

# Getting insight into the value of Port of Twente for the region of Twente



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**UNIVERSITY  
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## Preface

Dear reader,

In front of you lies my bachelor's thesis which is the result of my research for Port of Twente, which was conducted to complete my Bachelor of Industrial Engineering and Management. Starting in February of 2022, I have been busy with this research, and since then, I have received support from a couple of different people, whom I now want to thank for their support.

First of all, I would like to thank Jean Paul Sebastian Piest, my first supervisor at the university, for his time and guidance throughout this bachelor's assignment. Thanks to him, I got this assignment at Port of Twente and with his advice and feedback, he assisted me in finishing my bachelor's thesis. I would also like to thank Matthieu van der Heijden, my second supervisor, for his time and feedback.

I also want to thank Bas Spanjer, my supervisor at Port of Twente, for his help throughout the process. He helped me with gathering the right information and he made sure that I could contact the right persons when that was needed. Without him, I would have had difficulty reaching out to the members of Port of Twente, which would delay the research process even further.

Furthermore, I would like to thank all the members of Port of Twente who wanted to conduct an interview with me to gather information for my research. Without them, I would not have gotten the insight into the value of Port of Twente that I have gathered now. In addition to that, I would like to show my gratitude towards the board members of Port of Twente, who helped me by providing information whenever I needed it and who helped me evaluate the end result of this research.

I hope you enjoy reading my bachelor's thesis.

Pim Mulder

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# Management summary

## Motivation

Port of Twente is an organisation that thrives to increase the logistical power of Twente, by working together with companies, government institutions and educational and research institutions. Since its foundation in 2012, Port of Twente has climbed the list of Logistical Hotspots of the Netherlands. However, in 2021, they were set back five places, landing at the eleventh place. Port of Twente wants to know why the drop in places has happened, in order to improve in the following years. To find this out, the board of the organisation wants to know what the economic and social value of Port of Twente is for the region of Twente. With this insight, the board of Port of Twente has an overview of what they contribute to the region and how they can improve to be more valuable to their members and the Twente region.

## Research Question and Method

The main research question that will be answered throughout this research is '*What is the economic and social value of Port of Twente for the region of Twente?*' To answer this question, the 'Design Science Research Methodology' (DSRM), designed by Peffers et al (2007), was used. This method is specialised in proving a systematic approach to create artefacts. First, the problem of Port of Twente has been identified, in addition to a couple of concepts. After that, the objectives of the solution have been defined according to the wishes and requirements of Port of Twente. Then, KPIs were designed and developed, in order to get data that could be used to visualise in a dashboard. The dashboard was then demonstrated, with the help of an explanation, which shows what can be seen and how it can be used.

## Results

This research has provided insight into the value of Port of Twente, by creating and measuring KPIs. These KPIs have been visualised in a dashboard, which shows the logistical situation in Twente over a period of time. The economic value of Port of Twente is expressed by a couple of these KPIs and their change over time. Since the start of the organisation in 2012, the logistical employees have increased with 7.7% to a total of 33,770 people in 2021. The total flow of goods has increased with 41.4% towards 27,767,643 metric tons in 2020. The logistical investments level has increased with 61.8% since the start of Port of Twente to 123 million euros. All of these changes can be (partially) attributed to projects that have been executed by Port of Twente since its start, like the attraction of new logistics companies and the lobbies for better accessibility of the region, both over water and the road.

The social value of Port of Twente is measured by comparing different activities of Port of Twente to the experienced value of the members of the organisation or the region as a whole. These activities and contributions are placed in four different concepts, namely *local benefits*, *social relationships*, *environmental responsibility* and *participation*. For the local benefits, gains created for the region of Twente are examined. Some of these gains are the second lock chamber in Eefde, the widening of the Twentekanal and the creation of the XL Businesspark in Almelo. Social relationships have been improved since the start of Port of Twente, thanks to activities like the Logistics Café and the Huis van de Logistiek. These activities enable members of the organisation to come in contact with each other, which will create new and strengthen already existing relationships. Port of Twente also has a contribution to the topic environmental responsibility since they provide information about a wide

variety of topics, including innovation, sustainability and the state of the labour market. This information will help the members to improve their business, so that the work environment will improve, both for the environment and the personnel. By providing the option to participate in different activities, Port of Twente increases its social value. The members of the organisation stated that they appreciate the different activities and the network meetings that Port of Twente organises, since the members will come in contact with other members and by doing so, they will get an insight into other business.

In addition to these results, this research also provides a method that can be used to measure the value of other regions. If enough information is available about a certain region, this research can be used to evaluate that region on different topics, which will give an indication of its value.

### Recommendation

It is recommended that Port of Twente updates the data used in the dashboard on a regular basis, in order to keep the overview as up-to-date as possible. For the open sources, this means that they should be checked once every six months, to make sure that new data can be implemented as soon as possible. Data from the interviews could be updated once a year by sending out surveys to the members of Port of Twente, to get their view of what Port of Twente did for them that year. Additionally, Port of Twente should have meetings with all their members, to renew and improve the contacts with their members, in order to engage every member in the different activities.

Another recommendation for Port of Twente is that they should improve their communication towards their members regarding the topics and themes of the activities that Port of Twente plans since currently, some members are unaware of those topics.

Lastly, Port of Twente should try to improve on the different points that were stated by the members during the interviews and the survey. This will make sure the members will become more satisfied with the work of Port of Twente, which in turn will increase the experienced value of the organisation.

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# 1. Introduction

In this first chapter, the research is introduced and the method will be discussed. In section *1.1 Port of Twente background*, the company is introduced. After that, in section *1.2 Problem statement*, the problem is analysed and described. Then, the research design will be discussed in section *1.3 Research design*. Finally, the structure of this paper will be given in section *1.4 Structure of paper*.

## 1.1. Port of Twente background

Port of Twente is an organisation that defines itself as “the logistical cluster of Twente”. They work together with companies, government institutions and educational and research institutions to increase the logistical power of Twente. The Logistics Association of Port of Twente is founded by regional transportation companies and logistics services providers in 2012 because of regional problems on among other things the lock in Eefde and the labour market in the Twente region (Port of Twente, 2022). Since then, Port of Twente has closely worked together with different educational institutions in the region, like the University of Twente, Saxion and ROC van Twente. In 2017, XL Businesspark, Havenbedrijf Twente and the Logistic Association of Port of Twente decided to combine their forces in order to improve the communication and the overall regional development (Port of Twente, 2022), although they are still separate companies. The organisational structure of Port of Twente can be seen in Figure 1, which is from the perspective of the Havenbedrijf. Today, more than 80 organisations with different industrial activities are united via the Logistics Association of Port of Twente. Port of Twente currently is financed by the membership fees of those organisations and by funds of the Region Twente and Provincie Overijssel.

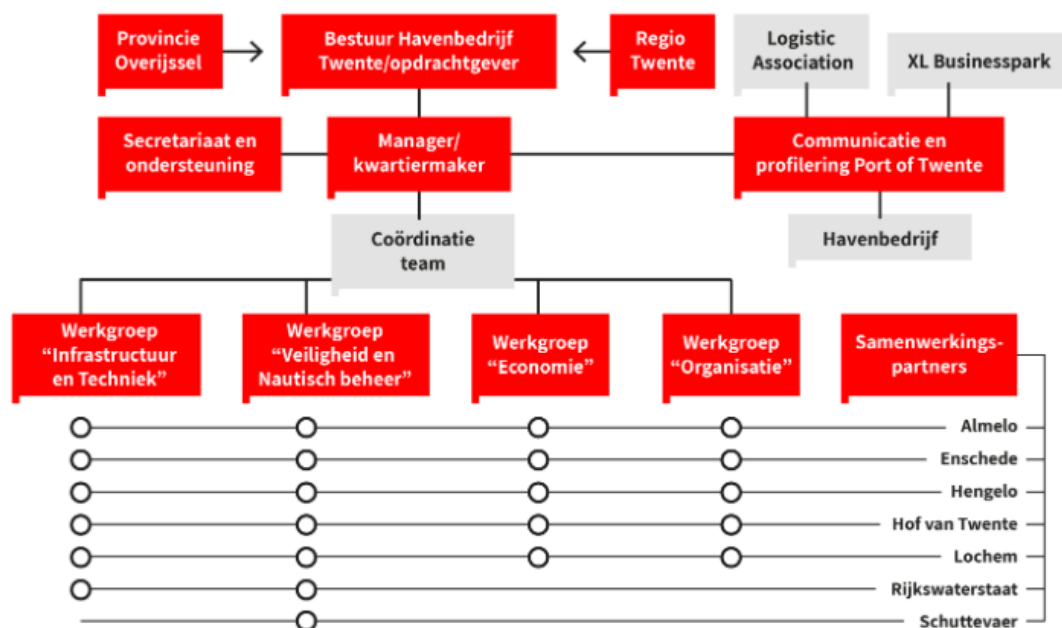


Figure 1 Organisational chart of Port of Twente

## 1.2. Problem statement

In this section, the problem of the organisation is described. In subsection *1.2.1*, the current situation and the action problem are given. The problem cluster and core problem are given in subsection *1.2.2*. In subsection *1.2.3*, the reality and norm are discussed. Then, the goal and scope of this research will be given (subsection *1.2.4*). Finally, in subsection *1.2.5*, the research question and the side questions are described.

### 1.2.1. Current situation & action problem

Since 2005, the magazine Logistiek publishes a list of Logistical Hotspots of the Netherlands (Logistiek.nl, 2020). From the point of foundation, Port of Twente climbed the list with the peak in 2020, at the sixth place out of 28 logistical hotspots. However, in 2021, they were set back to place eleven out of 28, which is a loss of 5 places. Since Port of Twente wants to be as high on the list as possible (they aim for a place in the top 3 (Dijkhuizen, 2019)), they want to know why they lost so many places, in order to improve for the following years. However, Port of Twente currently does not have a clear insight into why they were set back, so they would like to know why this has happened. The criteria that are used by Logistiek.nl are known (Logistiek.nl, 2020) and some of them will be used for this research to get insight into the value of Port of Twente, like the availability of personnel, the availability of enough business space and the presence of good infrastructure for a good accessibility of the region. Other criteria are quite subjective and thus not useful for this research. In order to improve the score for the following years, the board of the Logistics Association wanted to investigate what the economic and social value of Port of Twente is for the region of Twente. With this insight, they have a clear overview of what they contribute to the region and they can see what or where they could improve their activities. Therefore, the action problem is defined as follows:

*Port of Twente does not have a clear insight into its economic and social value for the Twente region.*

### 1.2.2. Problem cluster and core problem

After the action problem was identified, the search for possible reasons for this problem started. This was done by starting with the question “Why does Port of Twente not have insight into its value?”. After some investigation, a problem cluster with all the underlying problems was created, shown in Figure 2.

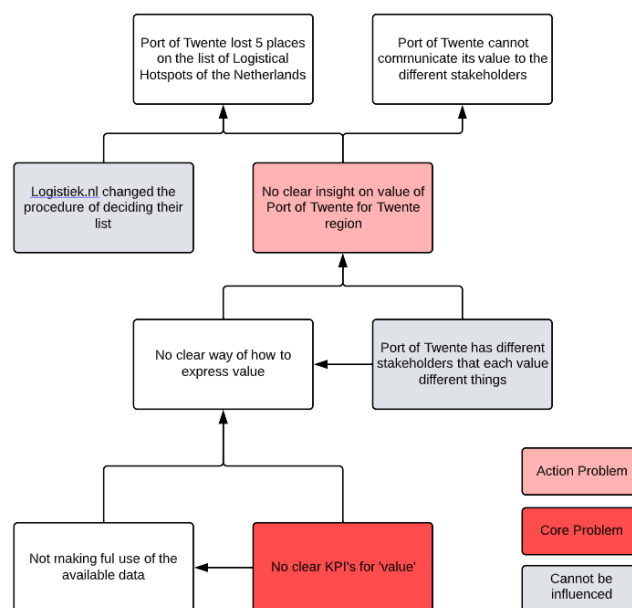


Figure 2 Problem cluster of Port of Twente

Two reasons for the action problem have been identified. The first reason is that Port of Twente has a lot of different stakeholders, who all value different things. Because of this, it is not clear what the main value of Port of Twente currently is. Another reason which is also related to this is that there is no clear way of how to express the value of Port of Twente. Without a clear definition, it is hard to get insight into what the value is, especially because there are a lot of different interpretations due to the number of stakeholders. It is possible to express value in a clear way, but the number of stakeholders

cannot be influenced to solve the action problem. Therefore, the lack of a clear expression for value was examined further and two important underlying problems were found.

First, Port of Twente does not have clear Key Performance Indicators (KPIs) that express the term value. KPIs are measurements that evaluate how a company executes its strategic vision (Warren, 2011). Those KPIs can form an overview of how effective some measurements are or what their chances of success are. Currently, Port of Twente does not have any KPIs that make its value visible.

Another underlying problem is that the available data are not used to its full potential. There are a couple of sites that contain a lot of data about the region of Twente and its labour market, like kennispunttwente.nl and twenteindex.nl, but this data is not fully used by Port of Twente. The lack of KPIs is also a reason for this since without proper KPIs, you cannot use data in a useful way. Therefore, the problem of the KPIs has been selected as the core problem.

Since the reason for this assignment is the loss of five places on the list of Logistical Hotspots of the Netherlands, it is also shown in the problem cluster. However, the lack of insight into the value of Port of Twente is not the only reason that they lost five places. Another reason for this drop of five places is that the procedure that Logistiek.nl follows to rank all the different logistical hotspots has changed since 2021. Since then, the criteria of Logistiek.nl also includes the opinions of the ten largest logistics service providers and the opinions of readers of the magazine Logistiek. These criteria and procedures cannot be influenced, so no further investigation will be done regarding those.

One other consequence of a lack of insight into the value of Port of Twente is that they cannot communicate this value to their stakeholders properly. However, when they do have this clear insight, they can communicate to their stakeholders what their current value is and what they are going to do to increase their value when necessary. This will make sure that the stakeholders are engaged more in the activities of Port of Twente and therefore, they feel more appreciated.

### 1.2.3. Reality and norm

#### *Reality*

The reality has been described above as the current situation. Port of Twente does not have a clear insight into what its value is for the region of Twente. The main reason for this lack of insight is the lack of clear KPIs for the concept value.

#### *Norm*

The norm, or desired situation, is that Port of Twente has a clear insight into its value for the region. This can be achieved by creating an artefact that visualises the strengths and weaknesses of the organisation so that they can see what goes well and what they can improve. It would be desirable to measure the performances periodically so that Port of Twente can continuously know how they perform and where and what they could improve, but more on this in section 1.3 *Research design*.

### 1.2.4. Goal and scope

The practical goal of this research is to give insight into the value of Port of Twente for the region of Twente since the board of Port of Twente currently is missing this insight. With this insight, the board can easily identify what their strengths are and where they could and/or should improve in order to increase their value. Besides this practical goal, this research paper will also have a scientific contribution. This research will namely provide a method that can be used to measure the value of a specific region. The method that will be used throughout this research can be generalised in such a

way that it can be applicable to a lot of different regions, given that enough information is available about that specific region. To use this method for other regions, data needs to be gathered for the different KPIs, so that an overview can be created of the change of these KPIs over time for that specific region.

