CONNECT TO BETTER

OPTIMIZING THE ONLINE CUSTOMER JOURNEY OF SENTIO

Graduation Thesis
Bachelor Industrial Engineering and Management

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Improving the Online Customer Journey of Sentio

A case study of Wavin

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PREFACE

This Bachelor thesis was written as part of my graduation project. I conducted it at the company Wavin in Zwolle. I analysed and optimised the customer journey of Sentio. The report is the culmination of my bachelor's degree in Industrial Engineering and Management at the University of Twente. I carried out my research over a period of five months, from February until June, which coincided with the bizarre experience of COVID-19. During my bachelor's degree, I enjoyed learning about different business optimisation techniques. My encounter with these techniques in practice proved even more exciting.

Doing research at Wavin for five months gave me insights into complex, interesting and, most of all, challenging projects in the business optimization field. I have always had a passion for optimising complex business processes, and this internship alerted me to the various opportunities that large companies offer. Furthermore, I learned to work both independently and as a member of a large project team.

I would like to thank Marco Oudshoorn for the opportunity to conduct my research at Wavin. It was a pleasure to work with him, and I am grateful for the opportunity to develop my skillset. He was always available for questions and brainstorming sessions on the possibilities that the study explores. I would also like to thank all Wavin employees, who made time to answer questions and think along with me.

I would also like to thank my first supervisor at the University of Twente, Peter Schuur, for his useful feedback and for his support, and even more for his enthusiasm and the enjoyable online meetings. I would also like to thank my second supervisor, Ipek Seyran Topan. Her feedback was very useful, and I will continue to use it in future reports.

Finally, I would like to thank my family and friends for their support and motivation during my entire bachelor's programme. I am extremely lucky to have these beautiful people around me. I especially want to thank Emma, Job and my dear parents for providing feedback on my thesis whenever I asked for help.

Self-belief and hard work will always earn you success.

Femke Geerts

Enschede, June 2021

MANAGEMENT SUMMARY

Introduction

The research that underlies this thesis was conducted at Wavin. Today, Wavin is a global leader in supplying plastic pipe systems and solutions above (45%) and below (55%) ground. Wavin wants to improve indoor life by making the public comfortable and healthy and by reducing energy consumption to benefit the environment. We spend 90% of our time indoors, and only 50% of Europeans are satisfied with conditions inside buildings (Wavin, 2020). Alive to this problem, in 2019, Wavin launched a system called Sentio. It controls the indoor environment through intelligent underfloor heating and cooling. Sentio is an entirely different product from the pipes and fittings that Wavin usually produces and sells.

Problem description and motivation

This new domain has posed a wide variety of challenges to Wavin in all phases of the customer journey. For example, most installers find setting up a Sentio system more difficult than installing pipes and fittings. Another new development is that the Wavin brand is now very prominent. Consequently, consumers now seek information directly from the company. Moreover, electronic products require more intensive maintenance and aftersales support than what Wavin is accustomed to providing. As a result, employees receive a large volume of telephone calls and emails. They do not always know who can answer the questions or what the correct answer is. The resultant delays eat into the time that employees can allocate to their other responsibilities. Sentio has been growing rapidly since its establishment in 2019. Its managers intend to grow the company further still, and Wavin is determined to keep up with the expected growth. Therefore, solving the problems described here is crucial. The main concern at the present time is that the rollout of Sentio necessitated more direct interactions with customers. At present, customer interactions are ineffective, inefficiently regulated and too time consuming. Addressing these issues will provide opportunities and benefits to both the company and end consumers. If interactions with end consumers are conducted in a more effective and efficient manner, employees will have more time for other activities, yielding economies of both time and money.

Central research question

Wavin accepts that more direct contact with customers is necessary, but its employees are unprepared and lack the in-house knowledge to prepare. Approaches to the problem differ between countries. When all the relevant information is aggregated, the action problem may be defined as follows:

Demand for personal contact with Wavin is too high.

Once the bottlenecks in the (online) customer journey and the most significant sources of value to the company are identified, Wavin can improve one part of the customer journey. If the online customer journey and online customer experience are improved, Wavin will be able to handle more questions online. Eventually, contact with end customers will become more effective and efficient, and demand for personal contact will fall. Online solutions are likely to prove useful. Therefore, the research question is formulated as follows:

How can the online consumer journey of Sentio be improved to make interactions with customers more effective and efficient?

Approach

First of all, the current situation is analysed to define the problem more accurately and to pinpoint the focal points of the research. Knowing when customers become frustrated or when they fail to locate the information that they need online, which prompts them to call Wain, highlights problems and avenues for improvement. We prepared a flowchart of the current customer journey and the online customer journey to isolate the relevant steps and to discover the conditions under which consumers demand contact with Wavin and the kinds of questions that they ask. This data was gathered by conducting 18 one-hour interviews with different stakeholders. The performance of the Wavin Sentio website was analysed to determine how easy it is for the customer to find the information that they need. Telephone calls were analysed from the perspective of the end customer, as were the frequency, duration and quality of those calls in each phase of the customer journey.

A literature review is conducted to identify a customer journey mapping method that suits this problem well. It was important that the experience, pain points and the opportunities of the customer journey were examined. We designed a new map that covers these matters, as well as visualising the experience of the employees who provide the service and the duration and the frequency of telephone calls in each phase. Consequently, the identification of areas for improvement will become more straightforward. We used the mapping method to visualise the customer journey of Sentio. To create the map, we interviewed 21 Wavin employees for one hour who answer customer telephone calls daily. The needs of customers became apparent as a result. We also analysed the content of the Wavin Sentio webpage in different countries to identify gaps.

The map of the customer journey is used to design alternative online solutions that improve the customers' online experience. The improvements are likely to depress demand for personal contact. Furthermore, consumers might even recommend the system to others, boosting sales. In the course of the research, it emerged that Wavin would benefit from the implementation of multiple solutions. Since they cannot be implemented simultaneously, we recommend a sequence that reflects considerations of ease and importance. Because of time constraints, only one solution, which is the most urgent and the least time consuming, is developed further. Wavin employees evaluated it positively. Finally, we provided Wavin with recommendations for implementing all of the solutions.

Results and recommendations

The analysis revealed that customers demand contact with Wavin in every phase of the customer journey and that performance, though it varies between phases, is generally dissatisfactory. The customer is redirected frequently, and only 40% of website visitors find what they are looking for. We designed the customer journey map to visualise the experience of the customer journey, user needs, pain points and opportunities. The map is unique in visualising the experience of employees and the frequency and duration of customer interactions. Once the customer journey map was completed, we could easily design and plan improvements. One result that stood out was that the product selection phase had the lowest score for both performance and experience. The analysis of the content of the website showed that content was missing on many local web pages, but this does not influence the number of visitors or the duration of their visits directly. Only the global, the Dutch, the Swedish, the Italian, the Lithuanian and the Polish websites contained substantial amounts of information.

We used the customer journey map to design different solutions for Wavin to implement on the Sentio website. The order of these solutions and some additional information are presented in the table that follows.

SEQUENCE	SOLUTION	ADDITIONAL INFORMATION
1	Helpful FAQ section	FAQ section must be created and translated. Positive effect on all phases and all KPIs.
2	Improving website content	Time consuming, affects many phases. Most important point of improvement from user experience research on website.
3A	Product configurator	Tool must be built and scenarios researched. Effect on lowest-scoring phase. Will affect all KPIs positively.
3B	Website URL on product	Easy to implement. No effect on lowest-scoring phases. Will increase website visits. Large effect on customer satisfaction.
3C	Improving the structure of the website	Time consuming, affects all phases. Second most important point of improvement from user experience research on website.
6A	Nearest seller tool	Tool exists in Poland. Sellers must be identified in each country. No effect on lowest-scoring phases.
6B	Support section	Not difficult to implement. Departments must prepare for more telephone calls. Will mainly improve customer satisfaction.
8	Translations	Effect on important phases. Small effect on all KPIs.
9A	Nearest installer tool	Tool exists, finding installers for each country is labour intensive. No effect on lowest-scoring phases.
9B	Serious game	Development demands a lot of time. Has effect on lowest-scoring phases.

Because of time constraints, we only developed the FAQ tool for the Wavin Sentio webpage further. The solution was evaluated by Wavin employees, and it met all of the requirements of the company. We combined the UK FAQ tool with visuals and videos that were already available. This tool makes it easy for the customer to find the questions that they are looking for through the built-in search functionality. The visuals and the videos clarify the answers. We recommended to develop the tool further and implemented it on the Wavin Sentio website. We also recommended improvements to the product configurator and the structure and the content of the website. Parts of these solutions are easy to implement and likely to exert a considerable effect on the problems that the company faces. Therefore, gains can be made quickly.

It is not easy to anticipate the performance of the new (online) customer journey prior to its implementation. It may, however, be said that the solution will improve all phases of the customer journey, a relatively large effect. First of all, the number of telephone calls will fall because more customers will find information online easily. Second, the duration of the telephone calls will also decrease. More employees can answer questions from customers with the help of the FAQ section. Therefore, fewer customers will be redirected. Third, it will become easier to refer customers to explanatory images or videos on the website. The use of such aids will also reduce the duration of phone interactions and improve the experience of both customers and employees. Consequently, interactions with customers will become more effective and efficient.

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LIST OF ABBREVIATIONS AND DEFINITIONS

Abbreviation	Full name	Page
Flowchart	Diagram of the sequence of movements/actions of people/things involved in a complex system/activity	6,9,49,51,58
MPSM	Managerial problems-solving Method	5,6,7,49
Customers	Sentio consumers if not mentioned otherwise	1-77
Consumers	End customers, Home owners that use Sentio	2,3,4,11,16,54
KPI	Key Performance Indicator	6,8,15-17,32,34,44-46,49,51,53,61
IDC	Indoor Climate	9,11,17,24,31,34,37,54,58,77
FAQ	Frequently asked question	4,24-30,32-40,44-47,75-77

1. INTRODUCTION

In the framework of completing the Bachelor of Industrial Engineering & Management, a study is performed at Wavin into optimizing the online customer journey of Sentio. The study focuses on analysing current customer journeys and optimising them to make customer interactions more effective and efficient. Chapter 1 introduces the parties involved and the research problems, as well as the methodology and the research questions. In Chapter 2, the current customer journey of Sentio is described. Chapter 3 describes the alternatives to visualize the experience of the customer in a customer journey map. Chapter 4 visualises the customers' experience in a customer journey map. Chapter 5 outlines the available solutions. Chapter 6 describes the solution that should be implemented first. Chapter 7 contains implementation recommendations. Chapter 8 concludes.

In this Chapter, Section 1.1 describes the history of Wavin. Section 1.2 elaborates on the aim of the research. Section 1.3 explains how the problem was identified. Section 1.4 describes the scope of the research. In Section 1.5, the problem cluster and the action problem are outlined. Section 1.6 defines the core problem. Section 1.7 circles on the problem-solving approach and the research questions. Section 1.8 concludes the chapter.

1.1. ABOUT WAVIN

Wavin's story began in 1950 in Zwolle, where the founder of the company, Johan Keller, was the director of WMO, the local water utility (Wavin Group N.V., 2015). WMO found itself battling against severe pipe corrosion and a significant loss of water. In 1953, Keller succeeded in producing the first plastic pressure pipes for potable water. In August 1955, Keller founded Wavin, an independent company, to focus solely on pipe production. In the years that followed, Wavin grew rapidly worldwide.

Today, Wavin is a global leader in supplying plastic pipe systems and solutions above (45%) and below (55%) ground. The applications include heating and cooling, cable ducting, water and gas distribution, water management and wastewater discharge. Wavin is involved in both major construction programs and small installations and refurbishment projects. It has 30 production sites spread over more than 25 countries, with its head office in Zwolle. It employs around 5,000 employees, and its annual revenues fluctuate around $1.2 billion (Wavin Group N.V., 2015). The goal of the company is to build healthy and sustainable environments. In this way, its managers want to change the world for the better. They know and accept their role in solving global challenges, such as population growth, climate change and water scarcity or overabundance. Their actions are animated by four drivers: a safe and efficient water supply, better sanitation and hygiene, climate-resilient cities and better building performance (Wavin Group N.V., 2015).

1.2. SENTIO

The Indoor Climate Solutions business unit is growing rapidly in the above-ground solutions market, and it is a pillar of company strategy. Wavin wants to improve indoor life by making the public more comfortable and healthy and by reducing energy consumption to benefit the environment. We spend 90% of our time indoors, and only 50% of Europeans are satisfied with conditions inside buildings (Wavin, 2020). The critical factors for comfort and health indoors are temperature, air quality and energy. Alive to these needs, Wavin developed a system called Sentio (Figure 1). It controls indoor temperature, air quality and energy use through intelligent underfloor heating and cooling. The product provides a high level of comfort while minimising energy consumption (Wavin, 2020). In the

design of Wavin Sentio, Wavin has put the interests of installers at the core of the product, focusing on ease of installation.

Figure 1: Wavin Sentio indoor climate control system

Wavin launched the system in January 2019. Although the system is still new, Wavin is already selling it in over 14 countries all over Europe. Customers can only buy the product from wholesalers.

1.3. PROBLEM IDENTIFICATION AND ACTION PROBLEM

To identify the main problems, we conducted approximately 10 different interviews with different stakeholders from various countries. The duration of the interviews ranged between 30 and 60 minutes. The interviews were held individually and were semi-structured. For each stakeholder, a structured list of questions was created with the problem owner. During the interviews, follow-up questions were asked when needed.

Sentio is an entirely different product to the pipes and fittings that Wavin usually produces and sells. This new domain poses various challenges to Wavin in all phases of the customer journey. Figure 2 shows the global stages of the customer journey that we investigated. The customer journey of Sentio necessitates a new process of customer interaction, not only for installers but also for end consumers.

Figure 2: Sentio global customer journey map

Wavin focused on ease of installation when designing the product. This said, not all installers possess the necessary expertise. For most installers, installing a Sentio system remains more difficult than installing pipes and fittings, among other things. This results in more direct contact with Wavin, both remotely and on-grid. To make this process more efficient, Wavin is developing a tool for logging into the system remotely to handle more remote support. In addition, gaps in installer expertise can cause poor installations.

One new development is that the Wavin brand now appears more prominently in a house. Usually, the end customers may not know anything about Wavin because pipes and tubes are not visible in a house. With Sentio, the brand name is visible throughout the building. Consequently, consumers approach Wavin for information directly, a trend which has been particularly pronounced in countries where the product has been sold for a longer period. As noted earlier, the product can only be bought from wholesalers and not directly from Wavin. Therefore, Wavin is not accustomed to handling support and maintenance questions from end customers. Before, end customers did not know that their products had been manufactured by Wavin and approached local installers with their questions.

Furthermore, electronic products require more intensive maintenance and aftersales support than what Wavin is typically expected to provide. Many maintenance problems can occur. For example, the product can run into errors, the batteries can run out of power, or the app can disconnect from the system. Aftersales operations are also more intensive because new features and products are launched regularly.

Wavin accepts that its employees will have more direct contact with customers, but they are unprepared, and they lack the in-house knowledge to prepare. The technical sales department, the customer support department, the marketing department and the back office are not ready. The approach to the problem in different countries varies. The main concern is that Sentio demands more direct contact with customers. At present, customer interactions are ineffective, inefficiently regulated and too time consuming. Wavin wants to keep up with the high demand, but it cannot do so at present. The aggregation of this information yields the following action problem:

Demand for personal contact with Wavin is too high.

1.4. RESEARCH SCOPE

Sentio has two different customer journeys: one for installers and one for end consumers. Some parts overlap because the end consumer's journey also plays a significant role in the installer's journey and vice versa. Because of time constraints, this research must focus on one of the two customer journeys. Given the overlap between them, however, some parts of the unexamined journey will also be considered.

Wavin is experienced in working with installers. Wavin employees know who the installers are and what they expect. The collaboration is not perfect yet, but Wavin understand the dynamic. Interactions with end consumers are entirely new for Wavin: little is known in-house about the end consumer perspective. At the same time, the volume of customer interactions is already substantial, and it is likely to intensify further when sales increase. Most telephone calls with the end consumers take 30 minutes, with some lasting up to an hour. On average, there are between Confidential telephone calls a day in each country. On average nine of those are from Sentio end consumers. Many departments do not know how to answer customer questions about Sentio, and therefore customers are redirected frequently.

Reducing installer telephone calls does not yield the largest benefits. Most of the time, installer questions are short, and their answers are difficult to find online. Wavin sees answering these questions as a training process and as an investment in the installers. Conversely, the answers of many of the end consumers' questions can be found online. Wavin does not perceive this as a learning process: there are many consumers, they all use the same system, and they are likely to return with the same questions repeatedly. When sales increase, the number of consumers will grow significantly harder than the installers. Therefore, the number of potential consumer queries will grow even further. For this reason, we focuses on end consumers and not on installers, even though there are still opportunities to improve in the latter domain.

1.5. PROBLEM CLUSTER

To solve the action problem, we had to identify its causes. According to Heerkens and Van Winden (2017), to find the root of an action problem, that is, a core problem, the following questions must be answered: what is causing the problem? How are the different problems related to each other? To explore these causal relations, we created a problem cluster (Figure 3). Each block in the problem cluster represents a problem that Wavin employees stated in the interviews. The arrows run from causes to effects. The action problem captures a discrepancy between norm and reality (Heerkens &

Van Winden, 2017). The aim of this research is to resolve that discrepancy. After conferring with Wavin, we chose the high demand for contact as the action problem.

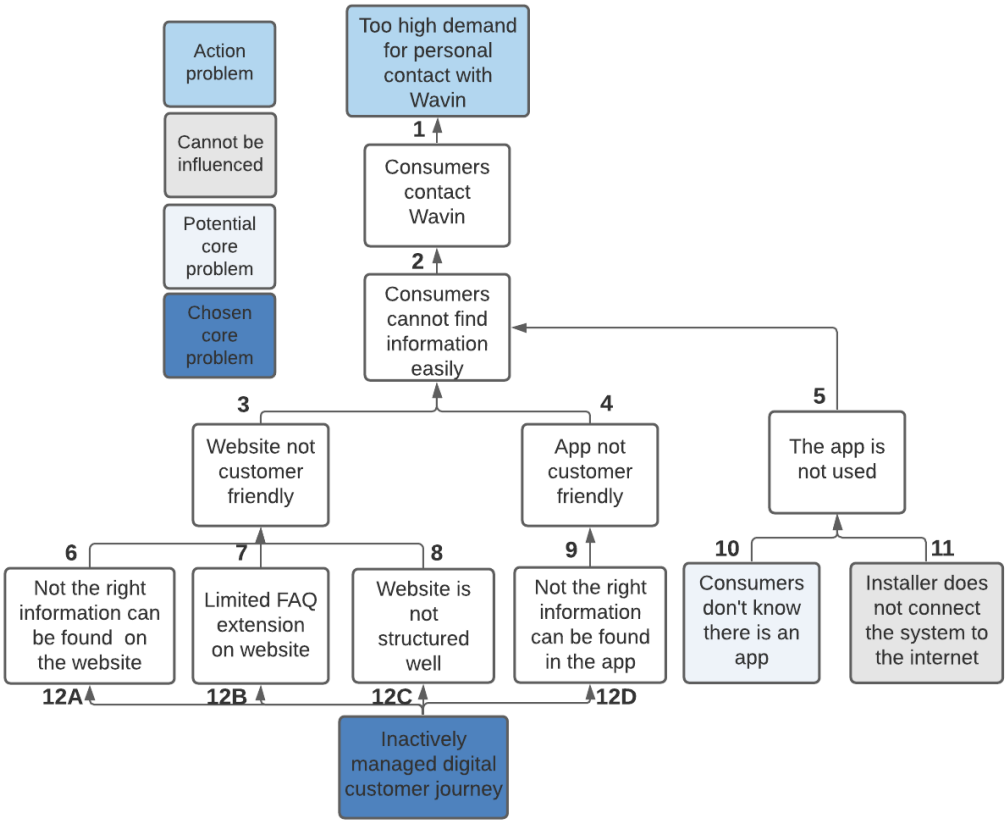

Figure 3: Sentio problem cluster

Each relationship will be briefly explained below.

1. The high demand for personal contact with Wavin causes consumers to contact Wavin.
2. Consumers demand personal contact with Wavin because they cannot find the information that they need (easily).
3. Consumers cannot find the information that they need (easily) because the website is not customer friendly and because it was not designed with end users in mind.
4. Consumers cannot find the information that they need (easily) because the app is not customer friendly.
5. Consumers cannot find the information that they need (easily) because they do not use the app.
6. The website is not customer friendly because not all of the information that is needed is available.
7. Another reason why the website is not customer friendly is that the FAQ section is minimal and that it was not designed with end users in mind.
8. The last reason why the website is not customer friendly is that it is not structured well. The website has many different layers, and the necessary information is hard to find.
9. The app is not customer friendly because not all of the information that is needed is available.
10. Consumers do not use the app because they do not know that there is an app for this system.
11. Another reason why consumers do not use the app is that some installers do not connect the system to the internet, the system has to be able to access the app via the Internet.
12. The limited information and the underdeveloped FAQ section on the website and on the app, coupled with the poorly structured website, are the causes of the inactive management of the digital customer journey. If Wavin understands the customer's online experience and acts when it is inadequate, the action problem can be overcome.

1.6. CORE PROBLEM

The action problem cannot be solved directly. The other problems that were described are its causes. At the end of the problem cluster, problems have no cause, and they influence the action problem directly and indirectly. Such problems are called candidate core problems. The actual core problem must be identified from the three candidates. Once the core problem is solved, so is the action problem.

The three candidate core problems are "inactively managed digital customer journey", "customers do not that know there is an app" and "installers do not connect the system to the internet". Heerkens and van Winden (2017) posit that for the core problem to be identified, the problems that cannot be addressed should be eliminated from the set of candidates. It is impossible to address the problem "installers do not connect the system to the internet". The company can provide guidance, but ultimate decisions are always made by the installer. Accordingly, the problem is deleted from the list.

The report focuses primarily on the problem "inactively managed digital customer journey" because its analysis yields insights on customers' experience of different parts of the online journey and because it is soluble. We did not choose "customers do not that know there is an app" as the core problem because the action problem would not be solved by increasing usage – the app is inadequate, and it is not customer friendly.

To solve the core problem, the whole customer journey of Sentio must be visualised so as to determine when customers interact with Wavin, be it online or directly. Thereafter, we had to discover the content of the online customer experience to ascertain how it can be improved and how demand for contact with Wavin could be reduced. Customer experience is one of the most critical factors in maintaining the competitive advantage that a company enjoys over its peers. Customers have enormous power and influence on companies (Schulze Kissing et al., 2019). Maital (1999) points out that customers know more about the products, services, competitors and prices of companies than do companies themselves. Customers are looking for unique experiences to accompany the delivery of systems, products and services (Maital, 1999). One common way of visualising customer experience is through customer journey maps, which usually contain different stages of the journey, user actions and emotions. The maps display the "touchpoints" between the user and the system, defined as points in space and time when specific interactions occur (Oliveira et al., 2020). Once the bottlenecks in the online customer journey and the biggest opportunity points are identified, Wavin can improve one part of the customer journey. By improving the online customer journey and online customer experience, Wavin will be able to handle more questions online. Eventually, interactions with the end customer will become more effective and efficient, and there will be less demand for personal contact. Wavin can improve the online customer journey and consumer experience through online solutions. Therefore, the research question can be formulated as follows:

How can the online consumer journey of Sentio be improved to make interactions with customers more effective and efficient?

1.7. PROBLEM-SOLVING APPROACH AND RESEARCH QUESTIONS

We conducted research to answer the main research question and to solve the action problem and the core problem. The managerial problem-solving method (MPSM) of Heerkens and Van Winden (2017) is used to formulate the research questions. Figure 4 shows the seven phases of the MPSM. The following section presents the approach in each phase of the MPSM, the related research questions and the deliverables. Appendix A displays the structure of the report with the corresponding chapters, MPSM phases, research questions and deliverables. Appendix B overviews the research design.

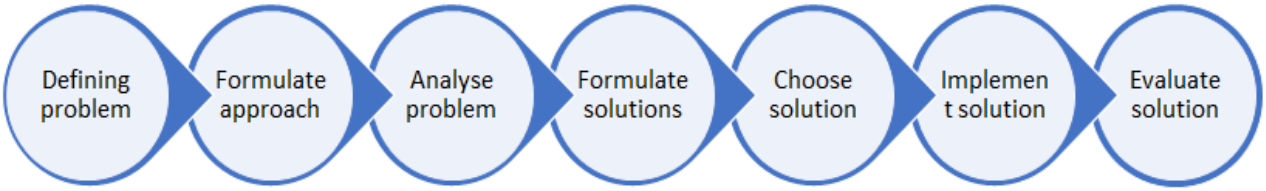

Figure 4: Phases of the MPSM

Phase 1: Defining the problem

1. *What does the current customer journey of Sentio look like?*
    - 1.1. *What are the steps in the current customer journey?*
    - 1.2. *What are the steps in the current online customer journey?*
    - 1.3. *What KPIs are currently in place?*

The global problem is identified by the end of this phase (Heerkens & Van Winden, 2017). Section 1.3 presents the identified problems, Section 1.5 overviews the problem cluster, and Section 1.6 explains the chosen core problem. To improve the problem definition even further, the current situation is described in Chapter 2. To describe the current situation, it is necessary to answer sub-questions 1.1, 1.2 and 1.3 chronologically. These questions are answered after conducting 18 one-hour interviews and observational studies with different stakeholders from different countries. Then, we used the collected data to prepare a flowchart of the current (online) customer journey. We also performed a textual analysis of the current situation to identify the KPIs that are currently in place.

