questionnaires were given to both the customers and Mozard by using Google Forms. Which is a professional questionnaire software made by Google.

By leveraging the diverse outcomes obtained from the questionnaires and utilizing the evaluation tables, an MVP is established and a roadmap is formulated. The full questionnaire results are also provided in the appendix (B.1 and B.2). A brief overview of the results can be found in the next chapter.

By combining all the diverse findings, our MVP is established through a two-step process. Firstly, we consider the company's results as the primary factor, followed by the evaluation of customer feedback. This approach ensures that our MVP effectively tests the viability of the company's business model and incorporates a sufficient number of customers to validate it. Additionally, it provides us with a roadmap that can be presented to customers who are not included in the MVP but express interest in utilizing the product at a later stage.

The matrix that will be utilized for determining the MVP, in the end, can be found in figure 6. This matrix has also been employed in the original research conducted by Lee et al. [1]. Following the classification based on the opinions of both customers and companies, this matrix can be utilized to ascertain the final MVP.

We have introduced one new row and one new column, namely the "Attractive" column and the "Not Must-Be" row. The "Not Must-Be" row represents any feature that is not accounted for by the other three features, while the "Attractive" feature refers to features that are appealing to customers but are not obligatory for inclusion in the MVP.

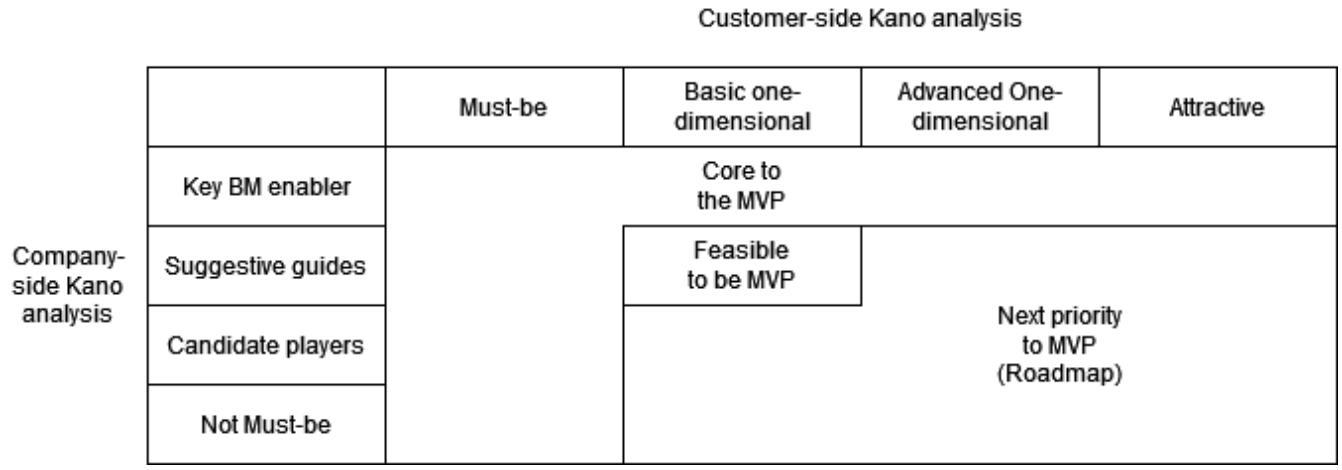

Figure 6: Final integrated matrix for determining MVP

5 Results

5.1 Company results

We have received a total of five responses from the company regarding our questionnaire. By combining these responses with the information presented in the tables shown in figures 3 and 4, we have drawn conclusions from the company's perspective. The result can be seen in table 3.