The scope of this research is determined by two factors. First, the research will run for a period of ten weeks, so the problem needs to be solvable within this period. This means that the problem cannot be taken too broadly, since this can cause time issues towards the deadline. Second, the organisation's input will determine what exactly needs to be researched. In consultation with Port of Twente, different members will be selected that can be examined to gain information. The information that is available, in addition to extra information that will be provided by Port of Twente and additional data that will be gathered, will be used to answer the different research questions and thus, this information is within the scope of the research. A stakeholder analysis is performed to get an understanding of all the different stakeholders of this research. This stakeholder analysis was then used to determine the wishes and requirements of the different stakeholders. The whole analysis can be found in *Appendix A - Stakeholder Analysis*. The different wishes and requirements are summarized in Table 1.

<b>Stakeholder</b>	<b>Wishes</b>	<b>Requirements</b>
<i>Everyone</i>	- Clear overview of situation in Twente	- Representative image of value of Port of Twente
<i>Developer</i>	- Not too complex coding - Dashboard easy to update - Aesthetically pleasing graphs	- Dashboard created in well-known software with customisable options - Creation in certain timeframe
<i>Users</i>	- Dashboard is easy to use with a clear explanation - Relevant data is shown in dashboard	- Dashboard ready to use - Easily explainable to board members
<i>Board of organisation</i>	- Dashboard should show improvement points	- Easily explainable by users

*Table 1 List of wishes and requirements by each stakeholder*

### 1.2.5. Research questions

The main purpose of this research is to get insight into the value of Port of Twente for the Twente region. This can be accomplished by solving the core problem. In order to do this, the main research question is created. The main research question is defined as:

*What is the economic and social value of Port of Twente for the region of Twente?*

To solve this research question, some smaller questions are defined that will be answered throughout the bachelor thesis in order to provide an answer to the main research question. The sub-questions are elaborated on below.

#### 1. *What are the different activities of the departments of Port of Twente?*

First of all, it is important to get a clear overview of the different activities of Port of Twente. This overview will make the current situation clearer, which will help in understanding what Port of Twente really means for the region of Twente. The data that are available will be used to answer this question.

## 2. How to define economic and social value?

The concepts of economic value and social value needs to be properly defined and operationalised. In order to do this, literature research will be conducted. This literature research will make sure that it is clear what is meant by the different types of value and that those concepts can be used throughout the thesis in an understandable way.

## 3. How to select Key Performance Indicators for those types of value?

When the different types of values are properly defined, some good KPIs need to be determined in order to express values to the concepts. Selecting those KPIs is necessary since those KPIs will be evaluated and visualised, in order to give insight into the value of Port of Twente. The selection of KPIs is based on a literature study.

## 4. What are the expressed values of the selected KPIs?

After the KPIs have been selected, they need to be evaluated and values should be assigned to them. In order to do this, field research will be conducted by conducting interviews with members of Port of Twente. This newly gathered information, in combination with the already available data, can create an overview of the value of Port of Twente for the region of Twente.

## 5. How to visualise the selected KPIs?

Finally, the data needs to be evaluated and visualised. This sub-question makes sure that the data are interpreted properly and that no mistakes are made. In addition, it needs to be determined what the best way is for the visualisation of the selected KPIs.

## 1.3. Research design

In this section, the research design will be discussed. First, the problem-solving approach will be given (subsection 1.3.1). After that, the deliverables will be discussed (subsection 1.3.2). In section 1.3.3, the operationalisation of key variables will be discussed.

### 1.3.1. Problem-solving approach

In order to find the value of Port of Twente for the region of Twente, a problem-solving approach is set up. For this, the 'Design Science Research Methodology' (DSRM) will be used (Peffers et al., 2007). The DSRM method is specialised in providing a systematic approach for creating artefacts and since an artefact will be created by means of a visual overview of the values of Port of Twente, this methodology method is suitable for this research. The DSRM method (shown in Figure 3) consists of six different steps, which will be elaborated on below.

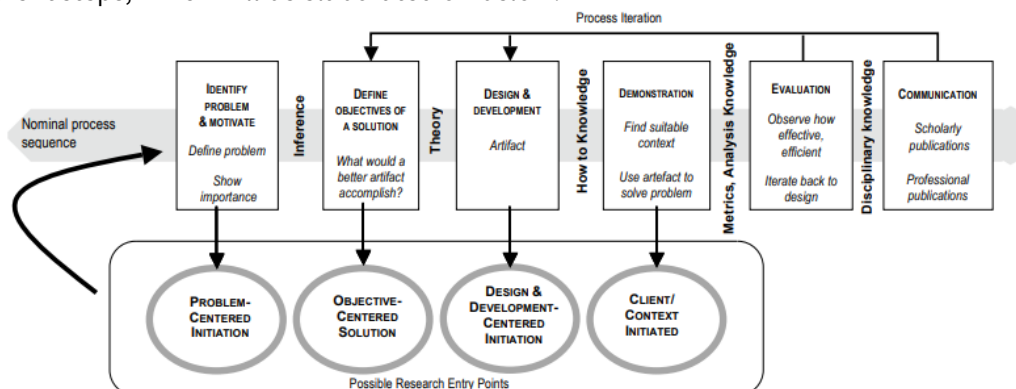


Figure 3 DSRM Process Model

### 1. *Problem identification and motivation*

The first step is to identify the problem and motivate why this is a problem that needs to be solved. This is done in subsection *1.2.1 Current situation & action problem* and subsection *1.2.2 Problem cluster and core problem*.

### 2. *Define the objectives for a solution*

During the second step, the goal and the requirements of the research and artefact need to be discussed. The wishes and requirements of Port of Twente need to be identified and these need to be implemented in the final product. These wishes also have an impact on the second, third and fourth sub-questions as defined in subsection *1.2.5 Research questions*, since they define what actually will be measured throughout this research. The goal and scope of this research have been discussed in subsection *1.2.4 Goal and scope* and here, the wishes and requirements of the different stakeholders are listed as well.

### 3. *Design and development*

In the third step, the artefact will be designed and created. First, data needs to be gathered that can be shown on the artefact. More about this procedure can be found in section *1.3 Research design*, whereas the actual data are gathered in chapters *4 Designing the KPIs* and *5 Developing the KPIs*. Additionally, knowledge needs to be gathered on how to properly visualise this data in a clear way, which will be done in section *6.1 Types of dashboards*. Sub-questions four and five have to do with this step since they are related to gathering and visualising data.

### 4. *Demonstration*

The fourth step is demonstrating the created artefact and how it solves the problem. With this, an explanation of the artefact needs to be provided, that states what can be seen and how it can be used. This explanation can be found in section *6.2 Created dashboard*.

### 5. *Evaluation*

In the fifth step, the artefact is evaluated on how well it solves the problem, which is done in chapter *7 Evaluation*. This is done by comparing the finished product with the objectives that were set during step 2. When the objectives are not accomplished enough, either the objectives need to be revised (step 2) or the artefact needs to be redesigned and redeveloped (step 3). After that, the rest of the DSRM method needs to be revised.

### 6. *Communication*

During the last step, the conclusion of the research will be communicated (Chapter *8 Conclusion & recommendations*). This means that the findings of the research, in addition to the created artefact, will be presented in a clear way. In doing so, it should be made clear how the artefact has helped in solving the problem that was identified during step 1 of the DSRM method.

## 1.3.2. Deliverables

In order to provide an insight into the value of Port of Twente, some research questions were set up, as described in subsection *1.2.5 Research questions*. When those research questions are answered, a couple of deliverables will be produced. First, a description of the current situation and activities of Port of Twente will be given. This will give insight into what tasks the different departments of the organisation perform. Besides that, a literature study will be conducted that will result in a clear definition of different concepts and a method of selecting relevant KPIs. With those KPIs, an artefact will be created that expresses the value of Port of Twente in a clear way. This method can then be used by other researchers to measure the value of other regions, so not only does this research create

an overview of the region of Twente, but it also creates a method that can be generalised and adapted to other regions. Finally, recommendations will be given about how they can improve certain KPIs, which can help Port of Twente to reach a higher spot on the list of Logistical Hotspots of the Netherlands.

### 1.3.3. Operationalisation of key variables

Whenever a research question needs to be answered, it must be clear what each concept in the question means. To do this, the key variables need to be operationalised. The only two variables in the research question are ‘economic value’ and ‘social value’, but sub-question 2 is already about what the definition is of these concepts. Therefore, it was decided that the operationalisation of these key variables would be combined with the structural literature review, in which a knowledge question should be answered. In chapter 3 *Literature review*, this literature review will be discussed.

## 1.4. Structure of paper

The rest of this paper is structured as follows. In the second chapter, the different activities of the departments of Port of Twente are discussed. This chapter will answer the first sub-question, which will create an overview of what each department contribute to the region of Twente. The third chapter shows the results of the literature review that has been conducted to operationalise different concepts. In the fourth chapter, a separate literature study has been conducted to design different KPIs. Some of these KPIs were originally not designed for logistical cluster, so they had to be altered in such a way that they can be used for this research. The fifth chapter is concerned with the development of the KPIs, which means that each indicator will be evaluated and the results will be presented. Both chapters four and five cover the third phase of the DSRM, which is related to the designing and development of the dashboard. In the sixth chapter, the dashboard is created and demonstrated (phase four of the DSRM). The dashboard shows the KPIs that were designed and developed in the earlier chapters. In the seventh chapter, the dashboard is evaluated by means of a questionnaire and updated according to the received comments. The eighth chapter contains the conclusion of this research. Additionally, recommendations for Port of Twente are provided and the limitations of the research are given.

## 2. Context analysis

In this chapter, the first research sub-question will be answered, which is *‘What are the different activities of the departments of Port of Twente?’*. In section 2.1, an overview of the recent history and the developments of Port of Twente is given. Then, the three different departments of Port of Twente and their activities are discussed (Section 2.2, 2.3 and 2.4 respectively).

### 2.1. Overview Port of Twente

As shortly described earlier, the Logistics Association of Port of Twente has been founded in 2012. The main event that caused a need for a partnership between different logistical companies in Twente was the lock blockage in Eefde (Port of Twente, 2022c). This lock blockage caused a lot of problems for all the companies in Twente that used the Twentekanaal for the transport of resources or products. The Twentekanaal is a waterway that connects the three largest cities in Twente with the rest of the waterways of the Netherlands. When the lock in Eefde failed in 2012, the whole Twentekanaal was closed off, which caused the water transport to and from Twente to come to a stillstand. Port of Twente was then founded to represent the different companies that were involved, to make sure that the interests of those companies were served as well as possible and that a good solution was created as soon as possible, to limit the damage that already was done (A. Pluimers, personal communication, 16 May 2022).

During this period, another event was happening as well. XL Businesspark in Almelo was originally created to provide business space for large companies, but due to the economic situation at the time, the available plots would not be bought by companies. The four municipalities that were involved in the XL Businesspark (Almelo, Enschede, Hengelo and Borne) therefore planned to create a solar park at the location (Tubantia, 2017). The solar park would be 23 hectares in size, which would result in less space for companies. Some people thought that this would not be beneficial for the business park and together with Port of Twente, they started a movement to change the plan of the XL Businesspark (A. Pluimers, personal communication, 16 May 2022). The approach that the four municipalities had regarding the business park was not beneficial, since they were mostly supply-driven without taking the competition into consideration, which resulted in higher prices than similar, competing business parks. By doing so, companies would rather go to the other business parks, which resulted in little demand for the available plots at the XL Businesspark and thus a large loss for the municipalities. Port of Twente offered different models to show how to manage the business park in Almelo in such a way that the losses would mitigate. After long negotiations, the municipalities finally listened and this resulted in the abandoning of the solar park idea and the start of a fully functional business park.

In the years that followed, Port of Twente mainly focused on attracting new logistic companies to Twente. In addition to that, they have profiled the logistics qualities of Twente, especially outside the region itself (Port of Twente, 2022c). Once the importance of the logistical sector in Twente was widely known and acknowledged, the Logistics Association focused on other things like the labour market. This also resulted in the merging of Havenbedrijf Twente, XL Businesspark and the Logistics Association in 2017 into the Port of Twente it currently still is. Below, each of those departments are discussed.

## 2.2. Havenbedrijf Twente

Havenbedrijf Twente is a partnership between five municipalities, namely Almelo, Enschede, Hengelo, Hof van Twente and Lochem. Within this partnership, the main focuses are combining and improving port-related tasks, promoting transport over water and stimulating innovations. With uniform port regulations, collection regulations, port fees and an automated collection system of those fees, the Havenbedrijf Twente made sure that the regulations across the different municipalities are uniform and clear. Within those five municipalities, there are eight different inland ports located on the Twentekanaal, which when combined is one of the largest inland ports of the Netherlands (Port of Twente, 2022h). These inland ports have a strategic location since they are located on the North Sea-Baltic Corridor, which runs from the North Sea (Amsterdam/Rotterdam and Antwerp) to the Baltic (Tallinn and Helsinki), as can be seen in Figure 4. In addition to that, the inland ports also form important nodes for companies in Twente and the Achterhoek, which create employment and added value as a result.

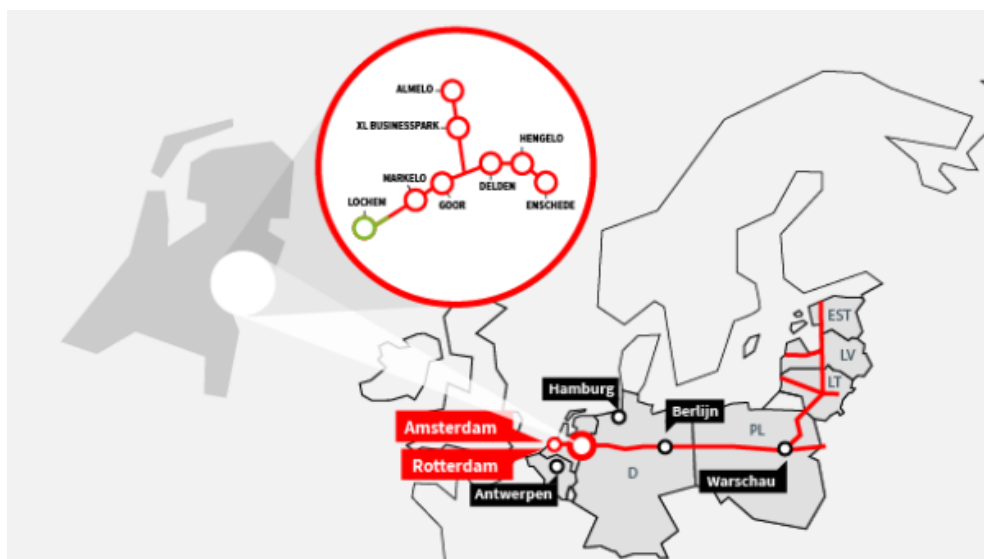


Figure 4 Map of the North Sea-Baltic Corridor

Within Havenbedrijf Twente, there are a couple of different teams that focus on different topics (Port of Twente, 2022g) (Waanders, 2018). The team “Infrastructure and Technology” is engaged in giving insight into the assets of the different ports and making them ready for the future. The “Security and Nautical management” team makes sure that the different ports and waterways are safe and accessible. The “Economy” team stimulates the transport over water and further develops port areas. The team “Organisation and Legal affairs” ensures a representable inland ports organisation. Each team is managed by a project manager, who is assigned by the different municipalities (Port of Twente, 2022g). In addition to those teams, Havenbedrijf Twente has set up the goal together with the Logistic Association and XL Businesspark to profile, position, promote and communicate the region of Twente/Achterhoek as a logistical hotspot under the joint name Port of Twente (Waanders, 2021). Together, it is easier to tackle problems and to lobby at the political level for common interests. Some examples of lobbies that Port of Twente has successfully executed are related to the second lock chamber in Eefde and the widening of the Twentekanalen (A. Scheijgrond, personal communication, 13 May 2022). Partly due to the influence of Port of Twente, these projects have been carried out or are currently being carried out.

