
How can Somitra B.V. Bridge the Gap between Potential Customers and their Product Solution within the German Market?

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Document: Research Justification

Program: International Business & Management

Date: 18th June 2022

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Executive Summary

General Information

The forthcoming research justification renders a lengthy explanation of how Somitra B.V. can bridge the gap between potential customers and their product solution within the German market. Somitra B.V. aims to determine the viability of their product "Smart Water Meters" directly with potential customers in the German market. In this approach, five information gaps were identified which served as a cornerstone for the market research.

1. German end-consumers' pains and frustrations with traditional metering systems.
2. German Water Utilities strategic infrastructure in solving metering problems for Residential, Commercial & Industrial use.
3. German Governmental Regulations in terms of product sensitivity and accessible user data by a third party.
4. Competitive Landscape in the German Smart Water Metering market.
5. Present Smart Metering Technologies utilized in Germany.

In order to fill in the missing information gaps stated above, it was necessary to investigate the German market from 3 distinct investigation areas, the market, the product, and the customer. To do so, 3 different research methods were utilized. Initially, desk research to collect, inspect, categorize, and analyze secondary market data gathered from published resources. This method enormously contributed to the formulation of a clear, comprehensive, and complete understanding for the market situation. Internal interviews were then held in the next stage of the research. Internal interviews were conducted in order to learn more about the company's products and services, including the mechanics underlying each device and the technologies employed. Internal interviews was critical to determine how Somitra can adapt its product and service solutions to eventually survive factors that heavily influence the German market. Moreover, external interviews were meant to identify potential customers' perception of product choices and preferences through one-on-one interviews with prospective customers. Somitra's potential clients are predominantly German water utilities because it operates under a B2G business model.

After assessing Somitra's current capabilities with the German market situation through a SWOT analysis that was derived from the fulfillment of the above-mentioned information gaps, it was observed, that Somitra cannot enter the German market with their current capabilities. Thereafter a confrontation matrix was conducted to dig further into the outputs of the SWOT analysis. The confrontation aided in the examination of each distinct combination of strength, weakness, opportunity, and threat. The objective was to determine the most vital operational problems that Somitra may face if they attempted to enter the German market at this juncture. The confrontation displayed 11 negative combinations when dimensions were integrated. In this approach, Recommendations were derived from the confrontation matrix results which aimed to convert negative combinations to positive combinations. The following 4 recommendations were as follows:

1. Strengthening Suppliers' Network
2. Enhancing Service Reliability
3. Selection of a Priority Sector
4. Temporary Shift to Private Water Supply Entities

The given recommendations were found to be the most superlative solutions for transitioning negative combinations in the confrontation matrix into positive combinations, which indicates a safe market entry. Recommendations are covered in depth within in Chapter 5 of the research justification.

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Preliminary Research

Chapter 1

1.1 Company Analysis

Somitra B.V. headquarters is located in Roosendaal, Zeeland, NL. Somitra B.V. is a privately owned as well as a multinational corporation and is actively operating in four major industries, Oil, Gas & Petrochemical, Water & Wastewater, Construction Material as well as Renewable Energy. Somitra B.V. displays itself as a diversified organization which adopts and pursues a strategy of broadening the organization's scope across various products as well as diverging market sectors. Mr. Sohrab Bozorg Pishani launched Somitra B.V. in 2012 and has defined an action-based statement that declares the organization's mission and how it serves its consumers, "We strive to deliver the highest quality products to our customers with competitive services". (["Do you know about us?", n.d.](#))

The intern's graduation project was held in the Water & Wastewater Industry at Somitra B.V. The organization is chiefly responsible for the technology and the assembly of their products with the support and guidance of their skilled experts and the participation of numerous Project Managers. Customer satisfaction is their primary goal, thus, Somitra B.V., adopts a Pricing Penetration strategy where it tends to deliver the best approach at the lowest price with spectacular results relying on innovation and experienced technicians. Somitra B.V. is designated to supply engineering services and equipment to businesses through the assistance of their engineering specialists. Thus far, the organization had successfully initiated and constructed its products and services which was released onto the local market and received eight international awards, their products and services in this sector mainly involves, Digital Water Meter Reader, Distilled Water Production Systems, Wastewater Treatment, as well as Water Purification Systems. (["Water & wastewater industry - Somitra: Business group", n.d.](#))

Somitra B.V.'s center of attention is presently focused on expanding globally and operating in foreign markets by exporting their products and services in the Water industry around the globe and primarily to neighboring countries in the European region as it opens the window of opportunity to a large yet untapped market. The organization's substantial partner, ODS Metering Systems aids Somitra B.V. with leading technology by enhancing their production facilities' capability to deliver optimum quality-products, services, and solutions to their consumers, leaving Somitra B.V. with a high competitive advantage over its market rivals. Furthermore, to manage all piping materials projects, Somitra B.V. collaborates with T.A.L. Holland Group, which is considered to be as one of the most prominent steel pipe suppliers in Europe. Somitra B.V. adopts Sustainable Development Goals as a part of its vision and values in which their products and services are always tailored towards sustainable solutions. The company's operations in the Water Industry addresses Sanitation, Quality, Health, Seawater to Drinking Water in addition to Wastewater Treatment. (["Our partner - Somitra: Business Group", n.d.](#))

For water utilities, the main hurdle is reading meter data, which is exceedingly costly. Changing mechanical meters in a short period of time is not feasible economically. Thus, Somitra's experts and R&D engineers in water and waste-water treatment and management developed an innovative concept. The upshot is a mechanical to digital converter sensor known as "Smart Water Meters". A Smart Water Meter is one-of-a-kind gadget for reading meter data. This ingenious and innovative technology uses a sensor module to automatically read the water meter. The mechanism of the gadget is constructed to have simple set up and installation on any meter body, requiring no physical modifications to the existing meter's shape or form. The setup is simple and can be completed in a couple of minutes. Residential water usage and measurement are causing severe concerns due to the high cost of water meters which are frequently shared. As a result, there is a lack of information in two major aspects. The amount of water utilized by each residential unit, as well as any piping issues or leakages. As a consequence, a tremendous amount of water is wasted; therefore, the digital water meter reading sensor enables users

retain valuable information such as real-time usage on a specific basis such as volume and cost. Furthermore, the user's consumption on each outlet, as well as a detailed comparison to neighboring units. (["Innovation in water meters - Somitra: Business Group", n.d.](#))

1.2 Product Development

Sleer B.V is a Somitra Group subsidiary that is currently operating in the Netherlands. Sohrab Bozorg Pishani, the founder of Somitra Group, is also the CEO of Sleer. Somitra Group is now able to achieve significant growth and stronger direct customer relationships with water utilities in its local market of the Netherlands as a European innovator of Smart and Digital technologies. (["Sleer", n.d.](#)) The company's Smart water metering products and services include Digital Scanners, Optical Sensors, Electromagnetic Sensors as well as the software that receives and analyzes data from the three devices. See Annex 7.1 – *Product Development* for an in-depth elaboration on each product and service solution.

1.3 Problem Analysis

Somitra B.V. aims to expand their business and deploy their smart metering products to new markets in Europe. They chose Germany as an outset for achieving the intended growth. Germany was chosen in particular for its embracing and continuous adoption of technological advancements that consider and strive to tackle water challenges, as well as the tremendous number of German Water Utilities willing to adopt smart metering solutions. According to both reasons, it was seen that Somitra's product and service range in the Smart Water Metering industry is aligned with German goals and commitments. In that sense, potential chances of Somitra being chosen by German water utilities for new rollouts that cover large cities within Germany is high. Which in return, increases Somitra's growth and profitability by forming strategic partnerships with German water utilities. However, the upcoming problem analysis is used to identify the main problem that arose from this decision, and to confirm the reasons behind the problem. An Ishikawa Diagram is illustrated – See figure 1 – *Ishikawa Diagram* to clearly demonstrate the problem and its core causes. The Ishikawa Diagram was particularly chosen to visually depict the problem, as well as its root and sub causes. Rather than focusing on symptoms, this diagram greatly aids in diagnosing the problem.

"Bridging the Gap between Customer Expectations & Product Solution" is the ultimate problem. Meaning, Somitra must test the viability of their smart metering devices by collecting detailed and in-depth data that covers various market investigation aspects to ensure correspondence with the German market. Somitra needs to carefully comprehend the German market and tailor their product solutions towards the market situation in order to meet customers' expectations. Somitra will be unable to determine how to tailor and modify their product solutions to suit customers' demands without examining the market and evaluating their product solutions in correspondence to the market situation, as represented in the Ishikawa diagram – See figure 1 – *Ishikawa Diagram*.

Somitra needs to ensure that their product and service range is viable and can be included in Germany's smart metering devices' rollouts. Furthermore, Somitra needs to ensure that their present position in comparison to German rivals will enable the organization to survive competition in Germany. In other words, Somitra needs to find out if their current product and service range meets the German market standards or not. These aspects can cause German water utilities to either purchase Somitra's smart metering devices or switch to other players operating in the market. In order to assess the business potential, Somitra must first evaluate the market's viability. To thoroughly analyze the market and see if the company can profit from the German market, this method necessitates the identification of market size, competitive landscape, and target audience as demonstrated in the Ishikawa diagram – See figure 1 – *Ishikawa Diagram*.

The problem is now being examined in Germany since the organization had identified the German market as the initial target for study and investigation.

The aforementioned problem largely impacts Somitra's Marketing department. As a result, the company is uncertain if entering the German market will yield the desired expansion outcomes or the focus should completely shift to another market. In this approach, it can be seen that poor market research practices will lead to erroneous assessments of potential customer needs, wants, and demands which will eventually cause the company to fail in meeting customer expectations in the Ishikawa diagram – See figure 1 – Ishikawa Diagram.

The problem is existent since Somitra opted to deploy its Smart Metering technology solutions to foreign markets as a part of their business development and expansion plan. When Somitra was unable to identify their market and product viability toward Smart Water Meters in Germany as shown in the Ishikawa diagram – See figure 1 – Ishikawa Diagram, the problem became more evident. As a result, any final conclusions or decisions based on inadequate data would provide inconclusive and misleading outcomes, obstructing the overall expansion process.

The problem is currently observed in Somitra's unfamiliarity with various factors that contributes to a thorough investigation of the German market. Those factors incorporate Market Size and Trends, Macro-environmental analysis, Industry and Sector analysis, the Competitive Landscape, a comparison of Somitra's capabilities to rivals, who are their target audience, and which Smart Metering technologies are presently adopted and utilized in the German market. Those factors must be accurately identified to generate an informed decision that eventually provides a decisive answer of whether or not Somitra should enter the German market.

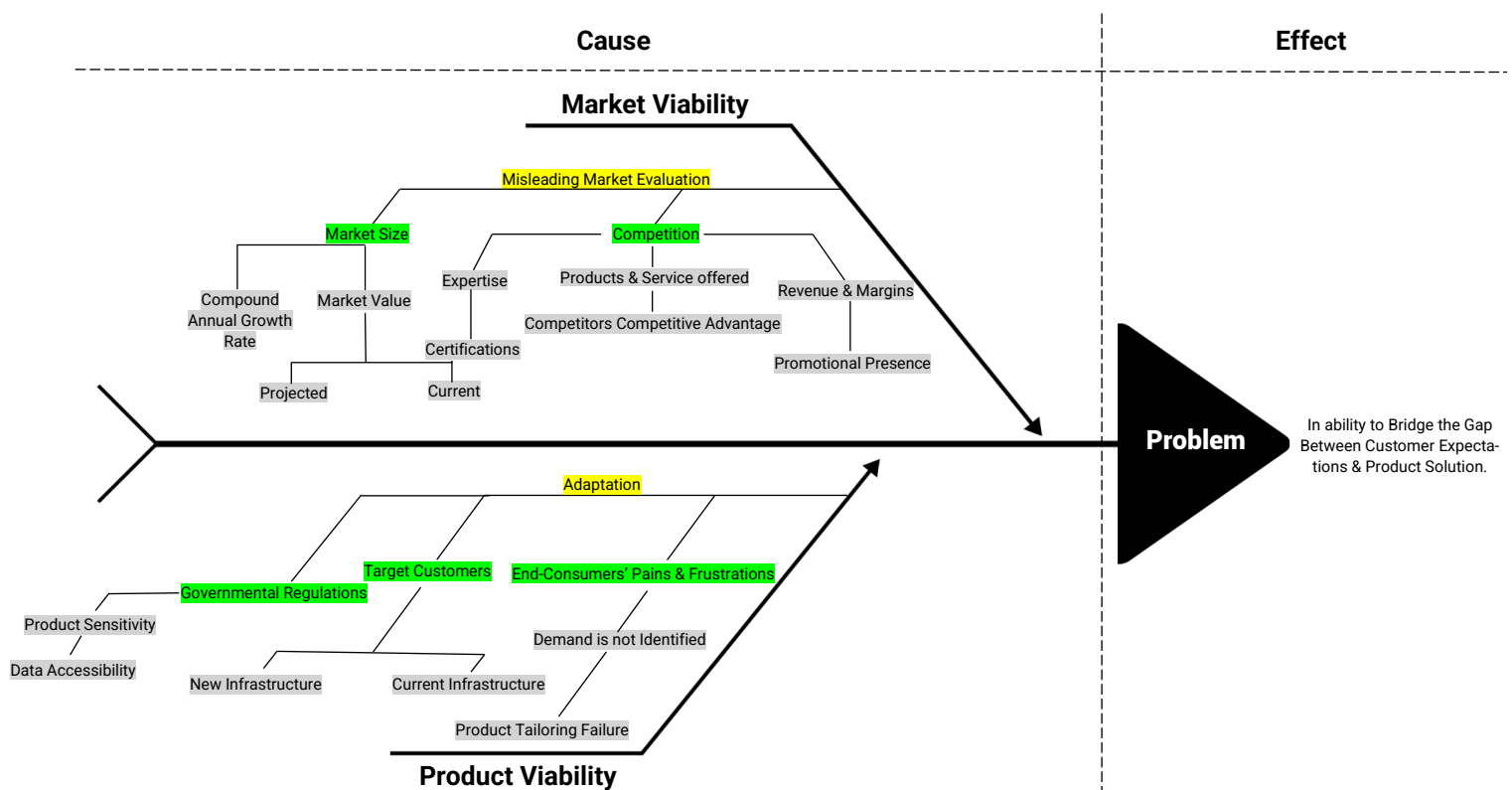


Figure 1 – Ishikawa Diagram

1.4 Domain

For Somitra to be able to determine accurately the viability of their product "Smart Water Meters" directly with potential customers in foreign markets, the company requires the student to conduct a comprehensive International Market Research that explores and examines the German market. The organization chose Germany as a point of departure primarily because its embracing and continuous adoption of technological advancements that consider and strive to tackle water challenges in recent years, as well as the tremendous number of German Water Utilities willing to adopt smart metering solutions. [\(Gtai, 2022\)](#) Somitra aims to establish partnerships with Water Utilities in this particular region. Therefore, solving the aforementioned problem in section 1.3 relies in the domain of "Marketing & Sales", specifically PLO TWM15, which is the ultimate key of resolving the initial problem stated. *Please Refer to Annex 7.2 – Project Aim* to view the project aim formulated through SMART criteria.

1.5 Research Questions

1.5.1 Information Gaps

1. German end-consumers' pains and frustrations with traditional metering systems.
2. German Water Utilities strategic infrastructure in solving metering problems for Residential, Commercial & Industrial use.
3. German Governmental Regulations in terms of product sensitivity and accessible user data by a third party.
4. Competitive Landscape in the German Smart Water Metering market.
5. Present Smart Metering Technologies utilized in Germany.

1.5.2 Main Research Question

- How can Somitra B.V. bridge the gap between potential customers and their product solution within the German Market?

1.5.3 Sub-questions

1. What are the main challenges of traditional water metering systems that directly impact end-consumers in Germany?
2. What is the current strategic infrastructure utilized by German water Utilities?
3. What is the new strategic infrastructure adopted by German Water Utilities to control water metering errors?
4. To what extent are German Water Supply organizations open to provide water consumption data to suppliers?
5. What are the competitive advantages does key competitors operating in Germany currently possess?
6. To what extent can Somitra B.V. adapt its product and service solutions to survive competition in the German market?
7. What are the metering technologies currently utilized in Germany?

Research Approach

Chapter 2

2.1 Approach per Information Gap

No.	Investigation Area	Information Gaps	No.	Sub-questions	Data Collection Method		
					Desk Research	Qualitative Methods	
						External Interviews	Internal Interviews
-	-	-	-	-			
1	Product / Market	German end-consumers' pains and frustrations with traditional metering systems.	3.1.1/ 3.1.2	What are the main challenges of traditional water metering systems that directly impact end-consumers in Germany?	✓	✓	
2	Market	German Water Utilities strategic infrastructure in solving metering problems for Residential, Commercial & Industrial use.	3.2.1	What is the current strategic infrastructure utilized by German water Utilities?	✓	✓	
			3.2.2/ 3.2.4	What is the new strategic infrastructure adopted by German Water Utilities to control water metering errors?	✓	✓	
3	Product	German Governmental Regulations in terms of product sensitivity and accessible user data by a third party.	3.3	To what extent are German Water Supply organizations open to provide water consumption data to suppliers?	✓	✓	
4	Product / Market	Competitive Landscape in the German Smart Water Metering market.	3.4.1/ 3.4.7	What are the competitive advantages does key competitors operating in Germany currently possess?	✓		
			3.4.8/ 3.4.9	To what extent can Somitra B.V. adapt its product and service solutions to survive competition in the German market?	✓		✓
5	Product	Present Smart Metering Technologies utilized in Germany.	3.5	What are the metering technologies currently utilized in Germany?	✓		

Table 1 - Research Design

2.2 Data Collection

2.2.1 Desk Research – Desk Research was the dominant data collection methodology for all sub-questions listed – See Table 1 – Research Design. The collection, inspection, categorization, and analysis of secondary market data gathered from published resources enormously contributed to the formulation of a clear, comprehensive, and complete understanding for the final market study. Because there is an enormous amount of data accessible on the subject, it was sufficient to depend on a single data collection

technique to acquire all the data necessary to complete the study. Browsing straight to specified material from statistical documents, technical articles, governmental publications, as well as commercial websites was the most reliable, and cost-effective technique to extract the required information and understand the research subject. Furthermore, the data acquired through desk research is publicly verified; thus, study findings are accurate and reliable.

