# Reducing the socio-economic gap between the northern and southern parts of Rotterdam

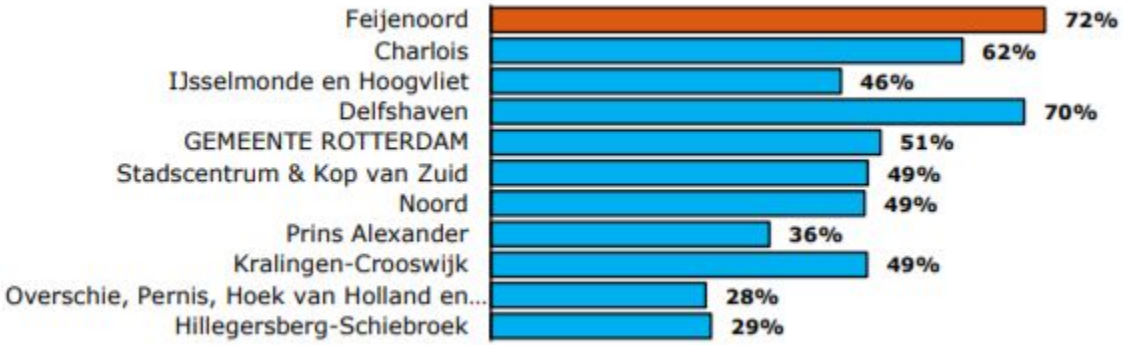
**Group 12**

TU Delft

Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

During the seventies, Rotterdam was in need of guest workers to fulfil the vacancies of blue collar jobs. These guest workers came to Rotterdam and were placed in neighbourhoods where the former workers lived. These neighbourhoods, typically located in the southern part of Rotterdam, were in need of renovation, but the intention was that the guest workers would only stay for a couple of years, and then would move back to their home country. This resulted in separate neighbourhoods where the guest workers stayed, and there was no intention for any form of integration.

This formed the basis for the difference between the northern and southern part of Rotterdam which we will look into.




**Percentage immigrants in the population, average 2010-2012, for each neighbourhood**

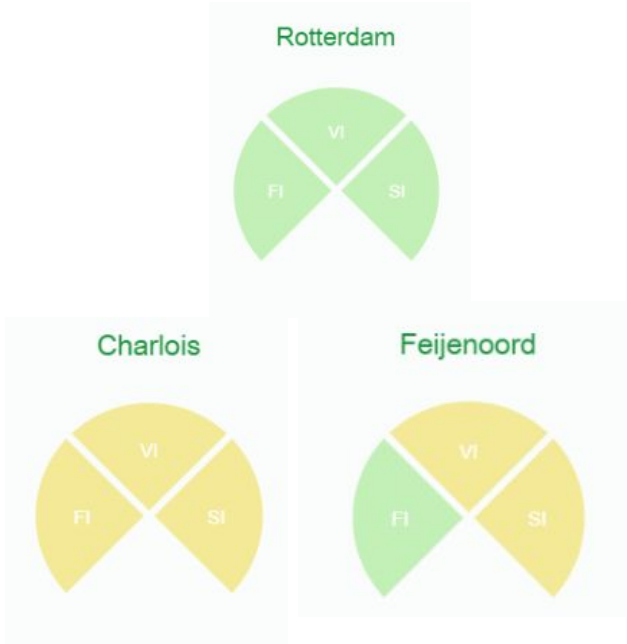
Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# Problem Definition - Social Cohesion

Since social integration between the immigrants and the original citizens of Rotterdam seemed unnecessary because the immigrants would leave at some point, social cohesion between the different parts of the city dropped significantly.

These differences between neighbourhoods affect people on all levels. The neighbourhoods of Charlois and Feijenoord score below average in a social context.

The social aspect is defined by, among other things, relationships between neighbours, and participation in activities and associations.