Key BM enablers	**F10, F11, F13, F15, F16, F17**
Suggestive guides	**F9**
Candidate players	**F1, F2, F3, F4, F6, F7, F8, F12, F14**

Table 3: Company result

5.2 Customer results

We received a total of nine responses from Mozard's customers, which are in total five different customers. For the customer their convenience, we have anonymized their organization names, in the table below can be found the number of respondents each customer has:

Customer Name	Amount of respondents
C1	2
C2	3
C3	1
C4	2
C5	1

Table 4: Customer table

To analyze the customer feedback, a stacked bar chart will be created to show the opinions of customers regarding each feature. For each feature, the chart will display the number of customers who voted for each type of opinion. This will provide a comprehensive overview of customer sentiments for each feature. The corresponding graph is presented in Figure 7.

Figure 7: Bar plot showing each feature and the number of votes for the feature type

Based on this overview, several conclusions can already be drawn. Firstly, it is imperative that F1 be included as a must-be feature for all customers, thereby warranting its inclusion in the MVP. Additionally, there are several other features, namely $F2$, $F6$, $F9$, $F10$, $F12$, $F15$, and $F17$, which a significant number of customers who classify these features as must-be. To establish this determination, we have selected features that received four or more votes as must-be. Therefore, it is crucial to consider incorporating these features as well in the MVP.

As a result, it is necessary to delve deeper into the remaining features, namely $F3$, $F4$, $F5$, $F7$, $F8$, $F11$, $F13$, $F14$, and $F16$. In order to analyze these features more thoroughly, a table has been

constructed to display the categorization of each feature by every customer. This table is presented in Table 5.

feature	Customer 1	Customer 2	Customer 3	Customer 4	Customer 5
F4	Attractive	Attractive	Attractive	Attractive	Must-be
F5	Indifferent	Attractive	Attractive	Indifferent	Must-be
F7	Attractive	Indifferent	Attractive	Attractive	Indifferent
F8	Attractive	Indifferent	Must-be	Attractive	Indifferent
F11	Must-be	Attractive	Must-be	Must-be	Indifferent
F13	Must-be	Attractive	Must-be	must-be	Indifferent
F14	Must-be	Indifferent	Must-be	Must-be	Attractive
F16	Must-be	Indifferent	Must-be	Must-be	Indifferent

Table 5: Results for each customer for not MVP features based on must-be features

Using this table, a feature set for each customer can be made. Looking for which features are must-be per customer. This gives the overview of which features need to be implemented before the customer will even consider using the document generator system. Examining the table 5, several observations come to light. The primary observation is that, based on the existing MVP configuration, customer 2's satisfaction has already been achieved. Consequently, there is no need for any further analysis concerning this particular customer.

Another significant observation is that customer 5 has exclusively identified two must-have features, namely $F4$ and $F5$. By incorporating these two features into the MVP, we can guarantee customer 5's satisfaction with the product. Regarding these features, there are two possible actions that can be taken: they can either be included in the MVP directly or added to the product roadmap for future implementation

The remaining features pertain to the essential requirements of the customers. Specifically, features $F11$, $F13$, $F14$, and $F16$ are must-be for Customer 1, Customer 3, and Customer 4. Consequently, these features must be incorporated prior to these customers even contemplating the utilization of the product. As per the customer analysis, it is imperative that these features are prioritized early in the product development roadmap.

5.3 Integrating customer and company results

To develop an MVP that encompasses both perspectives, it is crucial to consider and analyze the results from two key aspects. Firstly, it is essential to examine the Key Business Model Enablers, as the primary purpose of the MVP is to test the viability of the business model. Following this, it is imperative to assess the necessary features from the customers' point of view. These features must be incorporated into the MVP to ensure customer adoption. Furthermore, it is typically recommended to evaluate the one-dimensional features. However, in this particular feature set, there are no one-dimensional features present.

After identifying the MVP, it is essential to consider the remaining features in order to determine the product development roadmap. The prioritization and sequencing of these features should be carefully examined in order to establish an implementation plan.