Phase 2: Formulating the approach

2. *According to the literature, what is the best alternative to visualize the customer's experience in a customer journey map for Wavin?*
    - 2.1. *What are the different alternatives to visualize the customer's experience in a customer journey map?*
    - 2.2. *What are the advantages and disadvantages of those alternatives?*

In this phase of the MPSM, we drafted the problem-solving approach, which can be seen in Section 1.7. Chapter 3 shows the best means of visualising the customer's experience in a customer journey map. Literature research is conducted to identify the different alternatives of visualising the customer's experience in a customer journey map and their advantages and disadvantages. Eventually, the best method for Wavin in consultation with the company. The principal benefit of using a customer journey map is that it facilitates observation of customer touchpoints, the customer experience and opportunities. As a result, the requirements for a solution and the formulation of an approach to reaching it become apparent.

Phase 3: Analysing the problem

3. *What is the performance of the current (online) customer journey?*
    - 3.1. *How do customers and employees experience specific journey elements?*
    - 3.2. *Which part of the customer journey offers the most promising opportunities?*

In Phase 3 of the MPSM, we analysed the high demand for personal contact with Wavin by examining the performance of the current (online) customer journey (Chapter 4). Question 3.1 and Question 3.2 need to be answered chronologically to describe that performance. They are answered by reference to the customer journey map that was formulated in Phase 2. The touchpoints were mapped in the map in collaboration with Wavin. As a result, the experiences of customers and employees could be observed in each element of the journey. The map was completed with information from the interviews with stakeholders. The map is used to ascertain which part of the customer journey offered the most promising opportunities.

Phase 4: Formulating (alternative) solutions, Phase 5: Choosing a solution

4. *What will be the solution best fitting for Wavin to improve the online customer journey?*
    - 4.1. *Which alternatives are there to improve the current online customer journey?*
    - 4.2. *What are the advantages and disadvantages of those alternatives?*
    - 4.3. *What requirements does Wavin have for the solution?*

In this phase of the MPSM, we formulated alternative online solutions and discriminated between them. The alternatives needed to be described along with their pros and cons and the requirements of Wavin before a solution could be selected. The process is presented in Chapter 5. The alternatives emerged from the customer journey map that is presented in Chapter 4. The advantages and the disadvantages were identified through the stakeholder interviews and the literature research. Furthermore, we formulated a decision-making process by using the requirements of Wavin, which were also elicited through interviews. The requirements and the criteria were scaled and weighted. Eventually, one solution was chosen to first implement. Chapter 6 describes the chosen solution in detail with the help of a prototype. The solution is premised on literature research and the requirements of the company.

Phase 6: Implementing the solution

5. *What steps should Wavin take to implement the solution and improve the online customer journey?*

In this phase of the MPSM, we drafted an implementation plan. In addition, we prepared a detailed description of the activities and the order in which they need to be performed. The results are presented in Chapter 7.

Phase 7: Evaluating the solution

6. *To what extent does the proposed solution meet the goals and requirements of Wavin?*
    - 6.1. *How will the new (online) customer journey perform?*

In this phase, we evaluated the solution against the goals and requirements of Wavin. We analysed the performance of the new (online) customer journey before answering the question. Recommendations for further research are also based on this evaluation. Chapter 8 answers the corresponding research questions.

1.7.1. CONCLUSION

In this section, problem-solving method, the chapters, the research approach and the corresponding deliverables are described. The most important elements of the research concern the current situation, the performance of the customer journey and what the phases with the most promising opportunities are. Equipped with this knowledge, we researched online solutions that would improve the online customer journey, mitigate the problem of the high demand for contact and cause customer interactions to become more effective and efficient.

1.8. CONCLUSION

The focus of this research is on end customers and not on installers. The main concern is that the rollout of Sentio requires more direct contact with customers, which is currently ineffective, inefficiently regulated and too time consuming. Wavin can handle more questions online by improving the online customer journey. Eventually, customer interactions will become more effective and efficient, and there will be less demand for personal contact.

2. THE CURRENT CUSTOMER JOURNEY OF SENTIO

This chapter presents the current customer journey of Sentio. Its content reflects the numerous interviews that are conducted with stakeholders from different countries. Appendix C contains the stakeholder analysis, the interviews and the interview questions. Mapping the current customer journey is essential to discovering when customers contact Wavin and what the different ways of contacting Wavin are. The collection of this information is a prerequisite to improving the customers' online experience and making contact with Wavin more effective and efficient.

Section 2.1 discusses the different starting points of the customers with their corresponding customer journey. Section 2.2 describes the journey of a customer who is intent on having Wavin answer their questions. Section 2.3 explains the online journey of the end customer. In Section 2.4, the journey of the end consumer who calls Wavin is overviewed. Section 2.5 summarises the KPIs and current performance. Finally, Section 2.6, answers the first research question, "What does the current customer journey of Sentio look like?".

2.1. STARTING POINTS OF CUSTOMER JOURNEY

The Sentio system has four different end customer journeys. This is so because end customers start their journeys in different ways. The relative frequency of the journeys is unknown because Wavin sells Sentio through wholesalers. What is clear is that in the initial phase of the Sentio project, most products are sold to owners of large projects. This tendency is likely to change if Sentio becomes more familiar to advisors and homeowners and if its brand is displayed in more houses. As seen earlier, this development is already afoot in some countries, and more journeys start with referrals, professional advice and systems that have already been installed. The circles in Figure 5 show the different starting points of the customer journey. Although the customer is naturally free to end the journey, its terminal points are not displayed.

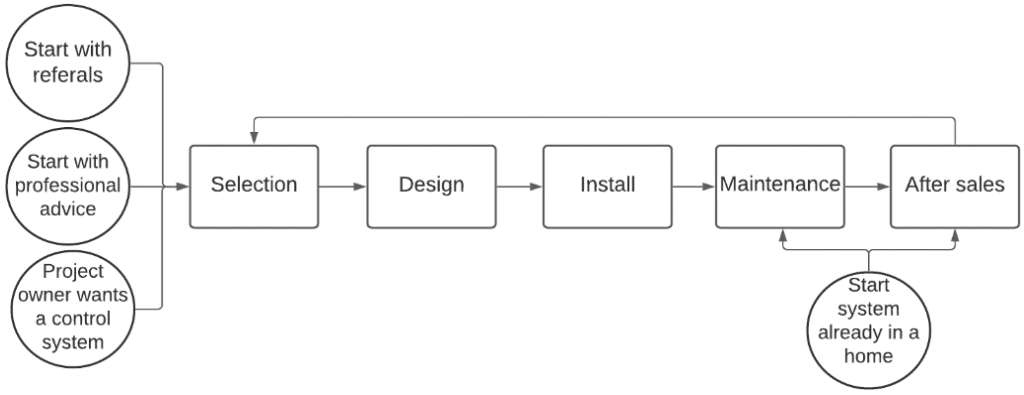

Figure 5: High-level customer journey

We divided the customer journey into five high-level phases to structure the approach. The five phases are as follows: (i) the selection phase, in which the customer chooses Sentio as their new indoor climate control system, (ii) the design phase, in which the customer selects the components of the product, (iii) the installation phase, (iv) the maintenance phase, in which customers can ask questions or identify problems and, last, (v) the aftersales phase, in which the customer may request new components for their system. All the customer journeys include these five phases, as can be seen from Figure 5. The following sections describe the four customer journeys in greater detail. We collected the data by conducting 18 one-hour interviews with stakeholders from different countries.

Customer journeys that commence through referrals are visualised in Section 2.1.1. The remaining three journeys are visualised in Appendix D.

2.1.1. Customer journey that commences through referrals

The customer journey of Sentio by can begin with a referral: the customer has seen the Sentio brand somewhere and develops an interest in the product, or they have seen an IDC system offered by a competitor and wish to compare it to Sentio. The latter scenario may occur because the customer wants their house to be more comfortable or more energy efficient. Figure 6A and Figure 6B show a flowchart of the whole journey. In Figure 6A, the green circle is the customer's starting point, the red circle is the end of the customer journey, the blue boxes are points of interaction with Wavin, and the yellow boxes contextualise the journey of the installer within that of the end customer. Not all of the end points are included in the figure because the customer can obviously leave the journey at any time. This section describes the five phases of the referral journey in greater detail because that journey is the most basic and thus serves as a useful comparator.

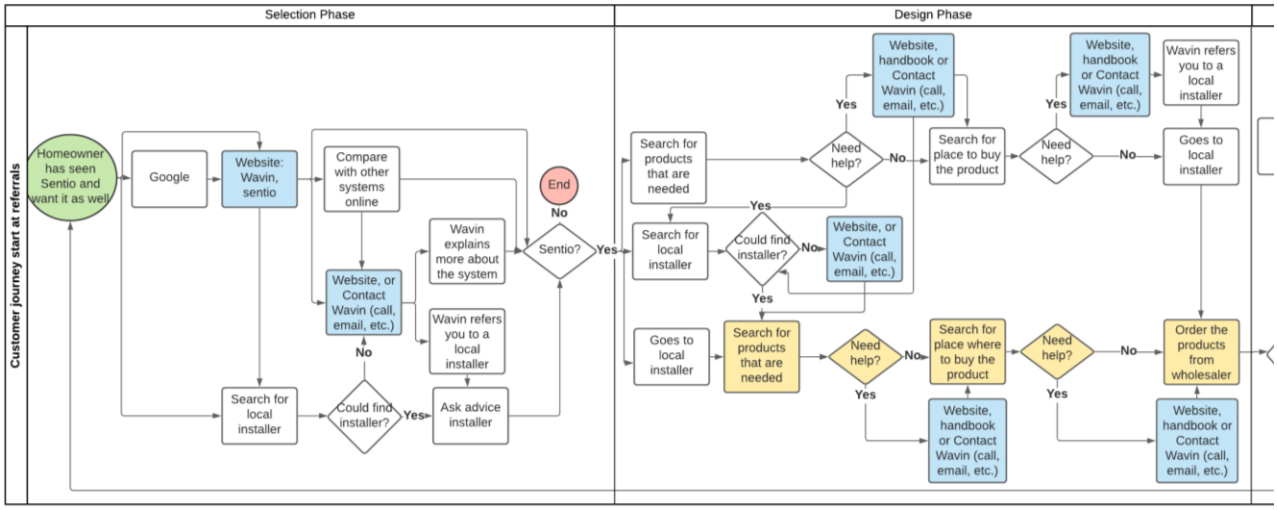

Figure 6A: The first two phases of the end customer journey of Sentio, (homeowner has seen Sentio and wants to purchase it)

Selection phase

Most customers enter the selection phase by searching for more information about Sentio on the internet or by seeking out a local installer. Figure 6A shows that when customers use the internet, they start on Google or they proceed to the Wavin website immediately. Therefore, most customers obtain their impression of the product on the Wavin website. Having acquired this impression, the customer can decide whether to terminate the journey or to seek additional information. Most customers who choose the latter option require information that they fail to locate on the Wavin website. To discover that information, the customers may search the internet, go to a local installer (possibly with the help of Wavin) or contact Wavin directly. The frequency with which each of these alternatives is chosen varies by country, for reasons that will be explained in Section 2.2. Questions about price, features and compatibility may emerge. The different means of contacting Wavin are described more extensively in Section 2.2. This phase ends when the customer settles on Sentio as their new IDC system, when the journey continues, or when the customer decides against purchasing a Sentio product, in which case the journey ends.

Design phase

The components of the system must be chosen in the design phase. Since their selection is rather complex, context specific, knowledge intensive, and not a lot of information can be found on the website, many customers demand personal advice. Most of these customers will retain or attempt to retain the services of a local installer. However, the number of do-it-yourself customers is increasing. Do-it-yourself customers usually need advice and contact Wavin in this phase. They may require assistance to locate a wholesaler that stocks the product or a good installer in their vicinity. The installers can, of course, have the same questions. Figure 6A shows this phase of the journey, too.

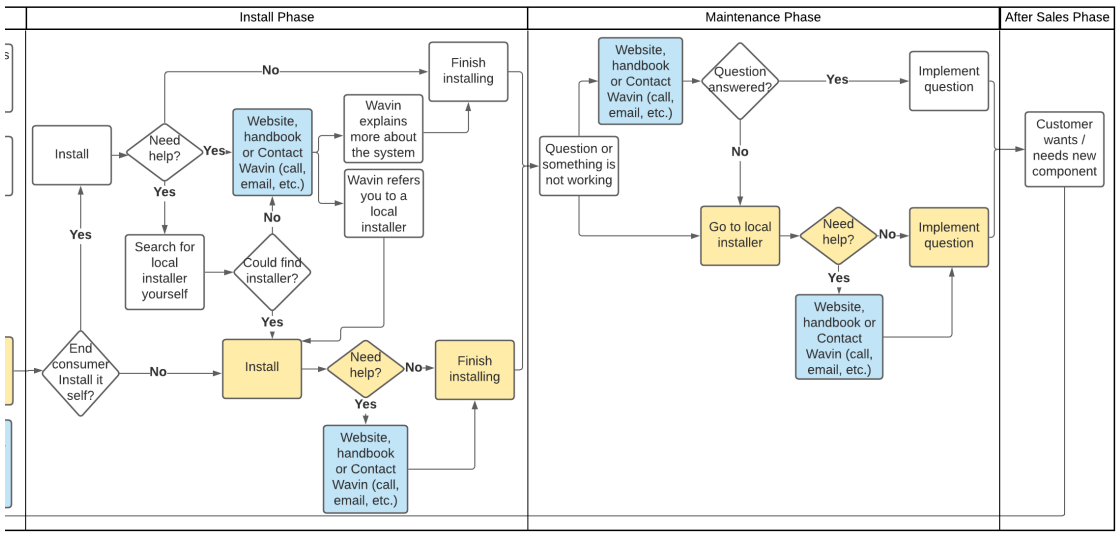

Figure 6B: The last three phases of the end customer journey of Sentio (homeowner has seen Sentio and wants to purchase it)

Installation phase

Many customers hire an installer because of the complexity of installation. In such cases, the end customer does not demand contact with Wavin, but the installer might. However, as mentioned earlier, do-it-yourself installations are growing increasingly common, and those who perform them may have installation questions for Wavin. As Figure 6B shows, if they discover that they lack the requisite expertise, they can still try to find an installer and might require Wavin's assistance to identify one. When the product is installed, those customers proceed to the maintenance phase.

Maintenance phase

In the maintenance phase, the customers can have all kinds of questions, such as what to do when the system is not heating or what is the meaning of the flashing light, or they might want to adjust the heating settings and find themselves unfamiliar with the process. Depending on the kind of question and its urgency, these customers may consult the Wavin website, go to an installer immediately or call Wavin. The choice between calling Wavin or an installer is specific to each case, and it is explained in greater depth in Section 2.2. Customers who decide to contact an installer instead of Wavin will not demand contact, but the installer might.

Aftersales phase

Finally, in the aftersales phase, the customer can ask questions about ordering replacement parts or the launch of new components. The customer journey recommences at this point, and the customer re-enters the selection phase.

2.1.2. Customer journey that commences with professional advice

The Sentio customer journey may also begin when the customer receives professional advice. For example, the customer may wish to purchase a new IDC system because their old system is broken or because they want additional features. Typically, the customer seeks (local) professional advice, for example from an installation or construction company. The customer journey begins if that company recommends Sentio. Alternatively, the customer may have a professional on site because they are renovating other parts of their property. That professional may advise them to install a new IDC system, such as Sentio. Figure 24 in Appendix D shows the whole professional advice journey of the customer. It is almost identical to the referral journey presented in Figure 6. The most significant difference is that when the journey begins with professional advice, the customer does not search for a local installer to receive information on control systems. Moreover, in the professional advice journey, the customer knows that a professional is available to answer their questions, as are Wavin staff. This is not always the case in the journey that starts with referrals. Therefore, the professional advice journey demands less personal contact with Wavin.

2.1.3. Customer journey that commences with a pre-installed Sentio system

This customer journey starts when a customer moves to a home where Sentio has already been installed, which is common at large residential developments and at private houses. This customer journey is almost the same as the referral customer journey from Figure 6. The most significant difference is that in the pre-installed system journey, the customer skips the selection phase and begins with the maintenance or the aftersales phase. Figure 25 in Appendix D presents the journey in its entirety. The customer might not know the identity of the installer or the type of system that they installed. Therefore, there is a larger probability that the customer will call Wavin when questions arise or when they need help from Wavin to find an installer.

2.1.4. Customer journey that commences with renovation project (not end customer's choice)

In this case, the landlord or project owner wishes to carry out renovations and decides to install new IDC systems. The installation is not the result of a choice made by the end consumer, who may meet it positively or negatively. This journey is analogous to that which commences with professional advice. However, it is the developer rather than the consumer who contacts Wavin or an installer. The project owner might have worked with Sentio frequently in the past. Therefore, Wavin may be required to give less advice than when the journey begins with end consumers. Moreover, if the project owner asks for advice from Wavin, their enquiry often concerns many systems. The end customers enter this journey if they have questions about maintenance or aftersales. They can either contact the project owner or Wavin. Their choice between these alternatives often turns on context and the type of question. If the project owner cannot help the end customer, they will contact Wavin or a local installer. Overall, this journey seldom necessitates much contact between end customers and Wavin. Figure 26 in Appendix D depicts the journey in detail.

2.1.5. Conclusion

In conclusion, in all four journeys, there are ten points at which the customers can demand contact with Wavin. Those points are depicted by the blue boxes in Figure 6. There are seven different types of questions, which recur in each journey. However, in each journey and in each journey phase, there is an important distinction between consumers who address their questions to installers and consumers who address their questions to Wavin. The journey that commences with a referral generates the highest demand for contact with Wavin. Conversely, the renovation project journey

that is not the end customer's choice demands the least amount of interaction. Remarkably, the likelihood that the customer will contact Wavin (rather than the installer) in the maintenance and aftersales phase is the highest in the pre-installed system journey. The next sections provide additional explanations of the customer journey and the volume of telephone calls to Wavin.

2.2. JOURNEY OF A QUESTION FROM THE END CUSTOMER TO WAVIN

There are different ways in which the end customer can have their questions answered. In the previous section, there is pointed out that much depends on whether the customer addresses their questions to an installer or Wavin quickly. The customer's decision depends on many factors. In some countries, it is more common to go to a local installer. In other countries, clients try to arrive at their own answers. Do-it-yourself customers, however, also need assistance from Wavin. Furthermore, it can be difficult to find a well-qualified installer in some regions. Sometimes, the installer cannot solve the customer's problem. Customers who find themselves in that situation contact Wavin to obtain additional information. Since the purpose of this thesis is to optimise interactions between end customers and Wavin, we will explain how customers contact Wavin in this section. Figure 7 depicts the whole journey of a customer who wishes to ask Wavin a question.

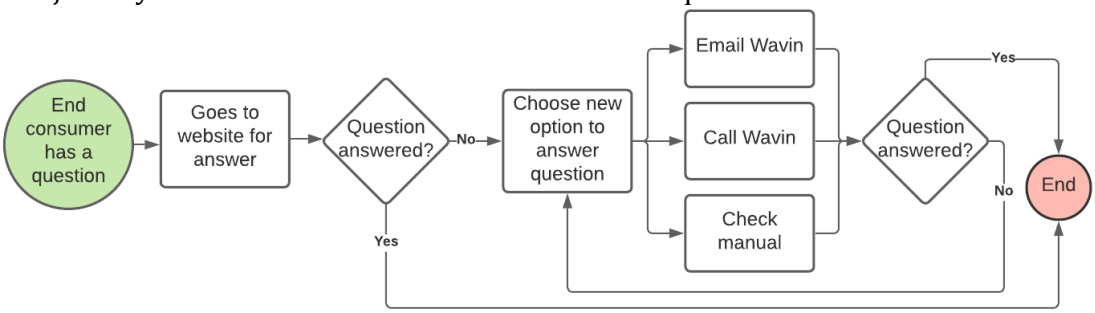

Figure 7: Journey of end customer who wishes to ask Wavin a question

Customers decide how to obtain answers to their questions from Wavin. They can access the website, read the manual, send an e-mail or make a telephone call. All options entail using the website: it contains the manual, the e-mail address and the telephone number, alongside information about Sentio. Even if the customer's original intent was to make a telephone call, the procedure nudges them toward the website. If they can find the information that they need quickly, the telephone call might prove redundant. If a customer cannot find the information that they need on the website or if they refuse to engage with it because they deem it unstructured, they have to choose another option, be it making a telephone call, sending an e-mail or reading the manual. This decision depends per culture, situation, and question. If a customer is a do-it-yourself enthusiast, there is a high likelihood that they will first check the manual or the website. If their question concerns a small issue, such as a flashing light, system information or a particular heating setting, they might attend to it themselves first. However, if external temperatures are freezing and the heating system is malfunctioning, the customer is likely to want it fixed as soon as possible, and there is a large probability that they will call Wavin immediately. Every failure increases the likelihood of a call or an e-mail to Wavin while causing customer experience to deteriorate. Chapter 4 discusses customer experience in more detail.

2.3. ONLINE JOURNEY OF THE END CUSTOMER

This section discusses the online journey of the end customer. Figure 7 shows that all customers that want their questions answered by Wavin begin the search process on the Wavin website. Therefore,

it is interesting to know who they are, what kind of information they seek and whether their visits to the website are fruitful. In 2019, Wavin monitored the performance of its website with the help of MetrixLab, a Macromill Group company. This research supplied quantitative and qualitative insights about actual website visitors. The results were obtained through an online survey on several Wavin websites. Appendix E elaborates on the purpose of that research and its conduct (Macromill Group, 2019).

Types of website visitors

The research showed that 83% of website visitors were incidental (Macromill Group, 2019). Therefore, there are limited opportunities to become familiar with the website. It can be inferred that good usability is essential. In addition, the Wavin website can expand the customer base because, on average, 60% of visitors are not (yet) Wavin customers, and two-thirds of visitors are responsible for purchase decisions at a company (Macromill Group, 2019).

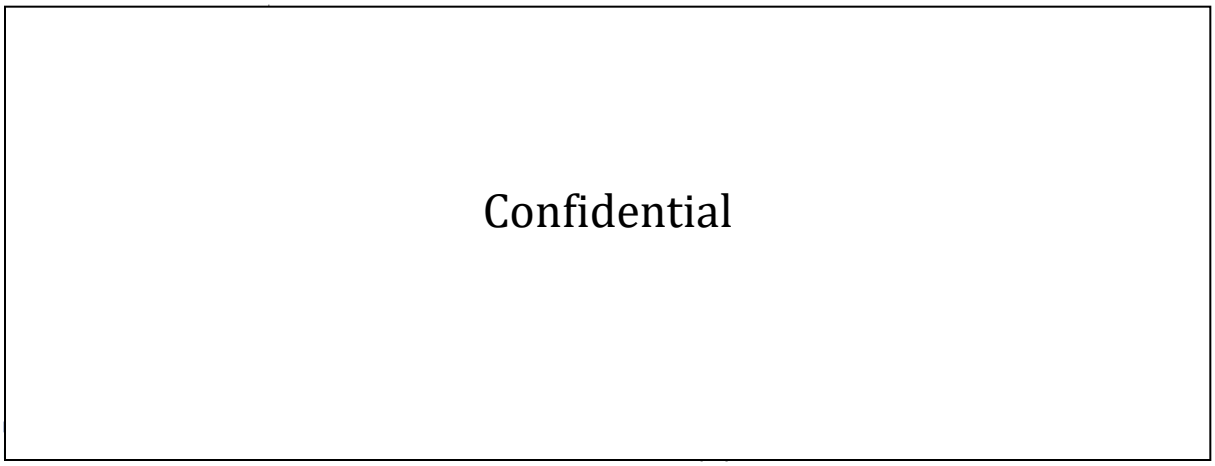

Figure 8: Background of visitors to the Wavin website (Macromill Group, 2019)

Figure 8 shows the types of visitors that the Wavin website attracts in each country. Engineers, installers, contractors, merchants, architects and investors are the leading target groups. However, on average, only 63% of website visitors belong to these groups, and 18% are homeowners (Macromill Group, 2019). In the instant study, we showed that Sentio is a product that attracts more homeowners than other products of Wavin. It is thus likely that more than 18% of visitors to the Wavin Sentio webpage are homeowners. A relatively high proportion of Danish visitors are homeowners. In general, sales of Sentio products in Denmark are the highest. There might be a correlation between the percentage of homeowners and the percentage of Sentio sales, but there is no hard proof of its existence. The website was not designed specifically for homeowners, even though they account for a significant proportion of total visitors.

Reason for website visit

Figure 27 in Appendix E shows that, on average, 63% of visitors to the website access it to obtain information about products, services and solutions (Macromill Group, 2019). Visitors also search for documents, prices and the contact details of Wavin. Most information searches concern products. This is a point of commonality in all countries. However, in Poland, a relatively large share of the visitors examine prices. Given that most visitors are looking for information, improvements to the online customer journey are likely to have a significant effect on performance.

Website performance

Only 40% of website visitors find what they are looking for, of whom 55% report that they navigated the search process easily (Macromill Group, 2019). Figure 28 in Appendix E shows the root causes of unsuccessful visits by country. On average, 35% of visitors cannot find the content that they are looking for. This proportion is exceptionally high in Germany and Denmark (Macromill Group, 2019). In addition, 13% of visitors find the content of the website to be incomplete (Macromill Group, 2019). This can be the result of missing or inaccessible information. These thwarted visitors are more likely to visit the website of a competitor and to choose another vendor. Figure 30 in Appendix E shows the user experience index for the website in each country in greater detail. What can be concluded is that the Italian user experience is exceptional and that user experience in Poland and Denmark can be improved the most. In all of the countries under observation except Italy, there is a general perception that the content of the website is incomplete and not up to date.

2.4. JOURNEY OF AN END CUSTOMER WHO MAKES A TELEPHONE CALL

When the end customer decides to call Wavin, there is a whole journey with different phone numbers, departments and employees that the customer must navigate to reach an individual who can answer their questions. This journey is different in each country. It depends on which departments operate in a country, which telephone numbers are published on the website and who the customer will be directed towards. An example with three different countries will be explained below. We elicited this data from comprehensive interviews with staff of the different countries.