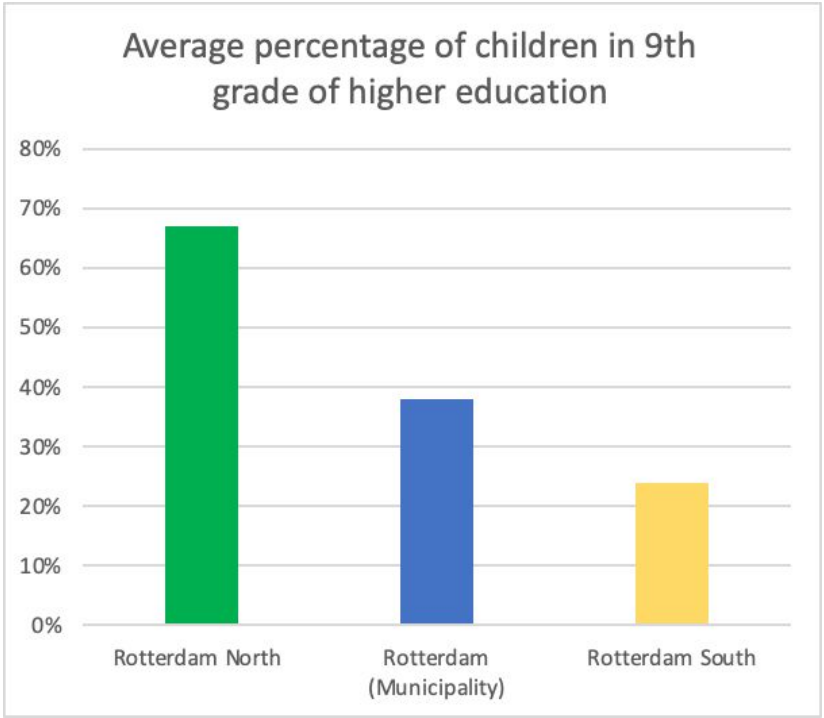

**Charlois and Feijenoord compared to the average of Rotterdam. The right quarter indicates the social aspect**
**[**https://wijkprofiel.rotterdam.nl/nl/2016/rotterdam**]**

Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# Problem Definition - Education

When the guest workers' families joined them in the Netherlands, educating their children was hard because of a language barrier differing perspectives on education. Therefore, education levels in Rotterdam vary widely.

For example, there exists a significant difference in the percentage of children in the 9th grade of higher education between the north and south of Rotterdam.



Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# Problem Definition - Economic Participation

Approximately 68% of the residents of the southern parts of Rotterdam have a low income (Nationale Programma Rotterdam Zuid, 2019).

A clear correlation can be seen with the education levels in these two parts of the city, as residents of Rotterdam South have a lower average level of education than those in the north.

Beside these aspects, only 60% of the labour force of Rotterdam south is employed (Nationale Programma Rotterdam Zuid, 2019), less than the citywide average of 64%.

Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# Existing Solutions

The city has a number of ongoing projects that aim to achieve a more balanced community.

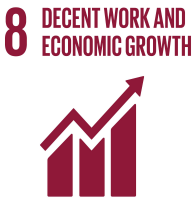
In 2011 the *Nationale Programma Rotterdam Zuid* was introduced which mainly focuses on education levels, labor participation and standards of living. However, current solutions mainly focus on improving the position of Rotterdam-South without involving Rotterdam-North.

The *NPRZ* also stresses that entrepreneurs have a big role to play in order to improve the socio-economic position of Rotterdam-South.

Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# Mission Statement

Providing Rotterdam south with opportunities to develop itself with the help of citizens from the north of the city in order to reduce the socio-economic inequalities between the northern and southern parts of the city.



Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# Sustainable Development Goals

The Mission Statement on the previous slide, is based on four sustainable development goals which are presented underneath the Mission Statement itself. These goals are:

- No poverty
- Decent work and economic growth
- Reduced inequalities
- Partnerships for the goals

These are the main objectives that the problem owner wants to focus on for this specific case. These four sustainable development goals together, cover the complete mission statement of the problem.

Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# Design Goal

To design a system that improves the socio-economic integration within the city of Rotterdam on a long-term basis. The goal is to design a system that reduces the threshold to economic participation by providing educational opportunities for potential employees. Secondarily we also want to provide users the chance to start out their potential careers as entrepreneurs. Thereby giving them the opportunity to further develop themselves.

Designing this system and providing these opportunities is a matter of participation by multiple user groups. Therefore we strive to bring in large Rotterdam based companies and institutions. For example a collaboration with *Rotterdam. Make it Happen.* (https://rotterdammakeithappen.nl/) could prove fruitful, as large companies and institutions are already affiliated with this project.