The desk research process was categorized and organized in accordance with the following. As Information Gap 1 primarily addressed consumers' behavioral patterns, it was necessary to extract information through Survey Research as well as Peer reviewed publications which aided in pinpointing customers pains, frustrations and how end-consumers respond to these challenges. Moreover, news articles were used to reveal recent German smart water metering deployments within German cities. News article served in identifying German water utilities actions and rollouts towards a new water metering infrastructure which unveils how it differs from the current infrastructure in terms of benefits and advantages delivered to both end-consumers. Additionally, Information Gap 3 addressed governmental regulations towards product sensitivity in terms of data access. This information gap was retrieved from governmental published sources. Primarily, The General Data Protection Regulation (GDPR), as well as Centre on Regulation in Europe (CERRE). These sources unveiled detailed information about privacy and data protection that concerns Smart water metering. Information Gap 4 on the other hand, focused on retrieving data from competitors' websites as well as annual reports to assess the companies' financial condition and operations over the previous year. In addition to any other corporate documents that are communicated to shareholders. Ultimately, information gap 5 necessitated the combination of both Peer reviewed publications, and the websites of the 7 German key competitors. German competitors websites provided the chance of identifying the recent adopted smart water metering technologies utilized in the German market. Furthermore, Peer reviewed publication provided in-depth information of how these distinct technologies operates, derives data and how each technology serves a differing purpose.

2.2.2 External Interviews – Although all information gaps were completed through desk research initially, external interviews were meant to serve as a supplementary data collection method in information gaps 1,2 and 3 to enhance the reliability and validity of the study findings. Moreover, external interviews were meant to identify potential customers' perception of product choices and preference through one-on-one interviews with prospective customers. Somitra's potential clients are predominantly German water utilities because it operates under a B2G business model. This business model was chosen in particular since water utilities are extensively controlled and regulated by governmental entities. The utilization of this data collection technique was meant to cover a wide variety of subjects as well as dig into specific comments about the company's product and service range. Interviews were intended to derive answers from Water Utilities to five key questions.

- **Utility Goals** - What are the utility goals for the end-user?
- **Utility Challenges** - What is preventing the Utility from reaching their goals?
- **Appropriate Features** - What does German Water Utilities expect from Smart Water Meters' Suppliers in terms of specifications and functionality?
- **Satisfaction Points** - To what extent can Somitra's product and service solutions potentially enable the utility to establish a partnership with Somitra and not with another supplier?
- **Retention Strategies** - What does this Utility expect from Somitra in order to reduce churn (End-users registering with other water utilities)?

Interviews were planned to be arranged with the chief and leading Water Utility companies that service and cover huge geographical areas throughout Germany. Hamburg Wasser (["Geschäftsfelder", 2022](#)), Berliner Wasserbetriebe (["Berlin", n.d.](#)), Mainova AG (["mainova", n.d.](#)), Stadtwerke Düsseldorf AG (["Stadtwerke Düsseldorf", n.d.](#)), Stadtwerke München GmbH (["Geschäftskunden: Stadtwerke München", n.d.](#)), and RheinEnergie (["Energie & Wasser für geschäftskunden: Rheinenergie AG", n.d.](#)) were among the water utilities

selected for the study. These utilities were the launching point for gathering information on customers' perception of product choices and preferences. The Saturation method, on the other hand, was designated to determine how many external interviews are required. Meaning that when no further outputs or insights are identified and data starts to be redundant and duplicates itself, then more interviews are no longer required and the interviews performed are sufficient and reliable.

2.2.3 Internal Interviews – Internal interview with Mr. Vahid Niroumand, Sleer's technical manager, were conducted in order to learn more about the company's product and service offerings, including the mechanics underlying each device and the technologies employed – *See Annex 7.5 – Internal Interview Transcription*. The interview was primarily focused on answering sub-questions nine and ten to assess and determine how Somitra can adapt its product and service solutions to eventually survive competition in the German market. This necessitated a thorough understanding of the company's present products and services, as well as their distinctive qualities from a technical viewpoint, allowing Somitra's current capabilities to be recognized. In addition, it was crucial to determine if Somitra's existing metering devices will work effectively when installed to the current German metering system or not. Both factors aided in performing a comprehensive examination of Somitra's present technologies to evaluate and compare the company's products and services to those of key competitors operating in Germany's Smart Water Metering market. This information provided a wealth of information in determining Somitra's competitive advantages in the German market.

2.3 Data Analysis

2.3.1 Secondary Data Analysis – Following the data collection process described in section 2.2.1, a thorough review and full inspection of data was then required. Examining the secondary data relevancy and checking its overall credibility were two key actions to be performed during this phase to ensure that the data obtained meets the study's objectives. It was necessary to evaluate the data collected through identifying valuable information that provided major insights for each chapter according to the study's structure. Furthermore, it was essential to double-check the data's credibility after identifying all the relevant data acquired. To determine if the data is factual and unbiased, data consistency in terms of retrieving similar data that matches the initial findings was required. This process necessitated a thorough examination and a closer inspection.

2.3.2 Transcribing – The data gathered through external interviews with German Water Utilities and internal interviews with Somitra's technical manager were transcribed into protocols and transcripts that served as a route path for further analysis. The qualitative study completed through audio recordings were then transcribed into a textual form that included precise details. Now that transcripts were available, the preceding course of action followed.

- **Examination** – The examination phase necessitated reading through the gathered data numerous times to gain a sense of what it contains which opened the window of opportunity to note down any thoughts, ideas, or farther questions.
- **Present Ideas in a Logical Order** – A presentation took hold that effectively conveyed the data's story back to Somitra. The presentation addressed all data retrieved for each chapter according to the study's framework.

2.3.3 Triangulation – Triangulation is a methodology for analyzing the outcomes of a single research utilizing several data collection methods. It was employed for three major reasons, to enhance and improve research reliability and validity, to paint a more detailed image of the research topic, and to investigate multiple perspectives on the research subject. Triangulation was used to enhance the reliability and the validity of the study findings by ensuring that results from multiple methodologies or witnesses of the same event are consistent. In the research design – *See Table 1 – Research Design*, triangulation was settled through the usage of three data collection methods and the integration of each method with the other. Those methods encompass, initially, desk research which served as the prominent data collection

method that incorporated pre-existent data for embedding insightful information. Subsequently, comes the external interviews which was planned to be conducted with leading Water Utility companies in Germany to gain knowledge about potential customers' perception of products' choices and preferences. Ultimately, internal interviews which served in gaining a full comprehension of the company's existing products and services, as well as their differentiating qualities in relation to competitors operating in the German Smart Water Metering market, allowing Somitra's current capabilities to be recognized. All three data collection methods were meant to be combined to eventually ensure data triangulation.

Results

Chapter 3

To fully examine the German smart water metering market and provide useful data that immediately fulfills the information gaps outlined in the research design – See *Table 1 – Research Design*, a comprehensive market research was performed to allow Somitra to make an informed decision on whether or not to enter the market.

3.1 Traditional Water Metering

3.1.1 Pains & Frustrations impacting End-Consumers - Traditional water meters have fulfilled their duty satisfactorily in the past few years. Customers and manufacturers are yet attempting to implement a far more advanced water management technologies to assist in avoiding the pains and frustrations of traditional metering. The sources of pain and dissatisfaction are primarily arising from issues that concern measurement inaccuracies for billing end-consumers. Traditional water meters are making it increasingly difficult for German municipalities and water utilities to identify leaks and accurately quantify water consumption rates per user using manual reading techniques. Traditional metering systems also restrict end-users from measuring their water usage in real time, resulting in billing inaccuracies. As a consequence, end-users are incurring a hefty monthly fee. ([Msamadya et al., 2022](#)) The following subsection examines four critical challenges that end-consumers in Germany encounter.

- **Billing Process:** Traditional water meters are often installed in residential units as households demand moderate water usage. In German municipalities, the cost of water usage is determined by the size of the property. As a result, a single-person household pays the same as a family of five because their houses are of the same size. For example, a consumer may have a modest household but a sizable garden that needs watering; in addition to taking daily showers. Another sort of consumer can be a household consisting of three or four people who only shower and do not have a garden. As a result of municipalities' failure to precisely measure water consumption per consumer, both will pay the same amount. This means that end-consumers are not paying for the water amount they actually use.
- **Late Leakage Detection:** A water pipe in Germany is found to rupture every 30 seconds, according to estimates. In 2019, 1.1 million cases of tap water damage cases were documented, totalling more than 3 billion EUR. ([Industrial News, 2022](#)) With the new digital technology, leaks and other anomalies in water consumption should be detected considerably earlier. As a result of the use of traditional meters, water leakage in the water network has become a major issue for end-consumers. Traditional water meters report excessive water consumption to municipalities, which is mirrored and reflected in the bills issued to that particular region, since leaks might remain undetected for a long period unless an investigation is requested. This approach is seen as non-cost-effective and impacts other dimensions alongside end-consumers.
- **Mechanical Flaws:** Not only are traditional water meters less precise than smart meters, but they also lose accuracy over time. Equipment must be renewed every 10-15 years on average, and several German water utilities are now in the process of doing so. In this way, mechanical elements of traditional water meters wear out, necessitating periodic accuracy testing. Traditional meters are susceptible to silty water, which causes mechanical issues. ([RF Wireless World, 2012](#)) This leads to a loss of precision, necessitating an instant replacement. To put it another way, traditional water meters have a short service life, which means that as soon as the meter suffers mechanical faults, reading discrepancies skyrocket, resulting in hefty bills. Why not use this chance to optimize a technology that is more precise and allows end-consumers to efficiently understand and respond to their usage?

- **Inconsistent Monitoring:** End-consumers are unable to monitor how much water is consumed since traditional water meters do not provide continuous monitoring and real-time data transfer. As a result, water usage and consumption surge, which goes unnoticed until a hefty bill arrives.

3.1.2 End-consumers' Response - The water supplier bills the households it serves for water usage. The amount of water used, and the cost of supplying water services are the two key elements that impact the received bill. Households make choices about their water consumption and spending in response to their water bill. When it comes to coping with rising water bills, consumers switch to one of three possibilities. Reduced water use is one of these solutions. While this is a viable alternative, research suggests that it may not be feasible for many households. Households with lower incomes may be less capable of cutting overall consumption than those with higher incomes. Moreover, consumers do not adjust their water use behavior in the near term, according to studies. Another way to deal with increasing water expenses is to lessen spending on other household expenses. Switching water supplier is the ultimate option. Switching water supplier and selecting a more suited water supply contract has several advantages. Among them are:

- Changing water supplier is a straightforward and fast procedure. It only takes a few minutes to arrange, and no interruption in the water supply will be encountered.
- Changing water supplier may assist in identifying a better offer that incorporates reduced costs. End-consumers might save roughly 12% on water costs by switching suppliers, according to estimates.
- A different water supplier might be able to provide better service and guidance, as customer service is crucial.

3.2 Water Utilities Strategic Infrastructure

3.2.1 Current Infrastructure – Metering inaccuracies in water distribution systems are by far the most common cause of water loss. There are 50 domestic water meters in Germany that employ various techniques to detect water flow. As a result, selecting the appropriate water meter is crucial, as the meter type affects measurements' precision. In Germany, traditional water meters operate according to two distinct concepts: rate of flow and volumetric flow.

- **Rate of Flow Meters:** In these meters, flowing water turns a propeller whose rotational speed (rpm) is measured. A certain propeller speed corresponds to a particular flow rate. The propeller speed indicator may be calibrated right away using this data. A counting device that totals the number of propeller spins is used to indicate the quantity of water consumed.
- **Volumetric Meters:** A rotating container with a predetermined capacity is continuously submerged in water and then drained in this type of meter. The amount of water that flows through the meter is indicated by the number of spins. Volumetric meters are primarily used to monitor low flow rates.

The meters in concern are used to measure specified flow rates; if the flow rates passing through the meter surpass the meter's capabilities, the meter's accuracy drops. In this approach, water consumption has a direct influence on the accuracy of the meter. (["Smart water meter- the facts", 2022](#)) The water use of numerous end-users was studied in an experimental investigation, and consumption patterns were extracted; the obtained water consumption patterns were then used to analyze water meter errors. The errors of water meters were verified by measuring flow rates, and error curves. According to the study results, volumetric-type water meters had the lowest flow rate and the finest accuracy, whereas rate of flow meters had the lowest accuracy and the largest flow rate. ([Ethem Karadirek, 2020](#)) In this manner, it can be seen that low flow rates can be accurately measured; whilst increased flow rates based on water consumption causes an error to occur. Hence, water bills to end-consumers are relatively high due to inaccuracies in measurements, which is a considerable pain for end-users, as discussed in section 3.1. As a result, traditional metering systems are incapable of providing accurate readings. Therefore, German Water Utilities are converting to Smart Water Meters to ultimately reduce water losses.

3.2.2 Drivers of a New Infrastructure – Municipalities in Germany are chiefly responsible for public water supply and sanitation. ([Profile of the German Water Sector, 2020](#)) Water utilities, on the other hand, operate as an intermediary in the improvement of water infrastructure by forming strategic partnerships with suppliers that introduce innovative technologies that address the challenges outlined in section 3.1. Water Utilities in Germany are currently undertaking the necessary steps to improve water sustainability. ([Vestner, 2020](#)) These measures are being taken as a result of an exponential increase in water demand over the previous decade. A growing German population of 83.24 million people and increased urbanization have resulted in a drinking water network length of 500,000 km, which indicates a high residential consumption of 122 l/cap/d. ([Tisserand, 2018](#)) As a result of the rising water demand and the increasing water loss as discussed in section 3.2.1, sustainable use has become a key aspect in meeting current and future water demands. ([Müller-Czygan et al., 2021](#)) In this approach, German water Utilities are deploying Smart Metering systems as a part of their new strategy which can track water consumption across a water utility's supply chain and are currently the best available options on the market. As a result, the number of water utilities adopting this new technology has significantly increased, propelling the smart water metering market forward on a global scale. ([Sensus news: German town deploys sensus iperl smart water meter system 2015](#))

Moreover, the German Smart Metering market growth is fueled by precise billing and a financial benefit to the end-consumer. The smart water meter market size is currently booming. In 2020, the European smart water meter market has reached a market value of 556 million EUR. In 2020, the German market led the European smart water meter industry, and it is projected to remain so through 2027; the German market is estimated to be valued at 2.0 billion EUR in 2027. ([Germany continues as dominant market till 2027, 2022](#))

Smart water meters are not only efficient in terms of functionality, but they are also cost-effective for both water utilities and end-consumers. These meters are a one-time expenditure that will last for several years with minimal maintenance. Customers are attracted to precise billing since they are being charged according to the water they have consumed only. This prevents the possibility of miscommunication between the service provider and the end-user in terms of metering errors. ([Hazlegreaves, 2021](#)) Moreover, these installations benefit industries that demand large quantities of water, such as the food and beverage sector, the textiles industry, and others.

3.2.3 The New Infrastructure – A traditional water meter is an instrument that monitors how much water flows through a certain area. A traditional water meter, for example, can be used to calculate bills and analyze consumption through measuring the amount of water that enters a property, or a section of a property, over a period of time. A smart water meter functions in a similar manner as a traditional water meter. However, Smart water meters allow real-time monitoring of water use, which catalyzes efficiency, terminates manual meter reading, and saves significant costs. Utilities can track water consumption to get more accurate billing information faster. ([Marco Iansiti and Karim R. Lakhani & Porter, 2020](#)) Furthermore, the Smart water metering system uses communication technologies, such as a Wi-Fi water meter, to link LAN or wide area networks, allowing for remote location monitoring and infrastructure improvements including leak detection. (["A guide to smart water meters", 2022](#))

3.2.4 New Infrastructure Advantages – Smart Water Meters aid in better water management, enabling end-users to cut costs on water bills. The main advantages of smart metering are listed below.

- **Precise Readings:** Compared to traditional water meters, smart water meters deliver accurate readings. This signifies that if end-consumers install a smart water meter, they will only be charged for the actual amount of water you consume each month. This is both economical and reliable. (["Smart Water Metering", 2021](#))
- **Water conservation & Sustainable Development:** End-consumers are more aware of how much water they consume when they install smart water meters. These devices can also notify customers if their water use is abnormal. Smart water meters may identify leaks and notify end-users as well

as utilities about excessive water usage. In this manner, if there is a leak detected, water valves seal automatically. ([“Smart Water Metering”, 2021](#))

- **Costs Reduction:** Water conservation entails lowering end-consumers water usage. Water use reductions will be reflected in bills as well. End-consumers can access their water consumption statistics at any time when using a smart water meter. Smart water meters can lead to cost savings on water bills by providing real-time data on end-users' consumption. In other words, Smart meters enables end-users to change their behavioural patterns in terms of consumption. ([“Smart Water Metering”, 2021](#))
- **Leakage Detection:** Water leaks might go undetected for a long period until a hefty water bill is received. With the aid of smart water meters, end-users may notice surges in their water usage as soon as possible. ([“Smart Water Metering”, 2021](#))
- **High Return on Investment:** Smart water meter installation costs would be more than offset by savings in leakage treatment, network administration, and the removal of the requirement for alternate water suppliers as mentioned in section 3.1.2. Due to the attractive return on investment, overall expenses paid to water suppliers would be reduced, resulting in decreased water bills and maintenance expenses over time.