With the Havenmonitor, Havenbedrijf Twente also provides information about the economic development of the different inland ports. Some data that can be found here are concerned with employment rates, added value and the number of establishments per port. In addition to that, information can be found about the transport to and from the Twentekanaal and data is provided about the shipping traffic (Port of Twente, 2022d). Although this information can be very useful, it does not provide insight into aspects that are not related to the Havenbedrijf, so it cannot be used by the board of Port of Twente to evaluate the value of the organisation as a whole.

### 2.3. XL Businesspark

XL Businesspark is a large and sustainable business park in Almelo, strategically located next to the A35 highway and the Twentekanaal. It is also only a few minutes away from the A1 highway, which leads directly to the Randstad, East Europe via Germany and the Ruhr district (Germany). The park contains approximately 125 hectares of ground, with plots of at least 2 hectares, so it is focused on large (inter)national companies that are related to logistics, transport, distribution or industry (Port of Twente, 2022a). Next to the Twentekanaal, there is a public loading and unloading dock and with the help of Combi Terminal Twente, containers can easily be moved from ships to distribution centres and vice versa. In addition to that, the business park features a couple of useful facilities. The business park has a collective security and only one access road, which is constantly monitored. It also has a central firewater system, which provides the firewater for all the companies on the business park. This enables the different companies to save money on investment costs regarding firewater systems.

XL Businesspark is currently managed, operated and developed by the Regionaal Bedrijventerrein Twente (RBT), which is a joint arrangement of four municipalities (Enschede, Hengelo, Borne and Almelo) and the province of Overijssel (Port of Twente, 2022b). Since 2017, XL Businesspark works under the name of Port of Twente, to strengthen the market position and to create synergy by joining forces. The way of managing the business park is not changed because of this merger (Port of Twente Logistics Association, 2021).

### 2.4. Logistic Association

When Port of Twente was founded, it originally started as the Logistic Association. The main activities of the Logistic Association in their early days (2013-2016) were the service of interests of the members of the Logistic Association and the promotion of the region of Twente. This first activity was mostly performed through lobbying. By drawing attention to bottlenecks in the infrastructure and requirements for the establishment, they made sure that these problems were known by those responsible in the politics. In addition to that, they made sure that the partnership between logistical companies and governmental- and educational institutions was strengthened (Port of Twente, 2022f). The Logistic Association promoted the region of Twente by participating in international fairs so that the region became broadly known. They also made sure that different logistical companies would come to Twente to settle down, with the ambition to attract five new companies with 250 new jobs in 2015 (Port of Twente Logistics Association, 2021).

After the merging of XL Businesspark, Havenbedrijf Twente and the Logistic Association into Port of Twente, the focus of the Logistic Association changed. Since the region of Twente was already quite well known, the focus on promoting the region decreased. Meanwhile, the Logistic Association started targeting the labour market and the influx of logistical employees. This focus was needed

since the availability of qualified personnel was getting a more important requirement for potential companies. This was also the reason that, together with two educational institutions, ROC van Twente and Saxion, and the government agency Werkplein Twente/UWV, Port of Twente set up the partnership named the Twents Huis van de Logistiek (Port of Twente, 2022e). The Twents Huis van de Logistiek organises events for the members of the Logistic Association, during which all kinds of different topics related to the logistics sector are discussed. Most of these topics are related to the labour market of the region and the recruiting of new staff. This is also the reason that the Twents Huis van de Logistiek is also focused on things like improving the logistics expertise in the region, stimulating career development and making sure that the right person is in the right place (Twents Huis van de Logistiek, 2022). These events are called Logistics Café and different presentations are given by members of the Logistics Association. After the presentation, there is room for the attendees to meet with each other and discuss various things, either regarding the given presentations or not. This is a way to let the different members of the Logistics Association meet with each other and let them make contact with different companies in the logistical sector. Another event that the Huis van de Logistiek organises is the Week van de Logistiek. During this week, students and job seekers are introduced to logistic companies (Port of Twente Logistics Association, 2021).

Another focus of the Logistic Association after the merging was innovation and sustainability. Together with the University of Twente, Port of Twente has participated in several innovative research- and development projects, which can be categorised into three themes: Sustainable logistics, Data-driven logistics and Chain management (Port of Twente Logistics Association, 2021). The theme Sustainable logistics is concerned with a sustainable deployment of (human) resources. New technologies and modalities, like alternative fuels (hydrogen and electricity) and drones, are also topics that are related to this theme. The theme Data-driven logistics focused on the application of big- and open data. Examples of this are the use of unmanned vehicles in warehouses or the advanced planning systems for ports. The last theme, Chain management, is related to the development of logistical functions in international chains. This is, among other things, focused on the realisation of intelligent transport systems (Port of Twente Logistics Association, 2021).

Although the focus of the Logistic Association has changed a bit throughout the years, one main aspect has remained the same and that is the aspect of servicing the interests of the members of Port of Twente. This was done so that whenever something wrong was noticed, this could be communicated to the responsible persons, who in their turn could solve the problem. In addition to that, the lobby for a good infrastructure from and to the region of Twente was also an important aspect that was focused on throughout the years.

### 3. Literature review

In this chapter, the systematic literature review will be discussed. In this review, which will be discussed in section 3.1, research sub-question 2 will be answered, which is *‘How to define economic and social value?’*. This knowledge question was chosen since this will make the different concepts clear so that a general definition can be used throughout the rest of the research.

In *Appendix B - Systematic Literature Review* the search terms, inclusion and exclusion criteria and the search results of the literature review protocol can be found. Now, the literature will be used to get an answer to the knowledge question described above.

In section 3.2, the concept dashboard is defined, such that a clear definition can be used throughout this research.

#### 3.1. Systematic Literature Review

##### 3.1.1. Economic value

In the research of Bellostat et al. (2015) they found that the general definition of economic value of social enterprises had some flaws. They state that “there are many references to economic value that question the neoclassical concept since its definition only recognizes consumer and producer or ownership of a company as legitimate stakeholders” (Bellostas et al., 2015). In order to come up with a sufficient definition, they identified “economic value with the returns of financial operations, without limiting its identity based on the income’s recipient” (Bellostas et al., 2015).

Adams et al. identified four different ways of how economic value can be created in the context of decentralised energy systems. These ways are “(1) increase self-consumption behind the meter; (2) achieve improved prices for exported power; (3) access wholesale, balancing and ancillary service markets; and (4) shift energy vectors to heat and transportation” (Adams, et al. 2021). In addition to that, they mentioned that local economic value can be increased in the form of community wealth, job creation and new revenue streams (Adams, et al. 2021). This last aspect, in addition to the second and third aspects, can be related to Port of Twente as well, whereas the other two are a bit too focused on the energy sector. When Port of Twente achieves a lot of good things with their activities, the region of Twente will become more attractive to companies who want to settle here. This will increase the demand for buildings and available land, which in turn will increase the price of these assets. By providing different services for the members of Port of Twente, they can also be valuable, since those members otherwise may have worked together with different agencies to fulfil their needs, which would have cost those members quite some money.

##### 3.1.2. Social value

In the literature review of Choi et al., they found that social value is more elusive than economic value since there are no objective means to measure it. In addition to that, they stated that social value is hard to define since it is intrinsically highly subjective and complex, which makes it difficult to construct a framework that identifies and measures social value (Choi et al., 2018). That is also the reason that there are various interpretations of the parameters of social value. After the review of different literature, they came up with the following definition: “financial/emotional appreciation by the users or potential users of products/services/brands (PSB), which address social issues for the individual, company, community and/or environment in order to create a good society whilst meeting the needs of an organisation.” (Choi et al., 2018).

According to Social Value UK, the definition of social value can be given as “the quantification of the relative importance that [the affected] people place on the changes they experience in their lives” (Cidik, 2020). It is remarkable that also in this definition, there is a lot of freedom regarding perspectives and time periods since different people experience changes differently at different times. This is also described by Adams et al., who say that “social values are inherently normative, and may be contested by different groups and at different points in space and time.” (Adams et al., 2021). In their literature review, they evaluate the social value in emerging decentralised energy business models according to a couple of concepts. These concepts are *Energy independence*, *Local benefits and provenance*, *Sharing and social relationships*, *Environmental responsibility* and *Participation and purpose*. For this research, the different concepts concerning energy are not relevant, but the general concepts can be. The main concepts that can be connected to the activities of Port of Twente are the Local benefits, Social relationships, Environmental responsibility and Participation. In Table 2, these concepts are described according to the research of Adams et al. and adjusted to the context of this research.

<b>Concept</b>	<b>Description</b>
Local benefits	Benefits that are created and retained in specific geographic communities or communities of practice. These benefits may be social or economic in nature.
Sharing and social relationships	Developing new and existing social relationships and reciprocity through the activities of Port of Twente.
Environmental responsibility	Shared ethical values which are derived from the different activities and actions of Port of Twente.
Participation and purpose	Value derived from the participatory process of engaging in activities and information meetings organised by Port of Twente.

Table 2 Definitions of social value concepts as defined by Adams et al. (2021)

In the literature review of Cartigny & Lord, they introduced the commonly used term ‘social capital’, which they defined as “a person’s ‘accumulation of human labour’ regarding ‘social networks’ and ‘trust’ a person has in a community” (Cartigny & Lord, 2017). By providing jobs and training opportunities to people in the local area, the individual social capital can be improved. Although this paper is focused on the construction industry, this definition can also be applied to Port of Twente. By providing jobs and trainings to the residents of Twente, they can improve the overall social capital. The paper of Cartigny & Lord also mentions the method of social return on investment (SROI) as a way to evaluate social impacts (Cartigny & Lord, 2017). The SROI is defined as the net present value of benefits divided by the net present value of investment, so it expresses the social value in monetary value. Arvidson et al. also use this method to reflect the value of social benefits. However, the SROI analysis relies partly upon assumptions and judgements (Arvidson et al., 2014) and that is the reason why this method will not be used during this bachelor’s research. When a lot of assumptions need to be made, a lot of knowledge needs to be present and within the scope of this research, it is not expected that this knowledge can be gathered in time to make appropriate assumptions on the value of benefits and investments.

### 3.1.3. Conclusion of SLR

To conclude this literature review, a summary of the findings will be given to get to an answer to the knowledge question, which was '*How to define economic and social value?*'. First, the definition of economic value will be discussed and after that, the concept of social value will be discussed.

The definition of economic value that will be used throughout this research is based on the definition given by Bellostas et al., for which they used "economic value with the returns of financial operations, without limiting its identity based on the income's recipient" (Bellostas et al., 2015). To write this in a clearer way, the definition that will be used throughout this research will be described as follows: Economic value is the financial benefit to a person or company, that can be derived from a good or service. This definition of economic value can be used to define how Port of Twente can create value in a couple of different ways. By providing certain products or services, Port of Twente can make the region of Twente more attractive to different types of companies, which will increase the monetary value of the different assets in the region. In addition to that, they can save their members quite some money, by providing different services for which other companies need to hire different types of agencies.

The concept of social value was harder to define since there were not a lot of concrete definitions that had no room for interpretation. The definition by Choi et al. is considered the clearest, so that will be used for this research. They defined social value as the "financial/emotional appreciation by the users or potential users of products/services/brands (PSB), which address social issues for the individual, company, community and/or environment in order to create a good society whilst meeting the needs of an organisation." (Choi et al., 2018). This definition is still not fully concrete since different users appreciate different things, which can also differ at different times, but when the context is clearly described, this definition can be used properly throughout this research. Adams et al. came up with different concepts that evaluate social value. The concepts that are most relevant for this research are Local benefits, Social relationships, Environmental responsibility and Participation (Adams et al., 2021), which are all discussed in Table 2. In addition to that, Cartigny & Lord mentioned that by providing jobs and training opportunities to people in the region, the individual social value can be improved (Cartigny & Lord, 2017), which is also relevant for Port of Twente.

## 3.2. Dashboard

### 3.2.1. Dashboard

A tool to measure and show the performance of an organisation or business is by means of a dashboard. In 2004, Few found that the term was used in a broad way without a clear, uniform definition. He stated that "The only common threads [between using the term dashboard in a broad way] are that dashboards appear on computer screens and involve information. That's hardly a useful definition." (Few, 2004). Because of this, Few decided that a clear definition was needed, which was not based on the type of information, but rather on the way the dashboard displayed the information to serve a specific purpose. Therefore, he came up with the following definition:

*"A dashboard is a visual display of the most important information needed to achieve one or more objectives; consolidated and arranged on a single screen so the information can be monitored at a glance."* (Few, 2004)

With this clear definition, Few also mentions some characteristics a dashboard should have. First, he notes that dashboards present metrics in a single consolidated view, do not show too many details

but rather show high-level overviews and have intuitive indicators that are quickly understandable. Additionally, he mentions that the information on a dashboard must be tailored to the requirements of the user since otherwise, the dashboard would not serve its purpose to achieve specific objectives. This also means that any type of information, either quantitative or qualitative, should be included in a dashboard whenever this information is important. Lastly, he states that when real-time data is needed to achieve the objectives of the users, the dashboards should display this, but otherwise periodic snapshots work fine (Few, 2004).

### 3.2.2. Faceted analytical display

In 2007, Few made a new article in which he reacted to his earlier work. The definition that he came up with for the term 'Dashboard' had been embraced by many people already, but "the term dashboard continues to be used in reference to almost any type of screen-based display that combines more than a single chart, no matter what its purpose." (Few, 2007). In order to end the confusion related to the term 'Dashboard', Few stated the following: "The greatest clarification that is needed today is a distinction between dashboards, which are used for monitoring what's going on, and displays that combine several charts on a screen for the purpose of analysis." (Few, 2007). For this latter, he came up with the term 'Faceted Analytical Display', which he defined as a set of interactive charts on a single screen, used to analyse data from a common dataset (Few, 2007). The main difference between the two concepts is in the actual purpose of the two displays, one is useful for monitoring the current situation at a glance whereas the other is useful for analysing information to find comparisons and relations between data.

The data that was gathered in the previous chapter needs to be visualised with the main purpose of monitoring the performance and value of Port of Twente. Therefore, a dashboard is more suitable for this situation than the faceted analytical display, since the data that will be shown will not be analysed very thoroughly but rather should give a clear picture of the current situation.