# Problem Owner Analysis

Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# Problem Owner Needs

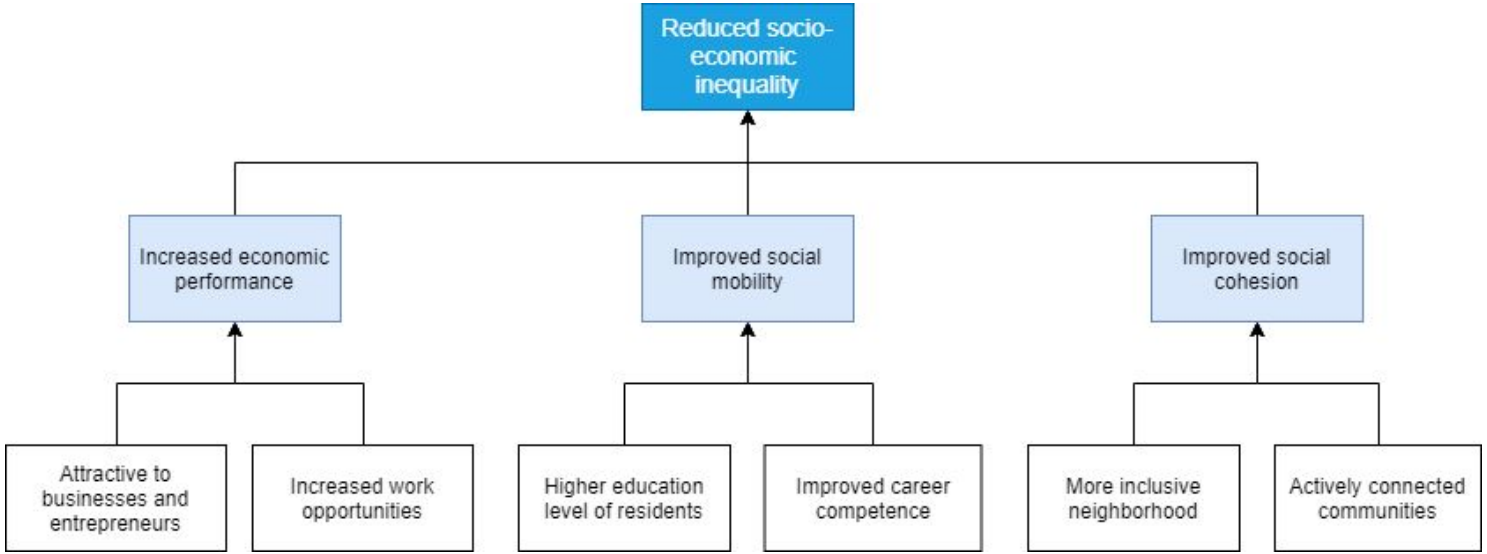
The problem owner is the municipality of Rotterdam. The municipality wants to lower social and economic inequalities between the north and the south of its city. Their idea is to design a systematic solution to improve economic performance, promote social mobility and improve the social cohesion of southern Rotterdam.

- Economic performance can be improved in two ways; by providing new job opportunities, and through attracting (existing) businesses and entrepreneurs.
- Social mobility can be improved by increasing the education level of residents, making them more broadly employable, and by providing training and other measures to enhance their skills in finding suitable career opportunities.
- Social cohesion can be strengthened by increasing inclusiveness of residential areas, and actively connecting otherwise disconnected communities.

Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# Problem Owner Needs-Objective Tree

*"Objective Analysis Tree is is a project planning tool that helps to analyze and graphically break down objectives into smaller and more manageable parts."*