3.3 Governmental Regulations

Smart metering refers to a new generation of innovative and intelligent metering systems that can record the water consumption of a particular measurement point in ten minutes or even shorter intervals. These so-called smart meters may also communicate and transmit data to the product supplier over any communication network in real time or at least on a regular basis for various purposes such as monitoring consumption rate or signaling irregular consumption activities as mentioned previously. ([et al., 2008](#)) As a result, the product supplier must adhere to the regulatory requirements for the deployment of smart meters in Germany. There are primary regulations that must be carefully considered. Initially, the General Data Protection Regulation (GDPR) which is derived from the Data Protection Directive and has officially replaced the Data Protection Directive on May 25th, 2018, by adding new regulations which now took effect and is known as GDPR. ([Sullivan & decades, 2020](#)) Because Somitra B.V. is situated in the Netherlands, the Smart Water Meter complies and aligns impeccably with the German data protection principles and legislation ([Lee & Hess, 2021](#)), requiring the data controller to process metering data in line with the European data protection standards. ([Cervigni & Larouche, 2014](#)) Hence, Somitra B.V. has the opportunity to extend their business into the German market without confronting legal issues that might hinder the process of expansion. Please Refer to *Annex 7.3 – General Data Protection Regulation (GDPR)* for farther elaborations on GDPR and its crucial derivatives.

To summarize, Germany's authority to regulate smart metering must be utilized within the boundaries of EU data protection legislation. Because metering data, especially when acquired at short intervals, might expose sensitive information on specific individuals, smart metering necessitates a reconsideration of the concept of personal data. Smart metering is now widely accepted in Germany as including personal data. However, data processing must be justified in light of one of the data protection legislation's mentioned objectives - See *Annex 7.3 – General Data Protection Regulation (GDPR)*. Data controllers, on the other hand, are responsible for ensuring that legislation is followed in order for end-users to practice their rights. ([Cervigni & Larouche, 2014](#))

3.4 Competitive Landscape

In order to examine the smart water metering competition, it is necessary to identify the key competitors currently active in the German market. According to investigation and study findings, 7 key competitors were identified. This chapter is categorized into three prime sections. Initially, a detailed analysis of competitors' competitive advantages; whereupon a detailed analysis of Somitra's competitive advantages, from which a comparative assessment is derived to determine the competitive rivalry. This

comparison assisted in displaying Somitra's capabilities to be able to determine whether they can survive competition in the German market or focus should be shifted towards another market. Please refer to *Annex 7.4 – Competitive Landscape* for a more detailed elaboration on each competitor.

3.4.1 Zenner

- **Experts and Innovators in Water Metering Technologies:** Zenner has 116 years of expertise in water metering and is represented in over 100 countries. Zenner has regional experience and local support partners all around the world, allowing them to fully understand the market and its demands. As a result, the company is capable of developing and supporting solutions that are appropriate for its broad range of clients. ([“About Us”, n.d.](#))
- **Innovative Measuring Technologies:** Zenner's measuring technology satisfies all criteria for product service life, precision, and the capacity to integrate meters into current communication technologies, allowing municipal utilities, energy providers, real estate businesses, and industrial organizations to easily accomplish all measurement operations. Zenner measurement instruments bring value to their clients by providing solutions that are both sustainable and future-proof.
- **Innovative Communication Technologies:** Zenner provides remote reading system planning, installation, and operation support. In addition to the hardware for wired M-Bus solutions, the company presently provides two additional wireless remote reading options for water meters: the wireless M-Bus system and the stationary LoRaWAN® IoT radio system. ([Zenner International 2022](#))

Zenner currently has 54 different product lines for smart water metering devices. ([“Products”, 2021](#)) The firm employs 2,300 people, allowing it to quickly respond to consumer demands and stimulate product and service development through the constant adoption of innovative technologies. ([“About Us”, n.d.](#)) According to Zenner's annual report, the company has generated a sales revenue of 250m EUR in 2021. ([“Zenner International - Overview, News & competitors”, n.d.](#))

3.4.2 Kamstrup

- **Innovative Measuring Technologies:** Kamstrup's cornerstone is creating long-term value for their clients by combining technological supremacy with in-depth customer knowledge and understanding. The company offers flexible end-to-end solutions that are adapted to each customer's unique requirements. This includes providing them with the tools and data they need to bill individual users in high-rise, multi-tenant buildings and commercial premises more precisely. Furthermore, Kamstrup smart metering has shown to save building owners significant amount of money on both financial and operational costs. ([Kamstrup, 2019](#))
- **Sustainability:** Kamstrup is committed to lead and continue to pave the path toward a more responsible and sustainable water supply that is capable of meeting the world's growing demand. Kamstrup's whole product range is manufactured with the highest certifications for environmental safety and quality at their automated production facilities in Denmark. ([Kamstrup, 2022](#))

The company has 1,500 employees and a generated sales revenue of 328m EUR in 2021. ([“IFS to power kamstrup's ambitious revenue growth plans”, 2019](#)) The firm offers 62 distinct product lines that are largely used for differing smart water metering purposes. ([“Kamstrup”, n.d.](#))

3.4.3 Lorenz Meters Wasserzähler

- **Sustainability:** In Germany, water meters must be replaced at regular intervals due to calibration rules and measurement accuracy, even if many components in high-quality devices are still fine after usage and replacement. This is the basis of the concept, which is unlike any other in the industry. Lorenz collects replacement flat water meters from metering services and water utilities, disassembles and reprocesses them, and returns the components to the production cycle. This process reduces material consumption and environmental impact by 30%, and with the next generation of radio water meters, impact reduction may reach up to 80%. ([“Lorenz erhält Deutschen Innovationspreis für klima und umwelt”, 2020](#))

- **Economic Advantage:** The financial viability of reprocessing is a critical success element. After all, customers benefit not only from the use of high-quality measuring instruments, but also from cost savings. Lorenz products are not only clear winners in terms of overall costs, but they also exceed plastic counterparts in pure unit price comparisons. Low-cost meters, on the other hand, might be readily discarded after a single installation, causing customers to incur further costs. As a consequence, resource efficiency and environmental preservation have become a competitive advantage for Lorenz. (["Resource efficiency and circular economy", n.d.](#))
- **Technological Advantage:** Through a combination of digitization, sustainable production, research and development, and active corporate responsibility, Lorenz is recognized as a driver of innovation. As part of their high-tech partnership, Lorenz works closely with the globally active ARAD Group, enhancing Lorenz's manufacturing capabilities in the German market. ([Die Beste Technik für alle durchflüsse, n.d.](#))

The company has 260 employees ([Lorenz GmbH & Co.KG](#)) and a generated sales revenue of 21m EUR in 2021. The firm offers 18 distinct product lines that are mostly utilized for various smart water metering applications. (["AUSGEREIFT bis ins detail", n.d.](#))

3.4.4 Sensus

- **Extensive Customer Relationships:** Sensus offers a large metering product and service portfolio and is well positioned in the advanced metering infrastructure (AMI) market. Regulations and customers' increased need for real-time data and lower operating costs are driving the AMI segment to grow at roughly double the rate of the entire metering area. ([Advanced Metering Infrastructure: Sensus Ami Solutions, 2022](#)) In this manner, Sensus' extensive customer relationships and connections enables the company to expand its product and technology reach into new markets across the world, emerging markets. (["Xylem Inc. to acquire Sensus, a global leader in Smart Meters, for \\$1.7 billion", 2016](#))
- **Product Differentiation:** The merging of Xylem's world-class brands and products with Sensus' cutting-edge, smart technology yields innovative solutions that better meet customers' evolving needs, such as enhanced water efficiency, water conservation, and lower end-consumer costs. Sensus is ahead of the competition owing to its product differentiation approach. The combined technology and R&D capabilities of both organizations drive the delivery of innovative solutions to their clients, particularly in the field of advanced analytics in the water, wastewater, and outdoor water sectors. Sensus' network infrastructure, FlexNet, supports and connects to numerous of Xylem's product offerings while also enabling for expansion into adjacent Internet of Things industries. The company sees an opportunity to develop its sophisticated data analytics platform, which provides clients with useful information. (["Xylem Inc. to acquire sensus for \\$1.7 billion", 2016](#))

Sensus employs 3,300 people and has generated sales revenue of 769m EUR in 2021. The company has 44 different product lines (["Water meters, gas meters, electricity meters and more", 2018](#)), which are used in various smart water metering applications.

3.4.5 Maddalena

- **Sustainability:** Maddalena Spa's decision to join Animaimpresa, a social promotion organization devoted to promoting CSR and sustainable development, is a significant step forward in the company's sustainability commitment. Being a member of this qualified and active community displays Maddalena's adherence and commitment to social responsibility across all domains, including economic, social, environmental, and governance aspects, which, in turn, encourages public utilities to form partnerships with the company. ([Arizzi, 2021](#))
- **Expertise:** Maddalena Spa is reinforced by 100 years of history and experience ([VDDW mitglieder, n.d.](#)), which enables the firm to produce precise & accurate metering and measuring equipment that guides it through a path of strategic sustainability as a source of competitive advantage. ([Arizzi, 2021](#))

The firm employs 46 people ([“Maddalena SPA”, n.d.](#)) and generated a revenue of 51.5 million EUR in 2021. ([“Maddalena spa company Profile - Dun & Bradstreet”, n.d.](#)) The company's 54 product lines are utilized in a variety of smart water metering solutions. ([Product range, n.d.](#))

3.4.6 Diehl

- **Strong Suppliers Relationships:** Diehl is able to maintain a strong supplier relationship management with the goal of ensuring customer satisfaction because of its continual attention on its end-users. Diehl's suppliers are critical to their success and performance in terms of supporting developments; as a result, Diehl's metering has 2,300 suppliers. ([KG, 2021](#))

The company has 1,705 employees and has generated a sales revenue of 333m EUR in 2021. ([“Annual report 2020 – Diehl”, 2020](#)) The company has 56 different product lines that chiefly serve the smart water metering industry. ([KG, 2021](#))

3.4.7 Aquametro Messtechnik

- **Experts and Innovators in Water Metering Technologies:** For over 90 years, INTEGRA Metering has been creating and producing high-quality smart water meters. Because of its extensive solution portfolio, INTEGRA Metering is a valued partner for water providers, utilities, property management businesses, and building operators. The firm is now focusing on Internet of Things (IoT) connectivity solutions for smart water meters. The purpose is to provide information to its customers and business partners that will help them manage resources, foresee growing demand, save costs, and contribute to a more sustainable water future. INTEGRA Metering now has established 68 partnerships across the world. ([Integra metering, n.d.](#))
- The firm employs 23 people and generated a revenue of 3.05m EUR in 2021 according to their annual report. The company's 36 product lines are utilized in a variety of smart water metering solutions. ([“Aquametro Messtechnik GmbH”, n.d.](#))

3.4.8 Somitra

In combination of the interview held with Mr. Vahid Niroumand, the Technical Manager at Somitra – See Annex 7.5 – *Internal Interview Transcription*, as well as Sleer's brochure, it was found that Somitra's product and service range offers three major competitive advantages which include:

- **Technological Advantage:** The Modbus output on the Digital Scanner is a technology for sending data across serial lines between electronic devices. Its operational voltage is 3.7 volts, and the battery may be charged by USB. It also has the capability of reading water temperature and pressure. The Digital Scanner communicates, and syncs monitored data to the software, allowing the utility to maintain track of end-user water consumption rates. When the gadget is placed, it triggers an alarm to distinguish between household and commercial use. Furthermore, the device does not require radio bandwidth and has an IP 65 rating to extend its longevity. To operate effectively, it does not require a continual connection to any type of network, cables, or landlines. Moreover, the final data output is automatically produced as a CSV file and numeric codes when the data is delivered to the Software for farther analysis. If appropriate, data can be integrated with other data. Between the device and the server, the package offers a highly convenient and straightforward connection protocol. Furthermore, Sleer's software does not necessitate any changes to the water utility's core program, making data merging and transfer smoother and agile. Moreover, when using encrypted data, there is a very low data transmission rate. Additionally, because the device was built at a factory, the IP address is static. Finally, there are no time constraints on reading and transmitting signals or information.
- **Sustainability:** Since it considerably minimizes electromagnetic radiation, the digital scanner is considered an environmentally friendly instrument. It also has a lengthy battery life due to the device's minimal energy usage. The digital scanner does not require any LAN networks, such as Wi-Fi or GPRS, which helps to reduce carbon emissions significantly. Additionally, the system utilizes this

feature to track consumption rates in real-time and promptly alerts utilities in the event of a leak or unusual water consumption. Lastly, the elimination of a radio bandwidth minimizes the amount of RF radiation and frequencies emitted, making the gadget incredibly eco-friendly.

- **Economic Advantages** - The data delivery to the water utility is completely free owing to the utilization of AMI technology. Furthermore, the device's installation on a water meter requires minimum infrastructure equipment, making it cost-effective. Finally, the device's immediate signals to the utility in the event of a water leak or unusual water consumption improves water utilities' agility to act, reducing loss costs and conserving a valuable resource.

Somitra employs 22 people and has 3 product lines that is directly linked to smart metering applications as previously noted in section 1.2.

3.4.9 Adaptation - Somitra's present capabilities indicate that they can hardly adapt their product and service solutions to withstand competition in the German market because developing and expanding their product lines to fulfill consumer demands will require significant investments. Mr. Vahid Niroumand, the technical manager of Somitra, remarked during the interview – See Annex 7.5 – Internal Interview Transcription that "The software is an important part of the Digital Scanners package, but there is currently one drawback, the software requires a server. For instance, if a utility purchases 100,000 units of the Digital Scanners, each user profile must be generated. The program is presently being built as a prototype, which means it will be unable to manage a large number of user accounts without causing it to lag and eventually crash ". Somitra is on the lookout for funding to upgrade the software of the Digital Scanner. The software can currently manage up to 100 users flawlessly, but it will have to be improved in order to support bigger user counts as smart water meters are typically supplied to water utilities that control water supply for a vast geographic area that include a large number of users; hence, it is obligatory that the software should run smoothly. In chapter 4, a full explanation is provided that explains and clearly reveals why Somitra B.V. will hardly be able to withstand competition in the German market at this stage.

3.5 Present Smart Metering Technologies

3.5.1 Arrival of Smart Metering - In recent years, smart water metering technology has advanced dramatically. German water utilities are considering smart metering as a feasible strategy to assure efficient water delivery, decrease loss, and control costs while also improving the customer-utility relationship in terms of invoicing, owing to the options presented by this advanced technology. In this context, a variety of smart metering technologies have emerged to meet a wide range of applications, including households, institutions, businesses, as well as municipalities. (Boyle et al., 2013) In order to contextualize the technologies used by Smart water meter companies operating in Germany, some basic concepts need to be identified first. Please refer to Annex 7.6 – Operations of Smart Water Metering System for a detailed illustration of smart meter's types and how they operate.

3.5.2 Smart Metering Technologies – The following, are the most common smart metering technologies utilized by Competitors operating in Germany.

- **AMR (Automated Meter Reading)**: and AMI are two types of smart metering systems. The main distinction is the degree of measurement, control complexity, as well as functionality. AMR, also known as remote meter reading, is the automatic transfer of recorded water consumption data to servers for storage and further analysis by the utility and/or a third party, this transfer often occurs through GPRS, CDMA, GSM, or private radio transmission. Although pulse/interval meters may also be employed in an AMR context. AMR improves data speed and accuracy; however, it is only said to provide a slight increase in data density, such as one read per month. (Boyle et al., 2013)
- **AMI (Advanced Metering Infrastructure)**: AMI follows a similar path but adds a two-way communication between the meter and the utility or other third party via the data logger, Moreover, AMI pro-

vides significantly higher data density. Although end-use analysis needs retroactive inspection utilizing trace software such as TraceWizardTM to yield useful insights, AMI effectively creates a data stream termed as "big data" by the industry, allowing for real-time monitoring and analysis. Furthermore, AMI gives a higher level of detail in terms of consumption statistics, such as number of pulses collected in short intervals by the data logger. Additionally, the two-way communication feature enables the meter operator to acquire meter reads on demand, determine whether water has recently flowed through the meter and onto the facilities or not, and issue commands to the meter to execute specific activities such as disconnecting or restricting water flow is referred to as two-way communication. ([Boyle et al., 2013](#))

- **IUWN (Intelligent Urban Water Network):** Is a network management program that utilizes new technologies to regularly monitor performance, remotely sense asset condition, assess water availability, and monitor real-time water use in attempt to optimize water, wastewater, and stormwater service delivery for all stakeholders. The IUWN model indicates a higher level of intelligence in monitoring not just water use but also water quality, pressure, and asset condition, allowing for more effective and sustainable urban water management and delivery. It's similar to the energy sector's "smart grid," which refers to the idea of an integrated "smart city". IUWN is considered as a complicated, yet manageable and adaptive system of fine-grained monitoring, automation, and control of distributed infrastructure. ([Boyle et al., 2013](#))

Conclusion

Chapter 4

This chapter offers a comprehensive conclusion based on confronting the strengths, weaknesses, opportunities, and threats of Somitra in accordance with the previously identified information gaps in Chapter 3. A confrontation matrix – *See Annex 7.7.2 - SWOT Confrontation Matrix* is demonstrated based on the outputs of the SWOT analysis completed previously – *See Annex 7.7.1 - SWOT Analysis* to provide a final conclusion that ultimately determines whether or not Somitra should enter the German market during this stage.