## 4. Designing the KPIs

In 2019, Buck Consultants International researched the strength of regional logistics ecosystems in the Netherlands. They based the strength of the ecosystems on four different categories, each with four different factors. Within those 16 different factors, 52 indicators were set up to establish the strengths of the 40 different COROP-regions (**Coördinatie Commissie Regionaal OnderzoeksProgramma**) in the Netherlands. The four different criteria used are 1) the substantial market size and opportunities for business development, 2) the attractiveness of the physical business environment, 3) the regional labour market for distribution centres and 4) the high level of innovation and sustainability in logistical companies (Buck Consultants International, 2019). These can be seen in Figure 5, in addition to the corresponding factors. Each of the criteria and factors were given different weights, due to the different importance on the strength of the ecosystem, which is based on the experience of the consultants (Buck Consultants International, 2019).



Figure 5 Four categories and 16 factors that determine the strength of regional logistics ecosystems (image source: Buck Consultants International, 2019)

The research of Buck Consultants International was mostly focused on finding the strengths of different regional logistics ecosystems in the Netherlands with regard to each other. Therefore, there were indicators used that are concerned with creating an order from best to worst. These indicators are not very useful for this research, since no comparison will be made between different regions. The indicators that will be used throughout this research need to show what the value of some activities is for the region of Twente itself, but they do not have to be compared with the values of other regions. However, some of the indicators that were used by Bulk Consultants International can be used to compare the impact of Port of Twente over a specific time period. By doing this, information can be gathered about the impact that Port of Twente had over that period. This makes some of the indicators that Buck Consultants International has used also applicable for this research, although some other indicators are still useless, for example, the indicators that evaluate the distance from specific regions to the nearest two airports or seaports. Those values do not change over time so it is not useful to look at those indicators.

Krupe et al. also did research on the logistical hotspots in the Netherlands, on behalf of TNO in 2009. They investigated which logistical hotspots were of national importance and which were not. In order to identify the ten most important logistical hotspots, they used ten quantitative criteria within five categories to assess all the 40 COROP regions in the Netherlands. The five categories that were used are 1) the current and future size of industrial estates, 2) the size of the (logistical) labour market, 3) the degree of multimodal transport, 4) the volume and composition of goods flows and 5) the existing road infrastructure (Krupe et al., 2009).

As with the research of Buck Consultants International, this research also focused on comparing different regions with each other. Therefore, some of the quantitative criteria that were used by Krupe et al. are not fully applicable to this research but they can be adjusted in such a way that they can be useful. This can be done by looking at the different criteria over a specific time so that the change of these criteria can be evaluated. When this change is compared with the different activities that Port of Twente carried out in that time period, something can be said about the impact of those activities.

De Langen et al. reviewed port performance indicators (PPIs) that are used to measure the performances of ports. Besides an overview of indicators that are currently used, they also analysed indicators that are relevant for other relevant areas, such as business parks and regional economies. Business parks are quite similar to ports since both have a large number of complementary and interrelated firms (de Langen et al., 2007). Ports can be described as a specific business park aimed at attracting companies that need land with water access. Performance indicators of regional economies can be relevant for port performance measurement since port regions can be considered as regional economies focused on port-related activities (de Langen et al., 2007). This also works the other way around, so the port performance indicators that De Langen et al. analysed can also be considered useful for Port of Twente since ports and regional economies are somewhat similar.

The different indicators that Bulk International Consultancy used, the criteria that were used in the report of Krupe et al. and the performance indicators analysed in the research of de Langen et al. are combined into KPIs. This was done by selecting all the relevant indicators and criteria in the different papers and merging them together. The selected criteria and the merging of them are shown in *Appendix C - KPI merging*. These KPIs were then divided into five categories, namely Space, Employment, Multimodality, Flow of goods and Infrastructure. The final KPIs are shown in Table 3, together with a description and an explanation of why they are relevant. These KPIs will be measured over a time period from 2012 to now so that a clear view can be gathered of the changes that have happened since the start of Port of Twente. The KPIs are related to different activities of Port of Twente, so a change in the KPIs can be connected to the impact of the activities that have been carried out.

<b>Type</b>	<b>KPI</b>	<b>Description</b>	<b>Relevance</b>
<i>Space</i>	Size of business parks	The total size of business parks in Twente, expressed in hectares	Measures the change in size of business parks in Twente over the years
	Issuable land	The amount of land that is still available, expressed in hectares	Measures how the amount of available land for new companies has changed over the years
	Land price	The price to buy one m <sup>2</sup> of land on a business park	Measures the change in price of useable business space
<i>Employment</i>	Logistics employees	The absolute number of employees in the logistics sector and the percentage of employees in the logistics sector compared to the whole workforce in Twente	Measures the change of logistics employees over the years
	Unemployment rate	The rate of unemployed people compared to the workforce in Twente	Measures the change in the rate of unemployment
	Local employees	The ratio of people living in Twente who also work in Twente compared to all the workers who live in Twente	Measures the change in the local employee ratio
<i>Multimodality</i>	Handling volume multimodal terminals	The volume of container transshipment at the inland ports of Twente	Measures how much cargo is transhipped at the inland ports of Twente, to see whether the demand of multimodal terminals has changed
<i>Flow of goods</i>	Total flow of goods	The total volume of goods that have been sent to and from Twente	Measures the change of volume of goods that have been shipped from and to Twente
	Gross regional product	Total value of all goods produced in Twente in a year	Measures how the economy in Twente has changed over the years
<i>Infrastructure</i>	Highway capacity	The capacity of the highways in Twente, measured in kilometres of highway	Measures how the main road infrastructure has changed over the years

Investment level	The amount of money invested in the region of Twente	Measures how much money is invested into the development of the region
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Table 3 List of KPIs that will be measured over time

The KPIs described above will be assessed over a period of time with data that is already available, as earlier discussed. For the interviews that will be conducted, additional indicators for the value of Port of Twente are selected. These benchmarks will be more related to the impact of Port of Twente on its members and have less to do with the region of Twente itself. However, the impact on the members of Port of Twente is quite relative, since each member values different things and therefore, they value the actions of Port of Twente in different ways. Consequently, the indicators that were selected to measure the impact on the members are mostly qualitative, since this will create a better view of how the different actions are valued by the members of Port of Twente. The benchmarks that were selected are shown in Table 4 and were selected in consultation with my supervisor at Port of Twente.

<b>Indicators</b>	<b>Description</b>	<b>Relevance</b>
<i>Reasons to join Port of Twente</i>	The reasons why the members chose to become a member of Port of Twente	Shows the important points of Port of Twente for non-members which can either convince or discourage them to join
<i>Extent of knowledge and interest in activities Port of Twente</i>	The knowledge and interests of the members in the different activities that Port of Twente organises	Measures the involvement of the members with the different activities of Port of Twente
<i>Scope of benefits of being member of Port of Twente</i>	The different benefits that members experience due to being a member of Port of Twente	Measures the pros of being a member of Port of Twente
<i>Member satisfaction</i>	The satisfaction of the different members of Port of Twente	Measures how satisfied the members are with their membership with Port of Twente on a scale of 1 to 10 at the current moment in time
<i>Areas of improvement</i>	The points on which Port of Twente can improve	Shows points Port of Twente could focus on to improve

Table 4 Indicators that will measure the impact on members of Port of Twente

## 5. Developing the KPIs

In this chapter, the fourth research sub-question will be answered. The fourth research question is *'What are the expressed values of the selected KPIs?'* The KPIs will be evaluated in the same order as described in Chapter 4, so first the KPIs over time will be discussed and after that, the indicators regarding the interview and members will be evaluated.

### 5.1. KPIs over time

First, the KPIs over time will be evaluated. Values will be given to the KPIs that were given in Table 3. These values are based on information that is gathered from different publicly available data sources. Each KPI has an explanation and at the end of this section, an overview is given of all the KPIs (Table 5).

#### 5.1.1. Space

##### Net area of business parks

For this KPI, the net areas of all the business parks in Twente were evaluated. IBIS (Integraal Bedrijventerreinen Informatie Systeem) has data of 3800 business parks throughout the Netherlands and after selecting the appropriate business parks, information could be gathered about the business parks in Twente. In 2012, there was a net area of 3124 hectares of business parks in Twente (IPO, 2019) and in 2019, this has changed to 3336 hectares (IPO, 2019), which is an increase of 6.8%.

##### Issuable land

For the issuable land, the available land on the business parks in Twente was evaluated. With data from IBIS and Panteia, information was collected of the land that still could be sold to companies. In 2012, this amount of issuable land was 551 hectares (Verhoeven et al., 2015) (Twente Index, 2021b), whereas it decreased by 24.7% to 415 hectares in 2019 (IPO, 2019).

Since the overall size of the business parks in Twente has increased with 212 hectares and the issuable land has decreased with 136 hectares, it could be remarked that a total of 348 hectares have been sold/issued to enable the development of new businesses.

##### Land prices

For the 'Land prices' KPI, two different sub-KPIs were set up. The first sub-KPI is the rental price of business space and the second sub-KPI is the sales price of business land. For the rental price, information was used from Kennispunt Twente, which showed the rental prices per square meter of business space of the five largest municipalities of Twente (Twente Index, 2021b). In 2012, this rental price averaged €42 per m<sup>2</sup>, whereas it changed by 23.3% to €51.80 per m<sup>2</sup> in 2021. This is in line with the national average rental price of business space that has increased over the years 2013 to 2020 as well, as can be seen in Figure 6 (NVM Business, 2021).

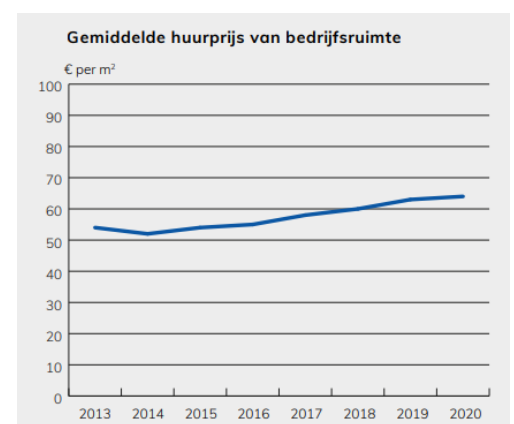


Figure 6 Average rental prices of business space in the Netherlands (2013 - 2020) (NVM Business, 2021)

For the sales price of business land in Twente, the reports of van der Wiel et al. and Centraal Planbureau were used. The average sales price of business land in 2012 was €132 per m<sup>2</sup> (Centraal Planbureau, 2015), whereas it has changed to €130.92 per m<sup>2</sup> in 2021 (van der Wiel et al., 2020). This decrease of 0.8% is somewhat in line with the data that is analysed by Nirayo, where the prices of business land in the province of Zuid-Holland decreased over the period of 2012-2016 as well (Nirayo, 2016).

### 5.1.2. Employment

#### *Logistics employees*

For the KPI related to the logistics employees, two different sub-KPIs were used. First of all, data was gathered about the absolute number of logistics employees and besides that, these numbers were also compared to the overall labour force in Twente, which gives a percentage of people who work in logistics.

For the first sub-KPI, a lot of different data was found. This had mostly to do with the different terms that are used to express the different activities in the logistics sector. Different sources use different terms, such as the “Transport and storage” sector (CBS, 2021a) (LISA, 2021), the “Logistics” sector (Kennishub Overijssel, 2020c) and the “Distribution” sector (Twente Index, 2021c). Different data is used to express the total employees for these terms, so there is no unambiguous number of how many people work in the logistics sector.

This results in the fact that there are 8120 people working in the “Logistical” sector (Kennishub Overijssel, 2020c) in 2020, 10,560 employees in the “Transport and storage” sector in 2021 (CBS, 2021a) (LISA, 2021), while in the “Distribution” sector, there are 33,770 employees (Twente Index, 2021c) in that year. After consultation with Port of Twente, it was chosen to take the last number described, since this number does not only entail all the people in the logistics sector itself, but also the people that perform logistical tasks in companies not purely fall in the logistical sector. Port of Twente has quite some members who have logistical tasks but are not considered as a logistics company so therefore, the source that gives information about the “Distribution” sector was used to determine the logistics employees.

In 2012, there were 31,370 logistics employees (Twente Index, 2021c) which was about 10.3% of the total workforce in Twente. In 2021 there were 33,770 logistics employees (Twente Index, 2021c), which is an increase of 7.7%. However, the percentage of the workforce was still 10.3% in 2021. This is the case because of the increase in the workforce of Twente, which has increased with 7.5% between 2012 and 2021 (Twente Index, 2021c).

#### *Unemployment rate*

The unemployment rate shows the ratio between unemployed people and the overall labour force in a certain region. The labour force in Twente was 337,000 in 2013, while it was 344,000 in 2021 (Twente Index, 2021a). The unemployment rate in those years was 8.5% and 3.9% respectively (Twente Index, 2021d). This means that in 2013, there were 28,645 unemployed people, while in 2021 there were 13,416 unemployed people in Twente.

#### *Local employees*

For the ‘Local employee’ KPI, information was gathered regarding commuters. A commuter is a person who regularly travels between their home and work. For this KPI, a ‘local employee’ is defined as someone who lives and works in the region of Twente. Data was used from 2014 since no reliable

sources could be found for information on commuters from earlier years. First, information was gathered of the number of people who live in Twente and also work in Twente. Then, numbers were gathered of the number of people with jobs who live in Twente, regardless of where those people work. A ratio was gathered by dividing the first gathered number by the later one.

In 2014, a total of 221.2 thousand people lived and worked in Twente (CBS, 2022a), whereas there are 275.6 thousand people living in Twente with a job anywhere in the Netherlands (CBS, 2022a), so the ratio of local employees is 80.3%. In 2020, 244.8 thousand people were living and working in Twente (CBS, 2022a). In that year, a total of 299.5 thousand people with a job were living in Twente (CBS, 2022a), which results in a ratio of 81.7%. This is an increase of 1.8%.

### 5.1.3. Multimodality

#### *Handling volume multimodal terminals*

In order to evaluate the handling volume of the multimodal terminals in Twente, information was used from the Havenmonitor, a dashboard that contains data of the different ports in Twente, managed by Panteia, on behalf of the Havenbedrijf. Two sub-KPIs were used, one for the number of containers and the other one for evaluating the total amount of weight that has been handled in the different inland ports in Twente.

The number of containers is expressed in TEU (Twenty foot Equivalent Unit), which is a unit of cargo capacity based on the volume of a 20-foot long container. In 2012, a total of 92,501 TEU were handled in the inland ports of Twente (Panteia, 2022). Almost all of these were handled in the port of Hengelo and only 134 were handled in Almelo. In 2021, a total of 94,090 TEU were handled in Twente, with 88.7% of those being handled in Hengelo and the rest in Almelo (Panteia, 2022).

The amount of weight that has been handled in the inland ports of Twente will be expressed in metric tons (1000 kilograms) since this is the most useful unit for expressing large amounts of weight. In 2012, there were 2,457,160 metric tons loaded in Twente and 2,913,452 metric tons unloaded, which makes a total of 5,370,612 metric tons being handled in Twente in 2012 (Panteia, 2022). In 2021, this has increased by 10.7% to 5,946,997 metric tons, from which 2,705,037 were loaded and 3 241 959 unloaded in the ports of Twente (Panteia, 2022).