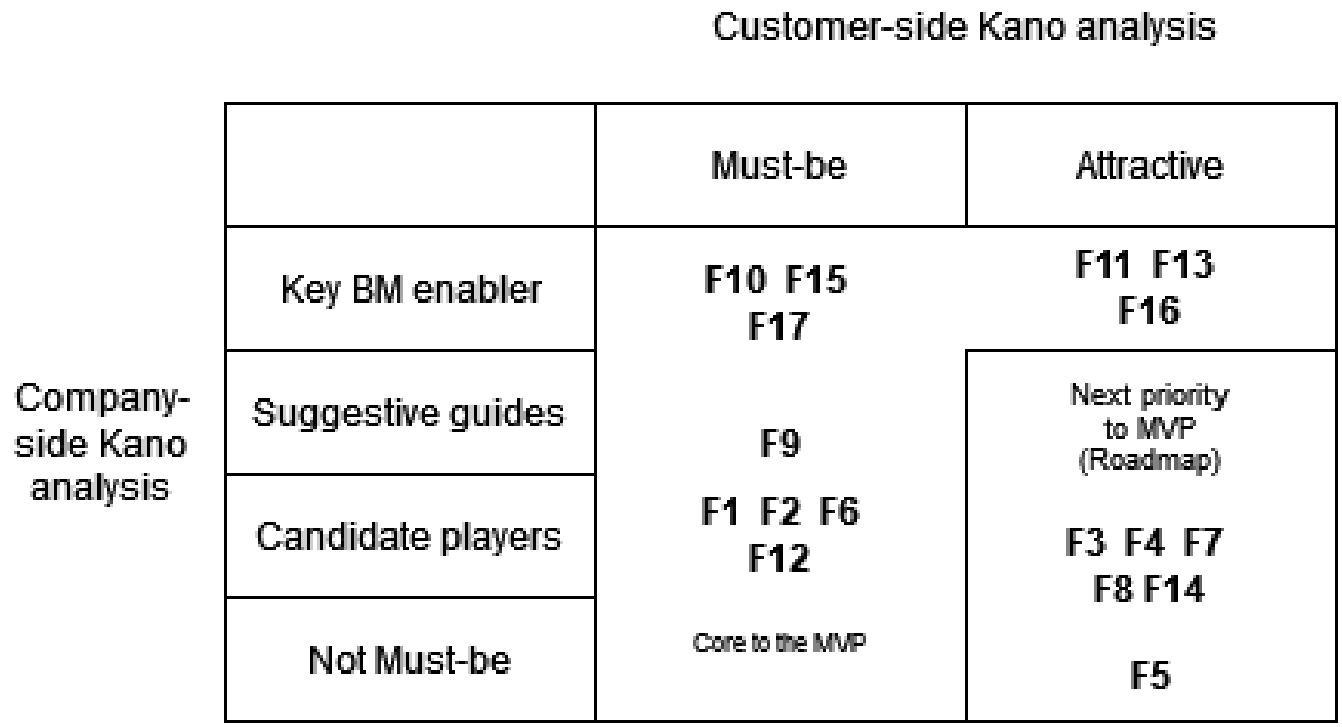

Figure 8: Final result using integrated matrix

Whereas $F4$ and $F5$ hold high priority in the product development roadmap, due to their significant impact on a wide range of customers, the remaining features can be implemented sequentially without any specific order.

6 Conclusions and Further Research

6.1 Limitations and future work

This research study possesses several limitations, which encompass both the case study and the methodology. In addition to outlining these limitations, we have provided potential approaches for addressing them in future research.

First, the sample size of the case study is inadequate. Not all of the possible responses provided were included in the results, such as the one-dimensional feature. This suggests that the sample may not be sufficiently representative of other similar problems. Consequently, the utility of this case study could be diminished, as it is unlikely that many companies will develop a product with identical attributes to this particular one. In future research, this issue could be addressed by employing a larger feature set and studying a more diverse range of products with multiple sections.

Second, the method has only been tested on two case studies. In order to validate its usability, it is necessary to conduct additional experiments. Moreover, it is important to identify the specific contexts in which the method would be most suitable, as its effectiveness can vary depending on the situation. Therefore, conducting such context-specific analyses is crucial to ensure the method's effectiveness.