4.1 Research Process

After the study findings were identified based on the information gaps demonstrated – *See Table 1 – Research Design*, data analysis and evaluation were essential to assess Somitra's present capabilities in regard to the current German market situation. This assessment was important to determine whether Somitra can endure and thrive in the German market, or whether they need to improve and enhance their existing capabilities in order to gain a firm foundation in the German market. To deliver a comprehensive evaluation, a SWOT analysis was used to assess Somitra's capabilities to the German market's environment – *See Annex 7.7.1 – SWOT Analysis*. The results of the preceding SWOT analysis were then used to construct a confrontation matrix – *See Annex 7.7.2 - SWOT Confrontation Matrix*. The Confrontation Matrix tool was used to dig further into the results of the SWOT analysis and aided in the examination of each distinct combination of strength, weakness, opportunity, and threat. The objective was to determine the most vital operational problems that Somitra may face if they attempted to enter the German market at this juncture. When integrating two dimensions, the red highlights in the confrontation matrix signify negative or highly negative repercussions. The attention on the red highlights is justified since they reflect the most serious threats to Somitra's entrance into the German market. There are currently 11 distinct combinations that represent a serious threat to Somitra – *See Annex 7.7.3 - Confrontation Matrix Results*.

4.2 Evidence

Based on the red highlights in the confrontation Matrix, a total of 11 combinations were generated – *See Annex 7.7.2 - SWOT Confrontation Matrix*. If Somitra attempts to enter the German market with their existing capabilities, those 11 combinations will constitute a substantial threat, limiting their prospects of gaining a high market position. Please refer to *Annex 7.7.3 - Confrontation Matrix Results* to view the 11 combinations that constraints Somitra from entering the German market.

4.3 Research Validity

The validity of the study results was strengthened by combining desk research and internal interviews as the core research methods – *See Table 1 – Research Design*. Looking through the research design, it can be observed that each information gap is linked to a specific investigation area. The strategy was to perform desk research to investigate the German market environment and internal interviews into Somitra's present capabilities and competencies to compare, assess and determine whether Somitra has the potential to thrive in the German market or whether it should shift its focus to another market. This assessment resulted in a SWOT analysis, which evaluated Somitra's present capabilities to the current state of the German market. Finally, using the confrontation matrix as an analytical method to analyze the results of the SWOT analysis in further depth indicated that **Somitra cannot enter the German market with their current capabilities**. Please Refer to *Annex 7.7.3 - Confrontation Matrix Results* for more detailed illustration.

4.4 Research Limitations

Research limitations were primarily reflected in external interviews. As mentioned in section 2.2.2, Somitra's potential clients are predominantly German water utilities because it operates under a B2G business model. This business model was chosen in particular since water utilities are heavily controlled

and regulated by governmental entities. The initial plan was to conduct interviews with chief and leading water utilities that service and span vast geographical areas throughout Germany. However, a failure of a successful reach has occurred prior to a significant number of attempts to contact the aforementioned utilities. The intention was to contact a variety of German water utilities to confirm that the data acquired was consistent and coherent with the data retrieved via desk research, hence increasing the study's validity. However, confronting this constraint, resulted in excluding the external interviews from the research findings which made triangulation unattainable.

In order to ensure that data is credible, valid and reliable, a thorough review and full inspection of data was undertaken. This process incorporated examining the secondary data relevancy and checking its overall credibility through performing two key actions. It was necessary to evaluate the data collected through identifying valuable information that provided major insights for each chapter according to the study's structure. Furthermore, it was essential to double-check the data's credibility after identifying all the relevant data acquired. To determine if the data is factual and unbiased, data consistency in terms of retrieving similar data that matches the initial findings was required. This process necessitated a thorough examination and a closer inspection.

Recommendations

Chapter 5

Somitra's current capabilities have proven that they do not correspond with the current market situation, resulting in 11 negative combinations that will have a significant impact on Somitra if they attempt to enter the German market during this juncture - See Annex 7.7.3 - *Confrontation Matrix Results*. As an outcome, Somitra is left with three possible solutions in order to bridge the identified gaps between potential customers and their product solutions within the German market. The following were found to be the most superlative solutions for transitioning 8 red highlights in the confrontation matrix into green highlights that demonstrate a positive impact on Somitra when dimensions are integrated, which indicates a safe market entry - See Annex 7.7.4 - *Expected Confrontation*. In the following sections, all 3 recommendations are covered in depth.

5.1 Strengthening Suppliers' Network

WO₁ - In Germany, competitors have strong ties with a wide range of suppliers. In the German smart water metering market, suppliers are crucial to a company's profitability and effectiveness in terms of supporting technological breakthroughs while maintaining high levels of customer satisfaction - See Annex 7.7.3 - *Confrontation Matrix Results* - WO₁. If the company strengthens its suppliers' network, Somitra can upgrade its material quality and catalyze its inbound logistics processes, which will be mirrored in the number of units produced, quality, and technology provided in the final product output. As a result, Somitra will be able to satisfy the requirements of a growing population by offering significantly more advanced products with higher quality and functionality. This increased quality and functionality will meet Germany's growing population demands in terms of features and attributes that can operate in an efficient and effective manner.

WT₁ - As suppliers' network expands, suppliers' competitiveness will increase in terms of the materials' quality provided. In this approach, quality reflects brand awareness; if quality is high, the possibilities of forming strategic partnerships with water utilities increase, and Somitra's brand awareness rises as a result.

WT₂ - Rivals' increasing sales and revenues allow them to expand and strengthen their supplier network, enabling them to provide higher-quality products than Somitra. Please refer to Annex 7.7.3 - *Confrontation Matrix Results* - WT₂ for an in-depth elaboration. Developing Somitra's suppliers' network will enable the company to offer products that are comparable to those of rivals in terms of quality, features, and attributes. This will greatly mitigate the negative impact generated from the combination of suppliers' network as a weakness and rivals' increasing revenues and margins as a threat.

WT₃ - Expanding suppliers' network will increase Somitra's agility in terms of units produced to fulfill changing customer demands while also enhancing the overall product quality through adopting of new technologies. This will eventually diminish the negative impact of the combination of a supplier's network as a weakness and business agility as a threat - See Annex 7.7.3 - *Confrontation Matrix Results* - WT₃. And boost the Somitra's opportunities in forming strategic partnerships with more utilities.

5.2 Enhancing Service Reliability

WO₃ - During the interview with Mr. Vahid Niroumand, it was highlighted that Somitra only has one manufacturing facility; also, the software in place to manage the smart water meter devices is still in the prototype stage and cannot handle a larger number of users - See Annex 7.7.3 - *Confrontation Matrix Results* - WO₃. If Somitra improves its service reliability, the company will be able to develop its software to manage a substantial number of users. As Germany's population and urbanization increase, so does the demand for water for numerous purposes. As a result, more water monitoring and solution efficiencies will be necessary. In this way, Somitra will enhance its possibility of being selected by water utilities,

as efficient solutions necessitate a greater level of service reliability, which will be maximized if service reliability is enhanced.

WT₅ - Because of their superior service reliability, German water utilities prioritize alternative options provided by competitors, which gives them a stronger brand awareness – See Annex 7.7.3 - Confrontation Matrix Results – WT₅. Higher service reliability inevitably leads to increased brand recognition, which in turn leads to enhanced brand awareness. As Somitra's service reliability improves, its brand awareness will increase. The rationale for this is that as water utilities form strategic partnerships with Somitra due to its high service reliability, Somitra will benefit from an increased brand recognition which will result in other water utilities selecting Somitra as a smart water metering supplier, resulting in a significant enhancement of Somitra's brand awareness.

5.3 Selection of a Priority Sector

SO₁ - Sler has a diversified range of manufacturing lines that serve a broad array of different sectors and provide products and services to a large range of business categories, according to Somitra's current profile. Sler presently serves seven different sectors in addition to Smart Water Meters. Due to a lack of focus, Somitra's capacity to compete in the smart water metering market in Germany with high-quality products is hampered, resulting in lower a production output than that of rivals. It can be observed that Somitra's current position is severely impacted by the combination of a diversified portfolio as a strength and a growing population and urbanization as an opportunity. Therefore, it is advised that Somitra focuses its R&D efforts toward a single sector to improve its presence in the smart water metering market with products that are comparable to those of competitors in terms of operating systems and functionalities. This will eventually lead Somitra to match the rising population's needs in terms of quality, and the number of units required to cover a vast geographical region through German water utilities. Sler's product lines are currently less advanced than those offered by German competitors – See Annex 7.7.3 - Confrontation Matrix Results – SO₁.

ST₂ - When compared to competitors, Somitra's limited budget is scattered over several business areas, prohibiting them from obtaining high levels of agility in the smart water metering market - See Annex 7.7.3 - Confrontation Matrix Results – ST₂. Thus, it is advised that Somitra tailor its limited budget in one direction to have the capability to satisfy changing customer demands in terms of units supplied and to adopt new technologies that concerns product development. In this approach, Somitra will enhance its agility to withstand competitor's continuous product developments.

5.4 Temporary Shift to Private Water Supply Entities (Side Recommendation)

This recommendation requires extended research and is illustrated as a long-term solution that can potentially eliminate two challenges when Somitra redirects its target market to Germany. In Germany, more than 99% of end-users are connected to a public water supply system, implying that water utilities are public utilities that are supplying vast geographical areas. (["Water affordability", n.d.](#)) This illustrates that German water utilities form partnerships with competent providers, allowing them to satisfy changing customer demands. Somitra currently lacks comparable capabilities of competitors operating in Germany - See Annex 7.7.1 - SWOT Analysis. Therefore, a transition to private water supply entities is recommended as a temporary solution. This transition is viewed as a springboard for raising Somitra's brand awareness through strengthening its promotional strategy. Subsequently, Somitra can gradually redirect the focal point on Germany's public water supply entities. As Somitra enters the German market at a future stage, this temporary move will substantially reduce two challenges. The sub-sections that follow clarifies how the solution alleviates those challenges.

WO₂ - Somitra is facing a highly negative effect as a result of the combination of promotion as a weakness and growing population and urbanization as an opportunity. As previously noted, as Germany's population and urbanization rise, so does water demand for a wide range of applications. As a result, Somitra will need a strong promotional strategy to boost its prospects of forming strategic alliances

with German water utilities. This strong promotional strategy is reflected through 3 key factors: the company's customer base, brand familiarity and products' reliability. If all 3 factors are present, end-consumers will be aware and familiar with Somitra's products and services, enabling water utilities to view Somitra as a reliable partner which increases Somitra's chances in forming strategic partnerships with water utilities.

Due to rising competitive rivalry, Somitra's current capabilities do not allow them to prove their product reliability which decreases their brand recognition and thus, failing to build a large customer base in the German market, which triggers German water utilities switch to rivals' products. Therefore, Somitra needs to adopt a blue ocean strategy, in which they can currently concentrate their efforts on private water supply entities outside of Germany, where competition is less intense and narrower geographical areas are covered. In that sense, the number of units required by private utilities will be less than those demanded by public utilities. Somitra will then be able to meet customer demands and generate new revenue streams; thus enlarging their customer base. In the long run, this strategy will increase customers' familiarity with Somitra's products and services, as their products and services will be already tested and proven effectiveness in other regions. As a result, Somitra's prospects of forming strategic alliances with German water utilities in a later stage will improve drastically, as its strong promotion will increase its publicity in communicating with its target market.

WT₄ - Because of the reliability of their products and their large customer base, the 7 leading players operating in the German market have such high brand awareness as a result of their strong promotional approach, providing them an advantage over Somitra during this stage. Please refer to *Annex 7.7.3 - Confrontation Matrix Results – WT₄* for an in-depth elaboration. If Somitra transitioned its focus to private water supply entities outside of Germany, as explained above, their promotional strategy will become effective, leading to a higher brand recognition, resulting in a higher brand awareness, which on the wider scheme will benefit Somitra in establishing a solid foothold when they enter the German market in a later stage. However, if Somitra attempts to enter the German market at this current stage, their weak promotional presence when compared to competitors will decrease and negatively affect their brand awareness.

Discussion

Chapter 6

This chapter is preordained to explain the constraints and limitations encountered during the execution of the internship in detail. The main assignment of this internship was to conduct a market research in Germany to ultimately guide the company in whether or not to enter the Smart Water Metering market in Germany. Hence, the student adopted a particular approach to deliver an accurate conclusion and base the recommendations given upon the conclusion conducted which provides an advice of How can Somitra bridge the Gap between potential customers and its product solution within the German market. In this approach, the student built a research design which formulated how data will be retrieved and information gaps will be fulfilled. The main limitations encountered during the process where as follows:

Poor In-Company Guidance

The company allotted Mr. Pourya Darnihamedani, the VP of Ventures Development at Somitra B.V. as the student's in-company supervisor. Mr. Pourya was never involved in the Smart Water Meters' Project at Somitra; consequently, his knowledge about the subject is very limited. Moreover, Mr. Pourya was available once a week for an online meeting to reply to any questions the student required an answer for. In this approach, the in-company supervisor was relying on phrases such as *"I think"* or *"I would say"* which demonstrates uncertainty about subject that concerned the project. As a result, the student struggled to extract any useful information about the company. Additionally, the student constantly requested supervision through employees that are directly involved in the Smart Water Metering project; however, it was mentioned that individuals who are involved in the project are constantly busy with domestic market matters and cannot offer any supervision.

This triggered the student to completely change the initial Plan of Approach submitted, as the problem analysis was not going into the right direction which obligated significant changes in the Information Gaps, and the Sub-Questions. Furthermore, the student constantly delivered Market Research chapters one by one for the In-company supervisor and the Managing Director for feedback. However, feedback was never received and when displayed during online meetings, limited feedback was provided.

Poor Communication

The research process was conducted through investigating the German market from various aspects and assessing those aspects with Somitra's current capabilities to ultimately depart at a definitive conclusion. However, due to poor communication, assessing Somitra's capabilities was extremely difficult. After significant attempts and requests to the Managing Director, Mr. Sohrab Pishani, a meeting with the Technical Manager was conducted. Mr. Vahid Niroumand, the Technical Manager did not obtain good command of English; therefore, the meeting was held in Farsi, and the in-company supervisor was translating the conversation; however, language barrier constrained the student to have his message perceived and comprehended in the right context. Moreover, as the research proceeded, farther questions emerged; thus, farther internal meetings were required. However, the difficulty of reaching employees within the organization and extremely late e-mail replies made it significantly difficult to arrange additional meetings to retrieve more information about the company. Those information were meant to assess Somitra's capabilities. For instance, the budget settled for the smart water metering project, the investment required by the company to develop the Software managing the Smart Metering devices, the manufacturing process, the company's revenue streams, as well as financial data. Such data would have assisted in developing more detailed recommendations that pave the way for the implementation plan.

The student requested more than once to visit the company instead of working from home to leverage communication and enhance the speed of obtaining information, but the student's request was constantly denied and vacillated.

Annexes

Chapter 7

7.1 Product Development

7.1.1 Sleer - Digital Scanner

With increasing pressure on utility companies to save limited water resources, The company's smart metering system allows them to streamline their water distribution processes by making data-driven decisions. Utility businesses can use smart water metering to collect usage data automatically, reduce manual meter reading, increase efficiency, and reduce costs. It also allows for a more efficient detection of leaks and abnormal consumption than manual alternatives. Electronic sensors and bidirectional communication networks are used in Sleer's smart systems to remotely read, store, and transfer data for analysis and feedback. The consumption data is transferred to the processing server via the transmitter, or the data logger linked to the water meter for analysis, billing, and other procedures. The automated meter reading and transmission method is flexible, and it can be done on daily, hourly, or real-time basis. Sleer's smart system provides end-consumers with features such as transparent consumption and billing. Water utilities will save time and reduce costs by eliminating manual meter reading, boosting leak detection, and cutting maintenance expenses.



Figure 2 - Digital Scanner – Sleer

Sleer's digital scanners are simple to operate and may be quickly fitted on a variety of meters. The scanner is now ready to read the information displayed on the meter and transmit data automatically without the need to manually read the meter after inserting the device on top of it. Sleer's Digital Scanner can be integrated and installed on any water meter, as water utilities do not need to make any changes to their existing meters for the digital scanner to work effectively. It is also possible to connect directly to the software's server, where data is transferred without the use of Wi-Fi or any other network. The device reads the information from the water meter automatically, without intervention from the water utilities. As previously noted, water utilities can alter the scanner to deliver water meter reading information on a daily, hourly, or real-time basis. With a diameter of 8cm and a height of 3cm, the device is rather light and compact as shown in figure 1 & 2.



Figure 3 - Digital Scanner – Sleer

7.1.2 Sleer - Optical Sensors

Optical sensors are a less expensive, less technologically sophisticated alternative to digital scanners. Optical sensors, on the other hand, provide similar benefits to the Digital Scanner. Sleer's Optical Sensors detect, measure, and communicate data from the analogue counters on the water meter to the water utility. Different measurements of water flow are provided by the counters on the water meters. So one counter displays readings in cubic meters, while the second displays readings in Liters, while the third displays values in CC. Depending on which metric the utility requests, the optical sensor offers reliable and precise data. The data is subsequently transferred from the optical sensor to the software for further analysis. The optical sensor can be manually adjusted to read the specific counter requested by the utility by rotating the sensor around the meter as shown in figure 3.