### 5.1.4. Flow of goods

#### *Total flow of goods*

For the total flow of goods, information was used of (Kennishub Overijssel, 2020a). Here, the total amount of goods that were transported to and from Twente has been given in metric tons. In 2012, a total of 19,682,497 metric tons have been transported to Twente, from which is 9,460,661 metric tons transported to Twente and 10,221,836 metric tons from Twente (Kennishub Overijssel, 2020b). This has changed to 27,767,643 metric tons in 2020, which is an increase of 41.1%. Of this total, 13,829,669 metric tons have been imported to Twente and 13,937,974 metric tons have been exported from Twente (Kennishub Overijssel, 2020b).

#### *Gross regional product*

In order to get a view of the economic value of the region of Twente, data regarding the gross regional product was gathered. The gross regional product expresses the total market value of all the goods and services produced in a region over a period of time. In 2012, the gross regional product of Twente

was 19,185 million euros (CBS, 2021b). In 2021, this has increased by 32.2% to 25,368 million euros (CBS, 2021b).

#### 5.1.5. Infrastructure

##### *Highway capacity*

For the KPI related to the highway infrastructure, two sub-KPIs were used. First of all, the total length of the national highways in Twente was evaluated. In 2012, there was a total length of 185 kilometres of highway in Twente. In 2021, this has increased by 10.8% to a total of 205 kilometres (CBS, 2022b). The second sub-KPI views this length as a ratio to the area of Twente, so the unit will be kilometre per squared kilometre (km/km<sup>2</sup>). In 2012, this ratio was 0.123 km/km<sup>2</sup>, whereas this was 0.136 km/km<sup>2</sup> in 2021. Since the area of Twente did not change (1503.8 km<sup>2</sup> (CBS, 2022c)), this ratio also increased by 10.8%.

##### *Investment level*

To see how much money is invested into the region of Twente, two sub-KPIs were set up. The first sub-KPI looks at the total amount of money that has been invested into the region, while the second one looks at the investments into the logistics sector of Twente. In 2012, a total of 3643 million euros was invested into the economy of Twente (CBS, 2021c). In 2020, this has changed to 4731 million euros (Kennishub Overijssel, 2020c), which is an increase of 29.9%.

The amount of money that has been invested in the logistics sector in 2012 was 76 million euros, which represents 2.1% of total investments (Kennishub Overijssel, 2020c). In 2020, 123 million euros were invested in the logistics sector of Twente, which was 2.6% of the total investments (Kennishub Overijssel, 2020c). These investments increased by 61.8% over the years.

### 5.1.6. Overview

<i>Type</i>	<b>KPI</b>	<b>Sub KPI</b>	<b>Unit</b>	<b>2012</b>	<b>Now</b>	<b>Change</b>
<i>Space</i>	Net area of business parks	-	hectares	3124	3336 (2019)	+6.8%
	Issuable land	-	hectares	551	415 (2019)	-24.7%
	Land prices of business space	Rental price	€/m <sup>2</sup>	42	51.80 (2021)	+23.3%
		Sale price	€/m <sup>2</sup>	132	130.92 (2021)	-0.8%
<i>Employment</i>	Logistics employees	Absolute numbers	#	31,370	33,770 (2021)	+7.7%
		Percentage of population	%	10.32%	10.34% (2021)	+0.0%
	Unemployment rate	-	%	8.5% (2013)	3.9% (2021)	-54.1%
	Local employees	-	%	80.3% (2014)	81.7% (2020)	+1.8%
<i>Multimodality</i>	Handling volume multimodal terminals	Containers	TEU	92,501	94,090 (2021)	+1.7%
		Weight	Metric tons	5,370,612	5,946,997 (2021)	+10.7%
<i>Flow of goods</i>	Total flow of goods	-	Metric tons	19,682,497	27,767,643 (2020)	+41.1%
	Gross regional product	-	€ * million	19,185	25,368 (2020)	+32.2%
<i>Infrastructure</i>	Highway capacity	Total length	km	185	205 (2021)	+10.8%
		Length to area ratio	km/km <sup>2</sup>	0.123	0.136	
	Investment level	Total economy	€ * million	3643	4731 (2020)	+29.9%
		Logistics sector	€ * million	76	123 (2020)	+61.8%

Table 5 Overview of KPIs and their values

## 5.2. Member indicators

In this section, the indicators that were designed to measure the impact on the members of Port of Twente will be discussed. Each indicator will be discussed separately, in the same order as they were presented in Table 4. As mentioned multiple times already, the main source of data for these indicators are the interviews that have been conducted with several members of Port of Twente. This interview had a semi-structured framework, which means that predetermined questions were set up but new questions can be asked during the interview as a result of the answers that the interviewee gives. The framework of the interview, with all the predetermined questions that were created, can be found in *Appendix D - Interview*

In addition to the interviews, information has been gathered through a survey that has been sent to each member of Port of Twente by the board of the organisation. In this survey, questions were asked regarding different interests and values of the members, where the members could check boxes with the most appropriate answers. Additionally, open-ended questions were asked regarding the added value of the membership and the possibilities to improve for Port of Twente. These topics also emerged in the interviews, so more information was gathered for those questions. The survey that was sent out by the board of Port of Twente can be seen in *Appendix E - Survey of Port of Twente*. In total, information was gathered from nine filled-in surveys. Since filling out the survey was voluntary, not all members filled it out. Therefore, the data that is gathered throughout the survey needs to be used a bit carefully, since it is assumed that only members filled out the survey who are at least a little bit interested in Port of Twente. Members that are not really engaged in the activities of Port of Twente are more likely to not fill out the survey, so their data is not collected, which could result in a more positive attitude in the result of the survey. However, the surveys can still be considered a useful way of collecting data, since insights are collected from members that were not gathered otherwise.

Now, each indicator will be discussed. To indicate what was said by the interviewees, the name of the respective company was written in *italics*. The interviewees gave consent for using the companies name in this research.

### *Reason to join Port of Twente*

During the interviews, several reasons to join Port of Twente were given. The main reason that companies became a member of Port of Twente is the network function that Port of Twente has. *DB Schenker* mentioned that this network function was important to them since they think it is important to have a good relationship with companies in the same sector, in order to learn from each other, which will help the region as a whole in the long term. *Heylen Warehouses* also mentioned the network function of Port of Twente as the main reason for their membership, but they were mainly concerned with getting in contact with new customers. With the networking activities of Port of Twente, they mainly hope to stimulate the attraction of new customers. Other companies mentioned that they had no apparent reason for why they joined Port of Twente, with *Twence* mentioning they did not even know they were members.

The surveys that were sent out by the board of Port of Twente revealed reasons that were mostly concerned with increasing the strength of the logistical sector in Twente. For example, *Brunen* mentioned that they wanted to get to know the sector better in order to increase its strength, whereas *CTT* indicated that they wanted to work together with other logistical companies in order to act collectively towards governments as a cluster.

### *Knowledge and interest in activities*

During the interviews that were conducted, it was shown that the variety of the knowledge and interest in the different activities of Port of Twente was quite wide. For example, the interviewee on behalf of *DB Schenker* mentioned that he has been quite active in the past, both for DB Schenker and other companies. Others mention that they have not been to one activity of Port of Twente yet. However, when some topics of activities were mentioned during the interviews, all interviewees reacted interested and said that those topics also would relate to their business. The main reason they gave for why they were not participating in the activities was the lack of knowledge of either the activities themselves or the topics of the activities. *MSG* also mentioned that it was kind of their own fault that they were not aware of all the different topics and activities of Port of Twente since they were not participating in many activities which was their own decision.

The survey showed some other results. In the survey, a question was asked about what events and network meetings were relevant for the members. Five options were given, from which the company visits were considered the most relevant (8 out of 9 votes). Furthermore, the Week van de Logistiek and the Logistics Cafés were also viewed as quite relevant activities of Port of Twente (6 and 5 votes out of 9, respectively). As mentioned earlier, the surveys were filled out by mostly somewhat interested companies, so this distribution would not be applicable to all the members of Port of Twente. However, it does show that the different activities can be considered appreciated by the participating members of Port of Twente.

### *Benefits of membership*

The members that were interviewed gave quite some different benefits they experienced thanks to their membership at Port of Twente. For example, *DB Schenker* mentioned that they attended several meetings organised by Port of Twente that were about acquiring new personnel and how to maintain this personnel, which helped them with problems related to this topic. In addition, they indicated that they were participating in a study related to a web environment with information for all the members of Port of Twente. Both *Heylen Warehouses* and *Timberland* mentioned the XL Businesspark as a great benefit they experienced due to Port of Twente. Both companies said that the business park that was created with the help of Port of Twente was one of the reasons for the establishment of the companies in the region. The collective security, good accessibility and the ability to make use of the terminal for multimodal transport are great characteristics of the business park. *Timberland* also mentioned that the ability to exchange personnel between companies at the XL Businesspark is a great addition. Another benefit of the membership, according to *Heylen Warehouses*, is that they improved their customer relationships with the help of Port of Twente, in addition to getting new customers.

*Rhenus* also states in the survey that they improved and got more contacts with the help of Port of Twente. Another benefit that multiple companies mentioned in the survey is the combining of forces for the logistical sector in the region. *CTT*, *Bolk* and *MSG* mentioned that joining forces is an added value of Port of Twente since this will make sure that they are stronger when things need to change. *Cape Group* adds to this that with combined forces, more knowledge can be shared to help each other forward and to make innovations go quicker.

### *Member satisfaction*

The member satisfaction was determined by asking each interviewee how satisfied they are with their membership at Port of Twente at this moment in time. Since *Twence* did not know that they were a member at all, they could not give a grade for their satisfaction. However, the other companies that were interviewed came to an average grade of a 7.5 for the satisfaction of their membership. These companies also said that they would recommend similar companies to become a member of Port of Twente since it would have quite some advantages. *Timberland* added to this that they think it is important to have good relationships with other companies in the region, so therefore, they do recommend it to others. *MSG* mentioned that similar companies could join for the network functions of Port of Twente, but that they should not join if they only expect to get new customers out of the membership. The member satisfaction can change over time, so these results are a snapshot of the current situation.

### *Areas of improvement*

During the interviews, quite some points were mentioned on which Port of Twente could improve to be even more beneficial for its members. *Heylen Warehouses* mentioned for example that they would like to get more information on the potential of personnel in the region so that they can use this information again to communicate it to potential customers. This information should be both quantitative and qualitative, so they would like to get information about topics like available people, how highly educated they are and in what fields they would like to work. So according to *Heylen Warehouses* Port of Twente could improve by providing more information, mainly about the current labour market in the region.

As stated earlier, *Twence* indicated that they did not know they were a member of Port of Twente. When different topics were mentioned during the interview, they stated that *Twence* themselves also had some problems related to these topics, so that there are meetings where these topics will be discussed sounded interesting to them. Because they did not know about these meetings, they recommend Port of Twente to better communicate what different themes are for their events to all of their members, so that everyone can be engaged when they want to. *Twence* also believes that Port of Twente could play an important role when it comes to connecting different companies in order to create sustainable supply chains in Twente. These companies need to be brought together, but the conditions for this cooperation need to be valid as well. *Twence* thinks that Port of Twente could help accomplish this by hosting events that are related to creating sustainable loops in the region.

*MSG* states that they would like to see a regional market that is more united. They experience the current market as a neutral one that does not work against each other, but also not with each other, whereas they would like to see a market that collaborates with each other to improve the region and regional economy. They believe that several different logistical tasks can be combined within the region to make them easier and better for all of the involved parties.

Furthermore, *Timberland* mentioned that there are a lot of distribution centres in the region. Every distribution centre needs the same type of personnel, so this results in a shortage of available people. Therefore, *Timberland* would like to see a larger diversity of companies in the region, from high-tech companies that require highly educated people to distribution centres that require less highly educated people, in order to make sure that not all companies try to employ the same few people that are available. *Timberland* believes that Port of Twente could try to encourage high-tech

companies to establish in Twente so that distribution centres do not end up without qualified personnel.

Lastly, *MinusPlus* and *21CC Education* mentioned opportunities to offer educational training and workshops to educate employees of other companies, in order to make them more resilient to upcoming changes. In addition to this, this would improve the ability of employees to exchange between companies when this might be needed. *CTT* also mentioned the possibility to provide vouchers for personnel that can be used for educational purposes.

## 6. Demonstrating the dashboard

In this chapter, research sub-question 5 will be answered, which is ‘How to visualise the selected KPIs?’. In section 3.2, the concept ‘Dashboard’ has been defined. This definition will now be used to develop further, such that an appropriate tool can be created (section 6.1.6.1). In section 6.2, an artefact will be created to the characteristics of this specific tool with the data that has been gathered in the previous chapter.

### 6.1. Types of dashboards

In a paper by Rahman et al., it was mentioned that the purpose of a dashboard differs according to the user’s managerial level, due to the role they play in an organisation. Since there are three management levels that the developer needs to be aware of before designing the dashboard, there are also three levels of dashboards according to Rahman et al. The first level is the strategic dashboard, which is used to monitor the implementation of strategic objectives, communicate strategy and review performance (Rahman et al., 2017). The second level is the tactical dashboard, which provides more detailed information compared to the strategic dashboard, with the main focus on monitoring and managing the performance of processes of departments or specific projects (Rahman et al., 2017). The third level is the operational dashboard, which enables the front-line employees to view current information that they can use to manage and control operational processes (Rahman et al., 2017). An overview of the different levels of dashboards with their purposes and features is given in Figure 7.

Level	Purpose	Features (Frequency of appearance)
<b>Strategic</b>	<b>Consistency</b> -Improve business process -Track KPI <b>Monitor</b> -Monitor organisational performance. <b>Planning</b> - To plan the organisation future	<b>Visual Features</b> -Fit single screen -Grid overlay <b>Functional Features</b> -Graphical Presentation (Bar chart, Pie Chart, Graph, Gauge Chart) -Time horizon
<b>Tactical</b>	<b>Consistency</b> -To standardise the service <b>Monitor</b> -Self-monitoring the performance of management. -Understand employee's performance -Summarise information by departmental -Monitor trend over the period. <b>Communication</b> -Communicate with the operational level. <b>Analysis</b> -Improve decision making among the departments.	<b>Visual Features</b> -Fit Single Screen <b>Functional Features</b> -Graphical Presentation (Fusion, historical, bar, gauge chart) -Drill down -Scenario analysis -Drag and drop -Hide/flag component -Report -Alert mechanism -Print -icon
<b>Operational</b>	<b>Consistency</b> -Increase speed and consistency of analysis -For information transparency. <b>Monitor</b> -Monitor individual or group information -Monitor activity -Monitor and detect relevant information -Measure individual performance <b>Communication</b> -Provide feedback on their performance -To extract information among the team member. <b>Analysis</b> -Analyse learning analytics -Analyse user's own Information -Analyse effects	<b>Visual Features</b> - Fit a single screen <b>Functional Features</b> -Percentage indicator -Graphical presentation (bar, line, pie, network, spider, trend,gauge) -Concept map -Table -Filter -Badge -Zoom -Rating -Calendar -Alert mechanism

Figure 7 The purposes and features of different level of dashboards

As described earlier, the main purpose of the dashboard that will be created is to monitor the value of Port of Twente, so the strategic level is the most suitable for this research. Some aspects of the tactical level could be implemented as well, such as the monitoring of a certain trend over a period of time. However, other things from this level are not useful, like the communication with the operational level or the understanding of the employee's performance, since those are not relevant for Port of Twente.