Third, there is a need to explore more effective approaches for incorporating multiple opinions from both the company and customers. In the current research, all opinions are given equal weight, and the average of all responses is calculated. However, this strategy may not always be optimal, as not every customer or stakeholder holds the same level of importance for the product. Therefore, it is necessary to devise a more sophisticated methodology that can appropriately handle this variation and consider alternative approaches beyond simply taking the average.

Last, this method solely relies on the Kano model and feature model. However, there are several other models that can be employed to enhance the performance of the overall approach. Additionally, there is a possibility that some customers may not fully comprehend the statements used in the questionnaire. Therefore, it is imperative to devise a mechanism that aids customers in understanding such statements effectively.

6.2 Conclusion

This study adopts a case study approach, drawing upon the methodology presented by Lee [1]. The methodology employed in this study incorporates the Kano model to ascertain the MVP for a product, taking into account both customer and company perspectives. Various modifications have been introduced to the original approach [1] in this study. Moreover, a distinct case study is conducted, concentrating on a software product comprising seventeen features, which differs from Lee's study [1] which analyzed a non-software product with nine features. Additionally, the present case study involves a company already acquainted with customers who express interest in such a product. Conversely, the previous study focused on a startup company introducing an entirely

novel product, where not all customers necessarily desired the product.

This research endeavors to advance the development of a systematic approach for determining the MVP. The proposed method incorporates the utilization of the Kano model, which serves as a classification framework for different features. While the original Kano model solely considers the customer's perspective, this research extends its application by incorporating a modified Kano model that incorporates the company's perspective as well.

The methodology employed in this study can be applied to use cases characterized by similar attributes. It has the potential to assist companies in developing products that require minimal effort yet attract a substantial customer base. This research endeavor aims to further explore the determination of an MVP.

In order to address the research question, we have devised a method for determining the MVP. However, the efficacy of this process should be evaluated through multiple additional use cases. Given that we have only examined two use cases in conjunction with the original research, it is insufficient to conclusively determine the effectiveness of this process.

To compare the two distinct use cases, one involving a completely new product and my particular use case, which involves an existing product, it is evident that determining the MVP for an existing product is relatively simpler. This is primarily due to the abundance of available resources that can be utilized in the MVP determination process. We possess detailed knowledge regarding our customers, the existing market landscape, and the strengths and weaknesses of the product itself. These additional pieces of information provide us with a broader scope for conducting research and effectively discerning the preferences of each individual customer.

In summary, the application of the Kano model in determining the MVP can be utilized not only within startup companies but also within established companies seeking to develop their own existing products. From various perspectives, employing this method for existing products proves to be even more effective. This is primarily due to the extensive knowledge held by the researchers and the company regarding the product and its customers, which provides them with a wider range of options and opportunities.

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A Questionnaires

In this section, you will find the questionnaires. While some questions may not be repeated due to their similarity, whenever this occurs, the relevant feature should be added to its designated location.

A.1 Customers

1. Question 1: What is the company you are affiliated with?
    - Free answer space
2. Question 2 - Question 18: How do you feel when the document generation system has/does not have *"fill in features"*?
    - I like it that way
    - I except it that way
    - I am neutral
    - I can accept it to be that way
    - I dislike it that way

A.2 Company (Mozard)

1. Question 1-18: Our document generation system will be successful if it has/does not have *"fill in the features"*.
    - Strongly agree
    - Agree
    - Neutral
    - Not agree
    - Strongly not agree
2. Question 19-36: The document generation tool has a competitive advantage over other competitors when *"fill in the features"* is/is not equipped.
    - Strongly agree
    - Agree
    - Neutral
    - Not agree
    - Strongly not agree

B Results

B.1 Customers

The score assigned is determined by the five potential answers, which are numbered as follows:

1. I prefer it that way
2. I accept it that way
3. I am neutral
4. I can tolerate it being that way
5. I dislike it that way

When computing the average score, it is imperative to round up or down in the event that the calculated value is not an exact numerical representation. This rounding procedure is deemed obligatory when either of the rounded numbers yields a must-be feature. In all other cases, the score is considered attractive or indifferent.