Figure 4 - Optical Sensor – Sleer

7.1.3 Sleer - Electromagnetic Sensors

In terms of options, Sleer's Electromagnetic Sensors are a more limited counterpart of the Optical Sensors. Only the magnetic counters on the water meter are read by the electromagnetic sensor, which then

transmits the information to the utility via software. The Electromagnetic Sensor uses 25% less electricity and energy than optical sensors. As a result, for utilities that do not require a multi-functional sensor and only need to read a single metric provided by an electromagnetic sensor, the electromagnetic sensor then becomes the most cost-effective option in terms of price and resources consumed. In that sense, optical sensors are far more flexible, as the sensor's rotation feature allows it to read all counters, whereas electromagnetic sensors are less flexible because they not only read magnetic counters, but they also might require changing the placement of the counter inside the meter to appropriately use the sensor, which is prohibited unless the water utility changes it. As a result, regulatory requirements limit the use of electromagnetic sensor, and installation may be problematic.



Figure 5 - Electromagnetic Sensor Chip– Sleer

7.1.4 Sleer - Software

building a software dashboard that employs AMI technology systems, Sleer is primarily focused on providing more particular insights and information to water utilities. The software enables a two-way communication channel, allowing the utility to quickly halt, limit, or enhance water delivery depending on the scenario. Furthermore, the software dashboard provides extremely detailed information on users' usage per household by profiling all meters used under a certain user's identity as shown in figure 5. The program can also be used by utility providers to open and close water valves. For instance, if a client fails to pay his/her bills or if a leak occurs in a specific location, the utility can use the dashboard to temporarily suspend the water flow in that region.

Into the bargain, searching for users is far more convenient for utilities. Users can be accessed by using the dashboard's search engine and inputting their last names, residence, area, postal code, or subscription number. Sleer makes it easier for water utilities to find customers. Furthermore, if an end-user installs energy or electricity meters, alongside water meters, or owns multiple households, the software creates a dossier and links all meters used under that person's identity. Sleer aims to provide as much information as possible regarding customer consumption, as well as the ease with which that information can be accessed.

Most importantly, using complex programming tools, the software automatically calculates an accurate pricing for each user based on their consumption rate, converting the water flow through the pipelines to a number that can be billed to the end customer. Additionally, the software generates comparable consumption statistics for the same user, comparing current consumption to consumption over the previous 24-hours and calculating an average consumption rate. Utilities will be able to monitor customers' activity more precisely, which will aid in the detection of other issues such as leakage. When leakage or unusual consumption is detected, the digital scanner can be configured as a detector and transmit alerts onto the software. Ultimately, the software and the Digital Scanner do not require Wi-Fi or any other form of internet connection to transfer or analyze data, which contributes significantly to sustainability in terms of carbon footprint reduction. In a nutshell, Somitra's technology allows utilities track water use and user behavior by providing a plethora of simple and easy-to-use solutions.

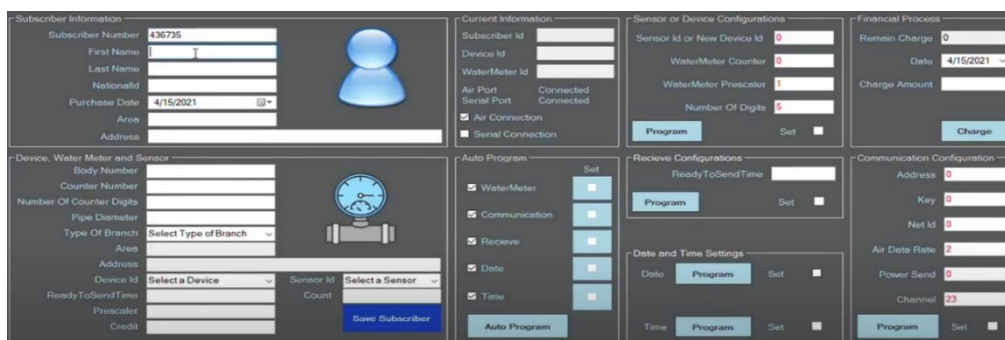


Figure 6 - Software Dashboard– Sleer

7.2 Project Aim

Criteria	Description
Specific	The research project held within the Marketing Department at Somitra B.V. entails a comprehensive and accurate International Market Research that explores and examines the German market in the Smart Water Metering industry. For the organization to have the capability of determining accurately the viability of their product "Smart Water Meter" directly with potential customers which are Water Utilities within Germany, an effective problem analysis was carried through utilizing the 6Ws method. This method derived and extracted an optimal research approach which served as a precise guideline for the student to follow throughout the implementation of the ultimate Research Project.
Measurable	Establishing partnerships will be used to quantify measurability. Somitra B.V. plans to grow beyond the local market by entering high-potential markets; primarily, the German market. Germany has over 6,400 water service providers and a high penetration rate, indicating a large market volume. Therefore, Somitra B.V. gauges its goal successfulness through establishing partnerships with German Water Utilities.
Attainable	Attainability was accomplished through two major stages of the market research implementation. The adopted strategy was tailored to focus primarily on German Water Utilities rather than individuals, with the goal of maximizing profits. In that respect, expansion will be catalyzed by the fact that this approach is designated to be a long-term working relationship with a characterization of a high order volume, which accelerates and drives up profitability in the overall scheme. Desk Research is the ultimate method utilized. The retrieval of data was based on two aspects, external interviews with German Water Utilities and Desk Research in order to gain deep insights about the information gaps indicated in section 1.4
Relevant	The research phases were all designed to gather insights and information that ultimately "bridge the gap between potential customer expectations and the product solution." Bridging the gap occurs when valid and reliable data is used to fill in information gaps, allowing the business to make an informed decision.
Time Bound	Six major phases were conducted to make up the complete market research. The first three phases of the procedure included, performing external desk research, as well as internal and external interviews, all were projected to take up to three weeks each. The conclusion of data analysis, examination of results, transcribing and coding data were all projected to take up to two weeks each. It was estimated that the overall process will take up to four months.

Table 2 – Project Aim

7.3 General Data Protection Regulation (GDPR)

While there are various advantages of smart metering, it imposes a serious threat on data privacy and security. The shift from a system in which meters were manually examined on a comparatively infrequent basis primarily for billing purposes has significantly transformed to a system in which meters are remotely controlled on a continuous basis for a variety of objectives, which risks end-consumers to privacy issues. The ability to acquire precise information on individual water consumption use and trends in the most private settings such as households, might result in significant violations of consumer privacy, whether directly through smart metering processes or indirectly through data theft. There are 3 major concerns to be discussed that directly influence data protection in Germany. Initially, the compliance of privacy and data protection regulations relies on when and where smart metering incorporates personal data. Under these circumstances, it follows that certain actors will be designated as data controllers, with the responsibilities that come with that role. Ultimately, the limitations of data processing are then outlined.

- **Personal Data:** The question of whether or not, the data gathered by smart metering systems inaugurate "personal data" under EU data protection law is the starting point for the applicability of privacy and data protection laws. Personal data is defined as "any information relating to an identified person, directly or indirectly, in particular by reference to an identification number or to one or more factors specific to his or her physical, physiological, mental, economic, cultural, or social identity" - *Article 2 of the Data Protection Directive*. The main consideration is that the data can be connected to a person, not that it may reveal insights into the lives of private individuals. Which means that smart metering might involve the gathering and processing of identifier data, for instance, meter number or other data that identifies an individual as acknowledged by WP29 and the European Commission. Personal data in this context refers to data that is related to an individual, whereas data intended to analyse network performance or data that is not linked to persons, such as office buildings and residential units, is not considered as personal data.
- **Data Controller:** When personal data is involved, one or more parties will be considered as "Data Controllers" for that data. According to Article 2 of the Data Protection Directive, a Data Controller is defined as "any natural or legal entity, governmental authority, agency, or other organization that decides the purposes and the means of processing personal data alone or jointly with others." The data controller is responsible for ensuring that data protection legislation is appropriately followed, as well as providing data subjects (anyone whose personal data were collected) with the rights that they are entitled to under data protection legislation, such as access, alteration, deletion, and refutation. As a result, the question is who among the various entities qualifies as a data controller? WP29 has speculated that the supplier would be a data controller in any case, according to the regulatory framework. However, other entities may serve as data controllers if they are responsible for installing and maintaining smart meter systems. In most cases, suppliers are typically in charge of installation and maintenance; therefore, they operate as data controllers.
- **Role:** After data controllers have been identified, they must put the rights of data subjects in relation to the personal data they are processing into practice. The responsibility to notify data subjects about the processing of their personal data according to the data protection directive, necessitates data controllers to install and maintain meters. Furthermore, explain to data subjects what data is being collected from the meter and how it is utilized. Additionally, data controllers must respect data subjects' rights to access and, when necessary, amend or erase information about them. End-consumers, for example, might have instant access to their water consumption statistics. This might be accomplished through a display on the smart meter and/or an available functionality on the smart meter that the user could link to his or her device, such as a smartphone or laptop to monitor his/her consumption rate in real-time. If indirect online access is required, for in-

stance, through the smart metering system operator's Wide Area Network (WAN), it should be assured that the data maintained by such parties is only accessible by the end-consumers only through secured online apps.


- **Data Processing Limitations:** Once personal data is involved, and the data controller has been determined, Data Protection legislation limits the capacity to treat personal data by requiring Data processing to be done within certain limits due to a number of legitimate reasons outlined in Article 7 of the Data Protection Directive. Consent, contractual constraints, fulfilment of public tasks, legal requirements, and the data controller's legitimate interests are among the limitations. In Germany, the precise role of Data Processing has yet to be clarified and specified. This makes determining the legitimacy of data processing challenging. Personal data, for example, cannot be reprocessed for a reason that is inconsistent with the original reason for which it was gathered. In other words, processing for the sake of contractual duties, for example, would simply cover billing only. Processing for public purposes may include the installation of smart meters to reduce overall water usage, but not the processing of personal data collected by these meters. Processing in accordance with legal responsibilities may include the installation of smart meters if required by law, but not the processing of personal data produced by the meters.

7.4 Competitive Landscape

Company Name	ZENNER International GMBH & Co. KG				ZENNER
Location	Römerstadt 6 66121, Saarbrücken, Saarland Germany				
Description	The headquarters of ZENNER International GmbH & Co. KG are in Saarbrücken, Saarland, Germany. The firm creates, manufactures, and sells metering and metrology technologies for global markets. Those technologies incorporate apartment, residential, and bulk-water meters; Moreover, heat meters, gas meters, and current system technologies such as radio-systems (wireless-bus, LPWAN for Internet of Things, GSM) and M-Bus systems, all part of the company's production line. With their own IoT (internet of things) business, Zenner initiated the transition into digitalization in 2016. Zenner has been supplying fully integrated IoT solutions for smart metering, smart utilities, and smart cities since 2018. These solutions are built from unique sensor devices, connectivity, fixed networks, IoT-cloud-services, and IoT-applications. ZENNER has production locations in Europe, Asia, and the United States, and is represented globally by 40 local companies. Since 2005, the firm has been a member of the family-managed corporate group Minol-ZENNER, which was formed in 1903.				
Business Focus	Smart Metering – Mag Meters & Ultrasonic	Gas Meters	Heat Meters	AMR/AMI Systems Technology – Stealth Reader System	
Products & Services	Water Meter Measuring Capsule Minolist 2"	Bulk Water Meter WSD/WSDE	Bulk Water Meter WSD/WSDE	Woltman Well Water Meter WB-N	
	Water Meters MTKD-M (-CC) & MTKD-N	Water Meter MNK-ST	Minomess Water Meter with Lo-rawan Interface	Water Meter 45 with 45 Inclined Dial	
	Positive Displacement Water Meter RTKP-MF-M-CC	Residential Water Meter MNK-N	Corrugated Stainless Steel Tubing & Connectors	Water Meters ETKD-L With Polymer Plastic Housing	
	Piston Type Water Meter RNK-RP-N	Water Meter MNK-RP-N With Protected Rollers	Connection Interface Type IST for Heat & Cooling Meter	Water Meter ETKDI/ETWDI	
	Ultrasonic Bulk Water Meter IUW	Compound Water Meter WPVR	Minomess Water Meter with Wireless M-Bus-Interface	Water Meter MTKD-L-N & MTKD-L-M	
	Water Meters MTKD-M-ST & MTKD-N-ST	Compound Water Meter WPVM	Water Meters ETKD & ETWD	Residential Water Meter MTKD-S	
	Hot Water Meter MTWD-M-ST & MTWD-N-ST	Bulk Water Meter WPD/WPHD	Positive Displacement Meter RTKD-M & RTKD-M-CC	Water Meter MTKD-M-FA & MTKD-N-FA	
	Bulk Water Meter WPD/WPHD	Dirt Filter for Bulk Water Meters	Positive Displacement Meter RTKD-L-M & RTKD-L-N	Residential Water Meter MNK-L-RP	
	Hot Water Meter MTWD-M-CC & MTWD-N	Ultrasonic Bulk Water Meter IUW	Water Meter ETKD R160	MNK-MF-N	
	Hot Water Meter MTWD-FA-M & MTWD-FA-N	Ultrasonic Flow Sensor IUF	Bulk Water Meter WPH-N-CC 90	Residential Water Meter MNK-N-FA	
	Residential Water Meter MNK-L/MNK-L-N	Piston Type Water Meter RNK-L-RP-N	Measuring Capsule Replacement Program	Water Meter Valve Meter Type MC	
	Water Meter MTK-S 45 with Inclined Dial	Water Meter Bathtub Meter Type MC	Universal Meter M22 for Installation Lengths From 110 to 190mm	Washstand Water Meter	
	Water Meter for Tap	Sensors for Woltman Bulk Water Meters	Adjustable Compensating Pieces for Bulk Water Meters	Irrigation Water Meter Woltman WI-N	
	Mobile Wireless M-Bus Radio System	ZENNER Flush Mounting Block 2"			
Employees	2,300 Employee				
Revenue	230 million EUR				
Competitive Advantage	Experts & Innovators in Water Metering Technologies - ZENNER has a history of water metering experience for 116 years and is represented in over 90 countries. ZENNER has regional expertise around the world, as well as local support partners, which allows them to understand the market and its requirements. As a result, the firm is able to provide and support solutions that are suitable for its clients all over the world.				
	Innovative Measuring Technologies - ZENNER's measuring technology meets all requirements for product service life, precision, and the ability to integrate meters into modern communication solutions, enabling municipal utilities, energy providers, real estate companies, and industrial companies to complete all measurement tasks now and in the future. ZENNER measuring tools provides their clients with added value as they are offering solutions that are sustainable and future ready.				


	Innovative Communication Technologies - ZENNER aids with remote reading system planning, installation, and operation. The firm offers two new options for wireless remote reading for water meters, heat, and cooling energy meters: as well as gas meters through the wireless M-Bus system and the stationary LoRaWAN® IoT radio system, in addition to the hardware for wired M-Bus solutions.
Target Audience	Customers of Zenner include Municipalities, Power companies and public utilities; as well as industrial firms, wholesalers, and measurement service providers.

Table 3 - Zenner – Competitive Landscape

Company Name	Kamstrup 					
Location	Skanderborg, Denmark					
Description	<p>Kamstrup is a prominent and leading manufacturer of smart energy and water metering system solutions across the world. Kastrup's excellent expertise, leadership and partnerships have served as the cornerstone for their cutting-edge technological advancements in energy, heat, cooling, and water solutions. They collaborate with energy and water corporations, utilities, and submetering firms to develop new revenue streams and inspire smarter and more responsible solutions for the communities they serve. Placing their customers at the center of everything they are doing, understanding the needs, and anticipating future challenges allows them to continuously develop and innovate product ranges of hardware, software, and services, such as consumption meters, communication infrastructure, meter data management systems, smart grid applications, hosted solutions, and tools utilized for data analysis. Employees work for the organization in more than 20 countries across the world as Kamstrup is represented in more than 60 countries. Every day, Kamstrup smart meters are installed in households and businesses throughout the world, allowing the delivery of more intelligent, reliable, and cost-effective solutions to monitor and control energy and water supplies.</p>					
Business Focus	Smart Water Metering	Smart Heating Metering	Smart Electricity Metering	Smart Cooling Metering	Sub-metering	
Products & Services	Water Meters	Modules	Accessories	Pressure Sensors	Meter Software	Meter Reading
	FlowIQ 2200 EU	Radio Module for Multical 41	READY Gateway	Kamstrup Pressure Sensor	Meter-Tool Water	RF Concentrator
	FlowIQ 3200 EU	Wireless M-Bus Module for Radio Network	Pit antenna	Kamstrup Valve	Meter Tool X	READY Converter Advanced
	FlowIQ 3100	ZigBee Module for Multical 601/602/61	Wall antenna			READY Manager & READY App
	FlowIQ 2101	GSM8H 3G	Wireless M-Bus Dongle			Radio Link Concentrator
	FlowIQ 2102	M-Bus Module	Kamstrup Pit Antenna II for Multical 21 & FlowIQ 3100			RF M-Bus Converter II
	FlowIQ 2101 – Concentric	Wireless M-Bus Modules for Radio Link Network	READY MTU			READY Collector
	Mag 8000	Wireless M-Bus for Multical 61/601/801	Geo Ensemble Water Display			Wireless M-Bus for Radio Network
	Multical 21	Wireless M-Bus for Multical 62, Multical 602 & SVM S6	Pulse Adapter			API Access
	Multical 62		Optical Read-out Head			READY Flagpole
	Multical 41		READY Repeat 5			READY Converter Basic
	Multical 61		Kamstrup 5-inch Pit Antenna			RF Router
			Kamstrup Temperature & Humidity Sensor			Meter Reading Import
			External Antenna			READY Mini Concentrator
			-Antenna			Radio Link Repeater