In order to create a dashboard that fits the correct level, a couple of aspects need to be included in it, like different graphical presentations and a time horizon. There are a lot of different ways to visualise data, although not all types of visualisations are useful for the data that has been gathered. One useful way of visualising and comparing different values is by making use of a column chart. Column charts can be used to make side-by-side comparisons between different values or to show change over a period of time (Team Sisense, 2022). This will be effective for the data that has been gathered since with column charts, comparisons can be made between 2012, the year Port of Twente was founded, and now, so the change in those years can easily be identified. Another way to display data is by means of line charts, which are particularly effective at showing different trends in a clear and concise way (Team Sisense, 2022). Line charts can also be combined with column charts, to highlight both key figures and an overall trend. This can create compact charts that contain useful data, without making it too hard to understand. Lastly, pie charts will be practical for the dashboard that will be created, since pie charts show proportions in an easy and intuitive way (Team Sisense, 2022). This type of chart can be useful to show the shares of different values that make up the total, so it can be made clear what each aspect contributes to the total KPI.

In addition to those charts, which will mainly show the KPIs that were measured over time, the member indicators will be shown by means of a list. Additionally, member satisfaction will be expressed as an average score.

## 6.2. Created dashboard

In Figure 8, the dashboard that is created is shown by means of a screenshot. Below that, an explanation is given of what can be seen and how the dashboard can be used. In *Appendix F - Dashboard*, the dashboard is shown larger.

### Dashboard Port of Twente



Figure 8 The created dashboard

Within this dashboard, several different charts can be seen that each represent a couple of the KPIs which are discussed and evaluated earlier in this report. Column charts are included to show the change of the specific KPI over the time period of 2012-2021. However, some charts do not represent data for a couple of years since this data was not available. Within some of the column charts, a line is included to show a particular trend or to show the percentage of the total. At the top of the dashboard, a specific year can be selected. Once this is done, additional information of each KPI for that specified year will be shown in the corresponding chart. In addition to that, an extra pie chart will be shown to further highlight the difference between the import and export of goods in Twente in that specific year. In Table 6, an overview of all the different graphs that can be found in the dashboard is given. Some graphs have multiple values and units, which are all explained in the list.

Furthermore, in the dashboard, there also is a list shown that expresses the member indicators. The user of the dashboard can select the indicator that they want to see from a drop-down box and the relevant information will be given. The three indicators that can be shown in the list are the *reasons to join Port of Twente*, the *experienced benefits of the membership* and the *areas of improvement for Port of Twente*. The values of the indicators are shown in alphabetical order, so the order of the list is not based on the relevancy of the values.

<b>Graph title</b>	<b>Unit</b>
<i>Logistical Employees</i>	The overall number of employees in the logistical sector
	The percentage of logistical employees with regards to the total workforce
<i>Local Employees</i>	The total workforce of people who live in Twente
	The number of people who live in Twente and work in Twente
	The percentage of people who live and work in Twente with regards to the total workforce of people who live in Twente
<i>Unemployment rate</i>	The total workforce in Twente (both people who live in Twente and who do not live in Twente)
	The number of people who are unemployed
	The percentage of people who are unemployed with regards to the total workforce in Twente
<i>Gross regional product</i>	The total gross regional product, in million euros
	The percentage of the difference with regards to one year earlier
<i>Flow of goods</i>	The total amount of goods shipped in Twente in metric tons, divided into the import and export of the goods
<i>Investment level</i>	The total amount of money invested in the Twente region, in million euros
	The amount of money invested into the logistical sector of Twente, in million euros
	The percentage of money invested into the logistical sector with regards to the total amount of money invested

Table 6 Overview of graphs shown in dashboard

## 7. Evaluation

In this chapter, the dashboard that has been presented in the previous chapter (Chapter 6) will be evaluated, in order to make sure that the dashboard solves the problem of Port of Twente. For this evaluation, a questionnaire has been created that has been answered by the supervisor of Port of Twente and additional board members of Port of Twente. In section 7.1, the process of creating the questionnaire will be discussed and in section 7.2, the results of the questionnaire will be given. In this section, the comments regarding the dashboard will also be processed and the changes towards the new dashboard will be discussed.

### 7.1. Questionnaire for evaluation

In 2003, Venkatesh et al. reviewed several different information technology acceptance models, in order to formulate a unified model that integrates elements from the reviewed models. The unified model that they formulated was named the Unified Theory of Acceptance and Use of Technology (UTAUT) and consists of four constructs that significantly play a role as direct determinants of user acceptance and usage behaviour, namely: *performance expectancy*, *effort expectancy*, *social influence* and *facilitating conditions*. Other determinants that influence the acceptance of information technology are *self-efficacy*, *anxiety*, *attitude towards using technology* and *behavioural intention to use the system*, although these are not considered direct determinants (Venkatesh et al., 2003). For each of these constructs, Venkatesh et al. formulated statements that could be used to test the acceptance of the technology by its users. Since the dashboard that was created for this report was intended to show the value of Port of Twente by means of an overview of the situation in Twente, not all constructs mentioned by Venkatesh et al. will be relevant for this research. The dashboard for Port of Twente will be used to get insight into the current situation but once this is done, it does not require daily use anymore. Therefore, constructs like anxiety while using the system or behavioural intention to use the system a <n> times a month are not relevant. However, other constructs like performance expectancy and the facilitating conditions can be used to evaluate the dashboard that has been created.

Hinderks et al. designed the User Experience Questionnaire in 2019, which was created to measure the success of a company or its product. For this questionnaire, they used six scales that each represent a distinct user experience quality aspect, which are *Attractiveness*, *Perspicuity*, *Efficiency*, *Dependability*, *Stimulation* and *Novelty* (Hinderks et al., 2019). For each of these scales, they developed additional questions that should be assessed on their importance on a 7-point Likert scale ranging from completely unimportant to very important. Some of these questions are not relevant to this bachelor's research, while other questions can be adapted to be useful for the evaluation of the dashboard that has been created.

With the constructs that have been designed by Venkatesh et al. and the questions that were developed by Hinderks et al., a questionnaire is created that can evaluate the dashboard that has been made for this research. This questionnaire is shown in *Appendix G - Questionnaire for evaluation* and consists of three main topics. The first topic is appearance and it is mainly focused on the actual looks of the dashboard, however, a distinguishment is made between the aesthetic attractiveness and the clarity of the dashboard is made. The overall theme is namely important for good aesthetics, but if the dashboard looks very busy and unclear, it can become very overwhelming. The second topic of the questionnaire is the functionality of the dashboard. This topic is mostly concerned with the

purpose of the dashboard itself, so if the dashboard shows relevant information and if it has added value with regards to numbers in a table and static text. The last topic of the questionnaire is usability, which is related to how easy it is to use the dashboard and if the needed resources to use it are at hand. Also, efficiency and predictability are related to this topic, since it is desired that the user knows what to expect when they make use of the dashboard. They should be able to anticipate what will happen if they give a certain input, in order to make the dashboard of good use.

The users of the dashboard should evaluate each criterion with a grade between 1 and 5, where 1 is the lowest and 5 is the highest score possible. At the end of the questionnaire, there is a field for additional comments.

## 7.2. Results of evaluation

In this section, the results of the evaluation will be discussed. Each topic in the questionnaire consisted of four or five criteria, which all could be graded between a 1 and a 5. Below, in Figure 9, the scores that the users gave are shown.

<b>Appearance</b>	<b>User 1</b>	<b>User 2</b>	<b>User 3</b>	<b>User 4</b>
The dashboard gives an attractive and pleasing impression	4	3	4	4
The dashboard has a uniform theme and provides a clear overview	3	4	4	4
The dashboard contains the right amount of graphs	3	4	4	4
The dashboard is innovative and creative	2	4	2	4

<b>Functionality</b>	<b>User 1</b>	<b>User 2</b>	<b>User 3</b>	<b>User 4</b>
The dashboard shows meaningful and correct data, which gives useful insight in the situation in Twente	3	4	3	2
The dashboard effectively shows different patterns and changes over time	3	5	3	4
The dashboard allows me to get a clear view of the KPIs in a quick way (compared to static numbers/report)	3	4	5	4
The different type of graphs in the dashboard are well chosen and each graph has a good contribution	3	3	3	4
The graphs come with clear information in the title and axis	3	5	2	4

<b>Usability</b>	<b>User 1</b>	<b>User 2</b>	<b>User 3</b>	<b>User 4</b>
The dashboard is clear and easy to understand and use	3	5	5	4
The interaction with the dashboard is efficient and reacts fast to user input	4	4	4	4
The behaviour of the dashboard is predictable (i.e. predictable what will happen if input is given)	3	4	4	3
I have the resources that are necessary to use the dashboard (software etc.)	3	4	5	4
I have the knowledge that is necessary to use the dashboard	3	4	4	4

Figure 9 Evaluation scores given by users

To see if the dashboard meets all the criteria, an average is calculated for each topic. These averages should all be at least a 3 in order to be sufficient since this is the middle of the possible scores. For appearance, the average score is 3.56, which means that the appearance is considered sufficient. From the grades given for the criteria, it can be stated that the theme itself was quite good, but the dashboard could be made a bit more innovative since this criterion was graded with a 2 two times.

The functionality scores a 3.5, which is sufficient as well. Some criteria for this topic scored quite consistent, whereas others varied quite a bit. Especially the criterion regarding the information in the titles and axis was graded differently by the users. One user gave a 5, whereas someone else gave a 2.

Some comments that were given were related to the clarity of the axis, but those comments will be discussed later. Overall, the users thought that the dashboard was quite functional.

Lastly, the usability will be discussed. This topic scores a 3.90 on average, which is quite good. For the score of this topic, there were no real outliers, which means that the users were fairly similar in their opinion. The dashboard was created in Microsoft Excel, which is a broadly known program, so this was probably the reason that no big problems occurred with the usability of the dashboard.

With these results, it can be stated that the users evaluate the dashboard as satisfactory, since the averages of the three main topics are all equal to or higher than 3.5, which is higher than the goal of an average of 3. The dashboard also fulfils the wishes and requirements of the stakeholders that were analysed during the stakeholder analysis (*Appendix A - Stakeholder Analysis*)

In addition to the scores, the users gave comments about what could be improved regarding the dashboard. Some of these comments were about the clarity of the displayed data, whereas others were about the type of data that was displayed and how that could be improved. The different comments will be shortly discussed below.

First of all, it was mentioned that large numbers should be displayed in a clearer way, by using a thousand separator since this will improve the readability of the numbers. In addition to this, it was recommended that in the axis of the graphs, the larger numbers would be rounded towards the nearest thousand or million since this makes the different axis clearer.

Another comment regarding the clarity of the data was regarding the colours used in the graphs. In some of the graphs, the colours were not really contrasting, which resulted in difficulties with the readability of the charts.

It was also mentioned that some charts were not really useful, since a wide range of data was displayed in one graph. Especially for the Investment Level graph, this was the case since the logistical investments were given beside the total investments, which were almost 40 times larger. This resulted in a graph that was hard to read, so therefore some users suggested that it would be better to change this graph.

Lastly, some comments were given about additional information that could be given about some KPIs that were already in the dashboard. The graph that displayed the Flow of goods in Twente showed somewhat the same data as the pie chart, but in a different way. Therefore, it was chosen to elaborate a bit more on this topic, which resulted in a column chart with data about the origin and location of the goods transported in Twente. The pie chart was updated in such a way that it now displays the flow of goods grouped by the modality of transport, namely water, road and railway.

These comments have been implemented in the new dashboard. This dashboard is shown in Appendix H - Updated Dashboard.

## 8. Conclusion & recommendations

In this chapter, the research will be concluded (section 8.1) and recommendations for Port of Twente will be given (section 8.2). In addition to that, the research limitations will be discussed in section 8.3.

### 8.1. Conclusion

The main research question for this research was defined as *“What is the economic and social value of Port of Twente for the region of Twente?”*. In order to solve this question, the concepts economic value and social value had to be defined, which was done by means of a systematic literature review. The concept economic value was defined as follows: Economic value is the financial benefit to a person or company, that can be derived from a good or service. Social value can be evaluated by looking at four concepts, which are Local benefits, Social relationships, Environmental responsibility and Participation. Now, the specific values of Port of Twente will be discussed.

#### *Economic value*

The economic value of Port of Twente was determined by looking at the growth of Twente as a region. Different KPIs were selected and evaluated to get an insight into this growth, where some were more related to economic value than others. KPIs like logistical employees, flow of goods, gross regional product and investment level are all related to the economical state of a region.

Between the start of Port of Twente in 2012 and 2021, the number of logistical employees has increased with 2400 employees to a total of 33,770 people, which is an increase of 7.7%. During this time, Port of Twente has been busy attracting new logistic companies to Twente, while also profiling the logistics qualities of Twente outside of the region itself. Due to these efforts, new logistics companies came to Twente, who in their turn hired logistical employees. The total flow of goods in Twente has increased from 19,682,497 metric tons in 2012 to 27,767,643 metric tons in 2020, which is an increase of 41.4%. This increase can partially be attributed to Port of Twente since they lobbied for the improvement of the accessibility of Twente, both by road and water. With this better accessibility, goods can be transported to and from Twente much easier than they could before, which results in the increase of the flow of goods in the region. The investment level of the logistical sector has increased by 61.8%, from 76 million euros in 2012 to 123 million euros in 2020. Port of Twente has contributed to these investments since they have lobbied for better accessibility, which resulted in investments to improve the reachability of the region. In addition, Port of Twente started research- and development projects with the University of Twente, which are concerned with themes like sustainable logistics and data-driven logistics, which also resulted in investments in the logistical sector.

#### *Social value*

The social value of Port of Twente was evaluated by looking at their value for their members and for the region of Twente. This was done by looking at the different activities the departments of Port of Twente carry out and what they contribute to either their members or the region. The activities and their contributions can be placed in the four different concepts that were used to define social value and by doing this, a picture of the value can be obtained.

Local benefits are gains that are created in a specific geographic community. Since the start of Port of Twente, a couple of things have changed in Twente. For example, in Eefde there has been opened a second lock chamber, which enables more ships to use the Twentekanalen. Port of Twente had an

important role in this project since they were the ones who lobbied for an extra lock in Eefde. Another large project that is currently being executed is the widening of the Twentekanalen, which will enable larger ships to make use of them, which will help companies dependent on transport over water in their turn. These projects are all local benefits since they improved this region's situation. Port of Twente also established a large business park, the XL Businesspark in Almelo, which resulted in new companies in Twente with a lot of employment opportunities (642 employees in 2020 (Twente Index, 2020)). This can also be considered as a local benefit since the region provides from this business park and the established companies.