Figure 9 shows the journey of Italy. The journey differs in every case and, most of the time, a customer will skip some of its phases. Individual journeys can begin at different phases, too. The most common journey is visualised through the bolded boxes and the least typical phases are visualised through dotted boxes. All options are visualised in Figure 9. In Italy, most customers call their local customer service office. They can find its number on their local Wavin website. However, if they did not access the country-specific website, they call the Wavin global office and are then redirected to the local customer service office. This is a relatively infrequent occurrence. In very few cases, customers call the Wavin local office instead of the local customer service office and are then redirected to the latter. However, this happens rarely because the telephone number of the Wavin local office is difficult to find. Most of the time, the local customer service office cannot answer technical questions about Sentio, and they redirect the customer to the local technical assistance centre. In many cases, the local technical assistance centre can answer the questions. If it cannot, the questions are referred to the local technical specialist. In rare cases, they cannot answer the questions and seek the advice of the global technical specialist. In addition, if an installer wants to direct a customer to Wavin, they almost always instruct them to contact the local technical assistance centre. Therefore, Italian customers are redirected at least once in most cases. Sometimes, they are redirected three or more times.

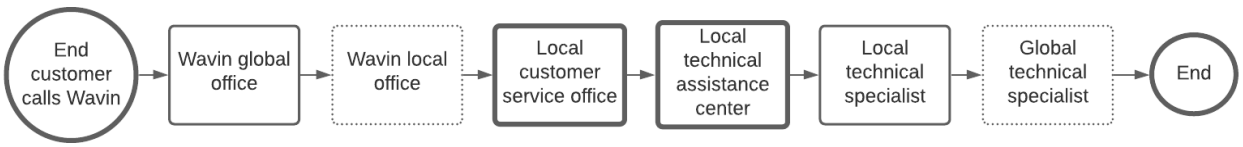

Figure 9: Journey of an Italian end customer who makes a telephone call

Figure 10 shows the same journey in the Baltics. Again, the journey differs between cases. The most common journey is visualised through the bolded boxes and the least typical phases are presented in the dotted boxes (Figure 10). Most customers join the journey by calling the Wavin local office

because its telephone number is easy to locate. An administrator receives the call. They can rarely answer the question and therefore redirect the customer to the sales and marketing department or to the local technical specialist, depending on the questions. Often, the customer does not explain the problem well and the administrator refers them to the wrong individual. The telephone call is then received by the wrong salesperson, and they have to redirect the customer once more. Alternatively, a call may be misdirected to the local technical specialist instead of the sales department. When a salesperson cannot answer a technical question, they will seek the advice of the local technical specialist and then try to answer the question themselves. The idea is to enable them to answer the next query unaided, but whether this procedure is actually followed depends on the urgency of the question. If the local technical specialist cannot answer the question, they consult the global technical specialist, an infrequent occurrence. In the Baltics, calls are often directed to the wrong department twice. However, the sales and marketing department is learning from the technical department, enabling it to resolve more queries.

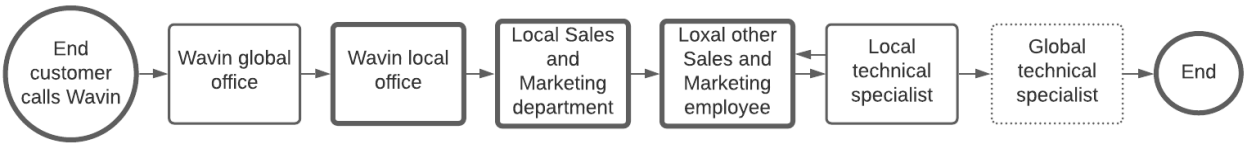

Figure 10: Journey of an end customer in the Baltics who makes a telephone call

Figure 11 shows the journey of an end user who makes a telephone call in the Netherlands. The visualisation of this journey is the same as those of the journeys described above. In the Netherlands, most of the telephone calls are directed to the local technical specialist. All departments are familiar with this practice and revert to it almost immediately, with the exception of the Wavin global office. If the local technical specialist cannot answer a question, they will ask the global technical specialist for advice, which happens rarely. As a result, the customer is almost always redirected only once. This can be seen as a desirable outcome. However, the technical specialist is not the one who usually answers customer questions. Customer service is not part of their job description, and they have no time for customer support activities.

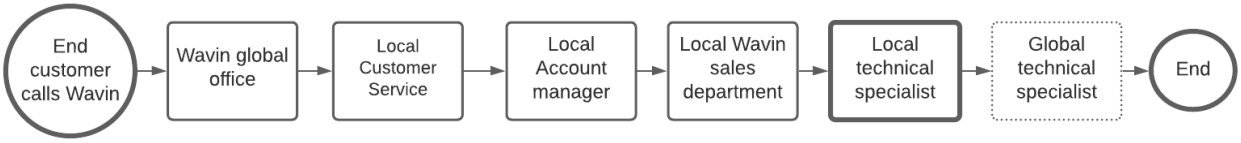

Figure 11: Journey of a Dutch end customer who makes a telephone call

Across the companies, end customers are redirected on multiple occasions, and their telephone calls are often answered by individuals who are not responsible for customer queries.

2.5. KPI PERFORMANCE

We identified five KPIs to measure the current performance of Wavin. The first is the number of telephone calls per country and per season. This research aims is to improve the efficiency with which Sentio-related telephone calls are processed. Therefore, it is good to determine how many telephone calls are received currently, which may can be reduced. The next two KPIs concern customer and employee experience of telephone calls in each phase of the customer journey. This information is necessary: if both customers and employees have positive experiences with telephone calls, reductions in volume or improvements in quality would not be exigent. Of course, positive telephone experiences also bolster Wavin's reputation. The last two KPIs are the frequency and

duration of the telephone calls in each phase of the journey. Measurement of this KPI can identify the phase on which the solution would have to focus. Improvements to the efficiency and effectiveness of the processing of telephone calls that occur often and take up the most time would affect the total volume of telephone calls more than improvements to the processing of queries that occur infrequently. Overall, the KPIs focus on performance in telephone calls made by Sentio end customers to Wavin. Actual performance is discussed below.

Table 1: Amount of telephone calls about Sentio per country per season

	Telephone calls per month during heating season	***Telephone calls per month outside of heating season***	***Percentage of total Sentio sales***
UK ***Italy*** ***Netherlands***	Confidential		

Table 1 shows the number of telephone calls that Wavin receives in three different countries. Most telephone calls with end consumers last for 30 minutes, with some extending to an hour. We collected this data by having Wavin employees record the number of telephone calls that they received from Sentio end customers every day over a month. We compared averages across seasons and adjusted this number were necessary. The numbers vary considerably across countries. The difference between Italy and the Netherlands can be explained by differences in sales volumes. The Netherlands accounts for twice as many sales as Italy, and the number of telephone calls during the heating season is also twice as high. UK is generally experienced with climate control systems. The customer service department performs well, and the UK website is customer friendly. These factors may explain the low number of telephone calls relative to sales. The figures also show that the volume of telephone calls is strongly seasonal. During cold periods, more individuals use their thermostats, and they appear to formulate more questions. The potential website improvements discussed in Chapter 5 could reduce the number of telephone calls from end customers.

Table 2: Frequency of Sentio-related telephone calls

	Question topic	***Frequency (1 to 5)***	***Duration (1 to 5)***	***Average***
1.	Installation	3.6	3.5	3.6
2.	System selection	3.5	3.4	3.5
3.	Product selection	3.2	3.5	3.4
4a.	Maintenance	3.2	3.2	3.2
4b.	Aftersales	3.0	3.2	3.2
6.	Finding an installer	3.1	2.6	2.9
7.	Product sales location	2.6	2.5	2.6

As mentioned earlier, Sentio customers ask seven types of questions. The types are presented in Table 2. We collected this data from the 22 interviews with Wavin employees from different departments and countries who receive telephone calls from end consumers daily. A Likert scale was used to capture frequency and duration. Because sales volumes differ among countries, five telephone calls that take 30 minutes each can be seen very taxing in some countries but not in others. The Likert scale enabled us to understand the average experience and the duration of the telephone calls in each phase better. The scale runs from 1 to 5. The values correspond to “never”, “rarely”,

"occasionally", "frequently" and "very frequently". The scale was designed to measure attitudes, opinions and perceptions (Jamieson, 2013). The second column shows the average scores of telephone calls on each topic in all of the countries that sell Sentio. Installation questions occur with the highest frequency, followed by questions about selecting an IDC control system. Questions about locating a store that sells Sentio are the most uncommon. The third column shows the average duration of the telephone calls , as rated by the employees in all the countries. Remarkably, the most frequent questions also take the longest to answer, and the most uncommon question appear to have the shortest answers. The final solution should focus on the most common telephone calls that take up the most time. Chapter 4 examines the content of the questions in greater detail.

Table 3: Customer and employee experience of Sentio-related telephone calls

	Questions about	Customer experience (1 to 5)	Employee experience (1 to 5)	Average
1.	Product selection	2.9	3.3	3.2
2.	Product sales location	3.2	3.6	3.4
3a.	System selection	3.5	3.5	3.5
3b.	Finding an installer	3.7	3.2	3.5
5a.	Installation	3.3	3.8	3.6
5b.	Maintenance	3.5	3.7	3.6
7.	Aftersales	3.8	3.8	3.8

Table 3 shows how end customers and Wavin employees experience telephone calls. The results are reported as averages on a per-country basis. The second column shows customers' rating of their experience on a Likert scale and by topic. The data was also collected from the same 22 interviews. Customers' experience of product selection conversations appears to be the most negative. Aftersales conversations are associated with the most positive customer experience rating. The third column presents the results on employee experience. The most negative experiences are associated with questions about finding an installer and product selection. The most positive experiences stem from conversations about aftersales and installation. Customer and employee experience differ occasionally. Given that both are as important, Table 3 also presents averages. On average, the most positive experiences are associated with aftersales, and the most negative experiences are associated with product selection. Chapter 4 explores customer and employee experience and the resultant opportunities in greater depth.

2.6. CONCLUSION

This chapter overviewed the current (online) customer journey and its performance. Section 2.1 described the current customer journey, and Section 2.3 described its online counterpart. Section 2.5 described the current KPIs in place. There are four different ways to join the Sentio customer journey. The journeys can be divided into five phases. In all these phases, customers ask different questions. The intensity of demand for contact differs between questions. Only 40% of website visitors find what they are looking for. Telephone calls are redirected on multiple occasions. The frequency and the duration of the calls and the experiences of employees and customers vary depending on the question and the phase of the customer journey. Chapter 4 concerns experience and opportunities in different phases of the customer journey.

3. VISUALISING CUSTOMER EXPERIENCE

In this chapter, we review the literature on customer journey mapping methods to answer the second research question, *"According to the literature, what is the best alternative to visualize the customer's experience in a customer journey map for Wavin?".* The relevant methods vary in their complexity. Their advantages and disadvantages are discussed in this chapter. Eventually, the best choice for Wavin will be explained.

Given the aim of this thesis, it is imperative to discover how the company scores on specific journey elements and how the customers experience them. Customer experience can be observed easily through customer journey maps, as can points of weakness. Consequently, upon improvement, the company can identify bottlenecks and the most significant sources of added value. As noted previously, most customer journey maps are used to visualise customer experience. Often, they take the form of diagrams that contain different stages of the journey, user actions and emotions. Some diagrams also display the touchpoints between the user and the system, that is, points in space and time where interactions occur. Section 3.1, Section 3.2 and Section 3.3 discuss different customer journey mapping methods. Section 3.4 identifies the best customer journey mapping method for Wavin.

3.1. METHOD 1: BASIC METHOD

The first method to consider is one of the earliest customer journey mapping methods (Crosier & Handford, 2012). Companies use it to improve their understanding of consumer motivations and behaviours. This method maps the experience of customers when they encounter a service or set of services. It considers what happens to them and their responses (Crosier & Handford, 2012). The principal output of this type of customer journey mapping is an easy-to-read graph that pinpoints areas where change is necessary. Typically, the graph has two axes. Time (throughout the journey) is depicted on the x-axis, and emotional responses are depicted on the y-axis. A process map of the customer actions can be overlaid onto this simple framework. Figure 12 shows the final map, including the emotional peaks and troughs of the journey.

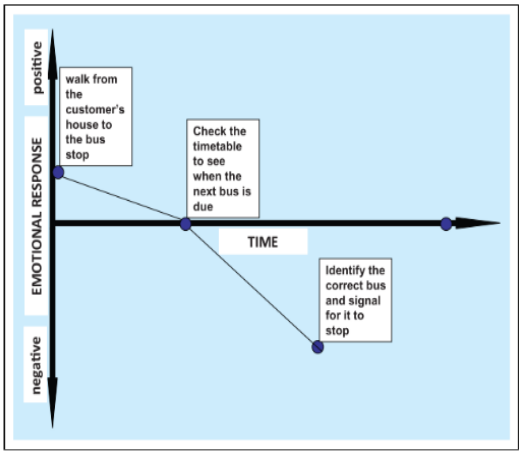

Figure 12: Method 1: Customer journey map (Crosier & Handford, 2012)

This type of customer journey mapping is used to document and understand the different steps in an individual's journey. It is ideal for identifying glitches in the service process as well as elements that function well. Areas that merit attention can be highlighted quickly. Consequently, those who oversee the journey can direct their efforts at areas where change is required to improve the quality of the experience.

3.2. METHOD 2: SEPARATE TOUCHPOINT TABLE

The second method identifies the lifecycle phases of the consumer's journey, the points of contact between customer and company, such as systems, products and services (touchpoints), and the emotions that may predominate in each of the stages (Schulze Kissing et al., 2019). Customer experience is divided into five types: the sense phase, the feeling phase, the thought phase, the action phase and the relative phase (Schulze Kissing et al., 2019). They manifest with varying strength throughout the customer journey, generating both positive and negative perceptions. To understand what customer experience means better, we had to consider all stages that the customer encounters. The stages and the experience types are covered by the customer lifecycle: the stages are divided into four phases, namely the acquisition phase, the loyalty phase, the reactivation phase and the winning-back phase (Schulze Kissing et al., 2019).

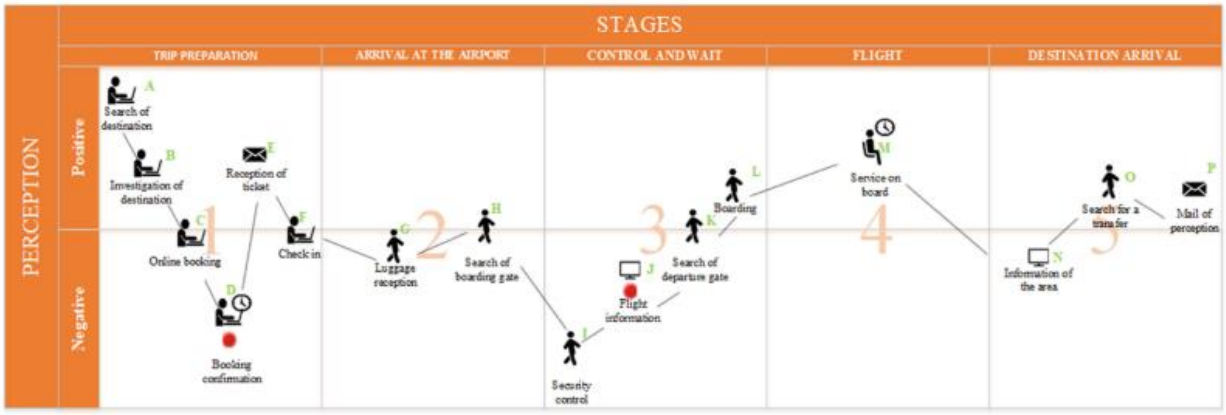

Figure 13: Method 2: Customer journey map (Schulze Kissing et al., 2019)

Figure 13 describes the customer journey map. It identifies stages, touchpoints and perceptions that relate to customer experience. A separate touchpoint table is presented alongside the visual customer journey map and customer emotions. Touchpoints correspond to any interaction that might alter how a customer feels about a product, brand, business or service (Schulze Kissing et al., 2019). The columns in Table 4 present the touchpoints that define the customer journey map for each stage.

Table 4: Touchpoints (Schulze Kissing et al., 2019)

Trip preparation	Arrival at the airport	Control and wait	Flight	Destination arrival
Company web sites	Word of mouth	Events	Gift	Discount
Price comparison	Display	Display	Catalogues	Newsletter
Word of mouth	Sponsor ship		Promos	Loyalty program
Email	Sales person			
	Packaging			

3.3. METHOD 3: USER BEHAVIOUR, NEEDS, PAIN POINTS, AND OPPORTUNITIES

The third method combines user behaviour, user needs, user pain points and opportunities in a single map (Wang & Wu, 2020). The journey of the customer is divided into rough phases. User behaviour in each phase is described in a few sentences. The customer's emotional experience of that phase is displayed in a graph. The user needs that correspond to the phase are outlined briefly, too. The key pain points in each phase are also described so as to highlight areas for improvement in the design of the product. Once the pain points have been highlighted, opportunities can be described easily.

Figure 14 shows the complete user journey. The map presents the concerns and needs of customers in each phase of the journey clearly.

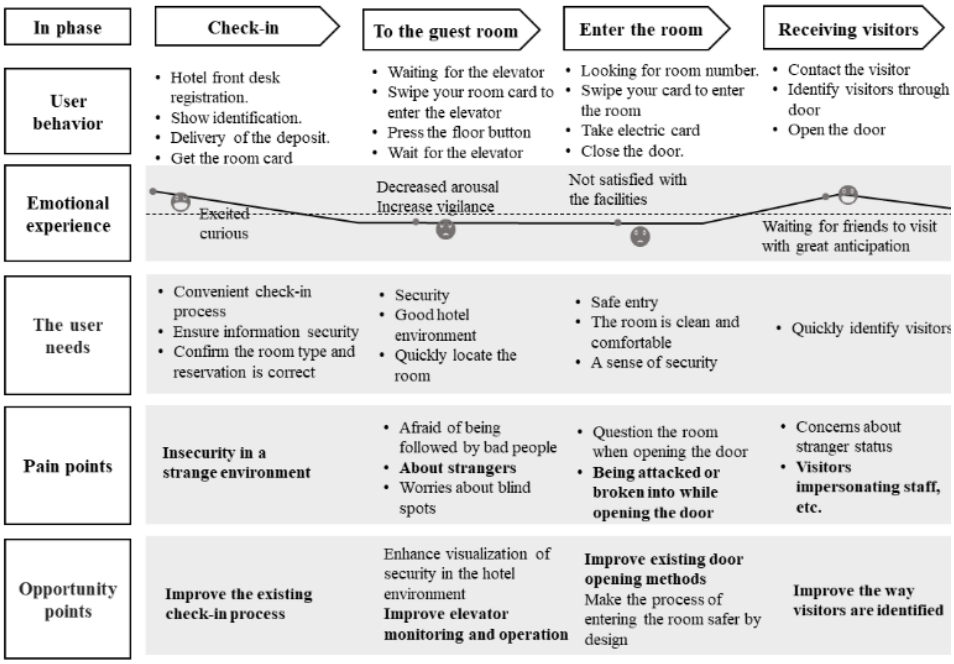

Figure 14: Method 3: Customer journey map (Wang & Wu, 2020)

3.4. SELECTION OF CUSTOMER JOURNEY MAPPING METHOD

The third method, which was discussed in Section 3.3, is the best fit for Wavin, with some minor additions. The first method (Section 3.1) produces an easy-to-read graph and represents the customer experience well. It is ideal for identifying the glitches in the service process, as well as elements that function adequately. However, Wavin also wants to remedy those glitches. Therefore, it is necessary to describe user behaviour, user needs, pain points and opportunities comprehensively. The map produced by the first method is insufficient for this purpose.

The benefit of the second method (Section 3.2), relative to the third, is that the customers' touchpoints are visualised. However, in the case of Wavin, it is difficult to visualise the different phases. Therefore, the second method is not ideal for Wavin. Moreover, the touchpoints are displayed in a separate table, which is suboptimal. The third method has the added advantage of presenting user behaviour and experience alongside needs, pain points and opportunities.

For these reasons, the third method fits Wavin best. The employees' experience of answering telephone calls might affect customer experience. This feature of the problem is considered, too, as can be seen from the final customer journey map. Another point is that we want not only to improve customer experience but also to make interactions between Wavin and its customers more effective and efficient. Therefore, it is crucial to know how often some telephone calls occur, how long they take and how the process can be improved. Therefore, two rows are added to the customer journey map, namely the frequency and duration of direct contact.

Figure 15 shows the final customer journey map. One column displays examples. Again, we used a Likert scale (Jamieson, 2013). Experience in each phase is described on a numerical scale, from 1 to 5. The available answers to frequency questions are "never 😀", 'rarely 🙂", "occasionally 😶", "frequently 😟" and "very frequently ☹". Experience can be "very poor ☹", "below average 😟", "average 😶", "above average 🙂" or "excellent 😀". Glitches and elements that function well can be seen

in the customer journey map, as can user needs, pain points and opportunities. What is unique about this customer journey mapping method is that it also shows the experiences of employees and the frequency and duration of contact. Wavin can thus easily see what needs to be improved and how improvements can be made.

Phase	Every phase	Selction	Design
User behavior	- Go to website - Call or email Wavin		
Perception	Finding installer	Selection system	Selection products
Experience customer	☹ 1		
Experience Wavin	😕 2		
The user needs	Finding a good qualified nearby installer		
Pain points	No information on website, Wavin cannot find installers easy and fast as		
Opportunity points	List with installers on website of for employees, make calcified installers		
Frequency contact	😀 5		
Duration contact	😶 3		

Figure 15: Wavin's Customer journey map

3.5. CONCLUSION

This chapter described the different means of visualising the customer's experience in a customer journey map. The three different methods have different advantages and disadvantages. We combined their elements to develop a map that suits Wavin. Wavin's manager and the marketing department reviewed Figure 15 because they are its intended users. They think that the map is easy to read and that all important glitches and opportunities can be identified and discussed easily. Therefore, this map fits Wavin best.

4. THE CUSTOMER JOURNEY MAP OF SENTIO

This chapter describes performance in each phase of the current (online) customer journey. Section 4.1 concerns user behaviour, the user needs, pain points and opportunities. Then, user experience, employee experience, frequency of contact and its duration in each phase of the journey are graded. In Section 4.2, present the analysis of the content of the website in each country, and the different versions are ranked by performance. Section 4.3 answers the third research question "What is the performance of the current (online) customer journey?"

4.1. PHASES OF CUSTOMER JOURNEY

This section concerns user behaviour, needs, pain points and opportunities. User experience, employee experience, frequency of contact and its duration in each phase of the journey are graded. We collected this data by interviewing 22 stakeholders from different departments. The employees receive telephone calls from end customers daily. The interviews lasted one hour. The numbers in Figure 16 draw on Section 2.5. The information in question is used to decide which phase of the journey to focus on.

Phase	Every phase	Selction	Design	
User behavior	- Google, site Wavin - Ask seller, Wavin, dealer - Referrals	- Google, site Wavin -Call Wavin, (local) installer, wholesaler and compare systems	- Calls seller, dealer or installer - Google or site Wavin	- Call Wavin, site, manual - Call seller, installer, dealer
Perception	Finding installer	System selection	Product selection	Store location
Experience customer	3.7	3.5	2.9	3.2
Experience Wavin	3.2	3.5	3.3	3.6
The user needs	- Experienced installer - Help to find installer - Contact installer	- Product, Technical, Availability info - Personal expert advise - Why this brand?	- Info about components and how to choose - Clear answers	- Names of wholesalers - Easy findable contact and clear advise - Price comparison
Pain points	- No installer list on site - Hard to find experienced installer, with the right knowledge.	- Limited info of benefits system on site - Not know how easy it is to install - No personal support	- Hard to know which components are needed - Too less expert advice - Not enough information about components	- Takes long to get to the right place or person - No clear comparison sellers - Cannot find place to buy
Opportunity points	- Installer selection tool or list installers on site - Show them how easy it is to install themselves	- Good FAQ list on site - Better, easier manuals -Info in own language -More personal support -Virtual product / video - Free better brochures at sales points -Share reference project	- Product configurator - Info in own language - More comparison of different components -More detailed info & visuals - More end user friendly site, landing page + FAQ section	- Info how the sales of this product works - Application nearest seller and prices on website - Interested in product? Need support? Sections on site
Frequency contact	3.1	3.5	3.2	2.6
Duration contact	2.6	3.4	3.5	2.5

Phase	Install	Maintenance	Aftersales
User behavior	- Call Wavin, site, manual - Call seller, installer, dealer	- Call Wavin, site, manual - Call seller, installer, dealer	- Call Wavin, site, manual - Call seller, installer, dealer
Perception	Installation	Maintenance	Aftersales
Experience customer	3.3 🙂	3.5 🙂	3.8 🙂
Experience Wavin	3.8 🙂	3.7 🙂	3.8 🙂
The user needs	- Technical support - Simple and quick way to find answers - Easy manual	- FAQ list - Wavin contact person - Quick response and info -Replacement products	- Answer about function, installation or errors - Info easy way to solve problem
Pain points	- Manual is too big and in wrong language - Customers find it too complicated to install - Cannot find FAQ or Info	- Info not own language - Hard to find out what the problem is - Hard to find the right info	- They cannot find the videos and info needed
Opportunity points	- Simple and easy to find FAQ section - Smaller manual in own language - More video's and visuals for installation	- App for maintenance support - More video's & simple FAQ section - Smaller manual in own language - Better support section on website	- Smaller manual in own language - FAQ on Wavin site - Better to find videos - Site: Better support section, More info for end users
Frequency contact	3.6 😕	3.2 😕	3.0 😕
Duration contact	3.5 😕	3.2 😕	3.2 😕

Figure 16: Customer journey map

Finding installer

End users may need to find an installer in every phase of the journey, as shown in Figure 16. The user can try to find an installer on the internet by using Google or by visiting Wavin's website. They can also call their seller, Wavin, the wholesalers or other individuals whom they know. Overall, the end users experience this process positively, but the Wavin employees who receive the calls experience it more negatively than other phases. In this phase, the user needs to find an experienced installer with Wavin's help. The pain points are that the Wavin Sentio website contains no information about installers and that it is difficult for the customer and for Wavin to find or recommend an experienced installer. Relative to the other phases, the frequency of such questions is average. The calls are comparatively short. Still, customers and employees do not experience frequency and length positively.