		FlowIQ Gateway Pulse Transmitter for Multical 61/62 & Ultraflow 14		READY 4G Bridge USB Meter Reader READY Concentrator Radio Link Network Kamstrup Mobile Radio Network PcBase III RF M-Bus Converter GSM Master Modem READY Radio Mesh
Employees	1,500 Employee			
Revenue	307 million EUR			
Competitive Advantage	<p>Technological Leadership - Kamstrup's cornerstone is producing long-term value for their clients through technology superiority combined with deep customer knowledge and understanding. The firm provides adaptable end-to-end solutions that are tailored to each customer's specific needs. This includes giving them the tools and data they need to bill individual users more accurately in high-rise, multi-tenant buildings and commercial properties. Furthermore, Kamstrup smart metering has shown to save building owners significant amount of money on both financial and operational costs.</p> <p>Sustainability - Kamstrup is dedicated to lead and continue to pave the way toward a more responsible and sustainable energy and water supply that can satisfy the world's expanding demand. In their automated manufacturing facilities in Denmark, Kamstrup's whole product range is manufactured with the highest certifications for environmental safety and quality.</p>			
Target Audience	Municipalities, public utilities, property managers, and industrial businesses are among the clients of Kamstrup			

Table 4 - Kamstrup – Competitive Landscape

Company Name	Lorenz Meters Wasserzähler				
Location	Burgweg 3 89601, Schelklingen, Baden-Württemberg Germany				
Description	Lorenz is a flow measuring technology manufacturer and supplier, delivering cutting-edge apartment, residential, and bulk water meters. Lorenz, which was founded in 1963, now manufactures over one million measuring instruments each year, serving public utilities, service providers, the process sector, and private consumers as a trustworthy and reliable partner. Several awards for research and development, as well as corporate social responsibility, have been given to Lorenz. This includes awards such as the Volksbanken Raiffeisenbanken Banking Group's VR Innovation Prize, the Institute of Business Ethics' CSR award "Ethics in Business," and Government initiatives including "100 Companies for Resource Efficiency" and "100 Places for Industry 4.0."				
Products & Services	Flat Water Meters	Residential Water Meters	Bulk Water Meters	Accessories	
	Radio Measuring Modules	Digital Residential Water Meter	Ultrasonic Bulk Water Meter Octave	Connecting Joints	
	Single Jet Radio Water Meters	Ultrasonic Residential Water Meter Sonata	Ultrasonic Standpipe Meter Stainless Steel	Gaskets	
	Impulse Measuring Modules			Distance Pieces	
	Impulse Single Jet Water Meters			Reductions	
	Measuring Modules			Elongations	
	Single Jet Water Meters				
	Resettable Water Meters				
	Solar Water Meters				
	Customized Measuring Instruments				
Employees	230 Employee				

Revenue	21 million EUR
Competitive Advantage	Ecological Advantage - Water meters must be changed at regular intervals owing to calibration regulations and measurement accuracy, although in high-quality products, many components are still in a fine condition even after use and replacement. This is the foundation of the concept, which is unlike anything else in the business. Lorenz collects replaced flat water meters from metering services and water utilities, disassemble and reprocesses them, and returns the components to the manufacturing cycle as far as possible. This process decreases material consumption and environmental impact by 30%, and with the next generation of radio water meters, impact reduction may reach up to 80%.
	Economic Advantage - The crucial success factor is that reprocessing is also financially viable. Customers, after all do not only benefit from the use of high-quality measuring instruments, but also from the cost savings: the products manufactured by Lorenz are not the only the clear winners in terms of overall costs, but they also outperform plastic counterparts in pure unit price comparisons. Low-cost meters, on the other hand, could easily be discarded after a single installation, which would result in additional expenses for customers. As a result, resource efficiency and environmental preservation become a competitive advantage for German-made high-quality water meters by Lorenz GmbH & Co. KG.
	Cutting-edge Technologies - Lorenz is recognized as a pioneer in digitalization, sustainable production, research and development, and active corporate responsibility. The firm is considered as a driver of innovation. Lorenz collaborates closely with the globally active ARAD Group as part of their high-tech cooperation, combining Israeli high-tech with German reliability.
	Quality Certification - Lorenz manufactures authentic high-quality products with the highest measurement precision and stability, superb materials, and data security. All are made in environmentally friendly, digitalized production facilities that are very agile and deliver in the shortest timeframe possible. Lorenz has its own state-approved water meter testing facility, which is ISO 9001 accredited.
Target Audience	Lorenz GmbH targets public utilities, service providers, process industry and private consumers.


Table 5 - Lorenz Meters – Competitive Landscape

Company Name	Sensus, a Xylem Brand 								
Location	Headquarters	637 Davis Drive, Morrisville, North Carolina 27560, United States							
	German Location	R&D Centre of Excellence Manufacturing/Assembly - Meineckestrasse 10 Laatzen, Germany 30880							
	German Location	R&D Centre of Excellence Manufacturing/Assembly - Industriestrasse 16 Ludwigshafen, Germany 67063							
Description	Sensus is a Xylem acquisition with over 80 million smart metering devices in use across the world. Sensus provides investor-owned utilities, cooperatives, and municipalities with remotely managed products and solutions that deliver accurate data at the right time. Smart devices and advanced applications link with a number of communication technologies as part of Xylem's digital portfolio to enable customers make fast choices that improve electric, gas, and water infrastructure. Sensus has large production facilities in the US, UK, Germany, Slovakia, and China. Sensus recently announced that the municipality of Bad Koenig, near Darmstadt, Germany, has selected the Sensus iPERL advanced water meter system after a trial deployment that showed considerable advantages to the community. Bad Koenig, a resort town of 9,300 people in Hesse State with a 47-square-kilometer area, installed 1,600 iPERL smart water meters and has now opted to buy another 1,400 units after the Sensus system drastically decreased meter failures and inspection delays. One of the main reasons for picking the iPERL system was its solid-state electromagnetic measuring technology. Furthermore, iPERL was chosen because of its very efficient and reliable radio technology, which allowed them to read 80 meters in less than 10 minutes.								
Business Focus	Smart Meters (Water, Gas, Electricity)			Communication Systems (Water, Gas, Electricity)			Software & Services (Water, Gas, Electricity)		
Products & Services	Smart Water Meters		Reading Devices	Accessories	Base Station	End Point	Hand-held Devices	Software	Third Party
	Residential	Commercial	Touch-Read® 6590 AutoGun Reading Device	Act-Pak® Remote Monitoring Instruments	FlexNet EasyLink™ Reader	SmartPoint® 510M Non-Pit Set Module	Field-Logic™ Hand-held Device (HHD)	AutoRead® Software	Juniper® Archer™ 3 Hand-held Device
	ac-cuSTREAM™ Water Meters	Hydroverse Insertion Meter							
	ally® Water Meters	Hydroverse™ Water Meters	Touch-Reader®+ 3096	CommandLink®	M400B FlexNet®	SmartPoint® 520M Pit Set Module	Juniper® Archer™ 3	AutoVU® Software	

			Reading Device	II Wireless Interface	Base Station		Hand-held Device		
	iPERL® (North America) Water Meters	Mainline Propeller Water Meters		Permalog+ Acoustic Monitoring Sensor	M400D FlexNet® Base Station	Vantage-Point® Lighting Control Module		Customer Portal Software	
	OMNI™ + R² Water Meter	OMNI™ + Compound (C²) Water Meters		Sensus® Smart Gateway Sensor Interface	R100NA FlexNet® Collector		Device Manager Application		
	SR® II Water Meters	OMNI™ + Fire Hydrant (H²) Water Meter			Vehicle Gateway Base Station (VGB)		FieldLogic™ Software Suite		
		OMNI™ + Fire-line® (F²) Water Meter					FlexNet EasyLink™ Workbook Application		
		OMNI™ + Turbo (T²) Water Meters					FlexNet EasyLink™ Workspace Application		
		OMNI™ + Verification (V²) Portable Test Water Meter					Pressure Profile		
							Regional Network Interface (RNI)™ Software		
							Sensus Advanced Analytics		
							Sensus Enhanced Analytics		
							Sensus Essential Analytics		
						Service Management			
						Vantage-Point® Lighting Software			
	Employees	3,300 Employee				17,000 Employee			
Revenue	769 million EUR				4.7 billion EUR				
Competitive Advantage	Extensive Customer Relationships - Sensus offers a large metering product portfolio and is well positioned in the advanced metering infrastructure (AMI) market. Regulations and customers' increased need for real-time data and lower operating costs are driving the AMI segment to grow at roughly double the rate of the entire metering area. Sensus' extensive customer relationships and connections will enable the company to expand its product and technology reach into new markets across the world, emerging markets.								
	Product Differentiation - The merging of Xylem's world-class brands and products with Sensus' cutting-edge, smart technologies will produce a unique solution that will better satisfy their customers' changing demands, such as increased water efficiency, water conservation, and lower life-cycle costs. This product differentiation strategy places Sensus ahead of competition. Combining both firms' superior technology and R&D skills and capabilities will speed the delivery of new solutions to their clients, especially in the field of advanced analytics in the water, wastewater, and outdoor water sectors. FlexNet, Sensus' network infrastructure, is capable of supporting several of Xylem's linked product offerings while also allowing for development into adjacent Internet of Things								

	businesses. The firm sees natural potential to expand its advanced data analytics platform, which offers clients with actionable insights.
Target Audience	Sensus targets with a wide range of public service providers, including utilities, city governments, industrial facilities, and institutions. Sensus product solutions are primarily involved in water, gas, and electrical infrastructure to improve the quality of life in the communities they serve. Sensus helps its customers reach further by leveraging technology and data-driven insights to increase productivity and responsiveness. With innovation in sensing and communications technology, data analytics, and services, the company collaborates with clients to anticipate and adapt to changing business demands.

Table 6 - Sensus, a Xylem Brand – Competitive Landscape

Company Name	Maddalena GMBH 						
Location	Headquarters		G.B. Maddalena 2-4, Povoletto, Friuli Venezia Giulia 33040, Italy				
	German Location		Steinberg 22 – D-42855 Remscheid, Germany				
Description	. Maddalena S.P.A		Maddalena is a global player in the measurement and smart metering of water and thermal energy. The firm has been assisting utilities, industry, and end-users in properly managing water resources and data since 1919. Water meters for potable, heating, and irrigation water, as well as thermal energy meters, are all part of the Maddalena product line. Stationary, walk-by, and drive-by reading devices are among the company's AMR and smart metering products. Maddalena also takes pride in being the first firm in Italy to have a certified laboratory that serves as a calibration center for water meters (UNI CEI EN ISO/IEC 17025:2005).				
	Maddalena GMBH		Maddalena GmbH is a completely owned subsidiary of Maddalena S.p.A., a firm that has been innovating, manufacturing, and distributing water meters for more than 100 years. Maddalena S.p.A. acquired a German firm based in Remscheid that specializes in the production of water meters in 2018. This was the first step toward establishing an independent presence in Germany and gaining direct access to the German market. Maddalena has added volumetric rotating piston meters, single jet meters, and large-diameter meters to its standard multi-jet meter line in both mechanical and ultrasonic variants during the previous two years. Remote radio reading systems based on common standard technologies are also available and may be incorporated to give solutions for sizes ranging from 15 to 200 mm. With a diverse product range, the firm provides full solutions to fulfill the needs of the German water metering industry. In Germany, all water meters sold meet the required drinking water standards. Maddalena GMBH possesses all of the mandatory ISO certifications for the German market.				
Business Focus	Smart Water Meters				Thermal Energy Meters		
Products & Services	Smart Water Meter		Communication Modules	Thermal Energy	Systems	Irrigation	Instruments
	SJ PLUS/EVO	ELECTO SONIC	RADIO EVO 868	MICROCLIMA EVO	Outdoor – Mobile Meter Reading Via Wireless M-Bus	WT	TDML/TDSL Batch Control Water Meters
	ELECTO SJ	WMAP EVO	ARROW WAN 169	KUS	Indoor – Fixed Meter Reading Via Wired M-Bus/Wireless M-Bus	HYDRANT GATE VALVE S58	Electromagnetic Flow Sensors
	VTZ	ELECTO T	RADIO LORAWAN 868	MICROCLIMA COAX	Wide Area Network – Fixed Meter Reading	IRRIMATIC	WMAC
	CD ONE TRP	ELECTO BULK	ARROW WAN 868 (LORAWAN)	CALCULATOR MICROCLIMA S3C		Flow Limiter	Batch Controllers & Counters
	DS TRP		ARROW EVO 868	MICOCLIMA U		DATAWATER WMVI	
	DS SD		ARROW WAN NB-IOT	90°C/130°C Water Meters			
	MVM		ARROW EVO 868 (SPLIT)	Temperature Sensors			
	WT		ARROW WAN NB-IOT SPLIT	Heat Cost Allocator			
	MVM PLUS C		ARROW WAN 169 (SPLIT)	FUE			

		M-BUS EVO	Optical Inter- faces
		ARROW WAN 868 (LO- RAWAN – SPLIT)	
		FLOWPULSE M-BUS	
		PULSE EVO	
		REED SWITCH	
		QUADRAPLUS – TRP	
		REED SWITCH – TRP	
		FLOWPULSE	
		REED SWITCH WOLT- MANN	
		TWIN-PULSE - M-BUS	
-	Maddalena GMBH	Maddalena S.P.A	
Employees	24 Employee	133 Employee	
Revenue	786,657 EUR	49.77 million EUR	
Competitive Advantage	Corporate Social Responsibility - Maddalena Spa's decision to join Animaimpresa, a social promotion organization dedicated to promoting CSR (Corporate Social Responsibility) and sustainable development, is a significant step towards the company's commitment to sustainability. Being a part of this qualified and active community demonstrates Maddalena's adherence to social responsibility that encompasses all domains, including economic, social, environmental, and governance aspects, which on the wider scheme results in stakeholders' engagement.		
	Quality Certifications - Maddalena GmbH meets the same high-quality standards as the parent company, based on the ISO 9001 certification and the fulfillment of all the regulatory frameworks in Germany; in addition to the elements of the Maddalena water meter that comes into contact with drinking water.		
	Expertise – Maddalena Spa is reinforced by 100 years of history and experience, which enables the firm to produce precise & accurate metering and measuring equipment that guides it through a path of strategic sustainability as a source of competitive advantage.		
Target Audience	Maddalena GMBH target Water Utilities, Muncipalties, Businesses as well as End-users.		

Table 7 - Maddalena – Competitive Landscape

Company Name	DIEHL GMBH					DIEHL
Location	Headquarters	Nuremberg, Germany				
	German Location	Industriestraße 13, 91522 Ansbach, Germany				DIEHL Metering
	German Location	Am Weimarer Berg 3, 99510 Apolda, Germany				DIEHL Metering
	German Location	Donaustraße 120, 90451 Nuremberg, Germany				DIEHL Metering
Description	Diehl Metering is a global player in smart metering system designing, manufacturing, and distribution. The firm’s solutions for metering equipment, systems, and software applications combined with experience of more than 150 years, helps suppliers globally in the domains of water, heating, and cooling. Their very precise meters are intended for a wide range of applications and communication options. Data-driven insights, IoT connection, fully flexible software, intelligent metering are all part of Diehl's comprehensive range of services and solutions. The company developed a number of innovative metering methods and continues to pursue digitalization and artificial intelligence technologies. Diehl Metering is part of the Diehl Group. Its cutting-edge technology has been used in system technology projects all across the world. Their whole business is based on delivering long-term value and cultivating long-term relationships with their clients. The company is based in Germany and has three manufacturing facilities there. It is a family-owned corporation with a global presence. The organization is noted for upholding its founding principles of quality, reliability, and their lose connection to clients while proactively crafting a better future for their customers and the communities they serve.					
Business	DIEHL METALL	DIEHL CONTROLS	DIEHL DEFENSE	DIEHL AVIATION	DIEHL METERING	