Social relationships are also improved thanks to Port of Twente. New and existing relationships have been developed through the activities of Port of Twente. At activities like the Logistics Café and the Huis van de Logistiek, members come in contact with each other, which results in new customer- or collaborative relationships. Companies that meet each other during those gatherings create new contacts, which can result in all types of new opportunities. Some companies help each other with problems related to personnel, whereas others can become business partners to make their supply chain more sustainable. Without Port of Twente, it would be a lot harder for companies to get in contact with other companies, especially with companies that are not directly related to them. Port of Twente also has an indirect contribution to the social relationships of personnel in Twente. The organisation has provided companies with a lot of information about acquiring new employees and with the Week van de Logistiek, Port of Twente has introduced a lot of potential personnel to logistic companies. Thanks to this, people have got a new job, which created new social contacts for them. These new social relationships for the personnel can be seen as an additional benefit of Port of Twente.

Port of Twente creates environmental responsibility by creating and stimulating shared ethical values during their activities. During meetings between members, Port of Twente provides information about a wide variety of topics. By providing this information, awareness is raised towards all kinds of problems. For example, when Port of Twente has a meeting with the state of the current labour market as its main topic, all attendees will get information about how the current market is developing and what can be done to improve the labour market. This will help create better work environments in the region, which will lead to more satisfied personnel. Another way of how Port of Twente creates environmental responsibility is by participating in research projects related to innovation and sustainability, focused on by the Logistic Association. By doing this, Port of Twente creates and gains knowledge on how the sector as a whole and companies alone can become more sustainable. With more sustainable companies in the region, Twente will be looked upon as a symbol of a durable region that can withstand the changes needed in the future.

The ability for members to participate in activities of Port of Twente also increases the social value of the organisation. In the survey that was sent out by the board of Port of Twente, members stated that they appreciate the different activities and network meetings that Port of Twente organises regularly. Getting in contact with other members and getting insight into their business is valued by the members. Providing training for personnel can also improve the social value of Port of Twente since this will encourage more people to participate in useful events. In addition to this, this would also indirectly improve the social relationships that these people will develop.

These four concepts show that socially, Port of Twente has improved the region of Twente with there activities and projects since their start in 2012.

## 8.2. Recommendations

Some recommendations for Port of Twente to improve their value for their members in the future will be discussed now. First of all, it is recommended that the data that is used should be updated on a regular basis to keep the dashboard relevant. As stated earlier, the data that is used to measure the KPIs over time should be updated once every six months to make sure that the data will not be too out of date, while also not waste time too often on checking whether the different sources already have updated their information. For the information that has been gathered throughout the survey and interviews, it is a bit harder to update every six months. Since it is important to keep this information as up-to-date as possible, it is recommended to create a survey that will be sent to each member once every year. Topics that could be relevant for the survey are *member satisfaction*, *desired services/projects* and *points of improvement* since these can change during a year, whereas topics like *reasons to join* or *experienced benefits* are probably almost the same every year. In addition to this, it is recommended that Port of Twente visits every member in the near future for a meeting. During the interviews that were conducted, it became known that not all members were aware of their membership or of the activities of Port of Twente. Therefore, it would be beneficial for Port of Twente to renew and improve its contact with all its members, in order to make sure that every member is aware of and engaged in the different activities of Port of Twente.

This also relates to another recommendation for Port of Twente. Some members were well-known with the different activities of the organisation, whereas others did not know anything about them. Therefore, it is recommended that Port of Twente improves its communication with its members, to make sure that everyone knows what the topics and themes are of relevant activities that are planned by Port of Twente.

Furthermore, it is recommended that Port of Twente tries to improve on the points that were stated by their members during the interviews and the survey, in order to make the members more satisfied. Some members think that the regional market could work together better in order to overcome problems every company in the sector faces, like the lack of good personnel and making sure the logistical sector becomes sustainable. Other points of improvement are discussed earlier in this report, namely in section 5.2.

Lastly, the dashboard can be expanded to show more relevant indicators regarding the region of Twente and the value of Port of Twente. One indicator that can be considered is the occupancy rate in warehouses in Twente, so insight will be given into what space is effectively used. There could also be provided an overview of the most popular destinations/countries of the transported goods towards and from Twente. For these indicators, data is needed that is not yet available, so additional research has to be done to gather this data. Therefore, these indicators can be considered for future research or for regions where this data is already available.

## 8.3. Research limitations

This section will give a reflection on the results, by stating the limitations of this research. First, it needs to be mentioned that the originally reserved time for this research was 10 weeks, but due to different reasons, the research could not be performed within this timeframe. Some parts, like planning and conducting the interviews with members, took longer than originally expected, which delayed other things in the process. This, in combination with the summer holidays, resulted in quite some delay in the finishing of this research.

One limitation is concerned with the KPIs that were used during this research and their contribution to the conclusion of this research. Some KPIs are useful for measuring the economic state of a region but cannot be assigned to one activity or one organisation on its own. Gross regional product is such a KPI, it does show how the region economically has changed over a period of time, but it does not show the contribution of the logistics sector to this total. In addition to this, it is hard to give activities of Port of Twente that are (partially) responsible for the growth of this KPI, since a lot of different aspects influence the growth of the gross regional product. This also applies to the social value of the organisation since this concept is hard to quantify. The concepts that were used to define the social value of Port of Twente were linked to activities and projects of the organisation, but this value cannot be expressed in terms of numbers.

Another limitation of this research is concerned with the data that has been found in open sources on the internet. For a couple of years, data was unavailable, which resulted in incomplete information. Other sources had conflicting data, which caused a problem related to the reliability of this data. These problems were solved by looking at the referred sources, which most of the time provided clarity. However, sometimes different open sources referred to other sources, but if those sources were checked on their data, the original data could not be found, so those open sources were not used in this research.

Furthermore, it would be beneficial for this research if more interviews were conducted with members of Port of Twente since this would result in more useful data. In addition to this, it cannot be proven that all the answers given during the interviews were fair answers since some members could have been giving answers that would make them look good. However, since the researcher is an independent person and does not work for Port of Twente, it can be assumed that the interviewed members gave fair answers to the questions since the researcher had no interest in either a positive or negative attitude towards Port of Twente. Nonetheless, more conducted interviews would mitigate the risk of unfair answers due to a larger group of respondents.

Related to this are the answers to the survey that was sent out by Port of Twente. These answers were used to measure the attitude of members of the organisation towards Port of Twente, just like the interviews were. As mentioned earlier, these surveys were voluntary, so it could be the case that only members that are engaged with Port of Twente filled out the surveys. Members that do not really know of or care about the activities of Port of Twente are not likely to fill out a survey about what Port of Twente does for them, so all the responses are probably skewed a bit towards a positive attitude. However, the answers are still useful since they are among other things used to gain knowledge of reasons why the members joined Port of Twente and for points of improvement, which is not really dependent on the attitude towards Port of Twente. Whenever a lot of members react to the survey of Port of Twente, the risk of positive skewed answers will reduce, so this problem can be solved with a larger number of respondents, just like the problem with the interviews.

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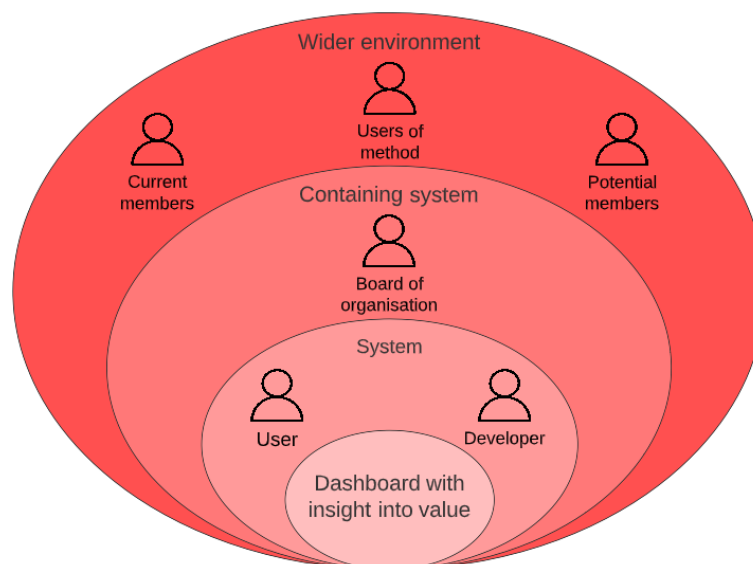
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## Appendices

### Appendix A - Stakeholder Analysis

In order to understand the stakeholders of this research, a stakeholder analysis was performed. A stakeholder is someone who experiences an advantage or disadvantage due to the outcome of a project (Alexander & Robertson, 2004). For this analysis, the different stakeholders are modelled by means of the onion diagram, which was designed by Alexander and Robertson. The onion diagram can be seen in Figure 10.



*Figure 10 The onion diagram of the stakeholders of this research*

In the smallest circle, the product of the research is depicted. For this research, this is a dashboard with insight into the value of Port of Twente. The second layer shows the system in which the product is placed and entails not only the product but also the stakeholders that directly interact with it. Both the developer and the users of the dashboard are included in this layer since they are the people who will interact with the dashboard. Some of the board members of Port of Twente will be using the dashboard to get insight into the value of the organisation, so those members are considered the users of the dashboard. In the third layer, the containing system is displayed, in which the 'functional beneficiaries' are shown. These are stakeholders that do not directly interact with the product themselves, but they do benefit from it (Alexander & Robertson, 2004). For this research, the rest of the members of the organisational board of Port of Twente are considered as functional beneficiaries, since they do not directly interact with the dashboard, but they will gain knowledge of the current situation during coming board meetings. Lastly, the wider environment is given, in which the stakeholders are represented that are outside of the organisation and do not gain direct benefits from the research product. These include the current members of Port of Twente, the potential members and users of the method of this research.

Now, the wishes and requirements of the stakeholders in layers two and three will be discussed, since those will be the most important due to the direct benefits that they will experience. These wishes and requirements will be taken into consideration while the dashboard is created.

First of all, each of the stakeholders wants a dashboard that shows the situation in Twente in a clear way, so an understandable overview is wished. This means that the dashboard should show a representative image of the situation in Twente and it should show the value of Port of Twente.

For the developer, the wishes and requirements are mostly related to the demonstration phase of the artefact, as defined in the DSRM method. The developer wishes that the coding that runs the dashboard is easy to understand and that it can be coded in a clear way. The dashboard should also be easy to update, so that it can be used in the future as well. This means that the dashboard should be made in a well-known software, which is used by the other stakeholders as well. The developer also wishes for an aesthetically pleasing dashboard, so the software should provide graphs that can be customised to different themes. Another requirement is that the dashboard should be created in a certain timeframe, so it cannot become too complex in terms of coding and data visualisation.

The wishes and requirements of the users can be related to two steps in the DSRM. First of all, the users wish to have a dashboard that show interesting and relevant data, that will project the current situation in a good way, while also providing information about the value of Port of Twente. This wish needs to be addressed in the design and development step of the DSRM. Related to the demonstration phase, the users wish to have a dashboard that can easily be explained to the board members that do not make use of the dashboard but want to know what was displayed. Therefore, the dashboard cannot become too complex since this will make it hard to explain it to the other board members of Port of Twente. Furthermore, the users want a dashboard that is easy to use, since a dashboard that is too hard to use is not functional. In addition to this, an explanation of how the dashboard can be used and what can be seen is wished, to clarify any problems that may occur. These wishes mean that the dashboard should be made in software that the users already have on their device, so that the dashboard is ready to use without having to install new programs. These wishes and requirement are related to both the development and the demonstration of the dashboard.

Lastly, the other board members wish for a clear insight into the value of Port of Twente. With this insight, they can see what they have achieved and where they can improve, to that they can improve the satisfaction of the members of Port of Twente. Therefore, they wish for a dashboard that can provide these points of improvement. Since some of the board members themselves will not use the dashboard, they require it to be easily explainable to them by the users of the dashboard. These wishes need to be taken into consideration during the development and demonstration phase, so that the requirements are met.

## Appendix B - Systematic Literature Review

Below, the systematic literature review protocol is given. First, the search terms are described and the used databases are given.

### *Search Terms*

Since this literature review is about defining the different types of value, the following search terms are being used: Definition, value, economic, social and logistics. The term logistics was chosen to make sure that the literature cover subjects that are related to the logistical industry, which is the industry in which Port of Twente operates the most. These terms are used in different search strings, which can be found in Table 8.

### *Databases*

The databases that are used to find the academic literature are Scopus and Web of Science since these databases have a lot of different literature that will be useful for this bachelor thesis.

### *Inclusion and exclusion criteria*

To filter the literature to a manageable number, inclusion and exclusion criteria are selected. The inclusion criteria need to be present in the given literature, whereas the exclusion criteria will make sure that unwanted articles are not given. The criteria are given in Table 7, with an explanation of why the criteria were chosen.

<b><i>Inclusion Criteria</i></b>	<b><i>Reason</i></b>
Keywords: Definition, value, economic, social and logistics.	At least one of the keywords needs to be included, in order to be relevant for this literature review.
<b><i>Exclusion Criteria</i></b>	<b><i>Reason</i></b>
Non-Dutch or non-English literature.	Not useful, since they cannot be read
Literature that is not available throughout the UT.	Literature that needs to be bought in order to check them is not useful, since it may not even be relevant after they are bought, which will be a waste of money.
Subject area: Any areas related to Healthcare, Medicines or Chemistry.	These topics are in no way related to this research, so they are not relevant.

*Table 7 Inclusion and exclusion criteria*

### *Search results*

The results of the search are shown in Table 8. First, the described search terms are used to find a broad range of different literature. Then, the inclusion and exclusion criteria are used to narrow this list down. Then, all the duplicates are removed from the literature list. After that, the list is narrowed by screening the relevance based on the title of the literature and finally, the list is completed by removing irrelevant sources after reading the full text. In Table 9, all the selected literature is given.