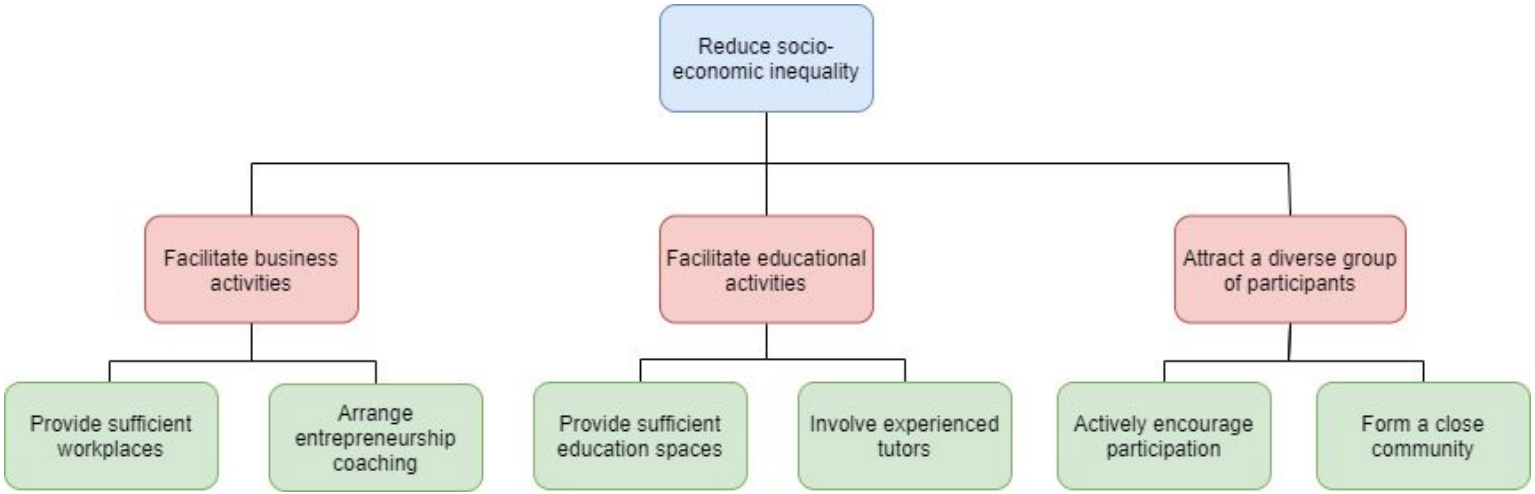



*Objective Tree*

Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# Problem Owner Requirements

In order to achieve the objectives, the system is supposed to facilitate the business and educational activities and attract a diverse group of participants. Ideally, the system could serve as a multi-functional facility including business campus, training center and communal space to improve socio-economic performance of South Rotterdam in cooperation with the North Rotterdam




*Preliminary Requirements Breakdown Structure*

Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# Preliminary validation criteria

In order to validate the success of the proposed system, the system needs to be evaluated on several validation criteria. These criteria are linked to the sub-goals of the problem owner. The primary goal of the problem owner is to reduce socio-economic inequalities in Rotterdam. This goal can be translated into the following validation criteria:

| | | |
|---|---|---|
| 01 | Revenue of companies while operating | • Linking to sub-goal: “business activities”<br>• Complementary indicators: number/market value of companies |
| 02 | Training Students employment rate | • Linking to sub-goal: “educational activities”<br>• Complementary indicators: training hours, number/evaluation scores of students |
| 03 | Number of residents involved in Rotterdam | • Linking to sub-goal: “participation”<br>• Complementary indicators: ratio of north and south residents, satisfactory rate |

Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# Problem Owner Constraints

## Schedule

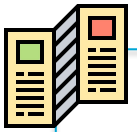
- 2-year preparation phase (from origination, design, construction, promotion, negotiation to real operation)
- Maximum 5-year subsidized phase, later achieve self-sufficiency with at least 20-year lifespan.

## Budget

- Initial investment within €10 million
- Operation costs during subsidized phase within € 2 million.

## Location

- Specific neighborhoods of Charlois or Feijenoord in South Rotterdam, two areas with lowest scores in term of social and physical issues and safety [1]



## Compliance

- Complying with the *Bouwbesluit 2012* [2], labour law and other related laws, regulations and policies of Rotterdam and Netherlands.
- Under the framework of *National Program Rotterdam South (NPRZ)*[3]

Reference: [1] https://wijkprofiel.rotterdam.nl/nl/2016/rotterdam [2] https://business.gov.nl/regulation/building-regulations/ [3] https://www.nprz.nl/over-nprz/nprz/over-ons

# Stakeholder Analysis

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Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# Stakeholders

There are different stakeholders that have an influence on the system. These will be elaborated on in this section.