Focus	Automotive	Home Appliances	Guided Missiles	Cabin Lining	Smart Water Metering
	Heating & Sanitation	Professional Appliances	Air Defense Systems	Luggage Compartments	System & Software
	Electrical Engineering	HVAC/R	Ammunition	Cabin Lighting	Thermal Energy Metering
	Mechanical Engineering	Industrial IoT	Reconnaissance & Protection	Fire Protection	Services
		Mobility	Components & Packaging	Water Management Systems	
				Cabin Management Systems	
				Air Distribution & Management Systems	
				Avionics	
Products & Services	Smart Water Metering	System & Software	System & Software Components		Thermal Energy Metering
	HYDRUS 1.3 – Ultrasonic Meter	IZAR@NET 2 – Software	REED SWITCH 570 – Electronic Accessory – Transmitter		SHARKY 775 – Compact Energy Meter – Ultrasonic
	HYDRUS 2.0 BULK – Ultrasonic Meter	IZAR@HOME – Software	PULSE TRANSMITTER 571/572 – Electronic Accessory – Transmitter		SHARKY SOLAR 775 – Compact Energy Meter – Ultrasonic
	HYDRUS 2.0 – Ultrasonic Meter	IZAR PLUS PORTAL – Software	IZAR BE PULSE – Electronic Accessory – Transmitter		SHARKY 774 COMPACT – Compact Energy Meter – Ultrasonic
	CORONA ER – Electronic Meter – Multi-Jet	IZAR@MOBILE 2 – Software	IZAR RC G4 – Radio Module		SCYLAR INT 8 – Calculator
	CORONA E – Electronic Meter – Multi-Jet		IZAR RADIO COMPACT ACM – Radio Module		SHARKY FS 473 – Flow Sensor – Ultrasonic
	AQUILA V4 – Single-Jet Meter		IZAR RADIO EXTEND – Radio Module		RAY FS WS 453/455 – Flow Sensor - Mechanical
	AQUARIUS S/P – Single-Jet Meter		IZAR@MOBILE 2 TABLET – Radio Handheld		RAY FS WP 456/457 – Flow Sensor - Mechanical
	AQUILA V# DIN – Single-Jet Meter		IZAR RECEIVER BT – Radio Receiver		
	ARIES ON15/20 – Single-Jet Meter		IZAR ROC BATTERY – Radio Receiver		
	CORONA 101/102 – Multi-Jet Meter – Wet Runner		IZAR ROC VEHICLE – Radio Receiver		
	CORONA MCI 108 – Multi-Jet Meter – Wet Runner		IZAR ROC PREMIUM 2 – Radio Receiver		
	CORONA MCI COMPOSITE 108 – Multi-Jet Meter – Wet Runner		IZAR RECEIVER M-BUS – Radio Receiver		
	CORONA DP 405 – Multi-Jet Meter -Dry Runner		IZAR OH BT 2 – Radia OPTO Head		
	CORONA ST 130 – Multi-Jet Meter – Standpipe		IZAR CENTER – M-Bus Master		
	ALTAIR MCI 119 – Rotary Piston Meter		IZAR PORT PULSE – M-Bus Converter		
	ALTAIR MCI COMPOSITE 119 – Rotary Piston Meter		IZAR PORT PULSE MINI – M-Bus Converter		
	ALTAIR V3 – Rotary Piston Meter		IZAR M-BUS COMPACT I – M-Bus Module		
	ALTAIR V4 DN15/20 – Rotary Piston Meter		SIGNAL CONVERTER 520.11 – Electronic Accessory – Display & Control Devices		
	ALTAIR V4 CONCENTRIC – Rotary Piston Meter		SWITCHING AMPLIFIER 521 - Electronic Accessory – Display & Control Devices		




	ALTAIR V4 DN25/32/40 – Rotary Piston Meter		IZAR PULSE I - Electronic Accessory – Display & Control Devices	
	WESAN WP G – Bulk Water Meter - Woltman			
	WESAN WS G – Bulk Water Meter – Woltman			
	WESAN WPV G – Bulk Water Meter – Woltman			
	WESAN WPV A G – Bulk Water Meter - Woltman			
Employees	1,700 Employee		16,866 Employee	DIEHL
Revenue	333 million EUR		2,979 billion EUR	DIEHL
Competitive Advantage	Strong Suppliers Relationship - Diehl is able to maintain a strong supplier relationship management with the goal of ensuring customer satisfaction because of its continual attention on its end-users. Diehl's suppliers are critical to their success and performance in terms of supporting developments; as a result, Diehl's metering has 2,300 suppliers.			
Target Audience	Diehl Metering enables utilities, municipalities, and businesses to take control of their infrastructures, allowing them to manage water and energy more efficiently and sustainably. Diehl Metering primarily targets water and heat suppliers, as well as businesses, engineering, planning, and construction firms. Diehl Metering also strives to establish relationships with installation businesses that work in the water or heat supply sectors in order to collaborate on joint development projects.			

Table 8 - Diehl – Competitive Landscape

Company Name	Aquametro Messtechnik GMBH				
Location	Headquarters	Ringstrasse 75 Therwil, 4106, Switzerland			
	German Location	Kurt-Schumacher-Allee 2 28329, Bremen, Germany			
Description	INTEGRA Metering owns Aquametro Messtechnik GmbH, which is a subsidiary that specializes in the development, manufacturing, and distribution of water and energy meters (heating/cooling), as well as data management systems for monitoring consumption in the water and energy supply industries. The company's measuring components are exactly aligned with one another, ensuring a reliable and cost-effective operations for their customers.				
Business Focus	Smart Water Metering			Smart Thermal Energy Metering	
Products & Services	TOPAS® SONIC - Smart ultrasonic free-flow water meter for domestic and cold-water applications	AMBUS® CMe2100 LTE - M-Bus Metering Gateway for mobile networks	TOPAZ ESKM - Ultrasonic meter for cold water with integrated M-Bus	RUBIN RD 02/022 pulse generator - Reed pulse generator for RUBIN WP-FS / FSL	
	RUBY® SONIC - Ultrasonic bulk water meter for cold water networks	TOPAS ESKR 2 - Ultrasonic meter for cold water with integrated wireless M-Bus radio	SAPHIR® Modularis - Apartment water meter for hot water measurements with pulse, M-Bus, and radio	RUBY OD AM/04 pulser - Opto-electronic pulse generator NAMUR according to DIN 19234	
	AMBUS® WEBLOG 250 - M-Bus data logger for 250 devices with touch screen and web server	TOPAS ESKM 2 - Ultrasonic meter for cold water with integrated M-Bus	Aquabasic® PMK basic - Cold water meter from DN 15 to DN 50 For horizontal installation, Temperature ranges from 0°C to 40°C	Aquaradio® smart pulse - radio reading	
	AMBUS® RelAir R2M Pro - Wireless M-Bus to wired M-Bus converter	AMBILL® smart link II - Wireless M-Bus converter	aquabasic® PMKF/-S - Cold water meter from DN 20 to DN 40 For vertical installation, Temperature ranges from 0°C to 40°C	Aquaradio® smart M-Bus - radio reading	
	AMBUS® CMiBOX - Wireless M-Bus receiver	Aquastream® M-Bus/Pulses - System module Dual M-Bus interface and pulse communication module for mechanical water meters	RUBY KMS / KMS+ - Mechanical bulk water meter for cold water	Aquaradio® smart radio receiver - Bluetooth radio receiver	

	AMBUS® CMeX50 - Wireless M-Bus receiver	RUBY WP FS - Bulk water meter for thermal energy measurement	RUBY KTW / KTW+ - Mechanical compound water meter for cold water	Mobile measurement service - Mobile ultrasonic flow or energy measurement as a clamp-on system
	AMBUS® CMeX10/11/10S/11S/12S/13S - M-Bus master for M-Bus installation extensions	RUBY WMS - Bulk water meter for thermal energy measurement	Aquastream® radio - Communication module radio	AMBUS® Link - M-Bus data centre
	AMBUS® CMe3100 - Smart M-Bus Metering Gateway for the fixed network	AMFLO® MAG Pro -Electromagnetic flow meter	Aquastream® M-Bus - M-Bus communication module	AMBILL® easy reader - USB radio receiver for reading radio consumption meters
	AMBUS® CMe3000 - M-Bus gateway for the fixed network	TOPAS ESCR - Ultrasonic meter for cold water with integrated radio	RUBY HRI pulse generator - Communication module for RUBIN water meter – pulse generator and M-Bus	AMBILL® smart suite 2 - Mobile reading and parameterization software
Employees	23 Employee		165 Employee	
Revenue	3.05 million EUR		24.48 million EUR	
Competitive Advantage	Expertise - INTEGRA Metering has been designing and manufacturing high-quality water and thermal energy meters for over 90 years. INTEGRA Metering is a preferred partner for water and thermal energy providers, public utilities, property management firms, and building operators because of its comprehensive solution range. The company is now concentrating on IoT communication technologies for smart meters and smart cities. The goal is to equip its consumers and business partners with the information they need to manage resources, forecast rising demand, save costs, and contribute to a more sustainable energy and water future. INTEGRA Metering currently has 68 partners across the world.			
	Quality Certification - Because suppliers are such an essential component of the company's service and quality provision, INTEGRA Metering is ISO 9001 certified, giving them a competitive edge in terms of high-quality products.			
Target Audience	Water suppliers, energy providers, public utilities, as well as property managers and building operators, are the company's target audience.			

Table 9 - Aquametro – Competitive Landscape

7.5 Internal Interview Transcription

Company: Somitra B.V.

Interviewee Name: Mr. Vahid Niroumand

Interviewee Position: Technical Manager

Interview Type: Internal Interview

Q1. What products will Somitra B.V. introduce in the German market?

A. Digital Scanners, Optical Sensors, as well as Electromagnetic Sensors. The Optical sensors detect, measure, and send data received from the analogue counters on the water meter, whereas the Electromagnetic sensor reads only the magnetic counters and sends the information received to the utility.

Q2. What is the purpose of the Counters? What exactly do they read?

A. Different metrics are measured by the counters. So the first counter measures in cubic meters, the second in liters, and the third in CC, so it keeps track of how much water is flowing through the pipeline. Somitra's three products provide three alternative ways to report to the water utility, each monitors a different metric.

Q3. Are there any particular types of meters that should be installed in residential or commercial areas?

A. It depends on the utility's reporting requirements; for example, the Electromagnetic Sensor only reports in cubic meters. In this respect, there are no specific sensor categories for certain areas; instead, it is dependent on the utility's reporting standards. For example, a utility may request an exact number of liters on occasion, but most of the time, measurements in cubic meters are preferred. Therefore, all three sensors can be fitted on any meter while taking into account the utility's metric requirements.

Q4. Why did Somitra introduce the Electromagnetic Sensor, which only reads a single counter? While the Optical Sensor can detect and measure all counters?

A. In comparison to optical sensors, the Electromagnetic Sensor uses 25% less electricity and energy. So, for utilities that don't require a multi-function sensor and is only required to read a single metric offered by an electromagnetic sensor, then the electromagnetic sensor becomes the more cost-effective option in terms of price and resources consumed.

Q5. Then Optical Sensors must be more costly in terms of production?

A. Yes, because optical sensors are far more flexible, and the rotation feature of the sensor allows it to read all counters, whereas the electromagnetic sensors are less flexible because it does not only read magnetic counters, but it also requires changing the placement of the counter inside the meter to properly make use of the sensor, which is not allowed unless the utility changes it. As a result, the electromagnetic sensor is limited by regulatory requirements and might be quite inconvenient to install.

Q6. It was mentioned that Digital Scanners are being launched by Somitra, could you elaborate more on this product?

A. This is a considerably more advanced technology since it accurately monitors the entire screen of the meter after being mounted on top of it, and it then analyzes and transmits all of the information provided on the meter to the software, where everything on the meter is precisely reported to the utility in real-time.

Q7. I can see that the products brand is called "Sleer". Is Somitra outsourcing the production of the sensors?

A. No, Sleer B.V. is a Somitra Group company that will soon begin operations in Roosendaal. Sohrab Bozorg Pishani, the founder of Somitra B.V., is also the CEO of Sleer B.V. As a top European smart and digital technology developer. So Sleer B.V. is a subsidiary of Somitra B.V.

Q8. In the Digital Scanners, what technological systems does Somitra employ?

- A. The company utilizes AMI technology systems because the software allows for a two-way communication path, allowing the utility to simply break, limit, or increase water flow depending on the situation.

Q9. What limitations would the utility incur when using the Digital Scanner's software dashboard?

- A. The software is a key component of the Digital Scanners bundle; however the only drawback is that it requires a server. For example, if a municipality purchases 100,000 units of the Digital Scanner, each user profile must be created. Meaning that the software is currently developed as a prototype, which implies that it won't be able to handle a large number of user profiles without causing the software to lag and eventually crash. As a result, the R&D department is presently working on building software that will be able to handle numerous users' profiles and will make the process of profiling for utilities easier, allowing them to properly manage the information transmitted through the Digital Scanner. In a nutshell, Somitra is on the lookout for funding to upgrade the software of the Digital Scanner. The software can currently manage up to 100 users flawlessly, but it will have to be improved in order to support bigger user counts.

Q10. What are Somitra's competitive advantage in comparison to the technologies adopted by competitors operating in the German Market?

- A. In Germany, competitors are primarily focused on providing beneficial insights to end-consumers rather than utilities, as their ultimate goal is to influence customer behavior and tailor it towards a more sustainable approach in terms of water consumption. As a result, competitors are primarily focusing on developing mobile applications and other services for end-consumers to keep track of their daily water consumption. Somitra, on the other hand, is largely focused on giving more specific insights and information to water utilities rather than end-consumers by establishing a software dashboard that, as previously indicated, allows for a two-way communication line using AMI technology. In addition, the software dashboard provides very precise information on a user's usage per household by profiling all of the meters used under the name of a certain user. Additionally, Utility companies can also use the software to open and close valves. For example, if a customer fails to pay their bills or if a leak occurs in a certain region, the utility can instantly close the water valve in that area using the dashboard. In the bargain, searching for users is considerably more convenient for utilities. Users can be found by typing their last names, residence, area, postal code, or subscription number into the dashboard's search engine. As a result, Somitra makes it easier for water utilities to find customers. In addition, if an end-user installs energy meters or electricity meters alongside water meters, or owns numerous households, the software automatically builds a dossier and links all meters used under that person's identity. Somitra strives to incorporate as much information about consumers' consumption as possible, as well as the convenience with which that information may be retrieved. Moreover, the software automatically determines the pricing for each user according to their consumption rate using sophisticated programming tools which converts the water flowing through the pipelines to number to an ultimate price ready to be billed to the end consumer. Furthermore, the software issues comparable consumption reports for the same user that compares real-time consumption to the past 24-hours consumption and retrieve an average consumption rate. That way, utilities can keep an accurate track of the customer behavior and helps with detecting other issues such as leakage. Ultimately, the software and the Digital Scanner does not require Wi-Fi or any type of internet connection to transmit or analyze data and this feature contributes enormously to sustainability in terms of reducing carbon footprints. In a nutshell, Somitra's software assists utilities in tracking water use and user behaviour through a mass of options that are simple, and easy-to-use.

Q11. How often does the Digital Scanner provides readings to the Utility?

- A. The scanner provides reading to the utility on demand, it can be real-time, once per hour, per day, per week, or per month. Depends on what the utility requests from the software.

7.6 Operations of Smart Water Metering System

7.6.1 Understanding Smart Metering - The term "smart" metering is often indiscriminately used to describe a technology combination that outperforms standard metering. On the other hand, this inherent ambiguity reflects the vast range of technological configurations that smart metering encompasses, as well as its importance to the water sector. Smart metering refers to any new technology that uses the latest connectivity capabilities and enhanced functionalities to monitor water use. A deeper examination of its components reveals two distinct elements, meters that use advanced technology to accurately record water consumption data and communication systems that can automatically capture and transmit water usage data in real time. This is performed through a connection to a data logger, which enables the water utility to monitor water use in real time. The data is also delivered to the end-consumer via a variety of feedback channels; hence improving customer engagement and water resource management. Smart metering is, in fact, a collection of components and techniques designed to continuously monitor and evaluate water usage.

The measurement, data transport, processing, and analysis, as well as reporting of water consumption data, are all integral parts of the smart metering system. Data storage is positioned between these operations. Mode; "the method of measurement delivery", resolution; "the accuracy or quality of data", and frequency; "the regularity of data", are the optimal ways to characterize how these processes develop. The link between mode and frequency is normally one of dependency, and data resolution is frequently a function of mode. These factors work together to give a framework for a better understanding of how and when water is utilized. The model illustrated in table 9 clarifies the role of the information supply chain as well as the various technologies adopted by the German market players.

Framework	Measuring Process	Data Transport	Data Processing	Reporting
Mode	To collect water consumption data, water meters and data loggers are used in conjunction. Displacement meters, which create a pulse signal once a certain volume goes through the meter, are primarily used in residential areas in Germany.	The method through which data from smart meters is communicated to water utilities and end-users. Data from the data logger is transmitted through a broadband cable or wirelessly via radio, GSM, or CDMA. Data can also be delivered remotely or via a close-range gathering method like a "drive-by" download.	End-use analysis software package is a way for water utilities and/or third parties to store data servers and manage water consumption data.	Postal bills, emails, online interfaces, and smart phone applications are examples of methods through which data is delivered to end-consumers for interpretation.
Frequency	The defined time intervals between the number of pulses at which the meter records water use. The data logger collects data from the meter, for example, every 10 minutes.	How frequent does the utility and/or the third party gather or communicate data. For instance, daily, half-hourly, or real-time updates. The length of time it takes varies greatly depending on the type of meter. "Pulse" verses "Interval," for example.	The speed at which water usage data is utilized to keep utility operations up to date. Leakage or pressure control, for example.	The rate at which water consumption data is sent to end-consumers, which can be quarterly, monthly, daily, or real time.
Resolution	The water meter's precision of detecting the water flow. This precision is determined through the purpose, capabilities, and settings of the water meter. The data logger specifies the resolution of the recorded data.	Even if the quality of the data is partial or complete, the resolution remains constant. The transmission process might be disrupted as a result. Therefore, smart meters should be installed in the appropriate locations based on their categories.	To study trends, data can be grouped and controlled, as in leak assessment or end-use analysis.	The degree of detail offered to the end-user, such as utilization per unit of time and/or end-of-use breakdown. Legibility and understanding are improved by using comparative framing and benchmarking. In that sense, information and framing will serve as critical determinants of consumers' behavioral change.

Table 10 - Operations of Smart Water Metering System

7.6.2 Smart Metering Types - To capture and record water usage, a variety of metering devices are used, each using a distinct concept. Displacement meters, velocity meters, compound meters, and electromagnetic meters are the four types of common metering technologies adopted by German competitors. To record water flow, displacement meters calculate the amount of water in a given area and mechanically displace components within the meter in proportion to the amount of water to appropriately read the consumption rate. At low to moderate flow rates, they offer the benefit of being affordable and accurate. Multi-jet, magnetic flow, and ultrasonic velocity meters all measure the flow velocity via a meter with a predetermined internal capacity. The speed of flow is then converted into volume of flow to determine the usage capacity available. In the event of high and low flow rates that need to be recorded accurately, compound meters combine the strengths of displacement and velocity technologies into a single meter. Electromagnetic flow meters take use of water's electromagnetic characteristics, which create voltage when it flows through magnetic field force lines. The voltage signal created is proportional to the speed of the flow. Electromagnetic flow meters are ideal for flows containing pollutants or debris that might otherwise harm a mechanical flow meter. In water treatment, magnetic flow meters are used to monitor treated and untreated sewage, process water, and chemicals.