<b>Search Terms</b>	<b>Scope</b>	<b>Date</b>	<b>Date Range</b>	<b>Results</b>
Search protocol for Scopus				
"Definition of social value"	Article Title, Abstract, Keywords	25-4-2022	Until present	11
"Definition of economic value"	Article Title, Abstract, Keywords	25-4-2022	Until present	1
"Definition" AND "Social" AND "Value" AND "Logistic*"	Article Title, Abstract, Keywords	25-4-2022	Until present	109
"Definition" AND "Economic" AND "Value" AND "Logistic*"	Article Title, Abstract, Keywords	25-4-2022	Until present	83
Search protocol for Web of Science				
"Definition of social value"	Title, Keywords, Abstract	25-4-2022	Until present	3
"Definition of economic value"	Title, Keywords, Abstract	25-4-2022	Until present	1
"Definition" AND "Social" AND "Value" AND "Logistic*"	Title, Keywords, Abstract	25-4-2022	Until present	44
"Definition" AND "Economic" AND "Value" AND "Logistic*"	Title, Keywords, Abstract	25-4-2022	Until present	39
<b>Total in Endnote</b>				<b>292</b>
Removed from selection based on inclusion/exclusion criteria				- 88
Removing duplicates				- 67
Removed after scanning titles				- 107
Removed after reading full text				- 24
<b>Total</b>				<b>6</b>

Table 8 Overview of the search protocol

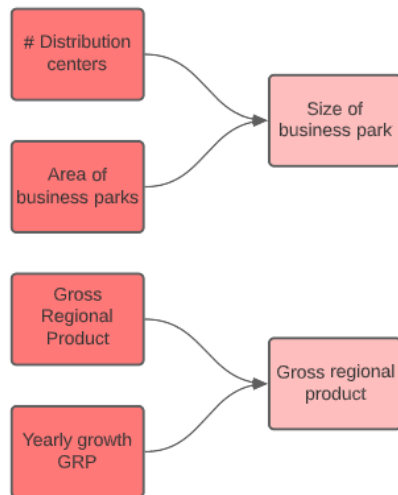
<b>Nr.</b>	<b>Title</b>	<b>Author (year)</b>	<b>Relevance</b>
1	Defining social value in the UK construction industry	Cartigny, T. Lord, W. (2017)	Definition of social value in the construction sector
2	Design for social value: Using design to improve the impact of CSR	Choi, Y., et al (2018)	Definition of social value from design perspective
3	Project managing the social value of built assets: A call for a focus on value manifestation	Cidik, M. S. (2020)	Definition of social value in the construction sector
4	Social and Economic Value in Emerging Decentralized Energy Business Models: A Critical Review	Adams, S., et al. (2021)	Definition of social value and economic value in energy sector
5	Social Value and Economic Value in Social Enterprises: Value Creation Model of Spanish Sheltered Workshops	Bellostas, A.J. López-Arceiz, F.J. Mateos, L. (2015)	Analysis of relationship between social impact and economic returns of social enterprises
6	The social return on investment in community befriending	Arvidson, M. Battye, F. Salisbury, D. (2014)	Illustrates the meaning of 'social value' and 'value for money'

*Table 9 Selected literature for SLR*

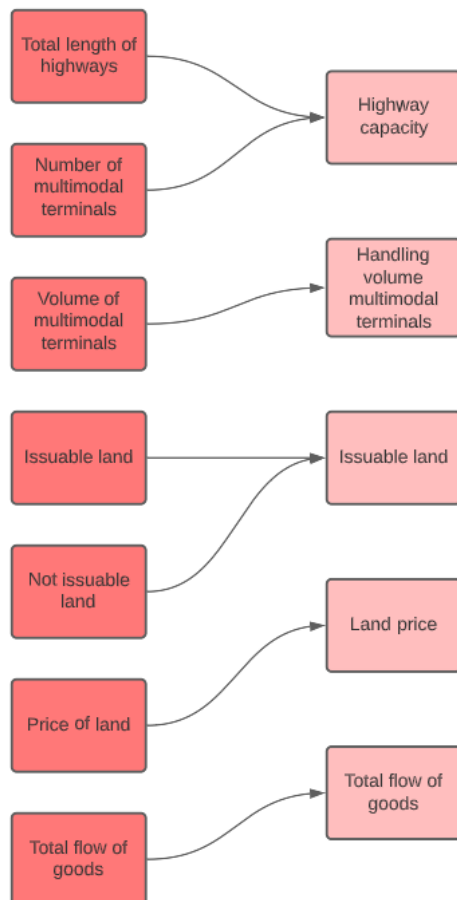
## Appendix C - KPI merging

The merging of the KPIs per theme, as described by Buck Consultants International (2019).

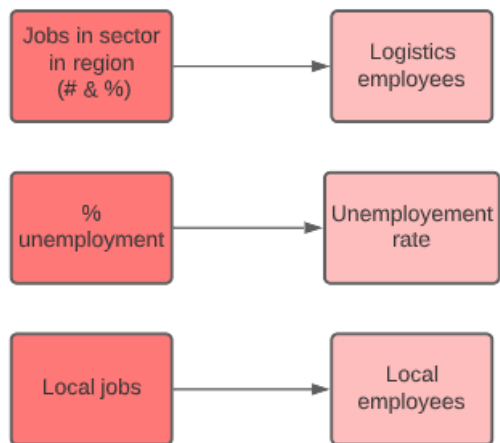
### Market and business development



### Physical distribution



### Labour market



### Innovation and sustainability



## Appendix D - Interview

### Introductie geïnterviewde

- Kunt u mij iets zeggen over uw functie en het bedrijf waar u voor werkt?
- (Hoelang zit uw bedrijf al in Twente? Wat was de reden voor een vestiging hier?)

### Lidmaatschap Port of Twente

- Hoelang is uw bedrijf al lid van Port of Twente?
- Wat was de reden dat uw bedrijf/organisatie lid werd bij Port of Twente?
  - o Zou u, met de kennis die u nu hebt, weer lid worden? Waarom wel/niet?
  - o Doorvragen op antwoord

### Impact Port of Twente

- Wat zijn zaken die Port of Twente voor u heeft geregeld/ voor elkaar gekregen?
  - o Doorvragen op antwoord
- Kunt u zeggen dat Port of Twente uw bedrijf heeft geholpen in het laten groeien van uw bedrijf, door bijvoorbeeld informatie te geven over innovatie, het helpen werven van nieuw personeel (/stage studenten) of het vergroten en verbeteren van uw klantennetwerk?
  - o Doorvragen op antwoord
- Heeft Port of Twente een rol gespeeld in de keuze om het bedrijf te vestigen op XL Businesspark? Zo ja, wat was deze rol dan? (Alleen bedrijven op XL Businesspark)

### Huis van de Logistiek

- Heeft uw bedrijf weleens deelgenomen aan het Huis van de Logistiek? Waarom wel/niet?
  - o Doorvragen op antwoord
- Zoals u wellicht weet, houdt Port of Twente zich ook bezig met het werven van nieuw personeel voor de logistieke sector (Huis van de Logistiek, Week van de Logistiek etc.). Heeft u hier zelf ook voordelen van ondervonden, door bijvoorbeeld nieuw personeel of studenten aan te trekken via Port of Twente?
  - o Doorvragen op antwoord

### Tevredenheid Port of Twente

- Op een schaal van 1 tot 10, hoe tevreden bent u met uw lidmaatschap bij Port of Twente?
- Zou u het andere (vergelijkbare) bedrijven in Twente ook aanraden om lid te worden?

### Mogelijke veranderingen Port of Twente

- Zijn er zaken waarin Port of Twente zich volgens jullie ook in zou kunnen verdiepen?
- Zijn er dingen die u graag ziet veranderen in de werkwijze van Port of Twente?

## Appendix E - Survey of Port of Twente

### Survey

Welke belangenbehartiging is waardevol?

- ☐ Infrastructuur lobby
- ☐ Chauffeurstekort
- ☐ Opleidingsvouchers
- ☐ Ruimtegebrek / gebiedsontwikkeling
- ☐ Promotie logistiek als sector

Iets anders, namelijk:

Welke events en netwerkbijeenkomst zijn relevant?

- ☐ Logistics Cafés
- ☐ Bedrijfsbezoeken
- ☐ Week van de Logistiek
- ☐ Banenmarkten
- ☐ Algemene ledenbijeenkomsten

Een andere bijeenkomst, namelijk:

Welke platformen zijn waardevol?

- ☐ Portoftwente.com - nieuws, events, projecten
- ☐ Indelogistiek.nl - vacatures, stages, bedrijfsprofielen
- ☐ Rondje Twente - promotie Twente, bedrijven en leren/werken in logistiek
- ☐ Future Logistics Community - innovatieprojecten, onderzoek

Een ander platform, namelijk:

Welke vorm van promotie is waardevol?

- ☐ Twente als Logistieke Hotspot
- ☐ Logistiek als Topsector
- ☐ Gezamenlijk beursbezoek
- ☐ Acquisitie nieuwe bedrijven
- ☐ Spotlight interviews met leden
- ☐ Nieuws delen vanuit leden

Een andere vorm van promotie, namelijk:

Welke samenwerkingsvorm is interessant?

- ☐ Ondernemers in Logistiek Twente
- ☐ Onderwijs - MBO, HBO, WO
- ☐ Private opleiders
- ☐ Onderzoeksinstellingen
- ☐ Lokale overheden en gemeentes in Twente
- ☐ Provincie Overijssel
- ☐ EURegio
- ☐ Branche organisaties

Andere samenwerking, namelijk:

## Open vragen

Waarom ben je lid van Port of Twente?

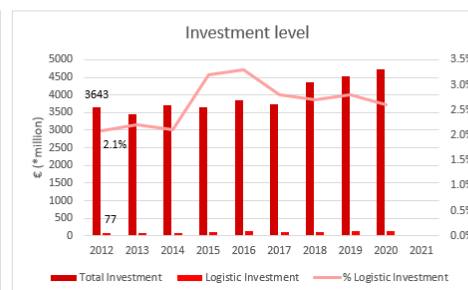
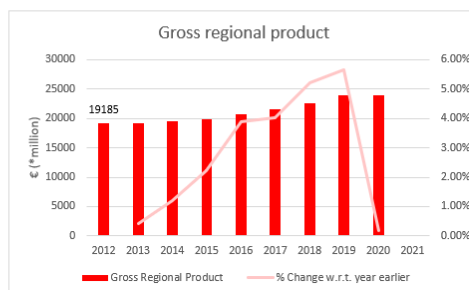
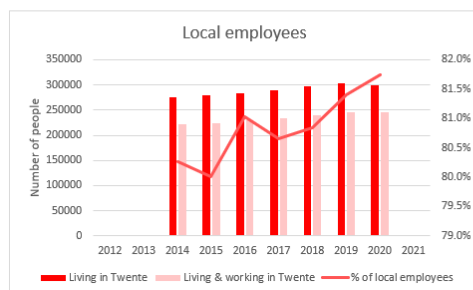
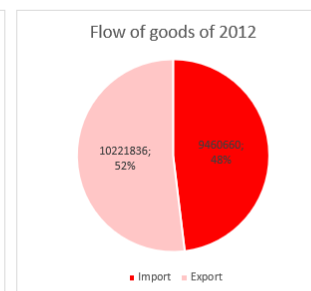
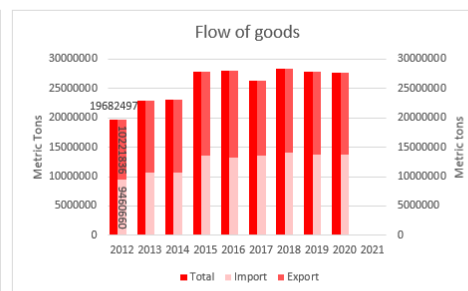
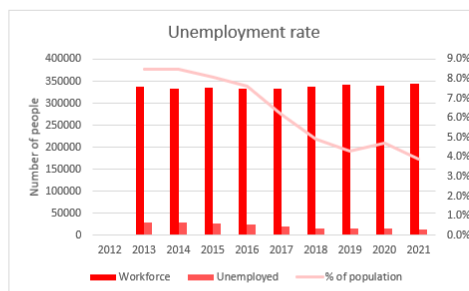
Wat is de meerwaarde van het Port of Twente netwerk?

Welke kansen/mogelijkheden zie je richting de toekomst?

## Appendix F - Dashboard

# Dashboard Port of Twente

Show data by year **2012**



### Member satisfaction

7.5

#### Reason to join Port of Twente

- Increase strength of logistical cluster
- Network for contacts with potential customers
- Network for relationship with companies in sector
- Work together to act as a collective

## Appendix G - Questionnaire for evaluation

<b>Appearance</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
The dashboard gives an attractive and pleasing impression					
The dashboard has a uniform theme and provides a clear overview					
The dashboard contains the right amount of graphs					
The dashboard is innovative and creative					

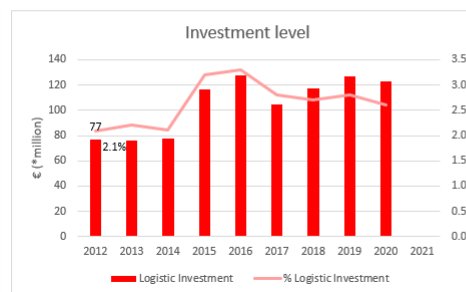
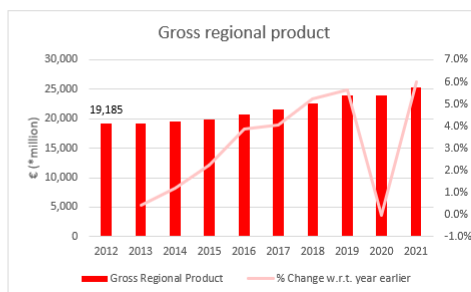
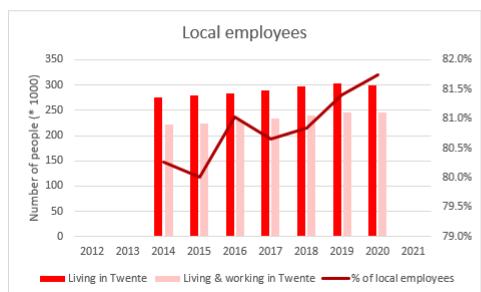
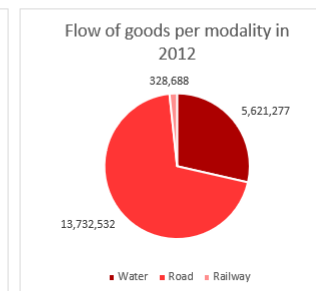
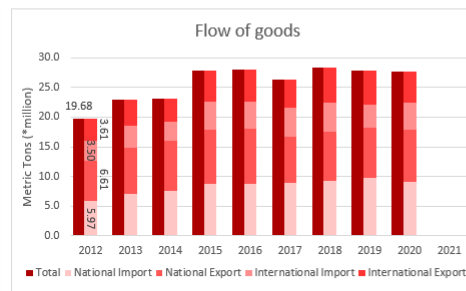
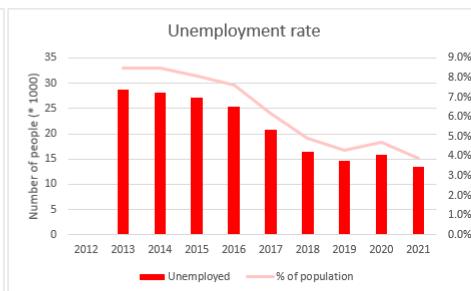
<b>Functionality</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
The dashboard shows meaningful and correct data, which gives useful insight in the situation in Twente					
The dashboard effectively shows different patterns and changes over time					
The dashboard allows me to get a clear view of the KPIs in a quick way (compared to static numbers/report)					
The different type of graphs in the dashboard are well chosen and each graph has a good contribution					
The graphs come with clear information in the title and axis					

<b>Usability</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
The dashboard is clear and easy to understand and use					
The interaction with the dashboard is efficient and reacts fast to user input					
The behaviour of the dashboard is predictable (i.e., predictable what will happen if input is given)					
I have the resources that are necessary to use the dashboard (software etc.)					
I have the knowledge that is necessary to use the dashboard					

### Comments

# Dashboard Port of Twente

Show data by year **2012**



## Member satisfaction

7.5

### Reason to join Port of Twente

- Increase strength of logistical cluster
- Network for contacts with potential customers
- Network for relationship with companies in sector
- Work together to act as a collective