B.1.1 Customer 1

Question	R1 (Pos — Neg)	R2 (Pos — Neg)	Average	Result
1	2 — 5	2 — 5	2 — 5	Must-be
2	2 — 5	1 — 4	1.5 — 4,5	Must-be
3	2 — 5	1 — 4	1,5 — 4,5	Must-be
4	1 — 4	1 — 4	1 — 4	Attractive
5	3 — 3	1 — 4	2 — 3,5	Indifferent
6	2 — 5	1 — 4	1,5 — 4,5	Must-be
7	2 — 5	1 — 3	1,5 — 4	Attractive
8	1 — 4	1 — 3	1 — 3,5	Attractive
9	2 — 5	2 — 5	2 — 5	Must-be
10	2 — 5	2 — 5	2 — 5	Must-be
11	2 — 5	2 — 5	2 — 5	Must-be
12	2 — 5	2 — 4	2 — 4,5	Must-be
13	2 — 5	2 — 4	2 — 4,5	Must-be
14	2 — 5	1 — 4	1,5 — 4,5	Must-be
15	2 — 5	1 — 4	1,5 — 4,5	Must-be
16	2 — 5	1 — 4	1,5 — 4,5	Must-be
17	2 — 5	1 — 4	1,5 — 4,5	Must-be

Table 6: The table presents the results for Customer 1, based on the questions described in the method section and the corresponding answers displayed in the introduction of Section B.1. R1 and R2 represent the respondents of the customer. Each question in the table is answered using a 5-point Likert scale. The answer structure in the table follows the format p — n, where p represents the answer to the positive question and n represents the answer to the negative question

B.1.2 Customer 2

Question	R1 (Pos — Neg)	R2 (Pos — Neg)	R3 (Pos — Neg)	Average	Result
1	2 — 4	1 — 5	2 — 5	1,7 — 4,7	Must-be
2	3 — 3	2 — 5	2 — 5	2,3 — 4,3	Must-be
3	3 — 3	2 — 4	2 — 5	2,3 — 4	Indifferent
4	2 — 4	1 — 3	1 — 5	1,3 — 4	Attractive
5	1 — 3	1 — 3	1 — 5	1 — 3,7	Attractive
6	2 — 5	2 — 4	2 — 5	2 — 4,7	Must-be
7	3 — 3	1 — 4	2 — 5	2 — 4	Indifferent
8	3 — 3	1 — 3	3 — 3	2,3 — 3	Indifferent
9	2 — 4	2 — 5	2 — 5	2 — 4,7	Must-be
10	3 — 3	2 — 4	2 — 5	2,3 — 4	Indifferent
11	1 — 3	1 — 3	2 — 5	1,3 — 3,7	Attractive
12	1 — 3	1 — 3	1 — 5	1 — 3,7	Attractive
13	3 — 3	1 — 3	1 — 4	1,7 — 3,3	Indifferent
14	3 — 3	1 — 3	- — -	2 — 3	Indifferent
15	3 — 3	1 — 3	- — -	2 — 3	Indifferent
16	3 — 3	1 — 3	2 — 5	2 — 3,7	Indifferent
17	3 — 3	1 — 3	2 — 5	2 — 3,7	Indifferent

Table 7: The table presents the results for Customer 2, based on the questions described in the method section and the corresponding answers displayed in the introduction of Section B.1. R1, R2, and R3 represent the respondents of the customer. Each question in the table is answered using a 5-point Likert scale. The answer structure in the table follows the format p — n, where p represents the answer to the positive question and n represents the answer to the negative question

B.1.3 Customer 3

Question	Respondent	Result
1	2 — 5	Must-be
2	2 — 5	Must-be
3	2 — 5	Must-be
4	1 — 4	Attractive
5	1 — 4	Attractive
6	2 — 5	Must-be
7	1 — 4	Attractive
8	2 — 5	Must-be
9	1 — 4	Attractive
10	2 — 5	Must-be
11	2 — 5	Must-be
12	2 — 5	Must-be
13	2 — 5	Must-be
14	2 — 5	Must-be
15	2 — 5	Must-be
16	2 — 5	Must-be
17	2 — 5	Must-be