- Municipality of Rotterdam

  The municipality of Rotterdam is the first and most important stakeholder in the issue since they are the problem owner. The municipality wants to improve the the economic and social environment in south part of the city.
- Major employers (e.g. Port of Rotterdam)

  Major employers like the port of Rotterdam have a lot of job vacancies which are currently open, or filled by overqualified personnel. The port is one of the biggest economic assets of the Netherlands and has a lot to offer in terms of jobs for skilled workers.
- Entrepreneurs

  The entrepreneurs will help create and manage the system to be developed. They will have the opportunity recruit potential colleagues and educate them in specific skills. In some way, the entrepreneurs help determine the objective of the system because they are driven by their interest in employees within their sector.

Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

- Citizens of north Rotterdam

  The citizens of north Rotterdam are presented as the wealthier and economically independent. They are able to help citizens from the south of Rotterdam by teaching them how to be economically independent, help them expand their social network, and maybe even create job opportunities.

- Citizens of south Rotterdam

  The citizens of south Rotterdam are the people on which this system to be is focused. The system should empower these people and create opportunities for job and education which will raise the economic and social standard in the south of Rotterdam.

- Educational institutes

  Educational institutes might be interested in helping create a learning environment for people who are eager to be educated and willing to work for it. The institutes can also provide basic support on teaching methods and possibly even teachers.

- Ministry of economic affairs

  The ministry has an interest in improving the economic and social environment in the Netherlands. They are able to support the municipality by providing subsidies and helping the municipality with rules and regulations.

Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# Stakeholder Requirements & Constraints

| Stakeholder | Requirement / Constraint | | | |
|---|---|---|---|---|
| | **Business** | **Project** | **External** | **Design** |
| *Municipality of Rotterdam* | The effect of the system has to be measurable | Location of the system is in south Rotterdam | All initiating stakeholders have to be on board in order to start | |
| *Major employers* | System should guarantee vacancies filled with competent employee | The system must educate people to do specific jobs | | It needs to provide enough room for training in practice |
| *Entrepreneurs* | There must be some kind of profit (e.g. possible employees, new ideas, …) | There must be freedom to select certain professional courses | | The system needs to provide space for both work and training |

Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# Stakeholder Requirements & Constraints

| Stakeholder | Requirement / Constraint | | | |
|---|---|---|---|---|
| | **Business** | **Project** | **External** | **Design** |
| *Citizens of north Rotterdam* | | Should be practical and rewarding | | Should provide space to work on their own endeavours |
| *Citizens of south Rotterdam* | The system should increase welfare | | | |
| *Ministry of economic affairs* | | Needs the effects to be measurable. | | |

Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# Stakeholder Management

Depending on the influence each (group of) stakeholder(s) has on the project, a different management approach should be used to interact with them. The stakeholders are mapped into one of four categories:

- Low power, low interest parties should be monitored
- Low power, high interest parties should be kept informed
- High power, low interest parties should be kept satisfied
- High power, high interest parties should be managed

The following slide contains a mapping of stakeholders onto these for categories.

Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

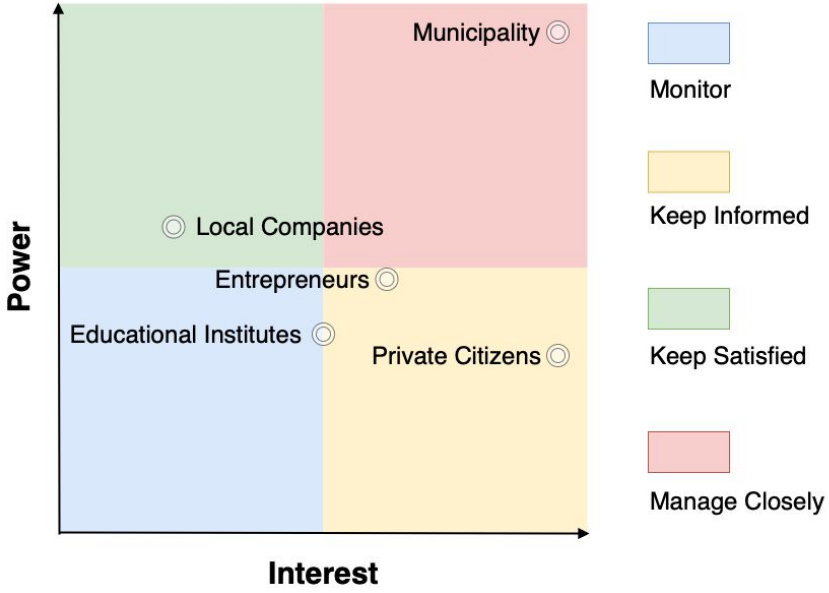
# Power/Interest Grid

The municipality is, both in power and in interest, the primary stakeholder in the project and therefore should be managed closely.