7.7 SWOT Confrontation

7.7.1 SWOT Analysis

Strengths	Weaknesses
<ul style="list-style-type: none"> • Sustainability - Somitra views corporate sustainability as a means of initiating social and economic benefit. The synchronization of the digital scanner and software simplifies the process of tracing irregular consumption patterns and diagnosing leaks via automatic warning features, allowing utilities to immediately close and open water valves to save water. Furthermore, the elimination of a radio bandwidth and LAN networks such as Wi-Fi or GRPS from the scanner reduces the quantity of RF radiation and frequencies emitted, making the device exceptionally environmentally friendly. • Certifications - Somitra's products and services have earned several certifications as well as eight international awards from various countries such as Germany. In 2019, they were awarded a gold medal and a certificate of honor by iENA in Nuremberg, Germany for new product innovation. • Diversified Product Portfolio - Sleer offers wide production lines where it serves multiple industries, providing products and services to a variety of business segments. Sleer's product lines employ comparable technologies in terms of operating systems and features introduced in the German competitors' product portfolio. 	<ul style="list-style-type: none"> • Suppliers Network - In Germany, competitors have strong relationships with a range of suppliers. Diehl, the German market leader in smart metering systems, for example, has 2,300 suppliers. Suppliers in the smart metering business are a vital component of a company's success and performance in terms of supporting innovations and developments while ensuring maximum customer satisfaction as it allows them to tailor their products and services to the demands of their customers. Competitors gain a competitive edge in terms of optimum quality by having several suppliers, which improves their market position in Germany. Somitra, on the other hand, lacks comparable relationships with suppliers, which is seen as a flaw that could hinder the company's operations in Germany. • Promotion - Somitra's weak promotional approach is inefficient, resulting in a lack of familiarity with its products and services among water suppliers, energy providers, public utilities, property managers, and building operators in Germany. This flaw poses a vulnerability for Somitra since the reliability of their products and services is questionable, preventing them from gaining a competitive advantage. Furthermore, because Somitra's products are comparable in functionality to those of its German competitors, consumers have low switching costs, allowing them to simply shift to competitors' products. • Service Reliability - The platform used for managing metering devices used by Somitra needs further investment to assure reliability as the number of users increase. Aside from the reliability of their platform, Somitra has only one manufacturing location which enforces limited production therefore, doubtful service reliability.
Opportunities	Threats
<ul style="list-style-type: none"> • Growing Population & Urbanization - Water demand for industrial, agricultural, municipal, and household purposes is surging as Germany's population and urbanization grow. As a result, greater water monitoring and solution efficiencies will be necessary. This will provide a window of opportunity for Somitra B.V. in Germany, where 13.5% of the available water supply is used, with public water supply accounting for 2.8%, meaning that 99.2% of the German population is connected to public water supply. Somitra advantages from this opportunity since their Digital Scanners can be used in both residential and commercial settings and will continue to perform effectively without the need for any extra components that would boost expenses. • Synergy - Unlike its German competitors, Sleer B.V. is able to supply consumers with custom-tailored solutions that meet their particular needs. Somitra's agility in terms of customizing highly personalized services at a faster pace to satisfy client expectations would be enhanced by adopting this method. Clients will benefit from the strong cooperation with Sleer B.V. in terms of coordination and development of various smart meter reading product lines, which will provide customers with full and unique solutions for optimizing the meter reading process. In that sense, Somitra B.V. can survive German market rivals' agility in adapting and developing products that meet customer demands, which is considered as a significant threat to the company. 	<ul style="list-style-type: none"> • Brand Awareness - In Germany, competitors are primarily huge corporations that have been operating in the German market for decades and offers a diverse range of products and services to their clients. Because of the reliability of their products, the seven key players in the German market mentioned above have such a high brand awareness, giving them an advantage in being chosen by German municipalities and water utilities over Somitra B.V. which is viewed as a new entrant to the market that has not yet established a solid foothold. • Increasing Revenues & Margins - According to the competitive landscape, market players from the smallest to the largest earned sales revenue in 2021 ranging from 23.29 million USD to 306 million USD. These revenues enable such businesses to be technologically agile, allowing them to develop their products, produce more units and expand their product and service range in the German market. Therefore, Somitra B.V. will find it difficult to achieve a higher market position. • Business Agility - All competitors have various manufacturing locations in Germany and employs a significant number of staff, allowing them to meet their clients' demands in terms of producing as many units as necessary. Somitra, on the other hand, employs fewer people and has only one manufacturing location, which may pose a threat to the company's ability to meet client requests, particularly if Somitra intends to form a B2G business model in the German market.

Table 11 - SWOT Analysis – Somitra in comparison to German Competitors

7.7.2 SWOT Confrontation Matrix

Initially, the confrontation matrix is constructed through a combination of strengths, weaknesses, opportunities, and threats. There are four combinations that yield various outcomes. A final conclusion was then drawn based on the outcomes derived from those four combinations of the confrontation matrix. Here are the combinations:

- **SO:** This is a combination of strengths and opportunities that allows Somitra to perform what it does best while also taking advantage of opportunities to secure and enhance its core competencies.
- **WT:** This is a combination of threats and weaknesses. Somitra should carefully consider this area, since there is a significant external threat that will have a significant impact on its future operations in Germany based on their existing capabilities.
- **WO:** This is the combination of weaknesses and opportunities. This is a problem spot since it demonstrates that Somitra is attempting to capitalize on an opportunity for which they lack the capabilities needed for it.
- **ST:** This is the combination of strengths and threats. These are possibilities that demonstrate Somitra's ability to convert threats into opportunities.

		Opportunities		Threats			Total
		Growing Population & Urbanization	Synergy	Brand Awareness	Increasing Revenues & Margins	Business Agility	
Strengths	Sustainability	2	0	1	0	0	3
	Certifications	1	1	1	0	0	3
	Diversified Portfolio	-2	0	-2	0	-1	-5
Weaknesses	Suppliers Network	-2	0	-2	-2	-2	-8
	Promotion	-2	0	-2	0	0	-4
	Service Reliability	-2	1	-2	0	0	-3
Total		-5	2	-6	-2	-3	

-2 (Very Negative)	Combination of the two strongly worsen each other.
-1 (Negative)	Combination of the two mildly worsen each other.
0 (Neutral)	Combination of the two has no effect on each other.
1 (Positive)	Combination of the two mildly reinforce each other.
2 (Very Positive)	Combination of the two strongly reinforce each other.

Figure 7 - SWOT Confrontation Matrix

7.7.3 SWOT Confrontation Matrix Results

SO₁ - According to Somitra's present profile, one can notice that Sleer has a diverse range of production lines that serve a wide range of different sectors and provide products and services to a wide range of business categories. Apart from the Smart Water Meters category, Sleer currently serves seven other industries. This diversification reduces Somitra's ability to compete in the smart water metering market in Germany with products of comparable quality to those of competitors. In terms of operating systems and functionalities, Sleer's product lines are currently less advanced than those offered by German competitors.

In the confrontation matrix, it can be seen that the combination of a diversified portfolio as a strength and growing population and urbanization as an opportunity has a very negative effect on Somitra's current position, as Somitra does not generate as much sales revenue as current competitors operating in the German market; as a result, competitors have higher chances of producing higher quality smart meters that can meet and withstand the growing population's demands in terms of quality and number units required by German water utilities. However, if Somitra focuses on several business categories with a low budget compared to rivals, it will be unable to match the rising population's needs in terms of quality, and the number of units required to cover a vast geographical region through German water utilities.

ST₁- Somitra's current position is negatively affected by the combination of a diversified portfolio as a strength and brand awareness as a threat. Competitors in Germany are primarily large corporations who have been operating in the German market for decades and provide a wide range of smart water metering products and services to their customers. The seven key players in the German market mentioned in section 3.4 have such a high brand awareness as a result of the reliability of their products, giving them an advantage of being selected by German water utilities over Somitra, which is currently seeking investments to have their service solutions operate effectively without experiencing sudden errors when processing a large number of users, as mentioned in section 3.4.9. As a result of this problem, Somitra is viewed as a partner with less reliable products for German water utilities. This problem is directly linked to the first combination, which deals with a lack of focus on smart metering production in terms of quality and functionality due to the need to distribute their focus over their diversified portfolio as mentioned in SO₁. This problem directly influences their reliability level with German Water utilities which negatively affects the water utilities' perception of Somitra's reliability level. Therefore, water utilities' choice of Somitra's products will be less likely to happen; hence, ruining the image and decreasing awareness of the products' brand when comparing to competitors operating in the German market.

ST₂ - As a result of combining Somitra's diversified portfolio as a strength with business agility as a threat, Somitra will be less agile to respond to customer demands. The smart water metering market's business agility is founded on two factors, satisfying ongoing customer demands in terms of units supplied and adopting new technologies in terms of product development. These two factors necessitate ongoing R&D engagement. However, since Somitra employs fewer people and has only one manufacturing location, the company's capacity to satisfy client demands is jeopardized. On the other hand, all competitors have various manufacturing locations in Germany and employs a significant number of staff, allowing them to meet their clients' demands in terms of producing as many units as necessary as well as continuously developing and improving their product range through adopting new technologies.

As seen in table 3, the combination has a negative effect. Somitra currently focuses on seven separate product lines, each serving a distinct business area, indicating a lack of focus on smart water metering, as discussed in SO₁. Somitra's limited budget is dispersed over multiple business areas, preventing them from achieving high levels of agility in the smart water metering market when compared to competitors operating in Germany. Lower agility primarily arises from two main factors. Initially, Somitra's

inability to handle large client requests. Moreover, the technologies utilized by Somitra in the smart water metering are inferior to those of rivals. This indicates that Somitra's agility is significantly lower than that of rivals.

WO₁ - Competitors in Germany have strong relationships with a variety of suppliers. Diehl, for example, has 2,300 suppliers and is a major German player in smart metering systems as mentioned in section 3.4.6. Suppliers in the smart metering industry are critical to a company's profitability and performance in terms of supporting innovations and advancements while maintaining optimum customer satisfaction since it allows them to adjust their products and services upon customers' requests. By having several suppliers, competitors obtain a competitive advantage in terms of optimum quality, thus improving their market position in Germany. Somitra, on the other hand, lacks comparable supplier relationships, which is seen as a flaw that could hinder the company's operations in Germany.

The combination of suppliers' network as a weakness and growing population and urbanization as an opportunity imposes a very negative effect on Somitra. This negative effect is primarily due to Somitra's poor suppliers' network, which is evident in the quality and technology displayed in the final product output when compared to rivals operating in the German market. As a result, companies with a strong supplier network can match the expectations of a rising population with considerably more advanced products that include higher quality as well as a far more advanced functionality. Unlike Somitra, which has a weaker supplier network, leading to lower product output in terms of quality and functionality across the German market.

WO₂ - Given the foregoing reasons, Somitra faces a very negative effect as a result of the combination of promotion as a weakness and growing population and urbanization as an opportunity. Water demand for industrial, agricultural, municipal, and household purposes is surging as Germany's population and urbanization grow. As a result, greater water monitoring and solution efficiencies will be necessary. However, as Somitra's product reliability remains questionable, water utilities switch to alternative products offered by competitors, leaving end-consumers unaware and unfamiliar with Somitra's products and services. Therefore, Somitra cannot induce an effective promotional approach due to German competitors that offers a far more reliable product and service solutions in the smart water metering market which are continuously selected by water utilities; hence, preventing Somitra from gaining a competitive edge.

WO₃ - During the interview with Mr. Vahid Niroumand, it was noted that Somitra only has one production facility; moreover, the software in place managing the smart water meter devices is currently developed as a prototype and requires investment in order to handle a greater number of users on the platform. On a wider scheme, both reasons reduce Somitra's overall service reliability with water utilities. Unlike rivals, who have several manufacturing locations and are continually embracing new technologies to improve the overall product solutions available. In this approach, water utilities are focused on smart water metering suppliers that have a high service reliability, ensuring the capability of delivering as many units as requested while maintaining optimal quality.

Somitra faces a very negative effect from the combination of service reliability as a weakness and growing population and urbanization as an opportunity. As previously stated, Germany's population and urbanization is increasingly growing; hence, water demand for industrial, agricultural, municipal, and household purposes is rising. Therefore, greater water monitoring and solution efficiencies will be required. To boost the odds of being selected by water utilities, efficient solutions demand a higher level of service reliability. To recapitulate, the more the population increases, the higher the number of competitors; hence, greater level of service reliability is necessary.

WT₁ - Suppliers variety and strong relationships are identified as essential elements in producing high-quality products in the smart water metering sector. Corporations in Germany cannot continuously provide a high-quality products and services to their clients without a strong relationship with suppliers.

Sleer presently has five suppliers for the smart water meters business category. Competitors, on the other hand, have a wide range of suppliers. Diehl, for example, has 2,300 suppliers, as described in section 3.4.6. Suppliers in the smart metering industry are critical to a company's profitability and performance in terms of supporting innovations and developments while maintaining optimum customer satisfaction since it allows them to adjust their products and services upon their customers' requests. By having several suppliers, competitors gain a competitive advantage in terms of optimal quality, which improves their brand awareness in Germany. Somitra, on the other hand, lacks such supplier relationships.

As a result, Somitra encounters a very negative effect from the combination of suppliers' network as a weakness and brand awareness as a threat. The negative effect is defined by the fact that suppliers are in charge of the company's product output quality. This is evaluated through the materials delivered for the manufacturing process. In this way, having multiple suppliers increases suppliers' competitiveness in terms of the materials' quality provided, which results in enhancing the overall quality of the end product. In this way, brand awareness is mirrored by quality; if quality is high, the possibilities of being chosen by water utilities increase, and the company's brand awareness rises as a result. Water utilities would switch to rivals' products if the quality offered is poor, resulting in lower brand awareness.

Somitra currently lacks comparable relationships with suppliers when compared to rivals operating in Germany. The quality offered by Somitra is lower than this of competitors' due to few suppliers who have the power to determine the quality of inbound materials needed, which is mirrored through a lower brand awareness. Since Somitra's end-products' quality is seen lower compared to their competitors, this situation confronts Somitra with difficulties to form partnerships with German water utilities in the presence of higher-quality products offered by competitors.

WT₂ - According to the confrontation matrix illustrated table 3, the combination of suppliers' network as a weakness and increasing revenues and margins of rivals has a highly negative effect on Somitra. A robust supplier network, as described in WT₁, has a substantial influence on products' quality. Competitors in Germany are using this strategy to continuously strengthen their supplier network in order to deliver the finest quality. Rivals' growing sales and revenues enable them to build a broader and stronger suppliers' network, allowing them to supply higher-quality products than Somitra.

WT₃ - Somitra is severely impacted by the combination of suppliers' network as a weakness and business agility as a threat which imposes a very negative effect as demonstrated in table 3. As competitors operating in the German market established a broad and strong suppliers' network, materials are then flowing into various manufacturing locations, allowing them to increase agility in terms of units produced to meet customer demands while also enhancing the overall quality of products through the adoption of new technologies. Somitra, on the other hand, is less agile due to a weak suppliers' network, which decreases products' quality and meeting customer demands when compared to rivals with such a large and robust supplier network, which, in turn, reduces Somitra's possibilities of forming alliances with German water utilities.

WT₄ - Competitors in Germany are primarily large corporations that have been operating in the German market for decades and offer a diverse variety of products and services to their customers. The seven key players in the German market mentioned in section 3.4 have such a high brand awareness as a result of the reliability of their products and their large customer base, giving them an advantage in being selected by German water utilities over Somitra, which is viewed as a new entrant to the market that has yet to establish a solid foothold. Somitra's current position will result in an ineffective promotional activity as German water utilities lack familiarity with the products and services offered by Somitra. Primarily because the reliability of Somitra's products and services is questionable, this weakness puts them at a disadvantage, preventing them from achieving a competitive edge in the German market. Therefore, the combination of promotion as a weakness and brand awareness as a threat, imposes a very negative effect on Somitra. If Somitra intends to enter the German market at this current stage,

their weak promotional presence when compared to competitors will decrease and negatively affect their brand awareness.

WT₅ - The combination of service reliability as a weakness and brand awareness as a threat imposes a very negative effect on Somitra. Referencing all of the factors determined from the confrontation matrix that have a direct impact on Somitra's service reliability, it is clear that German water utilities put a priority on alternative solutions supplied by rivals because of their superior service reliability. Higher service reliability leads to increased brand recognition, which eventually leads to increased brand awareness.

7.7.4 Expected Confrontation

		Opportunities		Threats			Total
		Growing Population & Urbanization	Synergy	Brand Awareness	Increasing Revenues & Margins	Business Agility	
Strengths	Sustainability	2	0	1	0	0	3
	Certifications	1	1	1	0	0	3
	Diversified Portfolio	2	0	-2	0	1	1
Weaknesses	Suppliers Network	2	0	2	1	2	7
	Promotion	-2	0	-2	0	0	-4
	Service Reliability	2	1	2	0	0	5
Total		7	2	2	1	3	

-2 (Very Negative)	Combination of the two strongly worsen each other.
-1 (Negative)	Combination of the two mildly worsen each other.
0 (Neutral)	Combination of the two has no effect on each other.
1 (Positive)	Combination of the two mildly reinforce each other.
2 (Very Positive)	Combination of the two strongly reinforce each other.

Figure 8 – Expected Confrontation After Recommendations are Applied

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