The experience and the process can be improved by (i) placing a list of experienced installers on the Wavin website or (ii) placing an tool on the website to find the right installer. If these solutions are implemented, customers will be able to find the contact information of a reputable installer quickly

and might call them before they call Wavin, saving both their own time and that of Wavin. Wavin employees can also use this list of installers or the tool when they answer customer queries. More employees will be able to answer calls, and customers will be redirected less. Wavin can also show customers how straightforward the installation of the system is, prompting them to install it themselves.

System selection

In the selection phase, customers choose IDC systems. To choose, the user needs product information, technical information and information about the availability of the product. They also need to know why they should choose the Sentio brand, and they often require expert advice. Users try to receive answers to these questions by using Google, by visiting the Wavin website, by calling Wavin, by calling a (local) installer, by visiting a wholesaler that sells Sentio and by comparing Sentio to other systems. Both customers and employees have positive experiences of this process. Customers call Wavin for information very frequently, and the duration of the telephone calls is also long. The information about the benefits of Sentio on the website is limited. For example, customers are not informed that their indoor life will become more comfortable or that monthly heating bills will fall. Customers are also not told how easy the system is to install, and they do not receive personal support.

Improvements can be made by (i) by placing a helpful FAQ section on the Wavin Sentio website, (ii) making manuals shorter, better and easier to read, (iii) adding an easy-to-locate support section to the website, (iv) creating a virtual product or more videos, (v) having free, well-designed brochures at sales points and (vi) sharing more reference projects. Customers would then be able to explore product features and benefits by themselves and make decisions without calling Wavin. The information could also be used by the employees who answer calls. Answering questions would be easier, customers would be redirected less, and customers and employees would save time.

Product selection

In this phase, the user attempts to learn more about the different components of the system, and they must decide which components they want or need. Questions must be answered clearly. Customers seek information by using Google, by visiting the Wavin website, by calling the organisation that sold them the system, by calling Wavin, by calling wholesalers or by calling their installer. This phase is associated with the most negative user experiences. The experiences of Wavin employees are also very poor relative to the other phases. The employees field product selection questions frequently, and these calls are the longest. There is too little information about the different components on the website. Therefore, customers struggle to determine which components they need for their project. Expert advice is also hard to find.

It is possible to make improvements by (i) translating all the information on the website, (ii) providing a better comparison between the different components, (iii) providing more detailed information and better visuals, (iv) creating a more end user-friendly website, (v) improving the landing page and making information more accessible, (vi) adding a helpful FAQ section to the website and (vii) introducing a product configuration tool to the website. These improvements would make it easier for customers to find the information that they need. If the information is available and comprehensible, the customers will make fewer telephone calls, improving the experience of both customers and employees.

Product sales location

In this phase, the user needs to locate a store where they can compare prices and purchase the product. As shown in Figure 6, this phase only occurs when the end user installs the product without retaining the services of an installer. Such telephone calls are short and occur infrequently. Users try to obtain answers to their questions by calling Wavin, by using Google, by visiting the Wavin website, by consulting the manual or by calling an installer. Customer experience is generally negative, while employee experience is average. The pain points are that it takes too long to get to the right place or person to buy the product or tell where you can buy it. Next to this, you cannot easily compare the sellers.

The process can be improved by (i) describing the sales process on the website, (ii) adding a "need support?" section to the website, (iii) creating an "interested in…" section, and (iv) developing an online application that displays the nearest seller and prices. If customers understand the sales process, they will not attempt to purchase the product themselves and will contact installers instead. A support section or an "interested in…" section would enable customer queries to be forwarded to the correct department, improving experience and saving time. The same is true of adding a map to the website. If a map is introduced, many customers would not have to search for stores, and many would refrain from calling Wavin.

Installation

Customers in this phase are installing the system on their own and require installation support. They need a quick and straightforward way of obtaining answers, an easy-to-read manual and, potentially, personal technical support. The customers try to find answers to their questions by calling Wavin, by calling their seller, by calling an installer, by calling a dealer, by visiting the Wavin website or by consulting the manual. Customer experience is average, and employee experience is positive relative to the other phases. Questions occur most frequently in this phase, and the duration of the telephone calls is the highest. Often, users cannot use the manual because it is not written in a language that they speak, because it is too long or because they find it overwhelming. In addition, they struggle to locate the information that they need, and installation is often beyond them.

The avenues for improvement include (i) placing a simple and easy-to-locate FAQ section on the website, (ii) writing shorter manuals in multiple languages, (iii) creating more visuals and videos for installation support and (iv) introducing a support section to the website. When the website is improved with more visuals and a better FAQ section, customers can solve their issues with greater efficiency. If the support section is easy to find, the customer can reach the correct individual immediately, and they would not need to be redirected. Customer experience would improve, and Wavin would save time.

Maintenance

Customers often have maintenance questions. They try to obtain answers to these questions in the same way as with installation questions. Customer and employee experiences are both relatively positive. In this phase, customers need a comprehensive and accessible FAQ section, information on the website, a contact person from Wavin who responds quickly and information about replacement products. The frequency with which such calls occur is average, as is their duration. The pain points involve difficulties in identifying problems and locating the necessary information, as well as localisation issues.

Improvements can be made by (i) adding a maintenance support section to the Sentio app, (ii) introducing a better general support section to the Wavin Sentio website, (iii) adding more maintenance videos to the website, (iv) writing a simple FAQ section and (v) developing shorter manuals in multiple languages. If these improvements are made, the volume of calls is likely to diminish. Customer experience would improve. Wavin and its customers would save time.

Aftersales

The sources of customer information in the aftersales phase coincide with those in the installation phase. In the aftersales phase, customers need answers to questions about functions, installation or system errors. Adequate information is essential. Both Wavin employees and end customers experience this process positively. The frequency and duration of the calls are both average. Customers struggle to find the information and the videos that they need.

Plans for improvement should circle on (i) shorter manuals in multiple languages, (ii) an improved FAQ section, (iii) more accessible videos on the website, (iv) a better support section and (v) more information for end-users online. If these improvements are made, customer and user experience will improve, and the volume of telephone calls will decrease.

4.2. WEBSITE CONTENT ANALYSES

In Chapter 2, we explored the phases in which a customer can call Wavin. In Section 4.1, we analysed the questions that are asked in these phases and the corresponding customer needs. By knowing what the needs are per phase of the journey, we checked whether the Sentio country websites contain sufficient information. If information about a journey phase is not on the website, customers are more likely to call Wavin. Table 5 overviews the scale used to assess the websites. The country-specific webpages are ranked from 1 to 5, in line with the scale described in the table. The Likert scale was used once more.

Table 5: Scale for rating the quality of Sentio webpages

Range	***Scale***	***Explanation***
No	1	No information is available.
limited	2	Some information is available.
Available	3	Information is available, but prior knowledge is necessary to understand it, or it is unclear. Alternatively, prior knowledge must be acquired from other websites.
Good	4	There is sufficient information to make decisions or to obtain answers to questions. However, the presentation of the information is not straightforward.
Very Good	5	The information is appropriate and presented in a straightforward way. Other countries can use the website as an example.

Table 6 shows an overview of the quality of the information available on the country-specific Sentio webpages.

Table 6A: Quality of information available on country-specific Sentio webpages

Country	Finding installer	System selection	Product selection	Product sales location	Installation	Maintenance
UK/global	1	3	3	2	3	3
NL	1	3	3	3	3	3
SE	1	3	1	1	3	3
DK	1	2	3	1	1	1
NO	1	1	1	1	1	1
TR	1	3	1	1	1	1
FR	1	2	1	1	1	1
IT	1	3	3	1	3	3
CZ	1	2	1	1	2	1
HU	1	4	2	1	2	1
LT	1	5	1	1	3	3
PL	1	5	1	5	3	3
Average	1	3.3	1.9	1.7	2.4	2.2

One result that stands out in Table 6A is that information about finding an installer is not available on any of the country-specific websites. Information about selecting products, finding a store and maintenance is also scarce. The Polish website can be used as an exemplar in the system selection and store location phases.

Table 6B: Quality of information available on country-specific Sentio webpages

Country	After sales	Support	Videos	FAQ	Average score	Views over 6 months	AVG time in sec
UK/global	1	1	**5**	2	2.4	Confidential	
NL	1	3	4	2	2.6		
SE	1	4	3	1	2.1		
DK	1	2	1	1	1.4		
NO	1	1	1	1	1		
TR	1	1	1	1	1.2		
FR	1	2	1	1	1.2		
IT	1	2	4	2	2.3		
CZ	1	2	2	1	1.4		
HU	1	1	2	2	1.7		
LT	1	1	4	1	2.1		
PL	1	2	4	1	2.6		
Average	1	2	2.9	1.5	2		

Table 6B shows that information about the aftersales phase is seldom available on the country-specific websites. The same is true of videos, the support section and the FAQ section. The video section on the global Sentio website is excellent and can be used as an exemplar. The last two columns

of Table 6B display webpage views over six months and the duration of the average visit to the website in each country.

Figure 17 is made to examine the potential correlation between the average score of a website, the number of views that it attracts and average visit duration. Evidently, content and views are not correlated. Average content scores and visit durations are closer to each other, but there is no strong correlation. The explanation is that multiple factors other than content influence the number and duration of website visits. The number of sales in a country is one example of such a factor. Culture can be a determinant of the time that a customer will spend on a website before making a telephone call to Wavin.

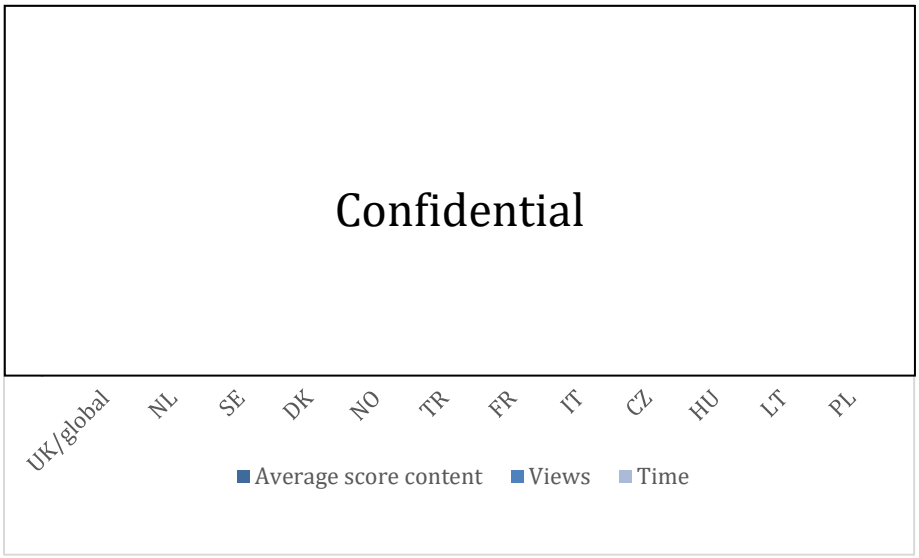

Figure 17: Analysis of website content by country

4.3. CONCLUSION

This chapter described the performance of the current (online) customer journey in greater depth. It also covered customer and employee experience. Performance in the aftersales and maintenance phase is excellent. However, no information about the aftersales phase is available on the website. It might be unnecessary. The product selection phase attracted the lowest scores for both performance and experience (Figure 16). Scores for the quality of the content of the website were also below average. Therefore, there is ample opportunity to improve the website by focusing on the product selection phase. Remarkably, the opportunities for improving many of the phases coincide (Figure 16). The most common improvements concern the FAQ section, content and accessibility. The analysis of the content of the website demonstrated that content is missing in many languages. However, gaps do not influence website visitor numbers directly. Only the Dutch, the Swedish, the Italian, the Lithuanian, the Polish and the global website provide sufficient information. Chapter 5 concerns alternative solutions.

5. ALTERNATIVE SOLUTIONS

This chapter considers alternative means of making telephone calls from the end customers to Wavin more effective and efficient and of improving the online customer experience. The alternative solutions were adapted after extensive consultations with the employees from Wavin and with brainstorm sessions with the user experience specialist from Wavin. This involves keeping the analysis accounts for user behaviour, experience, needs, pain points and opportunities (Chapter 4). Section 5.1 presents the alternative solutions. Section 5.2 analyses them. Finally, Section 5.3 provides an answer to the fourth research question, "What will be the solution best fitting for Wavin to improve the online customer journey?".

5.1. ALTERNATIVE ONLINE SOLUTIONS

This section describes the available alternatives. The exposition that follows covers the phase of the journey that they may affect, their benefits, their importance and the time necessary to implement them. The principal benefit of all the solutions is that the information that the customer needs would be easily available on the website. As a result, demand for personal contact and the volume of telephone calls would decrease.

Improving website content

Table 6 shows that, in many phases of the customer journey, some of the content that customers need is not available on the website. The same point emerged from an analysis of users' experience of using the website that was conducted in 2019. Countries that do not have the needed content on their website or, if it is limited, can check the site of the country that describes that phase well and can translate it for their website. Translation would not be difficult, and the project would not take long to complete. Important information about the benefits of products, reference projects, component comparison and the sales process is also missing. Its addition to all country-specific websites is likely to exert downward pressure on demand for personal contact. However, it would take time to produce good-quality content. These improvements would affect all phases, in particular those for which content is missing or limited, as shown in Table 6.

Improving the structure of the website

Section 2.3 explained that 60% of website visitors cannot find the information that they need. Information may be missing or inaccessible: 27% of visitors find the structure of the website confusing. They believe that the website is difficult to use and that there are no clear labels in place. This issue affects every phase of the customer journey and is therefore especially important. The structure of the Sentio webpage can be improved gradually. The conversations with the Wavin user experience specialist revealed that the whole layout of the website must be revamped, a long project. When it is complete, information will be more accessible, and the website will become more user friendly.

Helpful FAQ section

Chapter 4 and Figure 16 revealed that adding helpful FAQ sections to the websites would improve the system selection phase, the product selection phase, the installation phase, the maintenance phase and the aftersales phase. Table 2 shows that telephone calls about installation questions occur the most and take the longest to complete and that both customers and employees associate product selection conversations with their most negative experiences. Both phases would benefit from the introduction of a helpful FAQ section. The list would be easy to write. Employees in some countries

keep track of the most common questions. Important information from the manuals and the videos can also be added to the FAQ section. Table 6 shows that no country-specific website has an adequate FAQ section and that many websites do not have one at all. Therefore, this solution will have a positive effect on all websites and on all phases of the customer journey.

Nearest seller tool

The Polish website already has a nearest seller tool. It can be replicated on the websites of the other countries. However, Wavin must first discover record all store locations. Since it is only possible to purchase the product from wholesalers, customers ask few questions. Table 2 thus shows that the frequency and duration of these calls are the lowest. Therefore, there is no need to prioritise the implementation of this solution.

Nearest installer tool

The installer location tool can be created in the same way as the nearest seller tool (Figure 18). Since there is demand for installers in every phase of the customer journey, the tool is likely to be effective. Figure 16 shows that Wavin employees have negative experiences with calls about installer locations. The tool could also help them to answer such calls and reduce their volume. If a customer can find an installer easily, they are less likely to approach Wavin with questions. The implementation period of this tool, however, is relatively long. A list of experienced Sentio installers must be created. This might prove difficult because Wavin does not know most of its installers. Identifying them would benefit the company. If the installers are trained well, the number of telephone calls that they make to Wavin may be expected to decrease.

Figure 18: Sentio distribution and qualified installer map

Accessible support section

Table 6 shows that not all websites have a support section. This section is a necessity for the sales process and the maintenance process. If the website for a given country lacks a support section, customers must call the general support department. Section 2.4 shows that customers are redirected often. It would help if they could call a Sentio specialist immediately. Customer experience would improve, and economies of time would be realised. The interviews with Wavin employees revealed that there are two kinds of questions: sales-related questions and technical support questions. In most countries, these are handled by two different departments. To save time and to improve user and customer experience, it is recommended introducing a support section to every Sentio website. The purpose of this innovation would be to separate sales questions from technical maintenance questions. This outcome could be achieved by placing two phone numbers on the website or by having customers choose between topics in contact forms. The solution can be implemented easily on the website but only if local employees are ready for the higher demand for personal contact with Wavin.

Product configurator
Table 2 shows that calls about product selection take the longest and occur relatively often. Customer and employee experiences are predominantly negative. It is therefore important that this process be improved. Efficiencies stand to be realised from the introduction of a product configurator to the website. It can be used by employees or by customers. The volume of telephone calls and their duration would decrease, and customer and user experience would improve. The product configurator should provide a product list for different scenarios. For example, an operator, be they an employee or a user, could input the type of heating system, the number of rooms, preferences for wired or wireless systems and such like. The system can then provide a list of products. The introduction of this tool would mainly affect the product selection phase but also the system selection phase. Given the complexity of the task, the implementation period is likely to be long.

Serious game
Adding a serious game to the website can be helpful. With this tool, a customer can practice the installation of a product by trial and error. The installation phase is likely to benefit, but the tool can also be used in the sales phase to showcase features, functions and settings to the customer remotely. Both phases entail long calls. Therefore, the tool can be effective. However, its development would be costly and long.

Translations
At present, the videos and the manuals are not available in all languages. Figure 16 shows that many customers and installers encounter difficulties as a result. When they run into problems, they call Wavin. Translations are costly, but Wavin would eventually save time by reducing the volume of telephone calls. Every phase of the customer journey would be affected.

Website URL on product
As earlier mentioned, customers often struggle to locate information on the website. Some customers even fail to find the Wavin Sentio webpage. Only the Wavin brand is displayed on the product. Some customers do not know that they own a Sentio system and cannot find the support page. The URL of the global Wavin Sentio website should be placed on the product, to always easily find the correct webpage. This change would affect the maintenance and aftersales phase. In these phases, questions occur rarely, and they are handled quickly. Therefore, this solution is not a priority. Customer and employee experience is however not particularly positive.

5.2. ANALYSIS ALTERNATIVE SOLUTIONS

The content of Section 5.1 is summarised in Table 7. The ease of implementation are rated on a Likert scale, from 1 (longest) to 5 (shortest). Urgency ranges from “least important” (1) to “most important” (5). Importance is tied primarily to customer journey phases. If a solution affects many phases or underperforming ones, urgency is high. These numbers are together formalized with the user experience specialist at Wavin, the company’s IDC managers and with the interviewees. The third column of Table 7 displays more information about implementation periods and urgency. Fortunately, the solutions do not involve any trade-offs. We did not consider implementation costs because they all relate to employee working hours. Costs are therefore a function of implementation time.

Table 7: Analysis of alternative solutions

Solution	Affected phases	Additional information	Ease of Implementation	Urgency
Improving website content	All phases (except system selection)	Takes a long time but can be implemented and affects many phases. Most important avenue for improvement from user experience research on website.	4	4
Improving the structure of the website	All phases	Takes a long time, can be implemented and affects all phases. Second most important avenue for improvement from user experience research on website.	4	3
Helpful FAQ section	All phases	FAQ section must be drafted and translated. Positive effect on all phases and all KPIs.	4	5
Nearest seller tool	Store location	Tool exists in Poland, sellers must be identified in other countries. No effect on the worst-scoring phases.	4	2
Nearest installer tool	Finding installer	Tool exists but finding installers in each country is laborious. No effect on worst-scoring phases.	3	1
Support section	All phases	Not hard to implement, but departments must prepare for more telephone calls. Will mostly improve customer satisfaction.	3	3
Product configurator	Product selection	Tool must be built and scenarios researched. Effect on worst-scoring phase, will affect all KPIs positively.	2	5
Serious game	System selection, installation	Lengthy development. Has effect on worst-scoring phases.	1	3
Translations	All phases (except store location and finding installer)	Every document needs to be translated. Effect on important phases. Will have a small effect on all KPIs.	3	2
Website URL on product	Maintenance, aftersales	Easy to implement. No effect on worst-scoring phases. Will prompt customers to visit the website first. Large effect on customer satisfaction.	5	2

We made Figure 19 to compare the ease of implementation and urgency of the solutions. Implementation time and urgency are as important for Wavin to decide which solution to prioritise. Therefore, the graph also displays the average of importance and ease of implementation for each solution.

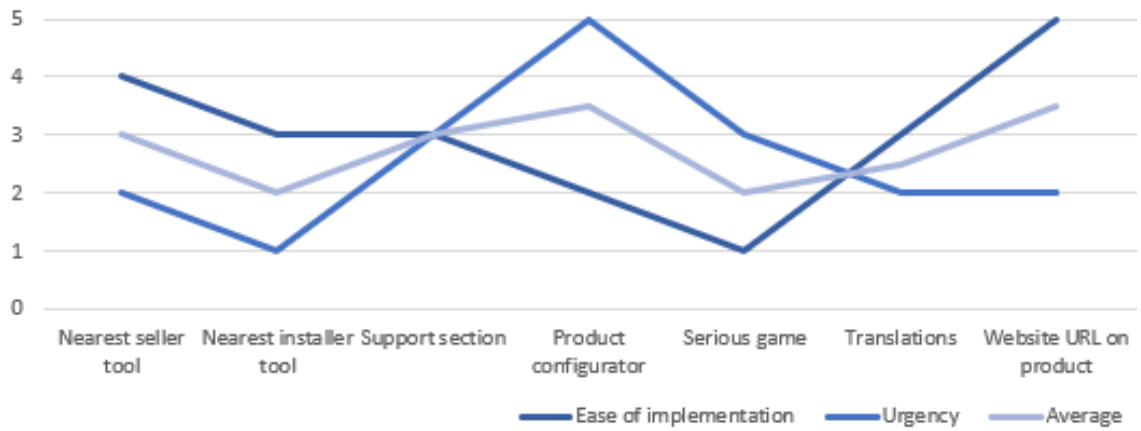

Figure 19: Ease of implementation and importance of each solution

5.3. CONCLUSION

In this chapter, all candidate solutions and their advantages and disadvantages are described. The solutions are means to increase the efficiency and effectiveness of calls from end customers to Wavin by improving online customer experience. It is essential to adopt all solutions, but they cannot be implemented simultaneously. Figure 19 displays the ease of implementation and importance of each solution. Implementation time and urgency are critical determinants of the order of priority of the solutions. The dark blue line in Figure 19 shows the average of the two scores for each solution. This score determines the order in which the solutions should be implemented.

Table 8: Order of implementation

SEQUENCE	SOLUTION
1	Helpful FAQ section
2	Improving website content
3A	Product configurator
3B	Website URL on product
3C	Improving the structure of the website
6A	Nearest seller tool
6B	Support section
8	Translations
9A	Nearest installer tool
9B	Serious game

Table 8 displays the order of priority of the solutions. The solution that should be implemented first is a helpful FAQ section.

6. SOLUTION TO BE IMPLEMENTED FIRST

The new FAQ section on the website must be developed and implemented first because it is urgent and because it can be implemented quicky. It will affect all phases of the consumer journey, including the low-scoring ones. It will exert a significant effect on all KPIs. End customers will be able to obtain answers to their questions more easily because of the increased availability of information and its improved accessibility. Customer and employee experience will improve, and the volume of telephone calls will fall. Employees will be able to use the FAQ list to streamline telephone calls. More employees will answer calls, and customers will be redirected less frequently. The solution will have a significant effect on KPIs, and it will be relatively easy to implement.

In this chapter, Section 6.1 describes the current situation and the requirements of the solution. Section 6.2 draws on the literature to explain how an appropriate FAQ section can be developed. Section 6.3 explains the solution. Section 6.4 contains implementation recommendations. Section 6.5 identifies the low-hanging fruit, that is, areas where work has already been undertaken. Section 6.6 evaluates the FAQ extension. Section 6.7 concludes the chapter.

6.1. CURRENT SITUATION AND REQUIREMENTS

Currently, only four country-specific websites have minimal FAQ sections. There are few questions on the lists. The answers are limited and hard to understand. When the list of questions expands, it will become unstructured, and it will be hard for customers to find answers. We worked with the user experience specialist at Wavin, the IDC manager and the interviewees to identify a few requirements for the new FAQ sections. The requirements are: (i) the FAQ section must cover more questions (Chapter 4 shows what the needs are in each phase of the customer journey; most of these needs must be covered by the list), (ii) the FAQ section must be structured in a way that enables customers to find answers easily, (iii) existing Sentio visuals must be added to the FAQ section to make the answers more precise, (iv) the FAQ section must be easy to implement and, lastly, (v) adding questions must be made easy.

6.2. LITERATURE ON FAQS

According to (Sneiders, 1999), one disadvantage of FAQ lists is that the user is forced to read through the entire list in order to find a relevant question. This problem can be solved by using a search engine and by sorting the questions by topic. It is essential that question be written from a customer perspective to make sure that the user can find the question they are looking for quickly. Some researchers (Hans van der Meij, 2008) have suggested that the minimalist approach can also be useful. Only questions that occur frequently should be included. Simplicity is also important. (Mayer & Moreno, 2007) suggest that information presentation is more effective when two methods, words and pictures, are used instead of one. The conclusion is based on the finding that individuals learn new information better when words and images are combined. The combination of text and pictures also improves attention (Yang et al., 2013), and it facilitates learning (Mason et al., 2013). One study focused on users' interaction with websites (Hong et al., 2004), lending support to the notion that the combination of text and images outperforms text-only presentation. Moreover, the combined approach entails shorter search times (Kovačević et al., 2016).

6.3. THE SELECTED SOLUTION

This section explains the solution and the reasons for its selection. One of the requirements was that the solution must be easy to implement. Therefore, we studied the available in-house solutions. There are no suitable solutions on the local websites or on the global Wavin webpage. This said, the UK website has a separate website for underfloor heating. On that website, there is a FAQ tool that meets almost all of the requirements. Figure 20 displays it.