Table 8: The table presents the results for Customer 3, based on the questions described in the method section and the corresponding answers displayed in the introduction of Section B.1. Each question in the table is answered using a 5-point Likert scale. The answer structure in the table follows the format p — n, where p represents the answer to the positive question and n represents the answer to the negative question

B.1.4 Customer 4

Question	Respondent 1	Respondent 2	Average	Result
1	2 — 5	2 — 5	2 — 5	Must-be
2	1 — 4	2 — 5	1,5 — 4,5	Must-be
3	1 — 4	2 — 5	1,5 — 4,5	Must-be
4	1 — 4	1 — 4	1 — 4	Attractive
5	1 — 4	3 — 3	2 — 3,5	Indifferent
6	1 — 4	2 — 5	1,5 — 4,5	Must-be
7	1 — 3	2 — 5	1,5 — 4	Attractive
8	1 — 3	1 — 4	1 — 3,5	Attractive
9	2 — 5	2 — 5	2 — 5	Must-be
10	2 — 5	2 — 5	2 — 5	Must-be
11	2 — 5	2 — 5	2 — 5	Must-be
12	2 — 4	2 — 5	2 — 4,5	Must-be
13	2 — 4	2 — 5	2 — 4,5	Must-be
14	1 — 4	2 — 5	1,5 — 4,5	Must-be
15	1 — 4	2 — 5	1,5 — 4,5	Must-be
16	1 — 4	2 — 5	1,5 — 4,5	Must-be
17	1 — 4	2 — 5	1,5 — 4,5	Must-be

Table 9: The table presents the results for Customer 4, based on the questions described in the method section and the corresponding answers displayed in the introduction of Section B.1. R1 and R2 represent the respondents of the customer. Each question in the table is answered using a 5-point Likert scale. The answer structure in the table follows the format p — n, where p represents the answer to the positive question and n represents the answer to the negative question

B.1.5 Customer 5

Question	Respondent	Result
1	2 — 5	Must-be
2	1 — 4	Attractive
3	2 — 5	Must-be
4	2 — 5	Must-be
5	2 — 5	Must-be
6	2 — 4	Indifferent
7	2 — 4	Indifferent
8	2 — 4	Indifferent
9	2 — 5	Must-be
10	2 — 5	Must-be
11	2 — 4	Indifferent
12	2 — 5	Must-be
13	1 — 4	Attractive
14	1 — 4	Attractive
15	2 — 5	Must-be
16	2 — 4	Indifferent
17	2 — 5	Must-be

Table 10: The table presents the results for Customer 1, based on the questions described in the method section and the corresponding answers displayed in the introduction of Section B.1. R1 and R2 represent the respondents of the customer. Each question in the table is answered using a 5-point Likert scale. The answer structure in the table follows the format p — n, where p represents the answer to the positive question and n represents the answer to the negative question

B.2 Company

The score assigned is determined by the five potential answers, which are numbered as follows:

1. Strongly agree
2. Agree
3. Neutral
4. Disagree
5. Strongly disagree

When the average score is not a precise numerical value, it will be rounded according to the second decimal place.