While local companies (small and large) can in some ways exert a significant influence over the project, we assume that they will retain a more reserved role.

Educational institutes and local entrepreneurs might see more initial opportunities, while having less influence on the overall project.

Lastly, private citizens (especially those who may benefit from the facility's functions) are likely to be highly interested in the project and its potential, but hold the least individual power.



Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# System Scope

The following section establishes the scope of the system. The following aspects are analyzed:

- What functions are considered to be in- and outside the scope
- Interfaces with external systems
- Strengths and weaknesses inherent in the system
- Threats and opportunities associated with the system

Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# Scope Definition

The focus of the system will be on the following interrelated aspects:

- Providing businesses and educational facilities.
- Being a ‘connection hub’ for local businesses and entrepreneurs looking for employees or associates.
- Attracting participants from among different social groups.

The following aspects are considered to be tasks of the external stakeholders, or otherwise outside the scope of the system:

- Performing educational activities.
- Actively creating jobs or labour tasks.
- Establishing a brand presence.

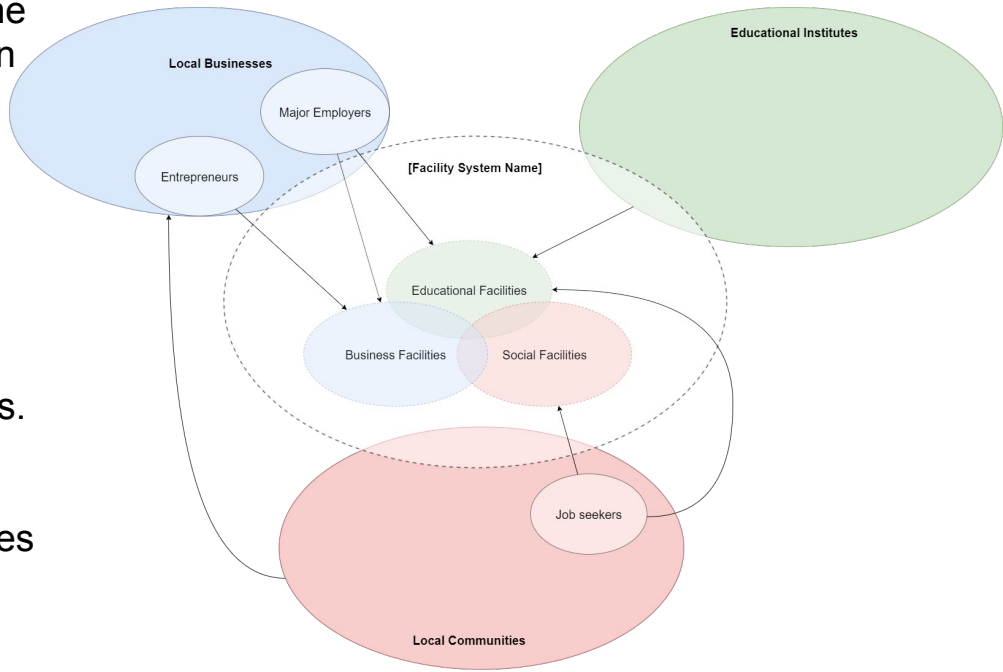
Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# Context Diagram

The context diagram displays the interfaces and relations between the internal (sub)system(s) and the external systems on which the design depends.

The three major parties that interface with the facility are the local businesses, educational institutes, and local communities.

These parties significantly influence their respective facilities within the system, where these subsystems interface with one another on a lower level.



Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# SWOT Analysis

Each project must deal with inherent strengths and weaknesses in the design that result from internal factors such as available knowledge, budget, the set of requirements and so forth.

Similarly, external factors can influence the outlook significantly and an effort should be made to identify the greatest opportunities and threats to a project.