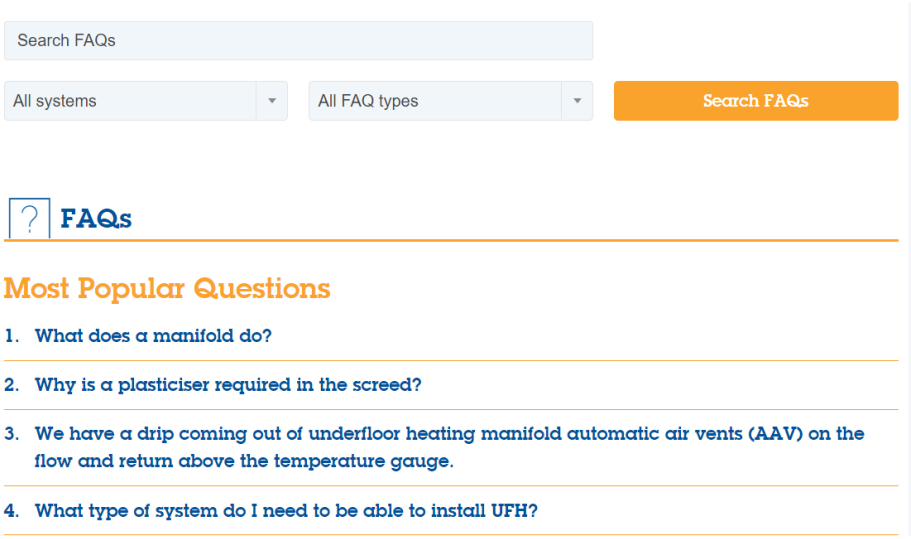

Figure 20: UK FAQ tool

The UK FAQ section shows a limited set of questions. These questions are the most common. There is also a search engine. If the customer does not know what precisely they are looking for, they can also select a system and a question type to see the most popular relevant questions. This tool makes it easier for customers to find the questions they are looking for. It is not necessary to trawl through long lists, a common problem on other websites. Wavin can also add many questions to the list, which would remain clear to customers.

Visuals are missing from the FAQ in Figure 20. The use of visuals is a requirement, and it has been proven to add value. We spoke to the user experience specialist and the digital platform specialist at Wavin to see if it would be possible to add pictures and videos to the FAQ list. They answered in the affirmative. Figure 21 shows the design of the recommended FAQ section. It would meet all the requirements, and it has all the attributes of an appropriate FAQ section. When the customer finds their desired question, they can click on it to read the explanatory text. Text, images and videos are all available. Customers are expected to inspect the images first (Kovačević et al., 2016). If they require more information, they will read the text.

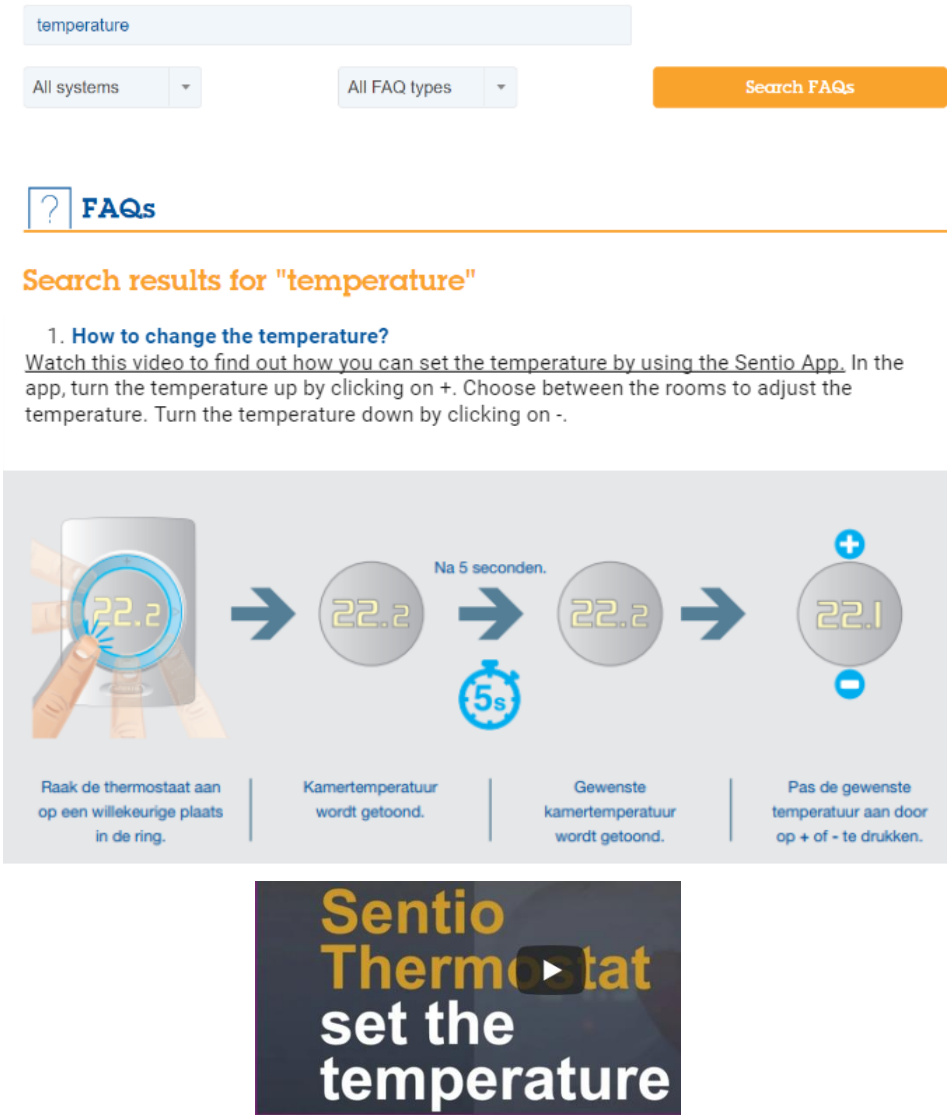

Figure 21: Final FAQ list Wavin Sentio

6.4. IMPLEMENTATION RECOMMENDATIONS FAQ SECTION

This section discusses some tips for the implementation of the FAQ section The first set concerns question selection. First, it would be desirable to inspect the FAQs that are already available and to determine if the answers that they contain remain accurate. If not, they should be removed or altered. Second, many Wavin employees field Sentio-related telephone calls daily. They should be allowed to keep track of FAQs and to update the FAQ list. Third, some of the vital information from the manual should be converted into questions. Finally, in Chapter 4, we described the needs of customers in each phase of the customer journey. It might be useful to check which needs are not covered by the FAQ list yet and to write relevant questions and answers.

It is also important to formulate the questions and the answers correctly. First, answers must be kept short. If an answer is long, it will not become more straightforward by virtue of its inclusion into the FAQ section. Second, is essential to write questions from the perspective of customers. For example, a customer is more likely to search for the question “Can I change the temperature?” than for the

question “Can you change the temperature of a thermostat?”. Third, it is essential that all questions and answers be translated to the language of each website. There is no need to translate the videos, but subtitles are recommended. Last, when all questions are formulated correctly, existing visuals ought to be matched with them. Additional videos and pictures should be created in the future if needed. Appendix I presents the FAQs that are ready so far.

6.5. EVALUATION OF FAQ SECTION

After we designed the prototype of the FAQ section but before implementing it, we evaluated the solution with the employees that specialise in customer behaviour to ensure that they were satisfied with the results. Since they had all been involved in the design of the prototype, the information that was required was not extensive.

Methods

The unified theory of acceptance and use of technology is used to evaluate the prototype (Venkatesh, 2003). It determines the fit between a problem and its solution. Using the method enabled to estimate the likelihood of success for the new technology. Seven different constructs play a significant role as a direct or indirect determinants of user acceptance and usage behaviour. In each category, questions are asked to quantify the different determinants of intention (Venkatesh, 2003).

- ***Performance expectancy:*** the degree to which an individual believes that using the system will secure gains in job performance.
- ***Effort expectancy***: the degree of ease associated with the use of the system.
- ***Attitude toward using technology***: an individual’s overall affective reaction to using a system.
- ***Social influence***: the degree to which an individual perceives that important others believe that the individual should use the new system.
- ***Facilitating conditions***: the degree to which an individual believes that an organisational and technical infrastructure exists to support use of the system.
- ***Self-efficacy***: an individual’s belief in their ability to succeed in a particular situation.
- ***Behavioural intention to use the system***: the intention to work with the system and to accept it in daily operations.

A questionnaire that covers all these constructs is developed, and shared with potential users. An overview of the questions can be found in Appendix J. To easily compare the answers, again the Likert scale is used again to ensure that the answers were comparable (Jamieson, 2013). Answers may vary from “strongly disagree” (1), “disagree” (2), “neutral” (3), “agree” (4) and “strongly agree” (5).

Results

The questionnaire is sent to seven employees from different departments and different countries to make the results as reliable as possible. An overview of the results can be found in table 15 of Appendix J. The average score of the employees is 4.2, which is highly satisfactory. The lowest score was 3.4, which is still acceptable. A few results stand out. The global user experience specialist, the product manager IDC global and the global customer service specialist both rated the FAQ tool very highly. Both are intimately familiar with customer behaviour and the customer service departments in all countries. That they rate this solution so highly therefore augurs well because they are well placed to predict the success of the FAQ tool among customers and employees.

The scores for questions PE-EP-3 and PE-EP-4 were below average. Not everyone thinks the if the employees use the tool to help them answer questions of the customers boost efficiency or productivity. Since the main goal of the tool is different, the discrepancy between employees and customers does not mean that it should be abandoned. Boosting efficiency or productivity would have been a positive side effect of the development of the FAQ tool when employees use the tool. That the side effect is not as pronounced as we would have desired is not fatal to the whole enterprise. The employees believe that their work environment will become calmer if customers adopt the tool. All in all, the employees rated the usability of the tool highly. It is important to remember that customers should remain the focus group.

Question EE-EP-1, SE-CP-2 and BIUS-CP-2 were rated very highly. The questions were about the ease of using the FAQ tool for customers and employees. They also inquired whether customers would use the system in the months after its launch. The conclusion is that the tool would be easy to use and that it would be adopted once released.

Conclusion
This questionnaire is circulated to determine whether the FAQ tool meets the requirements of the company. In general, the employees were very satisfied with it. They thought that it is easy to use and that customers would use it. The questionnaire also revealed the importance of focusing on customers as end users of the tool.

6.6. LOW-HANGING FRUIT

This section describes the low-hanging fruit, that is, solutions that are easy to implement and will affect the problem positively. Work has already begun on these solutions, alongside the preparation of the FAQ section. The low-hanging fruit include the product configurator, the content of the website and its structure.

Product configurator
When the product configurator came up in a meeting with my company supervisor, he explained that the company had already begun designing such a tool but had never finished it. This solution was ranked third in the order of priority, and it will affect the lowest-scoring phase of the customer journey. In light of this consideration and the advanced development of the tool, we decided to work on it during the research. Appendix G provides further explanations of the process and the tool. The tool is almost ready.

Structure and content website
The user experience specialist at Wavin is improving the content and the structure of the website constantly. At a fairly early stage of the research, it emerged that the Sentio webpage is not performing well and that there are many areas for improvement. Even though content and structure are not priorities, there is decided to discuss these matters with the user experience specialist and to conduct regular brainstorming sessions to prepare for the changes. He also took the view that the changes are necessary. Therefore, we began designing the new Sentio webpage while keeping the customer journey and the customer needs identified in this research in mind. There is striven to ensure that the content is structured well and that it is easy to find on the Sentio website. Some early successes are already achieved. Appendix H elaborates on the new design of the Sentio webpage and shows the new content that we have already incorporated into the webpage.

6.7. CONCLUSION

There is recommended that a new FAQ section should be implemented as a matter of priority. The new FAQ section can easily cover many questions while remaining structured. The answers to the questions are reinforced with visuals were possible. The solution is easy to implement because the knowledge is already in-house, and it is easy to add questions later. The solution meets all of Wavin's requirements, and it suits the company best. The product configurator and the structure and the content of the website have also been developed further because the changes are useful and can be implemented quickly.

7. IMPLEMENTATION RECOMMENDATIONS

In this chapter, Section 7.1 describes the implementation recommendations for each solution. Table 9 shows the order in which the solutions should be implemented and the individuals who are responsible for their implementation. If an individual feels that they are responsible for some activity, it is more likely that they will perform it. Section 7.2 answers the fifth research question, "What steps should Wavin take to implement the solution and improve the online customer journey?".

Table 9: Employees responsible for each solution

SEQUENCE	SOLUTION	RESPONSIBLE	INDIVIDUALS INVOLVED
1	Helpful FAQ section	User experience specialist	Local product manager
2	Improving website content	User experience specialist	Local product manager
3A	Product configurator	Global product manager (controls)	User experience specialist, global project manager, building design services, local product manager
3B	Website URL on product	Global product manager (controls)	
3C	Improving the structure of the website	User experience specialist	
6A	Nearest seller tool	Global product manager (controls)	Local product manager, user experience specialist, global product manager controls
6B	Support section	User experience specialist	Operating countries managers, customer service departments
8	Translations	Local product manager	Product managers
9A	Nearest installer tool	Global product manager (controls)	Local product manager, user experience specialist, global product manager controls
9B	Serious game	Not recommended	

7.1. IMPLEMENTATION RECOMMENDATIONS FOR EACH SOLUTION

Helpful FAQ section

The implementation recommendations for the FAQ section can be found in Section 6.4. The user experience specialist is responsible for this solution because he is in charge of improving the content of the website.

Improving content website

As can be seen in Section 6.6, work has already begun on improving the content of the website. Figure 16 overviews customer needs and the content that should be available on the website. We recommend focusing on the lowest-scoring phases of the customer journey and on product information, which can also be seen in Figure 16, first. Content should be improved on a phase-by-phase basis. It is desirable to launch the phases that have already been completed without waiting for work on the others to finish. We recommend start by translating the global Sentio webpage and adding the translated content to local webpages. This makes it maintenance-friendly because only

the global webpage needs to be built. Local offices will thus save time. Table 6 shows the quality of the information that is available on the different webpages. We recommend using successful local solutions as exemplars for the global webpage. Table 9 shows that the user experience specialist is responsible for this project. He knows the needs of customers best, and he is familiar with the design of customer-friendly websites. He has also worked on the Sentio webpage in the past. His technical knowledge of the products is insufficient for him to improve the content of the website alone. Therefore, he should seek the assistance of the global product manager for controls and the local product managers.

Product configurator
As can be seen in section 6.6, the product configurator is fully developed. The global project manager for controls took the lead in this project, and he is therefore responsible for it. He also knows when new product components are launched. Therefore, he can manage updates. We recommend discussing the positioning of the tool on the website with the user experience specialist, the global project manager for controls and the global project manager for building design services.

Website URL on the product
The global product manager for controls is responsible for this project. He can delegate, but he can also supervise the process. There is already a QR code sticker on the product. The same solution must be adopted for the global website sticker. It is easier for the production team to use a sticker for the global website than to use different stickers for local websites. Localised stickers are also unnecessary because reaching the local websites from the global one is now straightforward.

Improving the structure of the website
As can be seen in Section 6.6 we have already begun planning improvements to the structure of the website. Figure 6 depicts the customer journey and Figure 16 depicts the needs of customers at each stage. It is important that the information that pertains to a specific part of the journey be presented in proximity to other relevant information. A customer-centric perspective is desirable, and the steps that customers must take to access the information that they need should be considered. Improvements to the structure of the website can be implemented on a phase-by-phase basis, similarly to improvements to its content. Likewise, we recommend starting with the global webpage. Table 9 shows that the user experience specialist is responsible for this project. He knows the needs and behaviours of customers best, and he is familiar with the design of customer-friendly websites. In addition, he has already worked on the Sentio webpage.

Nearest seller tool
The nearest seller tool is already available in Poland. It is easy to replicate it on the other websites. First, selling points and contact details must be collected in all countries. The global project manager for controls has the closest contacts with all the countries in which Sentio is sold. Therefore, he is responsible for this project. The countries in which the company operates ought to collect information about selling points. The user experience specialist and the global digital platform expert can implement the tool on the website.

Support section
The support section on the website is easy to improve. It is essential that every department be prepared for this change. Certain individuals will receive fewer calls; others will receive more. Employees must be given time for these activities. Therefore, it is important to confer with the individuals who are responsible for answering calls. It might also be desirable to rearrange work

responsibilities. The user experience specialist is responsible for this solution, and he must consult customer service departments and managers in the countries where the company operates.

Translations
The local project managers are responsible for translations. They have overseen translation projects in the past, and they know how the process works. The advice is to begin translating the lowest-scoring phases from the customer journey map (Figure 16) and to avoid being side-tracked by store location and installer location. This project, too, can be completed on a phase-by-phase basis.

Nearest installer tool
The nearest seller tool is similar to the nearest installer tool, and the same technical processes can be used for the two solutions. The contact details of reputable installers must be collected locally, a task that might prove difficult because Wavin does not know the installers. However, they can ask installers if they want to feature on the Wavin website, when they speak them. Installers also are in contact with each other, so it may be expected that many will participate eventually. Participation is mutually beneficial: it is an excellent opportunity for the installer to acquire more customers, and it allows Wavin to train the installers. This will result in better installations and reduce maintenance questions. The global project manager for controls has the closest contacts with all the countries where Sentio products are sold. Therefore, he is responsible for the project. The user experience specialist and the global digital platform expert can implement the tool on the website together.

Serious game
This solution is very complex, and it should be developed by a large team of employees. First, the specificities of the installation procedure should be researched, potentially with the help of the manual. More importantly, the team must determine what happens when a mistake is made and how mistakes can be remedied. Once this information is aggregated, the tool must be built, which is likely to be time consuming. Testing should be thorough. Given the cost of the project and its anticipated duration, we recommend forgoing its implementation. If the expected benefits of completion increase in the future, it would be best to retain an external company to develop the tool.

7.2. CONCLUSION

To conclude, we recommend that Wavin implement the solutions in the order given in Table 9. The serious game should not be implemented. A responsible individual was identified for each solution. When a specific individual is responsible for a project, they know that its success depends on their actions. They are unlikely to prevaricate, and there is a higher change that the solution will ultimately be implemented.

8. CONCLUSION AND DISCUSSION

Section 8.1 of this chapter presents the conclusions from the research. The core problem and the research questions are restated and explained briefly. Section 8.2 surveys the limitations of the study, and Section 8.3 contains recommendations for future work. Lastly, the contribution that the thesis made to practice and theory is overviewed in Section 8.4.

8.1. CONCLUSION

This research aims to answer the main research question so as to solve the action problem. Throughout the thesis, six sub-questions to that end. The answers to the first five can be found in the conclusions to each chapter, and are shortly summarized in this section. The sixth sub-question and the main research question are answered in this section. First, the action problem, the core problem, the main research question and the sub-questions will be explained once more.

Action problem

Sentio requires more maintenance and aftersales than the other products that Wavin sells, as well as more intensive contact with end customers. The main concern is that customer interactions are ineffective, inefficiently regulated and too time consuming. The action problem is therefore as follows:

Demand for personal contact with Wavin is too high.

Core problem

We discovered that the core problem at Wavin was that the digital customer journey was not managed actively. High demand for personal contact has three causes, of which I selected the lack of active management of the digital customer journey as the main one. The other two were beyond the control of the company or had a smaller influence on the action problem. Once the bottlenecks in the online customer journey and the most significant sources of value are identified, Wavin can improve the customer journey. By improving the online customer journey and the online customer experience, Wavin can handle more questions online.

Main research question

The research question had to focus on means of improving the online customer journey of Sentio and making customer interactions more effective and efficient. The main research question is therefore as follows: Therefore the main research questions were formulated as follows:

How can the online consumer journey of Sentio be improved to make interactions with customers more effective and efficient?

Several factors had to be considered to answer the question. We had to analyse the current (online) customer journey and its performance, and, among other things, to identify the solution that would suit Wavin best. Sub-research questions were formulated accordingly.

Sub-research questions

What does the current customer journey of Sentio look like?

We analysed the current customer journey of Sentio to determine the timing and the substance of customer enquiries. The analysis was premised on interviews with stakeholders. I also investigated the process by which customers obtain answers to their questions and Wavin's performance. What stood out was that customers demand contact with Wavin in every phase of the customer journey and that performance, though it varies between phases, is generally dissatisfactory. Customers are

redirected frequently, and only 40% of website visitors find what they are looking for (see Chapter 2).

According to the literature, what is the best alternative to visualize the customer's experience in a customer journey map for Wavin?

Chapter 3 reviewed the literature on customer journey visualisation. The conclusion was that a combination of different maps would be the best fit for Wavin. Accordingly, we created a customised map for Wavin. In it, user needs, pain points and opportunities can be seen easily. What is unique about this customer journey mapping method is that it represents the experience of employees and the frequency and duration of customer interactions. As a result, avenues for improvement and means to achieve it become apparent readily.

What is the performance of the current (online) customer journey?

In Chapter 4, we used the newly designed customer journey mapping method to visualise performance in the different phases of the customer journey. We collected the necessary data by conducting interviews. It emerged that product selection had the lowest scores for both performance and experience. The analysis of the content of the website revealed that essential content was lacking on many local webpages. However, the scarcity of information did not influence the number of visits or their duration. Only the Dutch, the Swedish, the Italian, the Lithuanian and the Polish website contained a significant volume of information.

What will be the solution best fitting for Wavin to improve the online customer journey?

Various solutions were formulated in Chapter 5. We identified their advantages and their disadvantages. The conclusion was that it would be best for Wavin to implement all of the formulated solutions in a specific order. The order is based on ease of implementation and urgency. The two factors are both as important to Wavin. The final order of priority is given in the table below. Because of time constraints, we only designed one solution. The FAQ section is recommended to implemented first because its urgency and importance are the highest and because its implementation period is the shortest.

SEQUENCE	SOLUTION	ADDITIONAL INFORMATION
1	Helpful FAQ section	FAQ section must be created and translated. Positive effect on all phases and all KPIs.
2	Improving website content	Time consuming, affects many phases. Most important point of improvement from user experience research on website.
3A	Product configurator	Tool must be built and scenarios researched. Effect on lowest-scoring phase. Will affect all KPIs positively.
3B	Website URL on product	Easy to implement. No effect on lowest-scoring phases. Will increase website visits. Large effect on customer satisfaction.
3C	Improving the structure of the website	Time consuming, affects all phases. Second most important point of improvement from user experience research on website.
6A	Nearest seller tool	Tool exists in Poland. Sellers must be identified in each country. No effect on lowest-scoring phases.
6B	Support section	Not difficult to implement. Departments must prepare for more telephone calls. Will mainly improve customer satisfaction.

8	Translations	Effect on important phases. Small effect on all KPIs.
9A	Nearest installer tool	Tool exists, finding installers for each country is labour intensive. No effect on lowest-scoring phases.
9B	Serious game	Development demands a lot of time. Has effect on lowest-scoring phases.

Chapter 6 explained the FAQ section, and it described specific implementation recommendations. The tool is presented in Figure 21. The final design of the FAQ tool combines elements of the tool that is used in the UK with visuals and videos that Wavin has already developed. It enables customers to find the questions they are looking for easily through the built-in search function and to receive clear answers. Work has also begun on the product configurator and the structure and the content of the website. Parts of these solutions are easy to implement, and they are likely to produce beneficial results.

What steps should Wavin take to implement the solution and improve the online customer journey?

In Chapter 7, gives implementation recommendations for all the solutions. Wavin must implement the solutions in a specific order. Individual Wavin employees are responsible for implementation.

To what extent does the proposed solution meet the goals and requirements of Wavin?

We evaluated the FAQ tool with Wavin employees. They found it highly satisfactory. It is their view that it is easy to use and that customers will in fact use it. It met all of the company's requirements. It also emerged that it is important to continue focusing on customers as end users of the tool. It is not easy to predict the performance of the new (online) customer journey. This said, we expect it to exert a positive effect on all phases of the customer journey. Its effect will therefore be relatively high. First of all, the number of telephone calls will decrease, as will their duration. More employees will be able to answer the customers' questions by using the FAQ list. Consequently, customers will be redirected less often. Moreover, it will be easier to refer customers to images or videos on the website, which is likely to yield economies of time and to improve customer and employee experience. As a result, customer interactions will be more effective and efficient.

Answering the main research question

How can the online consumer journey of Sentio be improved to make interactions with customers more effective and efficient?

The online customer journey of Sentio can be improved by implementing all of the solutions described in Chapter 5. The redesigned FAQ section ought to be introduced to the Wavin Sentio website first. The other solutions should be implemented in the order described in Table above.

8.2. LIMITATIONS

This section addresses the limitations of the research to enable you to identify its imperfections (Cooper and Schindler, 2014). First, the research is conducted as an assignment for the bachelor's degree in Industrial Engineering and Management. The time that could be allocated to it is limited. We could not interview all of the important stakeholders from all of the countries that sell Sentio products. We assumed that the results from the interviews that are conducted are representative. We may have also missed crucial data, ideas and solutions. Time constraints made it impossible to implement the chosen solution – we only provide a prototype.

Second, this was the first time that Wavin conducted extensive research on the performance of their (online) customer journey and the processing of telephone calls. Therefore, the company has not set target values for itself yet. It is thus difficult to compare current values to values for the customer journeys of other Wavin products.

Third, solutions must be available and uniform in all of the countries where Sentio is sold. This might not be ideal because approaches to obtaining answers to questions vary across cultures. For example, individuals from some countries prefer to use Google; individuals in other countries prefer to make telephone calls. Therefore, the optimal solution may depend on culture.

Lastly, the problem of high demand for contact is not unique to Wavin. Other companies which sell products that require maintenance and aftersales and which have websites can run into the same problem. They might can use the same customer journey map method to analyse their situation and to identify pain points and opportunities. However, it was impossible to test this proposition, and it thus remains unproven.

8.3. RECOMMENDATIONS FOR FUTURE WORK

The first recommendation is to investigate the commercial possibilities of the product configurator. It is fully automated, and it is working very well. Therefore, its potential is high. We recommend connecting it to the new Sentio all-inclusive concept. Sentio all-inclusive provides the customer with a complete pre-programmed system that meets their needs. Installers and customers do not have to programme the system anymore. This will reduce the volume of calls and the number of frustrated customers drastically. The all-inclusive concept has already been adopted in Denmark. If it becomes possible for customers to input their attributes and needs into the product configurator tool, the process could be automated fully.