Question	R1	R2	R3	R4	R5	Average	Result
1	3 — 3	3 — 2	1 — 5	3 — 2	1 — 3	2,2 — 3	Acceptable
2	3 — 3	1 — 2	1 — 5	3 — 2	2 — 4	2 — 3,2	Acceptable
3	3 — 3	2 — 1	5 — 1	2 — 3	4 — 2	3,2 — 2	Acceptable
4	3 — 3	4 — 3	5 — 2	2 — 2	3 — 2	3,4 — 2,4	Acceptable
5	3 — 3	2 — 2	4 — 1	2 — 2	2 — 2	2,6 — 2	Indifferent
6	3 — 3	2 — 4	1 — 5	2 — 5	2 — 3	2 — 4	Critical
7	1 — 5	1 — 2	2 — 4	2 — 2	1 — 4	1,4 — 3,4	Acceptable
8	1 — 5	1 — 4	2 — 4	2 — 2	1 — 4	1,4 — 3,8	Critical
9	1 — 5	1 — 4	1 — 5	3 — 3	1 — 2	1,4 — 3,8	Critical
10	1 — 5	1 — 5	1 — 5	1 — 5	1 — 5	1 — 5	Urgent
11	1 — 5	1 — 5	1 — 5	1 — 5	1 — 5	1 — 5	Urgent
12	1 — 5	2 — 4	1 — 5	1 — 5	2 — 4	1,4 — 4,6	Urgent
13	1 — 5	1 — 5	1 — 5	1 — 5	1 — 5	2 — 4	Urgent
14	1 — 5	1 — 5	1 — 5	1 — 3	2 — 3	1,2 — 4,2	Critical
15	1 — 5	1 — 4	1 — 5	1 — 5	1 — 4	1 — 4,6	Urgent
16	1 — 5	1 — 5	1 — 5	1 — 5	1 — 4	1 — 4,8	Urgent
17	1 — 5	1 — 5	1 — 5	1 — 5	1 — 4	1 — 4,8	Urgent
18	3 — 3	3 — 3	1 — 5	3 — 3	3 — 5	2,5 — 3,8	Acceptable
19	3 — 3	1 — 3	1 — 5	3 — 3	2 — 5	2 — 3,8	Critical
20	3 — 3	3 — 5	2 — 4	3 — 3	3 — 5	2,8 — 4	Acceptable
21	3 — 3	2 — 3	1 — 5	2 — 4	1 — 5	1,8 — 4	Critical
22	3 — 3	3 — 3	2 — 4	3 — 3	3 — 5	2,8 — 3,6	Acceptable
23	3 — 3	2 — 4	5 — 2	3 — 2	5 — 1	3,6 — 2,4	Indifferent
24	3 — 3	2 — 4	1 — 5	2 — 3	1 — 5	1,8 — 4	Critical
25	1 — 5	2 — 4	2 — 4	1 — 3	2 — 5	1,6 — 4,2	Critical
26	1 — 5	1 — 3	1 — 5	2 — 3	1 — 5	1,2 — 4,2	Critical
27	1 — 5	3 — 5	1 — 5	3 — 3	3 — 5	2,2 — 4,6	Critical
28	1 — 5	3 — 5	1 — 5	2 — 3	3 — 5	2 — 4,6	Critical
29	1 — 5	3 — 5	1 — 5	2 — 3	3 — 5	2 — 4,6	Critical
30	1 — 5	3 — 5	1 — 5	2 — 3	3 — 5	2 — 4,6	Critical
31	1 — 5	3 — 5	1 — 5	3 — 3	3 — 5	2,2 — 4,6	Critical
32	1 — 5	3 — 5	1 — 5	3 — 3	3 — 5	2,2 — 4,6	Critical
33	1 — 5	3 — 5	1 — 5	3 — 3	3 — 5	2,2 — 4,6	Critical
34	1 — 5	3 — 5	1 — 5	3 — 3	3 — 5	2,2 — 4,6	Critical

Table 11: The table displays the questionnaire results for the Company, based on the questions outlined in the introduction of Section B.2. Each respondent's answer is represented in the table using the p — n structure, where p represents a positive response and n represents a negative response. The average result is calculated, and the final result is determined based on this average.

Feature	Integrated result
1	Candidate player
2	Candidate player
3	Candidate player
4	Candidate player
5	-
6	Candidate player
7	Candidate player
8	Candidate player
9	Candidate player
10	Key BM enabler
11	Key BM enabler
12	Key BM enabler
13	Key BM enabler
14	Candidate player
15	Key BM enabler
16	Key BM enabler
17	Key BM enabler

Table 12: The table provides integrated results for the Company, illustrating the functional classification of each feature.