We recommend tracking the number of telephone calls, their topics and the kinds of questions that customers ask. In this way, recurrent questions can be identified easily and added to the FAQ section. Recurring topics should feature prominently on the website to reduce the volume of telephone calls.

Third recommendation is to analyse the customer journey maps of other Wavin products. Performance, pain points and opportunities can be identified in this way. It might emerge that some product is performing poorly or that improvements can be implemented easily. As a result, company-wide demand for personal contact would fall.

8.4. CONTRIBUTION

This section describes the theoretical and practical contribution of the research.

Theoretical contribution

In scientific terms, this research introduced a unique customer journey mapping method. Contemporary researchers increasingly see the value of customer journey maps for visualising customer experience, pain points and opportunities (Bradley et al., 2021). The topic has thus become popular. However, customer service is often provided by company employees. The employees' experience of customer service, good or bad, can influence their performance. Therefore, the customer journey map that we developed also visualises the experience of the people who provide the service. This model also visualises important KPIs. As a result, it becomes easier to pinpoint the root cause of a problem, focal areas and opportunities for improvement. The KPIs that were added to the customer journey map in this research are the frequency and duration of telephone calls.

Practical contribution

The practical contribution of this research is twofold. First, it yielded a customer journey map which presents user experience, pain points and opportunities in different phases clearly and with a view to improvement. Second, the research identified several solutions that will improve the customer journey of Sentio and make customer interactions more effective and efficient. The FAQ tool for the website was evaluated positively by Wavin employees.

Having set out these conclusions, limitations and recommendations, I would like to conclude my bachelor's thesis.

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APPENDICES

APPENDIX A: STRUCTURE OF THE REPORT

Table 10: Structure of the report

Chapter	Research Questions	MPSM phase	Deliverable
1. Introduction		Phase 1 & 2: Defining the problem, Formulating the approach	Action problem, Core problem, Scope, Methodology & Research questions
2. Current customer journey of Sentio	*1. What does the current customer journey of Sentio look like?* *1.1. What are the steps in the current customer journey?* *1.2. What are the steps in the current online customer journey?* *1.3. What KPIs are currently in place?*	Phase 1: Defining the problem	Flowcharts of the current (online) situation. Textual analysis of the current situation and KPIs in place.
3. Alternatives to visualize customer's experience in a customer journey map	*2. According to the literature, what is the best alternative to visualize the customer's experience in a customer journey map for Wavin?* *2.1. What are the different alternatives to visualize the customer's experience in a customer journey map?* *2.2. What are the advantages and disadvantages of those alternatives?*	Phase 2: Formulating the approach	Textual analysis of the different alternatives to visualize the customer experience in a customer journey map. Customer journey map best fitting for Wavin.
4. Visualization of the customer's experience in the customer journey map	*3. What is the performance of the current (online) customer journey?* *3.1. How do customers and employees experience specific journey elements?* *3.2. Which part of the customer journey offers the most promising opportunities?*	Phase 3: Analyzing the problem	Filled in customer journey map for the five different phases of the customer journey. Textual analysis of the phases and description of the best part to improve.

5. Alternative solutions	*4. What will be the solution best fitting for Wavin to improve the online customer journey?* *4.1. Which alternatives are there to improve the current online customer journey?* *4.2. What are the advantages and disadvantages of those alternatives?* *4.3. What requirements does Wavin have for the solution?*	Phase 4: Formulating (alternative) solutions Phase 5: Choosing a solution	Textual analysis of the different alternative solutions and recommendation which one to first implement.
6. Chosen solution to first implement			Description/prototype of solution to first implement.
7. Implementation Recommendations	*5. What steps should Wavin take to implement the solution and improve the online customer journey?*	Phase 6: Implementing solution	Textual recommendation for implementation.
8. Conclusion and Discussion	*6. To what extent does the proposed solution meet the goals and requirements of Wavin?* *6.1. How will the new (online) customer journey perform?*	Phase 7: Evaluating the solution	Textual conclusion, discussion, limitations and recommendation.

APPENDIX B: OVERVIEW RESEARCH DESIGN

Table 11: Research design

Question	Type of research	Research population	Subjects	Method of data gathering	Method of data processing
1. *What does the current customer journey of Sentio look like?*	Descriptive	Company	Problem owner, Installers, end-users, sales department	Quantitative, Qualitative, Communication (interviews)	Flowcharts current situation (quantitative). Textual analysis of the current situation and KPIs (Qualitative)
2. *According to the literature, what is the best alternative to visualize the customer's experience in a customer journey map for Wavin?*	Reporting (identify alternatives), Explanatory (which method fits Wavin best)	Literature	Researches on customer journey experience	Qualitative, monitoring (existing documents and literature)	Textual analysis of different alternatives to visualize the customer experience. Visual map of the choice that best fits Wavin. (Qualitative)
3. *What is the performance of the current (online) customer journey?*	Explanatory	Company	Problem owner, Installers, end-users, sales department	Qualitative, communication (interviews)	Visual map of the current experience of the customer. Textual analysis of the phases of the customer journey. (Qualitative)
4. *What will be the solution best fitting for Wavin to improve the online customer journey?*	Reporting (identify alternatives), Explanatory (requirements Wavin) Explanatory and reporting (make the solution)	Company and Literature	Literature and Problem owner, Installers, end-users, sales department	Qualitative, Monitoring (literature), Communication (interviews)	Textual analysis of the different alternative solutions. (Qualitative) Description/prototype of the chosen solution. (Qualitative)
5. *What steps should Wavin take to implement the solution and*	Reporting and Descriptive	Company	Problem owner, Installers, end-users, sales department	Qualitative, Monitoring (literature), Communication (interviews)	Textual recommendation for implementation. (Qualitative)

improve the online customer journey?					
6. *To what extent does the proposed solution meet the goals and requirements of Wavin?*	Explanatory	Company	Problem owner, Installers, end-users, sales department	Qualitative, communication (interviews)	Textual conclusion and evaluation. (Qualitative)

APPENDIX C: STAKEHOLDER ANALYSIS, CONDUCTED INTERVIEWS, INTERVIEW QUESTIONS

Stakeholder analysis

This section describes the stakeholder analysis. It explains who the important stakeholders are and how the solution will affect them. Stakeholders are actors that influence my thesis and will be influenced by the solution (Zusza & Brugha, 2016). To analyze the different stakeholders, we use the stakeholder analysis method of Zysza & Brugha. We use three steps to analyze the different influences and interests of stakeholders. The first step is to identify your stakeholders. This research's vital stakeholders are the university supervisor, the company supervisor, the marketing department, the IT department, the commercial/sales department, the installers, and the Sentio users. The second step is to classify the stakeholders in one of the four categories: keep satisfied, actively collaborate, monitor, and inform. Figure 22 shows the stakeholder matrix in which the different categories are depicted. The third and last step is understanding your key stakeholders. In the following paragraphs, these steps will be analyzed for every vital stakeholder.

University supervisor

My University supervisor Peter Schuur supports me in executing this research. He gives me information, feedback, and tips. Next to this, he makes sure the research meets the Bachelor thesis requirements of Industrial Engineering and Management, and makes sure the research can be conducted in ten weeks. He, therefore, has big power in the project. However, his interest is lower because the research outcomes will not directly affect him or the University of Twente. We must keep this stakeholder satisfied and meet his needs.

Company supervisor

My company supervisor, Marco Oudshoorn, is the problem owner. He brings me in contact with other stakeholders and gives me information, tips, and feedback. He has very high power because he can impact in which direction the research continues. He is also the one who decides if this solution will be implemented or not. However, the input of the KPIs comes from other stakeholders, so he cannot influence this. His interest is high because the solution will influence the departments that works with Sentio a lot, but not directly his work responsibilities. The company supervisor must be managed closely. Communication with him is crucial in properly completing this research.

Marketing department

The marketing department has the most knowledge about the customers, and they decide what goes on the website and whatnot. They are therefore a crucial stakeholder with high power, but their interest is lower. They are very busy, and they are not all convinced yet of the benefits of this research. Because their power is high and interest not, it is crucial that they will see the benefits of this research. It is therefore essential to give them updates frequently and ask for information.

IT department

The IT department implements the solution on the website. Their interest is low because they will not benefit from the solution. They get tasks to implement on the website. However, they have influence on the order. They, therefore, have power over the implementation time of this solution.

Customer service/sales/product (manager) department

This are the departments that get the phone calls and emails from the customers. Their workload is very high. This can be reduced, with the solution. This makes there interest high. However, they are not all convinced that a global solution for this problem is a great idee, because in the past it not always worked out. With the solution, they maybe have to work differently and have to learn new things. They can also be scared of this. They know the problem the best, and therefore also might have good ideas for the solution. This department will be interviewed for the input KPIs. All in all, they are a very important stakeholder. Their belongings must be kept in mind all time.

Installers
Installers had in the past a lot of contact with the end consumers. This will reduce with the solution. Therefore their interest is medium, and their power is low. They can be used to gather information.

Sentio users
Lastly, the end consumers, the way their questions are answered will change by the solution, more questions will be handled online. Their power is medium because when they do not want to use a specific tool, the solution will not influence the problem. Their interest is low. It does not matter what the solution is as long as they can have a quick response to their questions.

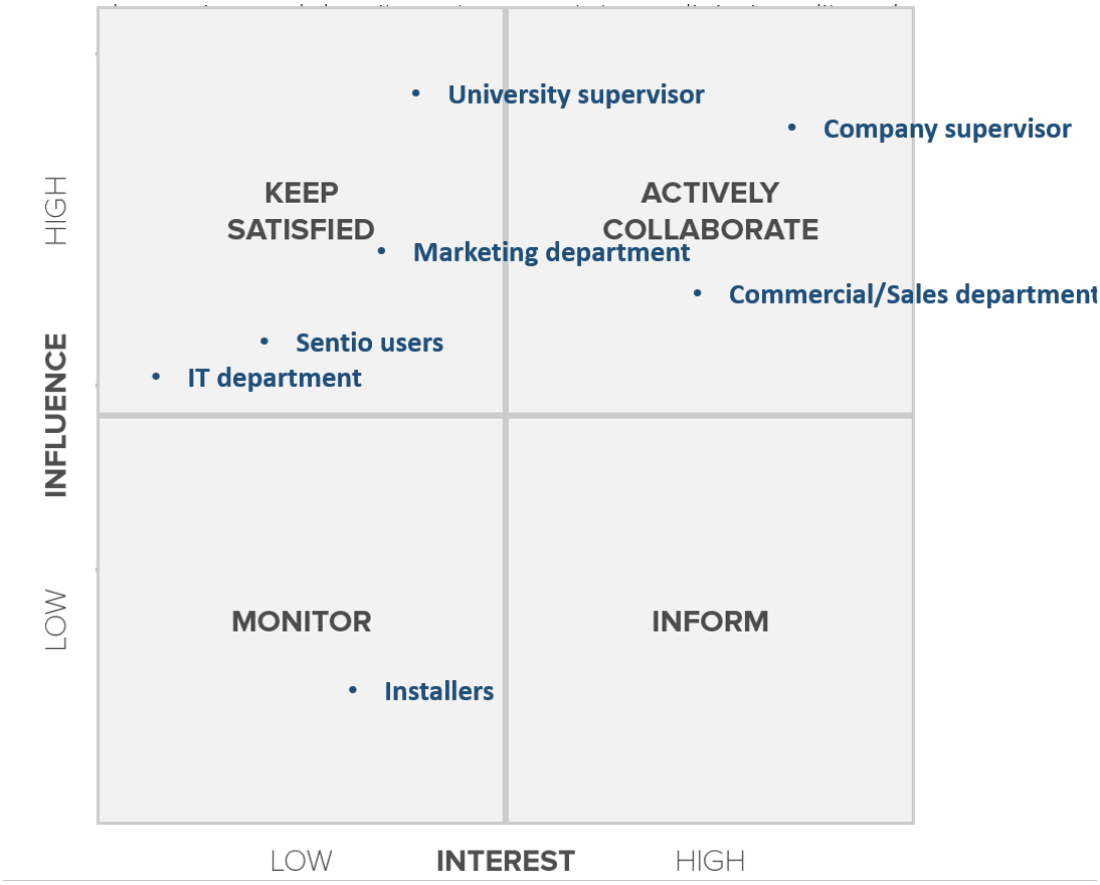


Figure 22: Stakeholder analysis

Conducted interviews
Marketing department: Director Global Marketing, Global User Experience Specialist, Marketing team lead Italy, Marketing team lead Poland & Baltics.

*Customer service departmen*t: Manager Customer Service Benelux, Technical service manager UK, Commissioning & Maintenance team leader UK, Customer service team leader Denmark, Technical support Denmark, Technical After-Sales Italy.

Sales department: Commercial advisor climate The Netherlands, Director global ICS commercial, Global BU Director IDC, Sales manager Baltics.

Installers: Technical Advisor UFH The Netherlands, Global product development engineer.

Product managers: Project manager Technology & Licenses The Netherlands, global product manager Controls, Local product manager Baltic.

Interview questions

This section gives an overview of the questions of the interviews we conducted. The interviews were semi-structured. The interviewees were divided up into four target groups. For each target group, a list of questions is prepared. Before the interview, there was checked if questions were missing for this specific interview. During the interviews, some questions of the other departments are also asked if needed, and flow-up questions are asked.

Questions to get to know the interviewee

- Can you briefly introduce yourself and your work responsibilities?
- What does a typical day/week for you look like?
- How long have you been in this profession?
- How is your work related to Sentio or other control systems?

Interviews marketing

Sentio customers

- How do you describe Sentio customers?
- How do you describe the Sentio market?
- How do you experience this new product?
- How do customers react to this new product?
- What is the performance of the Sentio campaigns?
- Are there any projects you are working on with Sentio today?

Customer journey end user

- What do you already know about customer journeys?
- Together look at the customer journey of the end-user. Can you elaborate and improve it?
- What do you think is going very well?
- What do you think can be improved?
- Where do you think the biggest problems or points of improvement are?
- What kind of problems is this?

Data gathering

- Do you have data on how many people visit the Sentio website?
    - Yes: who are those people, percentage of the total amount of installers.
- Do you know how long someone visits certain pages or on which page they leave, for example?
- Which information channels do you use to inform and answer questions from the customer?
- Do you have analytics of these channels?
- Do you know where the customers go most often when they have questions (which channel)?

Interview customer service department

Customer service channels related to the Sentio system

- Which information channels do you use to inform and answer questions from the customer?
- Do you have analytics of these channels?

- Do you know where the customers go most often when they have questions (which channel)?
- Are you handling questions of online?
- Bij wie komen de telefoontjes terecht (welke afdeling)?
- How do customers find You?

Questions from customers regarding Sentio

- What kind of people ask questions regarding Sentio (installers, end-users, etc.)?
- How often do you get questions regarding Sentio? (make sure to get a reference)
- What kind of categories?
- What are the most asked questions regarding Sentio?
- Are you always able to quickly answer all the questions?
    - No: how do you solve this? To who do you go?
- What problems do you see that the installers (end users) most often have?

Solving problems/finding information regarding Sentio

- If there is a problem or you need more information, where do you go for answers?
- What are you missing from support from Wavin?
- How can we help you to improve problems and make your day easier?
- What is the most time-consuming part of your job that we can take away from you?
- Do you see points of improvement in support of the end-user?
- What do you think of handling of more questions online?

Commercial employees

Relationship with their customers regarding Sentio

- Who are your customers? (end-users?) (numbers) (New Home, Renovation, etc.)
- How do you communicate with your customers (channels)?
- How do you get new customers?
- How do customers find Sentio/Wavin/You?
- To which department do the questions of the customers go?

Questions related to the Sentio system

- Which are the easiest and the most challenging jobs for you?
- Which are your biggest pains at work?

On the job (all questions are related to customers working with the Sentio system)

- What was the last job you worked on about?
- How did you acquire this job, and how was the customer?
- What did the job look like from beginning to end?
- Did you run into an unexpected problem? How did you solve it?
- How did you work together with your customer?
- What are the critical challenges of your job?

Questions about customers

- What problems do you see that the end-users have?
- What kind of questions do the end-users often come to you?
- Do you see points of improvement in support of the end-users?

Solving problems/finding information

- If there is a problem or you need more information, where do you go for answers?
- What are you missing from support from Wavin?
- How can we help you to improve problems and make your day easier?
- What is the most time-consuming part of your job that we can take away from you?

Installers

Relationship with their customers

- Who are your customers?
- How do you communicate with your customers (channels)?
- How do you get new businesses?
- How do customers find You?

Questions about their work

- For how long do you install Sentio?
- How often do you install Sentio?
- How do new customers find you?
    - What percentage is renovation, maintenance, aftersales, or new home?
- How often do homeowners call you with questions?
    - What are the frequently asked questions?
    - Which (most time consuming) questions can we take away from you by handling them online or by Wavin? (to make your day easier)
    - Have you ideas on how to reduce the number of phone calls?
- Have you experience with other controls?
    - If yes: Why switched to Sentio?
    - What did you like from the other system and company which Wavin does not offer?
    - What is Wavin doing better?
- What do you think of the website and app?
    - Ideas to improve it?
- What do you usually do when you need help or information regarding Sentio?
- What are you missing from Wavin's support?

APPENDIX D: CURRENT CUSTOMER JOURNEYS OF SENTIO

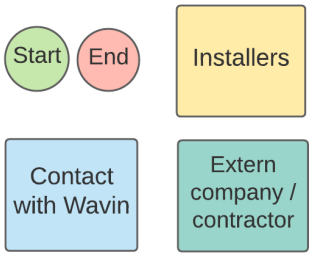


Figure 23: Legend flowchart customer journey

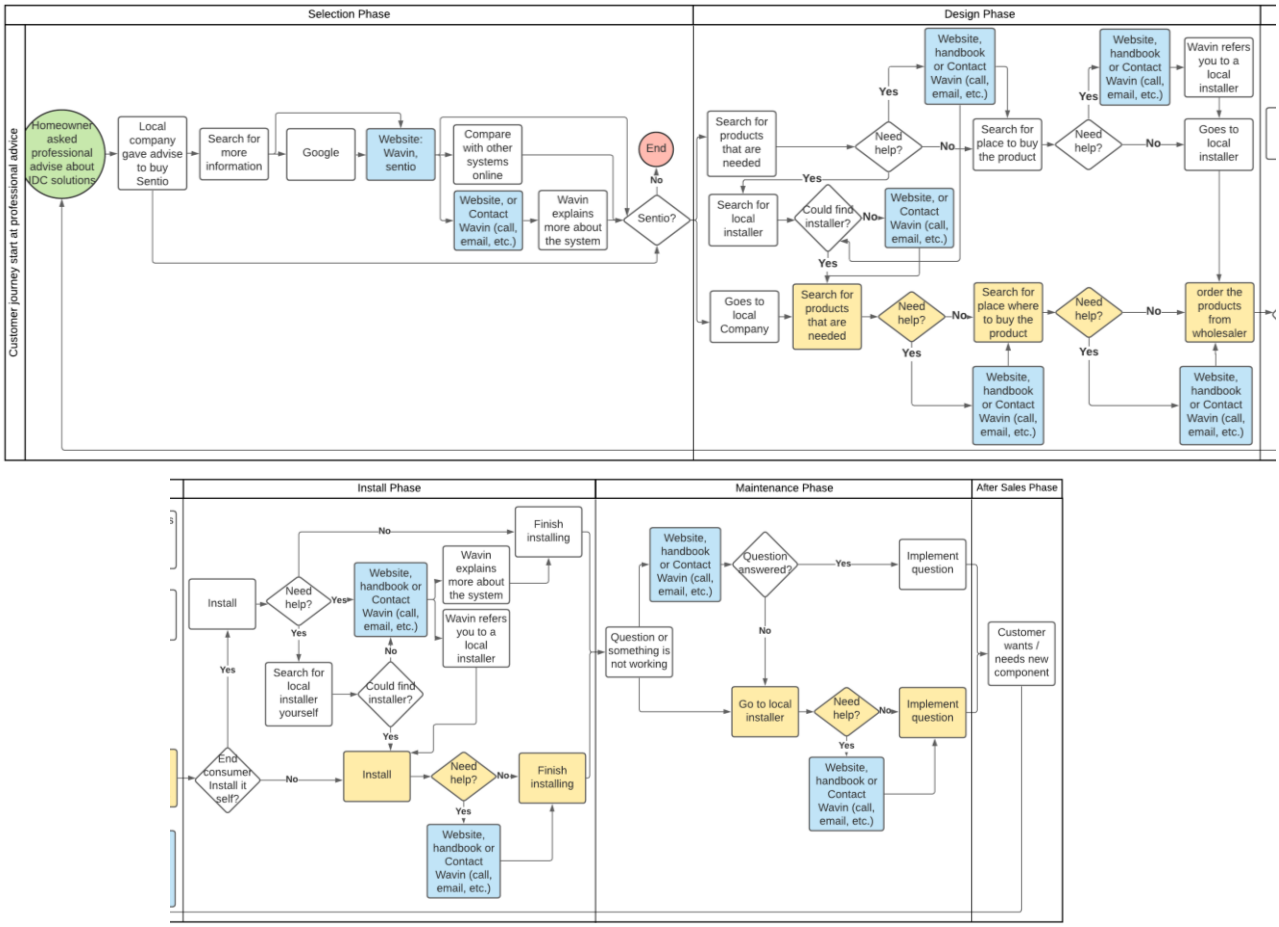


Figure 24: End-customer journey of Sentio, homeowner asked professional advice about IDC solutions

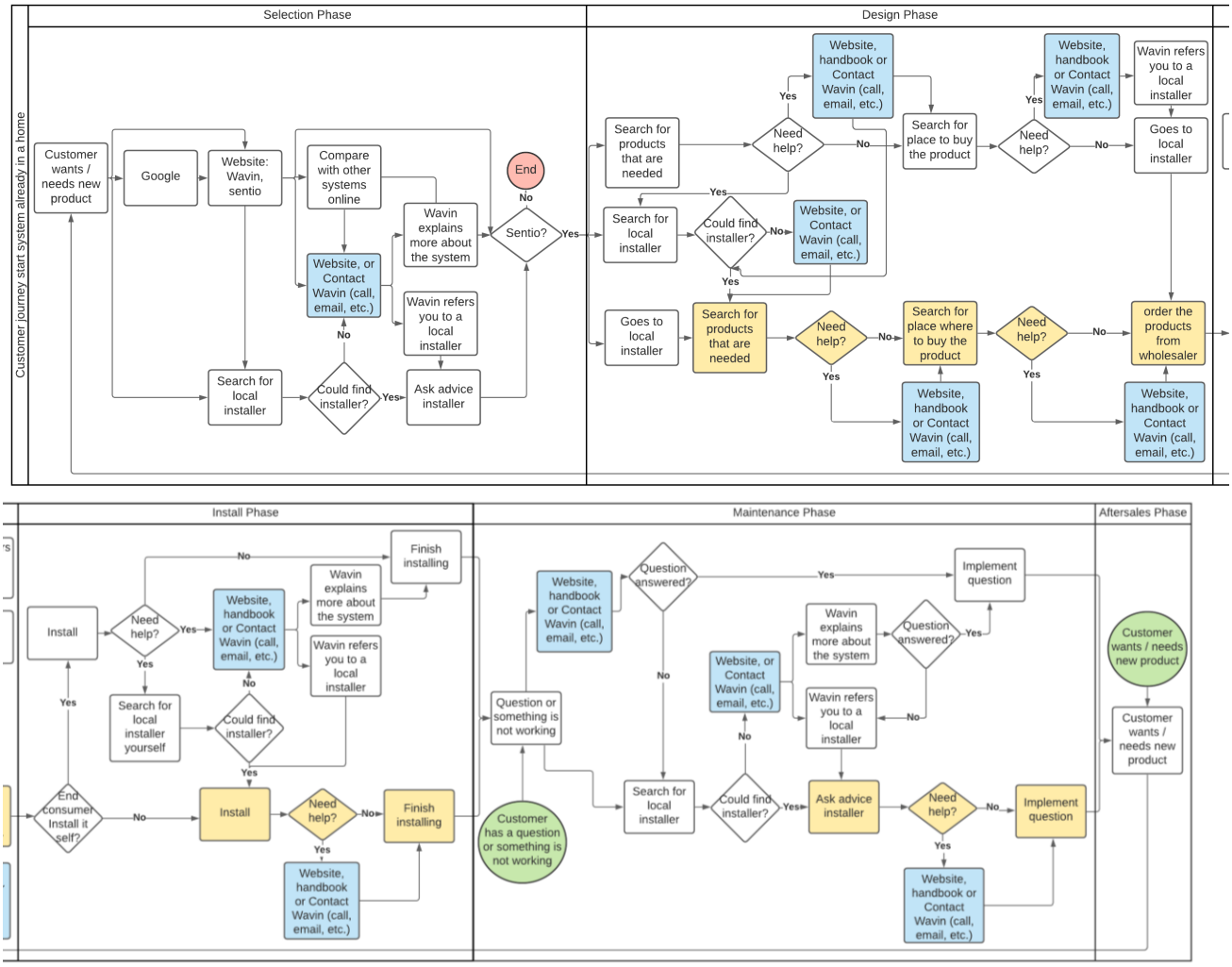
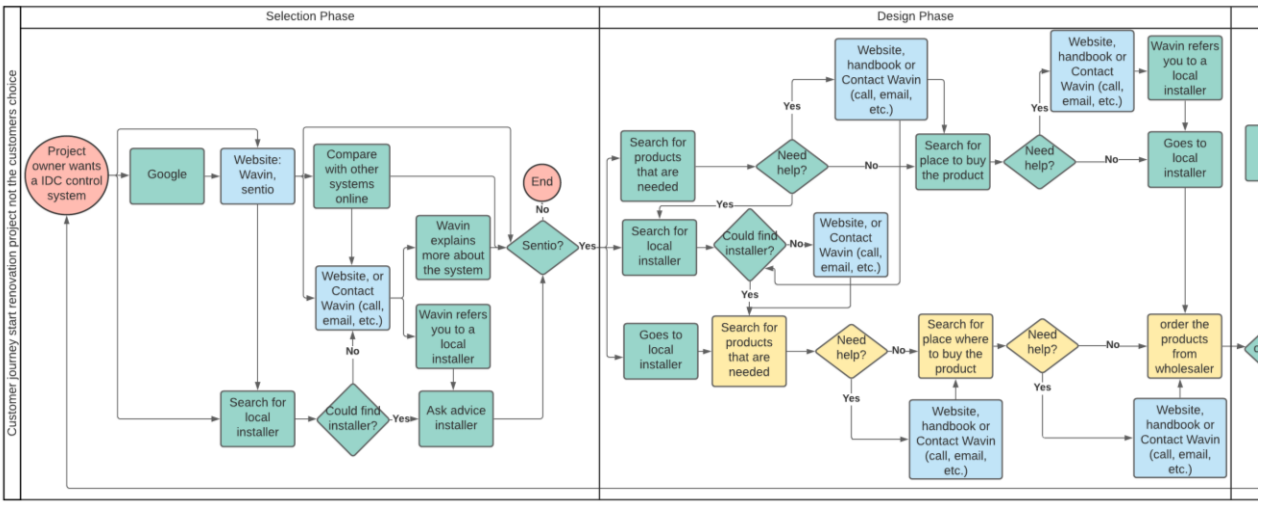


Figure 25: End-customer journey of Sentio, customer moved to a house with Sentio already in it and has a question



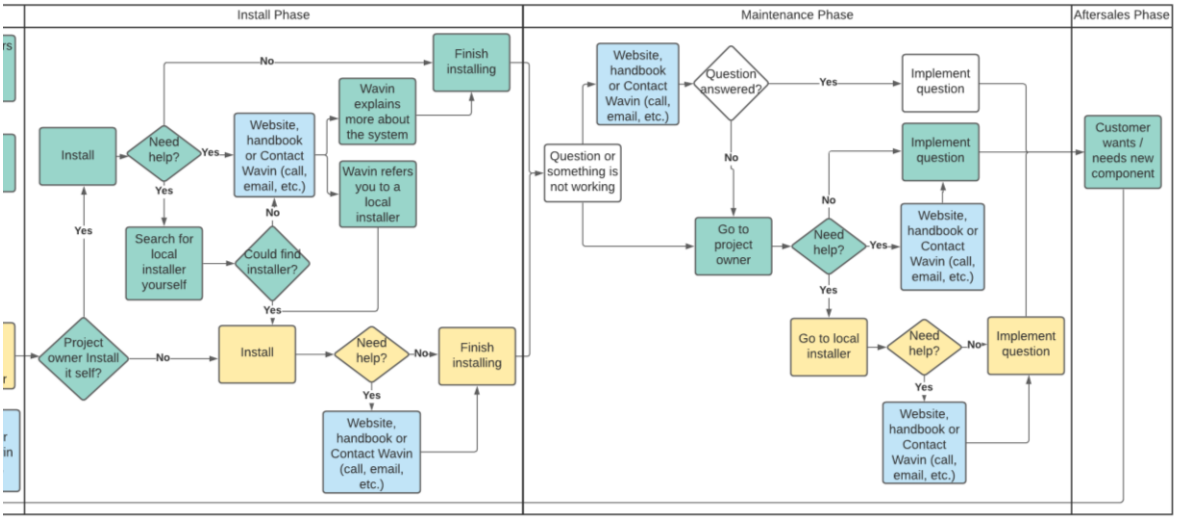


Figure 26: End-customer journey of Sentio, project owner wants an indoor control system

APPENDIX E: ONLINE CUSTOMER JOURNEY WAVIN BY METRIXLAB'S

Wavin has conducted this research for 9 months in 2019, to get feedback from actual website visitors after interacting with the website, to evaluate the website on a large number of metrics, including KPIs on content, structure and design, and to measure the success on visiting goals & overall

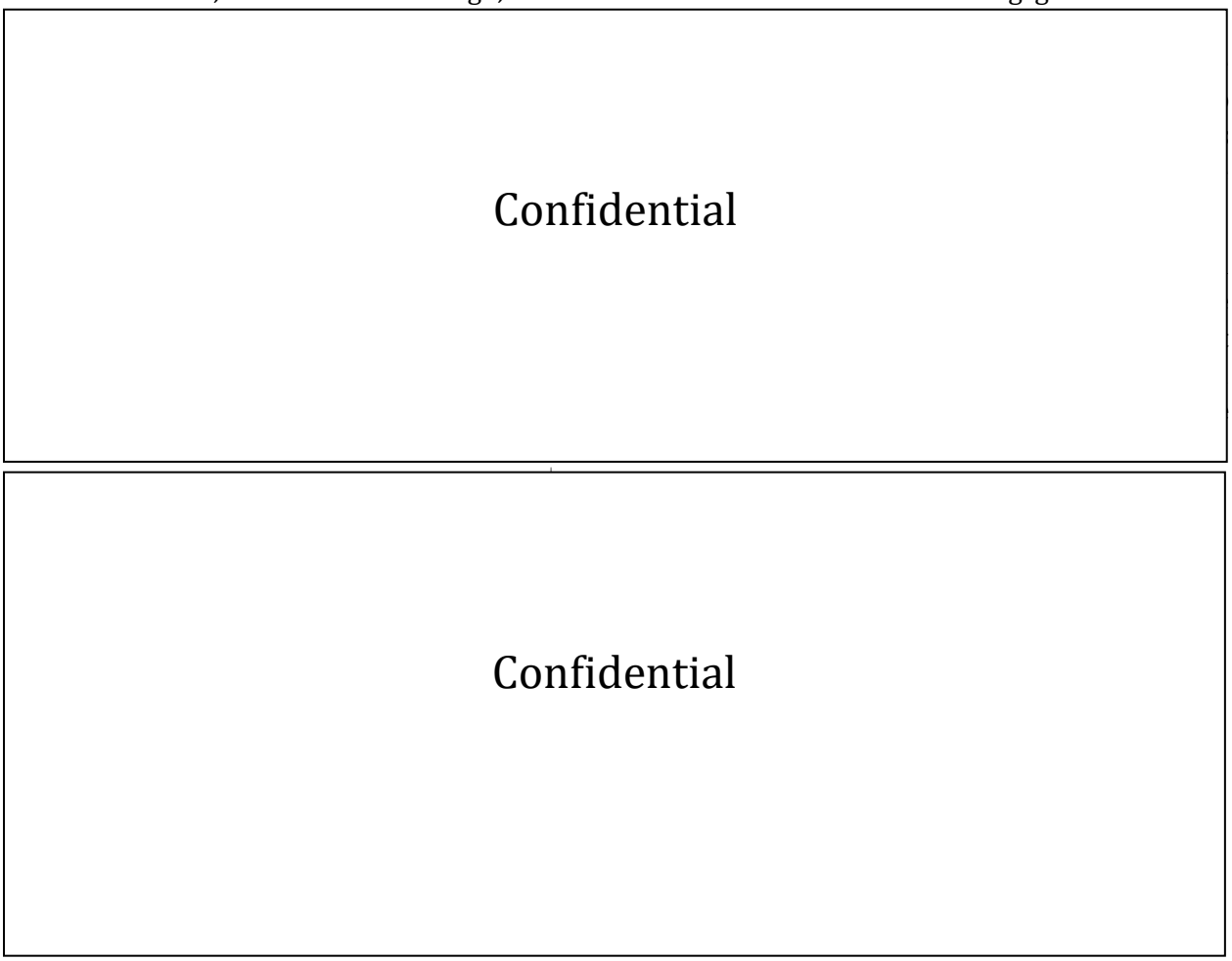


Figure 27: Main visit reasons Wavin website (wavin/MatrixLab, 2019)

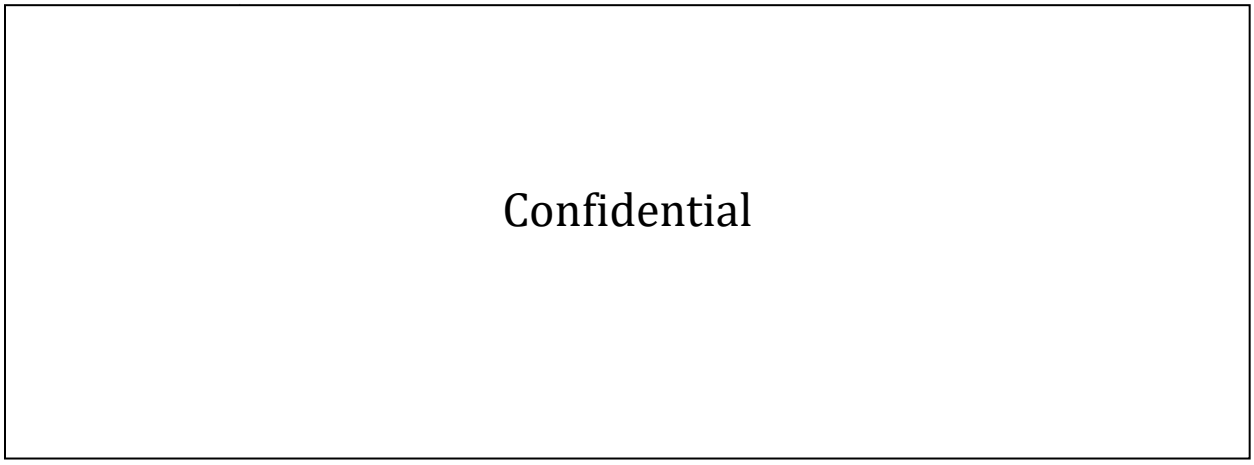


Figure 28: Root causes for not completely successful website visit (wavin/MatrixLab, 2019)

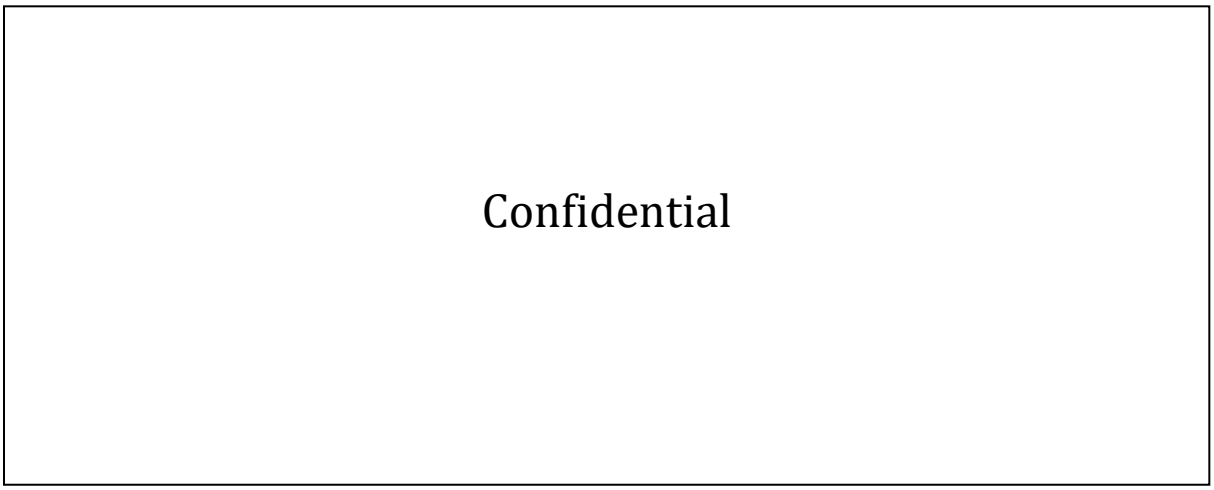


Figure 29: The Wavin website User Experience Index (wavin/MatrixLab, 2019)

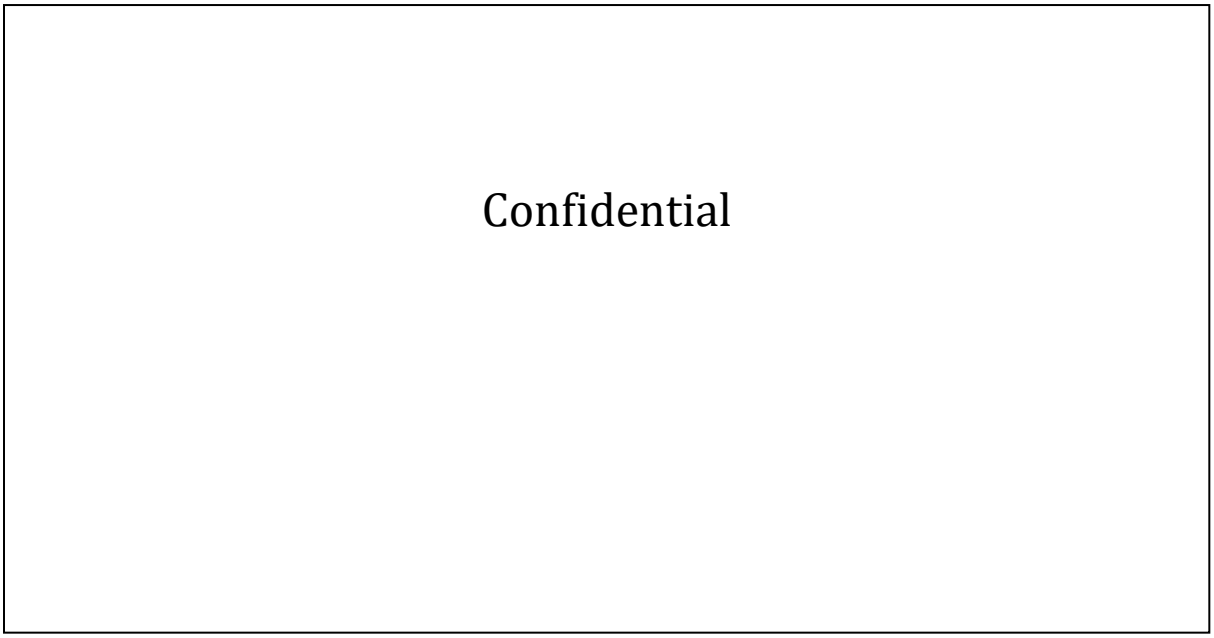


Figure 30: The Wavin website User Experience Index per country (wavin/MatrixLab, 2019)

APPENDIX F: LITERATURE REVIEW

To obtain the academic sources to answer research question 2: *"According to the literature, what are the different alternatives to visualize the customer's experience in a customer journey map?"*, a systematic literature review is conducted. The theory conducted from the systematic literature review can be found in chapter 4 of this thesis.

According to Noort (2021), the eight steps to conduct an excellent systematic literature review are:

1. Formulate the research question
2. Define the selection criteria
3. Choose the databases
4. Formulate search terms
5. Define search strategy
6. Carry out the searching
7. Evaluate the systematic literature review
8. Document your findings

These steps are used as a guide to conduct the systematic literature review.

Literature research will be conducted to find the different alternatives to visualize the customer's customer journey experience. Eventually, the best method to visualize the customer experience in the customer journey for Wavin will be chosen in consultation with the company. The benefits of visualizing the customer's experience in the customer journey are that you can easily see the customer's touchpoints, the customer goals, and the business goals. With this, you can easily see the solution's requirements and formulate the approach for the solution. Therefore the following research questions are formulated for the systematic literature review:

- *According to the literature, what are the different alternatives to visualize the customer's experience in a customer journey map?*
    - *What are the pros and cons of those different alternatives?*
    - *What choice would be the best fitting for Wavin?*

Selection criteria are used to determine whether the articles found in the search should be included in the systematic literature review or not. The exclusion and inclusion criteria used in this review with explanation can be found in table 12.

Table 12: Exclusion and inclusion criteria used in the systematic literature review

Exclusion criteria	**Inclusion criteria**
The paper does not originate from the selected fields of study. (It does not help to answer the research question.)	The paper is available to answer the research question. (The article needs to be free and accessible.)
No combined customer journey and customer experience map. (The combination to measure the customer experience in a customer journey map is key for this research.)	The paper is published in English

No visual map of the customer journey. (The goal is to visualize the customer journey, so this must be in the articles as well.)	There is a visual map of the customer journey. Without a visual map, it is not easy to research how the customer experience can be made visually.)
The theory used not explained. (If only the theory is used and not explained, no pros and cons are described or arguments why something is done. This both is important to be able to answer the research question.)	

Table 13: Logbook search string

Date of search	**Database**	**Search terms (plus additional search functionalities)**	**Amount of hits and explanation**
29-03-2021	Scopus	Customer journey, Sorted on: relevance	1581 results, since I've sorted on relevance, the first page only contains useful sources. WE scanned through those sources and found out that a lot did not go over customer journeys.
29-03-2021	Scopus	"Customer journey", Sorted on: relevance	481 results, since I've sorted on relevance, the first page only contains useful sources. Many more of those sources went about customer journeys, but not in many sources was a visual map of the customer journey.
29-03-2021	Scopus	"Customer journey" AND map, Sorted on: relevance	87 results, some useful sources about customer journey maps were gone. We figured out that articles sometimes also use Maps or mapping instead of only maps.
29-03-2021	Scopus	"Customer journey" AND map*, Sorted on: relevance	135 results, since I've sorted on relevance, the first page only contains useful sources. Still, a lot of sources did not include a visual map of the customer journey.
29-03-2021	Scopus	"Customer journey map*", Sorted on: relevance	103 results, since I've sorted on relevance, the first page only contains useful sources. More sources did now include a visual map of the customer journey. However, the experience of the customer on the map was quite often missing.
29-03-2021	Scopus	"Customer journey map*" AND experienc*, Sorted on:	57 results, many sources contained a visual map of the customer journey with the customer's experience

		relevance	included.
29-03-2021	Scopus	"Customer journey* map*" AND experienc*, Sorted on: relevance	57 results, to make this search string even better also after journey an asterisk is placed. This, however, did not result in more results.
29-03-2021	Web of Science	"Customer journey* map*" AND experienc*	31 results, the same search string as in Scopes is used in the Web of Science database.

Table 14: Papers used in the systematic literature review

Title	**Authors**	**Year**	**Subject**	**Selection criteria**
Customer Journey Mapping as an Advocacy Tool for Disabled People: A Case Study	Crosier, Adam; Handford, Alison	2012	Positive negative customer journey mapping	Method used and explained, clear visual map of the experience of the customer journey
Journey mapping from a crew's perspective: Understanding rail experiences	Oliveira, Luis CR; Birrell, Stewart; Cain, Rebecca	2020	Customer experience	Method used and explained, very good explanation of customer experience and customer journey mapping
User as Customer: Touchpoints and Journey Map	Schulze Kissing, Dirk; Bruder, Carmen; Castengerdes, Nils; Papenfus, Anne	2019	Positive negative customer journey mapping with touchpoints	Method used and explained, clear visual map of the experience of the customer journey
Research and Design for Hotel Security Experience for Woman Traveling Alone	Wang, Hong Jiao; Wu, Chi Hua	2020	Very extensive customer experience journey mapping	Method used and explained, clear visual map of the experience of the customer journey
The Experience Economy: work is Theatre & Every Business a Stage	Maital, S	1999	Customer experience	Method used and explained, very good explanation of customer experience and customer journey mapping

APPENDIX G: SOLUTION PRODUCT CONFIGURATOR

Description process development tool

Before this research, the development of the product configurator already started. The reason why is that many customers did not know which products they needed for their project, and installers wanted to have a document to show to their customers what would come into their house. Next to this, this product is more complex than other products, and mistakes can be made easier. From this perspective, Wavin decided to start developing this tool. The product configurator makes to process of deciding which products are needed easier, and customers can choose the products without the help of Wavin. This will have a significant effect on the problem statement of this research. Therefore there is chosen to help to finish developing this tool.

The development of this tool was quite complex. The first step taken was to brainstorm about what should be concluded in the tool. After this, each scenario had to be worked out. All the different combinations needed to be investigated. All the exceptions needed to be explored, and all the minimum and maximum combinations needed to be figured out. Lastly, all the combinations that were not possible needed to be researched. Whit all the scenarios, an external party was hired to develop this tool. When a concept was finished, many sprints went by to resolve bugs and implement missing aspects. The further development of this tool stopped for an unknown reason.

When this research started, and we again convinced Wavin of the tool's benefits, we continued developing the tool. We tested the tool many times to find existing bucks that the external company good resolve. When the tool worked properly, there was made a start to work on the tool's appearance. At the same time, we filled in the tool's database with all the different product codes and descriptions from the different countries. We made sure that all the products were active on the countries landing pages. When this was done the tool was ready to be tested and translated by all the operating countries. They could give us feedback that we tried to improve or sent it to the external company to improve. Wavin is now almost ready for the launch of this product, but first, we need to finish deciding where to place the tool and how to bring it live.

Description product configurator tool

The first step for the tool user is to choose the language they prefer. The tool is available in all countries languages Sentio is sold. After this, the user will be guided through five phases and eventually will get a list of products. The first step for the user is to decide how many rooms they want to be controlled and with how many heating circuits all the rooms are connected to. Figure 31 shows how this first step looks like. Step two for the customer is to decide which thermostat they want in every room. They can have a wired or wireless thermostat, or only a room sensor, with a floor temperature sensor or not. Good tips will show up for the user to make their decision easier. The third step is to select the number of manifolds per system. One Sentio central control unit can control maximum of 2 pumps, with or without inlet temperature control. Again tips are given to help the customer choose.

The fourth step is to choose the accessories for the products. For each product, there is described what it does and what the benefits are. There is also given advice on what accessories are suggested for your project. For example, if you have 2 Sentio thermostats, it is suggested to have two wall boxes to hang them up. Step 5 gives an overview of all de recommended products to buy. The last step is to download the product information for your project. In this file, a summary of the products per room can be found, the bill of materials, and a link to the website to find more information about the products needed.

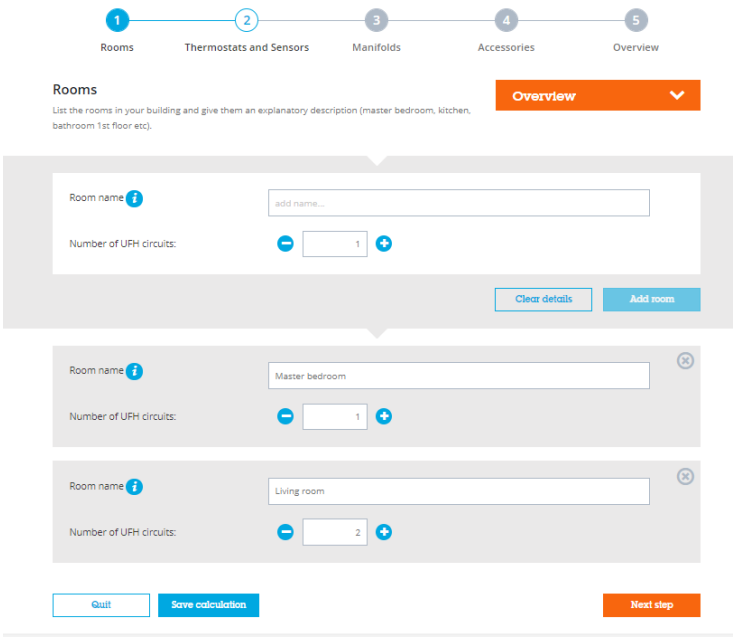


Figure 31: Sentio product configurator tool

APPENDIX H: STRUCTURE AND CONTENT SENTIO WEB PAGE

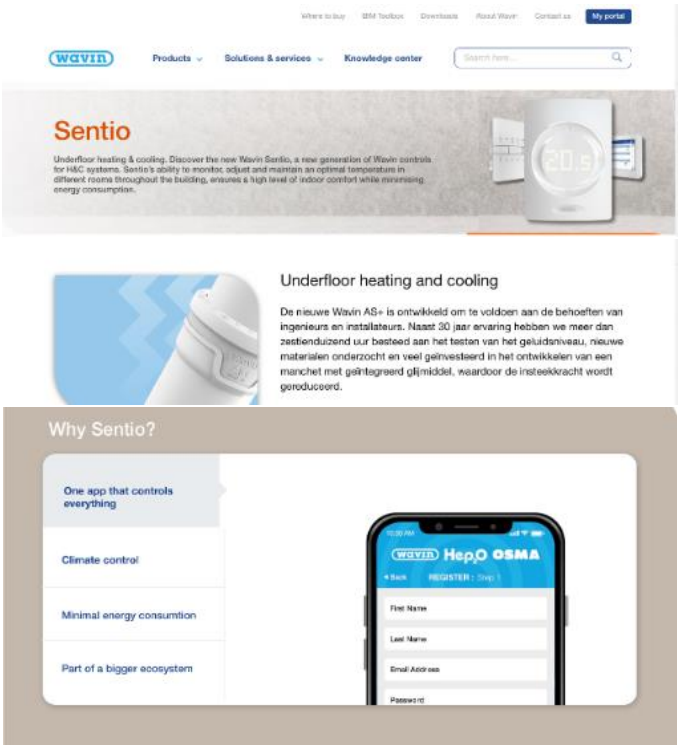
During this research, we designed a new layout for the Sentio webpage. By designing the Sentio webpage, we kept the customer journey in mind. The customer journey shows through what stages the customer goes in which order. It is important that these stages can be found in a logical order on the website. Next to this, the website must make it clear for the customer at which stage they are and, therefore, what information is relevant for them now.

The customer journey map from figure 16 shows what the customer needs are in each stage. With the new web page design, it is kept in mind that all this information can easily be found on the web page. Therefore, the new web page requirements are that there must be focused more on the end customers, all the needed information for the customers must be available, and the information must be easy to find.

For the implementation of the new design, a roadmap is made. First quick wins will be implemented on the global Sentio webpage. After this, on one local Sentio webpage, the new design will be implemented. When the new web page is live, Wavin will have a close look at its performance for a period of time. Finally, the web page will be translated and copied to all the other local Sentio webpages if everything works well. The following sections show the new and old designs of the web pages to explain what and why things are changed.

Global Sentio web page

The new global Sentio web page aims to have quick references, small facts, and immediately redirect the customer to their local web page. Figure 32 shows the new design, and figure 33 shows the old design. The new design is less chaotic, has clear titles, and does not have unneeded information. The customer can easily click for more information in the why Sentio section and quickly click on their own local Sentio web page.



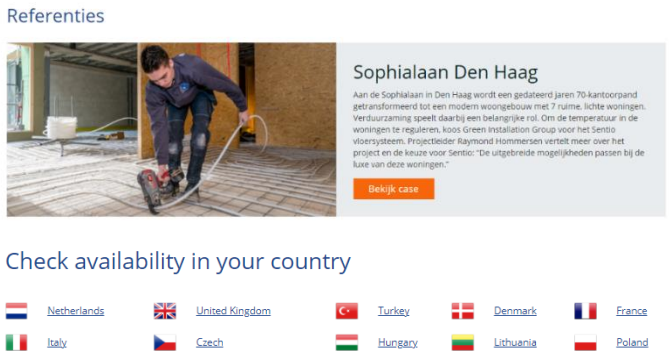
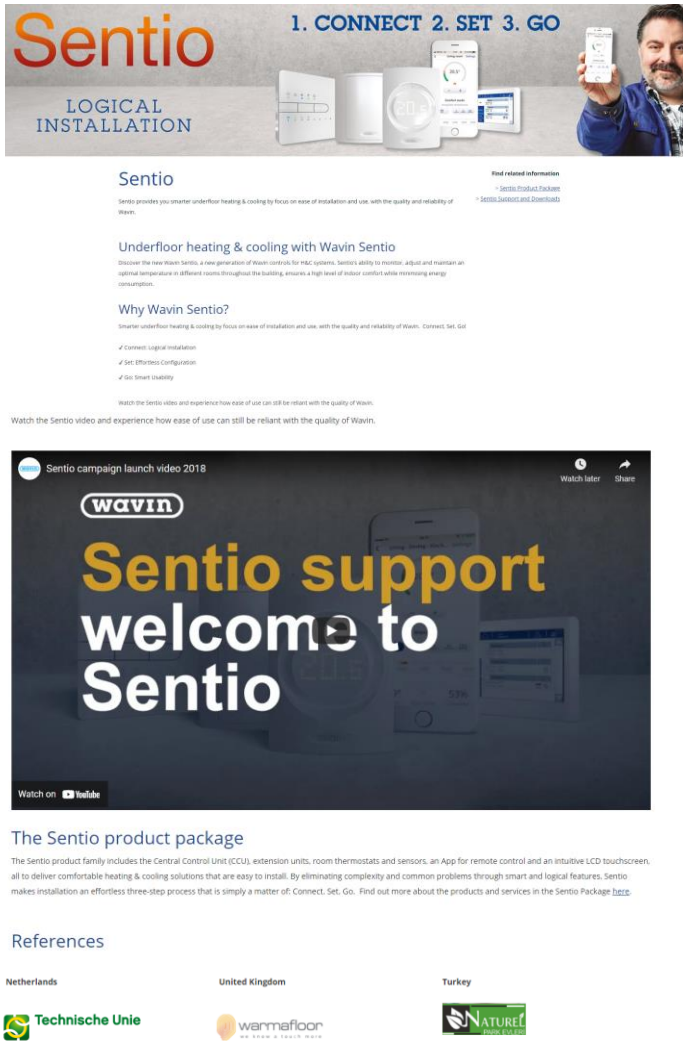


Figure 32: New global Sentio webpage

Figure 33 shows the current and old global Sentio web page. A lot of information is written on this web page. However, the design is chaotic, and the downloads can better be placed on the local Sentio webpages as well as the references. This because the downloads are in multiple languages available, and the references differ per country. Also, the check availability in country is not up to date.



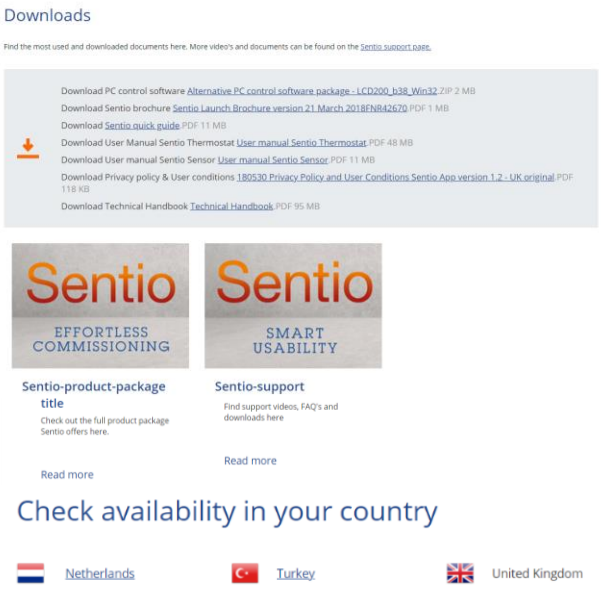
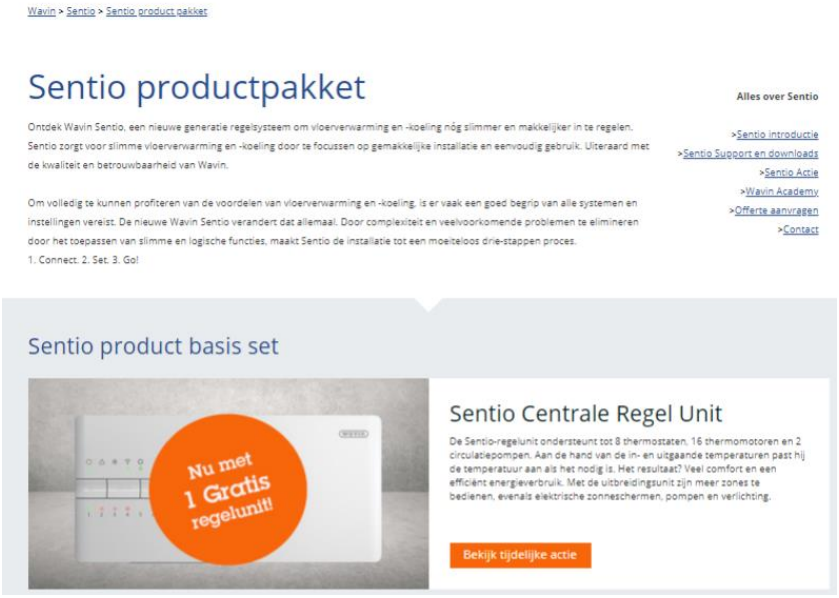
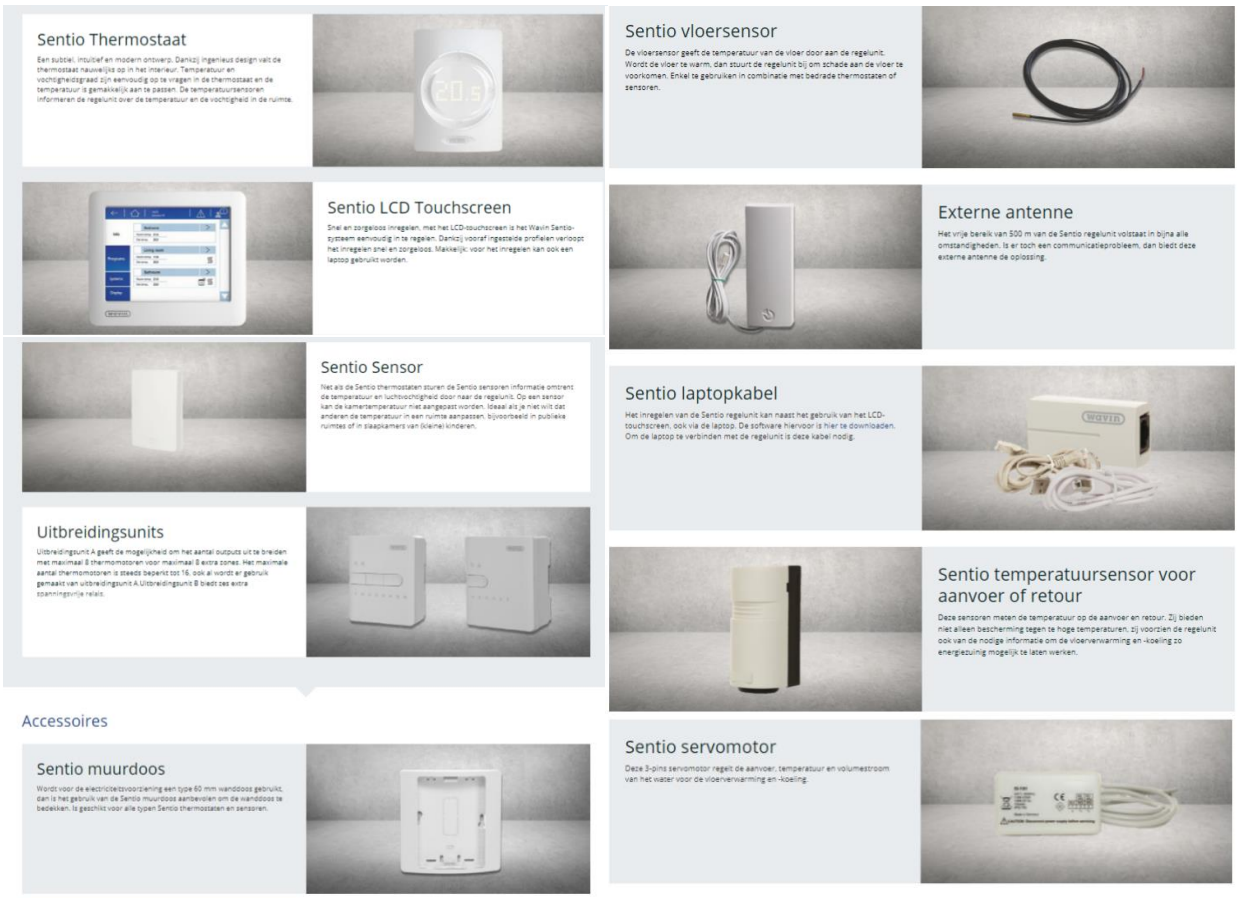


Figure 33: Old global Sentio webpage

Local Sentio webpage

Figure 35 shows the new design of the local Sentio webpage, and figure 34 the old design. In the old design, a lot of information is shown on one webpage, and on the right side, there is a menu to go to even more information. Therefore, it is very hard for the customers to find the information needed, and not even all the information needed is available on the webpage. During this research, we figured out that customers in the sales process and customers who have the product and are in the maintenance phase demand different information. With the new design, this is kept in mind.





Sentio Product Data

The color of the Sentio components is RAL9003.

Cataloguscode	Omschrijving	Gewicht	Hoogte	Lengte	Breedte		EAN code	ETIM klasse
	Thermostaten en sensoren							
4866710000	Sentio Thermostaat Bedraad	70 g	20	90	65	mm	5708525532321	EC010927
4866700000	Sentio Thermostaat Wifi	80 g	20	90	65	mm	5708525532338	EC010927
4864410000	Sentio Sensor Bedraad	70 g	20	90	65	mm	5708525532345	EC010174
4864400000	Sentio Sensor Wifi	80 g	20	90	65	mm	5708525532352	EC010174
4866700002	Sentio Thermostaat Infrarood	80 g	20	90	65	mm	5708525532369	EC010927
	Toebehoren thermostaten en sensoren							
4866648600	Sentio Muurdoos	45 g	22	95	95	mm	5708525532444	EC010927
4866869004	Sentio Vloertemperatuursensor	180 g	20	100	100	mm	5708525532512	EC010927
	Regelunit							
4866869000	Sentio Regelunit Basis	825 g	55	230	110	mm	5708525532383	EC010927
4866869100	Sentio Regelunit Uitbreiding 8 kanalen	220 g	55	100	110	mm	5708525532413	EC010927
4866869200	Sentio Regelunit Uitbreiding 6VFR	220 g	55	100	110	mm	5708525532420	EC010927
	Toebehoren Regelunit							
4866869002	Sentio LCD Display	160 g	29	90	77	mm	5708525532437	EC010927
4856800004	Sentio Laptop kabel voor Regelunit	100 g	29	90	77	mm	5708525575878	EC011313
4864510000	Sentio Buitensensor Bedraad	135 g	35	90	110	mm	5708525532475	EC010927
4864500000	Sentio Buitensensor Wifi	165 g	35	90	110	mm	5708525532482	EC010927
4866869005	Sentio Ext. Antenne Regelunit	150 g	30	150	45	mm	5708525532505	EC010927
4853010004	Sentio Temperatuursensor Aanvoer en Retour Pompunit	25 g	35	80	55	mm	5708525575373	EC011410
4858000009	Sentio Servomotor 3-pins 24V	250 g	85	122	100	mm	5708525575885	EC011290

Figure 34: Old country specific Sentio webpage

Figure 35 shows the new design. There is focused on a structured webpage, with all the information needed for the customers easy to find. What can be seen in the figure is that on the top page, a menu is shown. This menu is always visible and disappears, not when you scroll down. After this, the customers will be immediately separated. The customers who demand for sales information will click on your all-in-1 solution option, and the customers who demand support will click on the need help option. If they are not sure, they will scroll down. The why Sentio section is very small, but they can easily click on the other sections if they demand more information. At last, also the product range is visible for the customers that want more information about that.

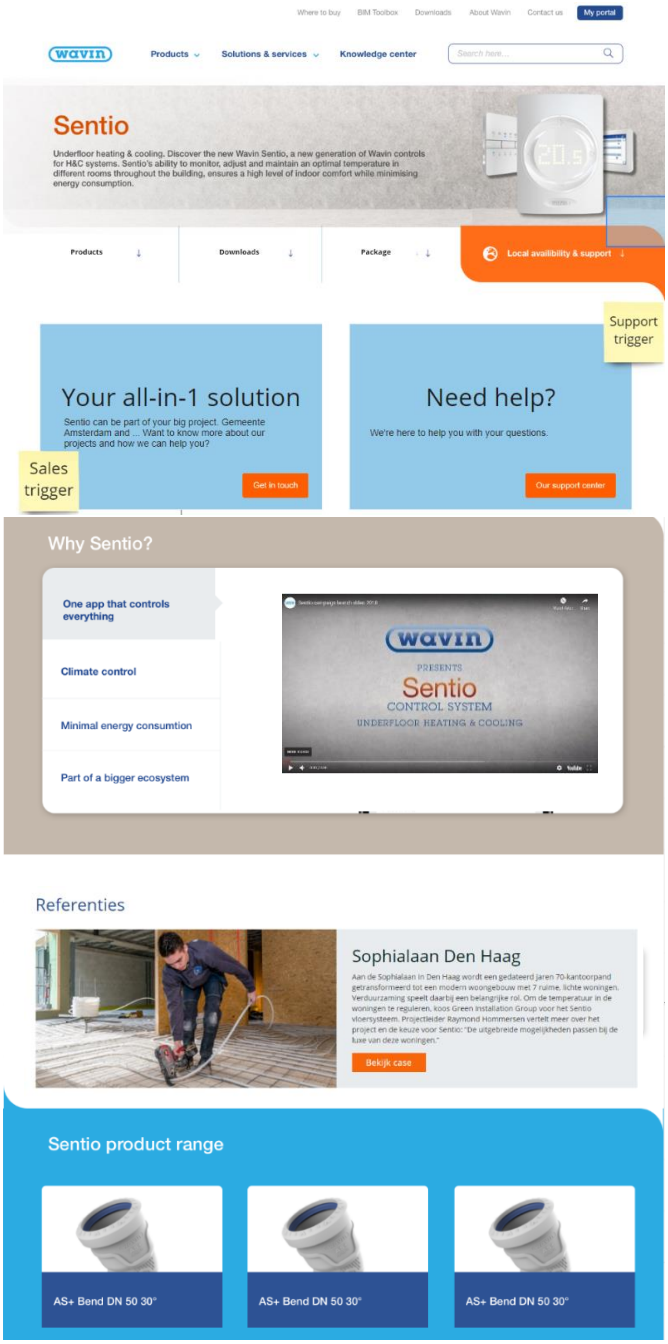


Figure 35: New country specific Sentio webpage

Sentio product webpage

The product webpage was also not structured and needed improvement. Figure 36 shows the new design, and figure 37 shows the old design. In the new design the customer is easier referred to the local Sentio webpages, and there is an information and support button. Next to this in the new design, an overview in the form of a table will be given for all the Sentio products.

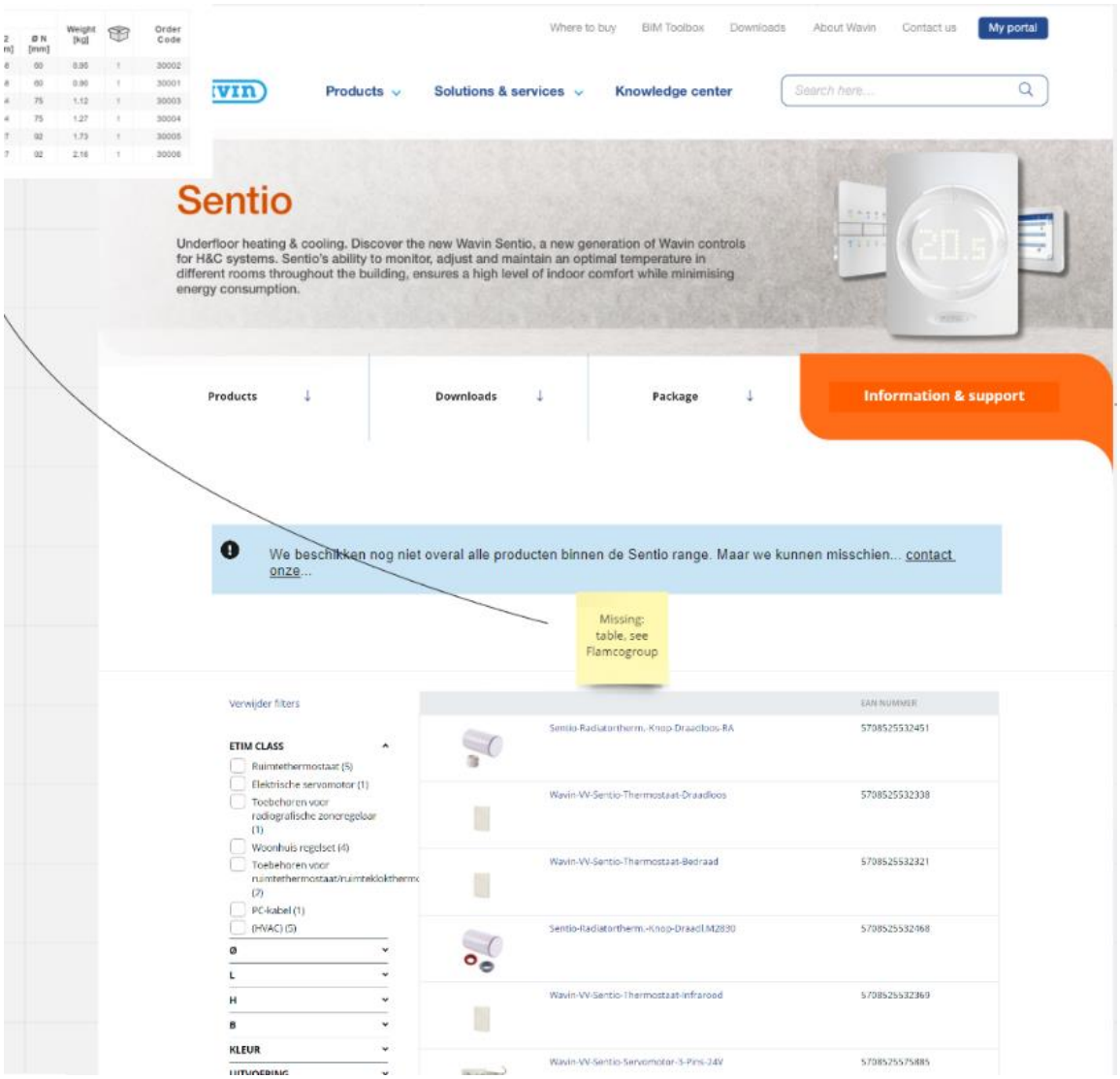


Figure 36: New Sentio product webpage

Figure 37: Old Sentio product webpage

Implemented quick wins on the website

The check availability in your country section is already implemented on the global Sentio webpage. Figure 38 shows the old webpage, and figure 39 the new one.

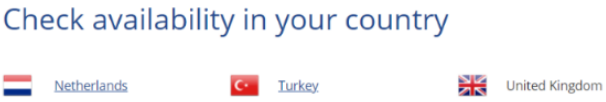


Figure 38: Old check availability in your country section

Figure 39: New check availability in your country section

APPENDIX I: EAXAMPLES FAQ'S

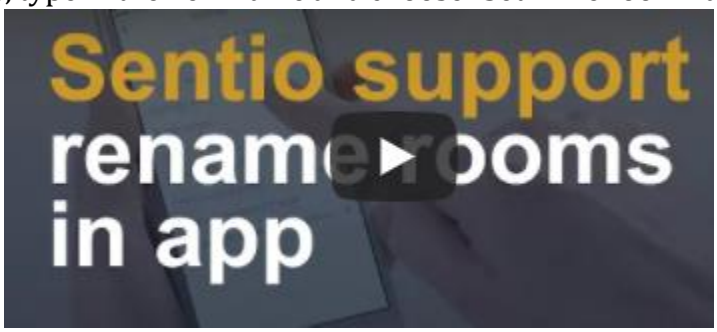
How to check the humidity percentage in the room?

Watch this video to find out how you can check the humidity percentage in the room using the thermostat. Place your finger anywhere on the touch area of the thermostat and press for three seconds. The humidity percentage in the room appears.

How to change the batteries of the thermostat?

Watch this video to find out how to change the batteries of the thermostat. Press and tilt the front to detach the room thermostat from the wall. The thermostat uses standard AA batteries. Replace the batteries and attach the thermostat with a small push onto the back panel.

How to rename rooms in the app?
Watch this video to find out how you can rename rooms by using the Sentio App. Choose the settings icon in the app. Choose “Room names” and choose your location. Choose the room you want to rename, type in the new name and choose “Set”. The room name is now changed.



How to set the stand-by mode in the app?
Watch this video to find out how to set the standby mode using the Sentio App. Choose the settings icon in the app and choose “Stand-by mode”. Turn the standby mode on and off by activating the icon next to the location.

How to lock the thermostat in the app?
Watch this video to find out how you can lock the thermostat using the Sentio App. In the app, choose “Detail”. Choose the settings icon and choose “thermostat lock”. Turn the lock on and off by choosing “Confirm”. The thermostat is now locked.

APPENDIX J: EVALUATION FAQ EXTENSION RESULTS

Questions evaluation

1. **Performance expectancy**
   PE-EP-1: Customers using the FAQ tool enables me to accomplish my tasks more quickly
   PE-EP-2: Customers using the FAQ tool increases my productivity
   PE-EP-3: Me using the FAQ tool to help me answer questions of the customers, enables me to accomplish my tasks more quickly
   PE-EP-4: Me using the FAQ tool to help me answer questions of the customers, increases my productivity

2. **Effort expectancy**
   EE-EP-1: I would find the system easy to use
   EE-CP-2: Customers would find the system easy to use

3. **Attitude toward using technology**
   ATUT-CP-1: Customers will like the idea of using the FAQ tool
   ATUT-EP-2: I will like the idea of using the FAQ tool to help me answering the customers questions
   ATUT-EP-3: Customers using the FAQ tool will makes my work more peaceful
   ATUT-EP-4: Me using the FAQ tool to will makes my work more peaceful

4. **Social influence**
   EP-1: In general the organisation will support me to use the system

5. **Facilitating conditions**
   FC-EP-1: The FAQ tool is unique in comparison with the resources available at the moment
   FC-EP-2: A specific person (or department) is available to assist me with questions regarding the FAQ tool
   FC-CP-2: A specific person (or department) is available to assist the customer with questions regarding the FAQ tool

6. **Self-efficacy**
   SE-EP-1: I could use the FAQ tool if there was no one around to tell what to do
   SE-CP-2: The customers could use the FAQ tool if there was no one around to tell what to do

7. **Behavioural intention to use the system**
   BIUS-EP-1: If the FAQ tool is live I predict I would use it in the next months
   BIUS-CP-2: If the FAQ tool is live I predict the customers would use it in the next months

Table 15: Results evaluation FAQ extension

Question	After Sales IT	UX global	Product manager Baltic	Product manager IDC global	Product development global	Customer service global	Account Manager ICS	Average
PE-EP-1	5	5	4	4	4	4	5	4.4
PE-EP-2	5	4	4	4	4	5	5	4.4
PE-EP-3	3	4	3	3	2	5	4	3.4
PE-EP-4	3	4	3	3	4	5	4	3.7
EE-EP-1	5	5	4	-	4	5	4	4.5
EE-CP-2	3	5	4	-	3	5	4	4.0
ATUT-CP-1	4	4	3	5	5	5	4	4.3
ATUT-EP-2	3	5	4	5	4	4	4	4.1
ATUT-EP-3	5	4	3	5	5	5	4	4.4
ATUT-EP-4	3	4	4	5	4	4	4	4.0
EP-1	4	5	5	-	3	5	4	4.3
FC-EP-1	4	4	4	5	5	5	4	4.4
FC-EP-2	4	5	3	3	4	5	4	4.0
FC-CP-2	3	4	3	5	2	5	4	3.7
SE-EP-1	3	4	5	5	1	5	4	3.9
SE-CP-2	5	5	4	5	5	5	4	4.7
BIUS-EP-1	3	5	5	5	4	4	5	4.4
BIUS-CP-2	5	5	4	5	5	5	4	4.7
Average	3.9	4.5	3.8	4.5	3.8	4.8	4.2	4.2