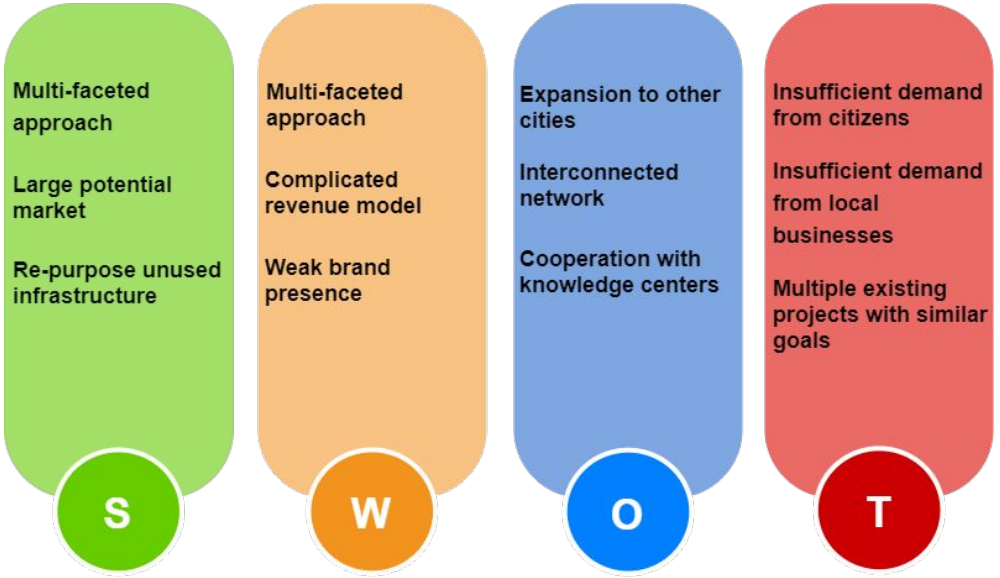
The primary strengths, weaknesses, opportunities and threats have been outlined on the next slide.

Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# SWOT Analysis

We consider the multi-faceted approach of the system to be both its greatest strength and weakness. While this boasts a lot of potential, there is an obvious risk of becoming a jack of all trades, master of none.

Aiming at a variety of user groups provides a large potential market, but also complicates the revenue model and estimation.



# System Requirements

Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# System Requirements

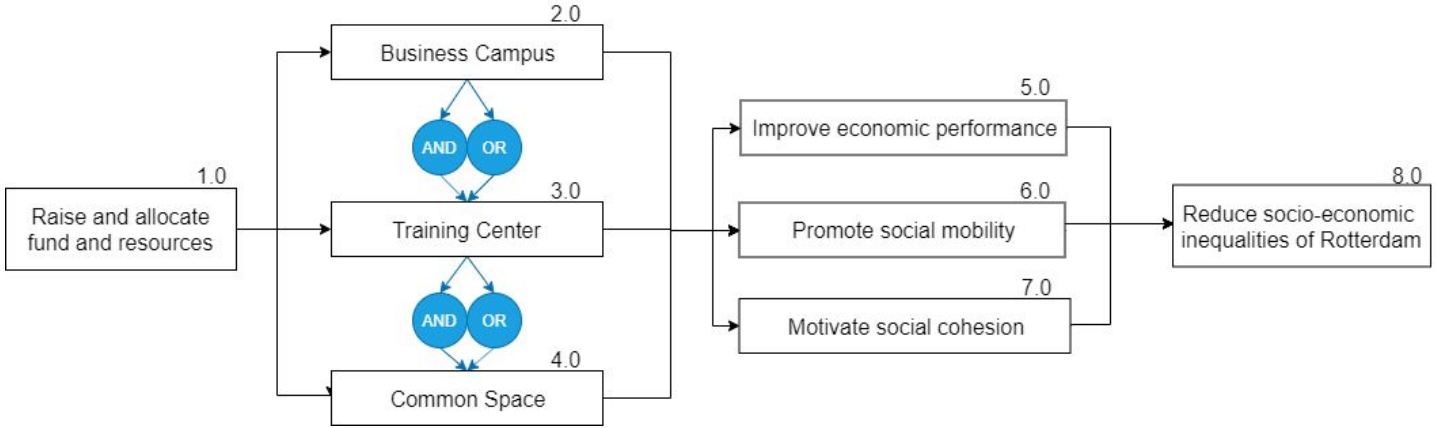
In the following section a closer analysis of the system to-be-designed is performed:

- The system's requirements are expanded.
- The validation criteria are expanded.
- A rationale for the requirements is given.
- Technical performance measures are defined.

Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# Functional Flow Block Diagram

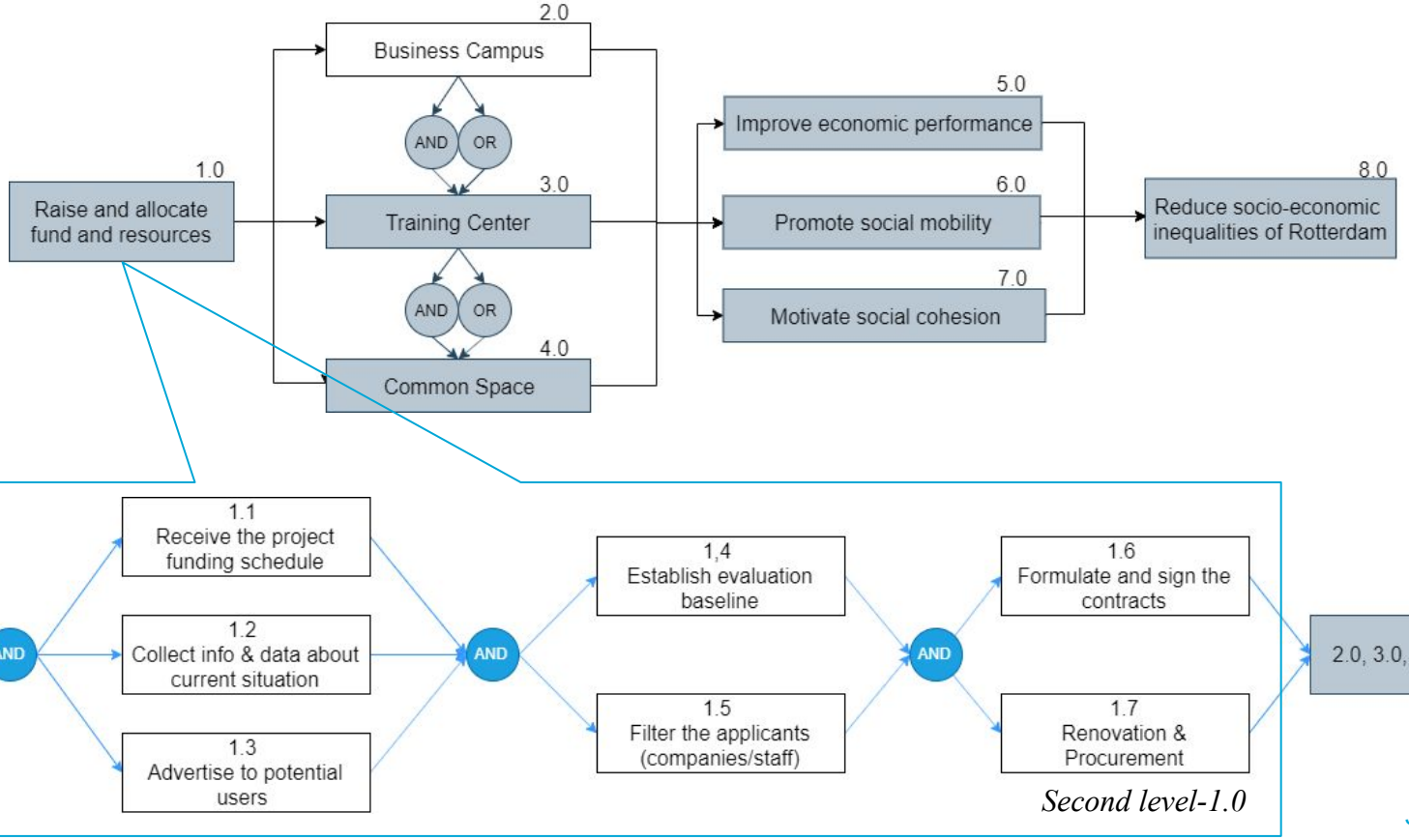
First of all, enough and stable funding is guaranteed and all the required resources (labor, contracts, compliance documents, etc) are ready for further implementation. The system shall facilitate business and educational activities, as well as attract diverse groups of participants. This suggests a need for three distinct subsystems: a business campus, training center and communal spaces. In the end, the system will play a vital role in reducing socio-economic inequalities of Rotterdam.




*First level*

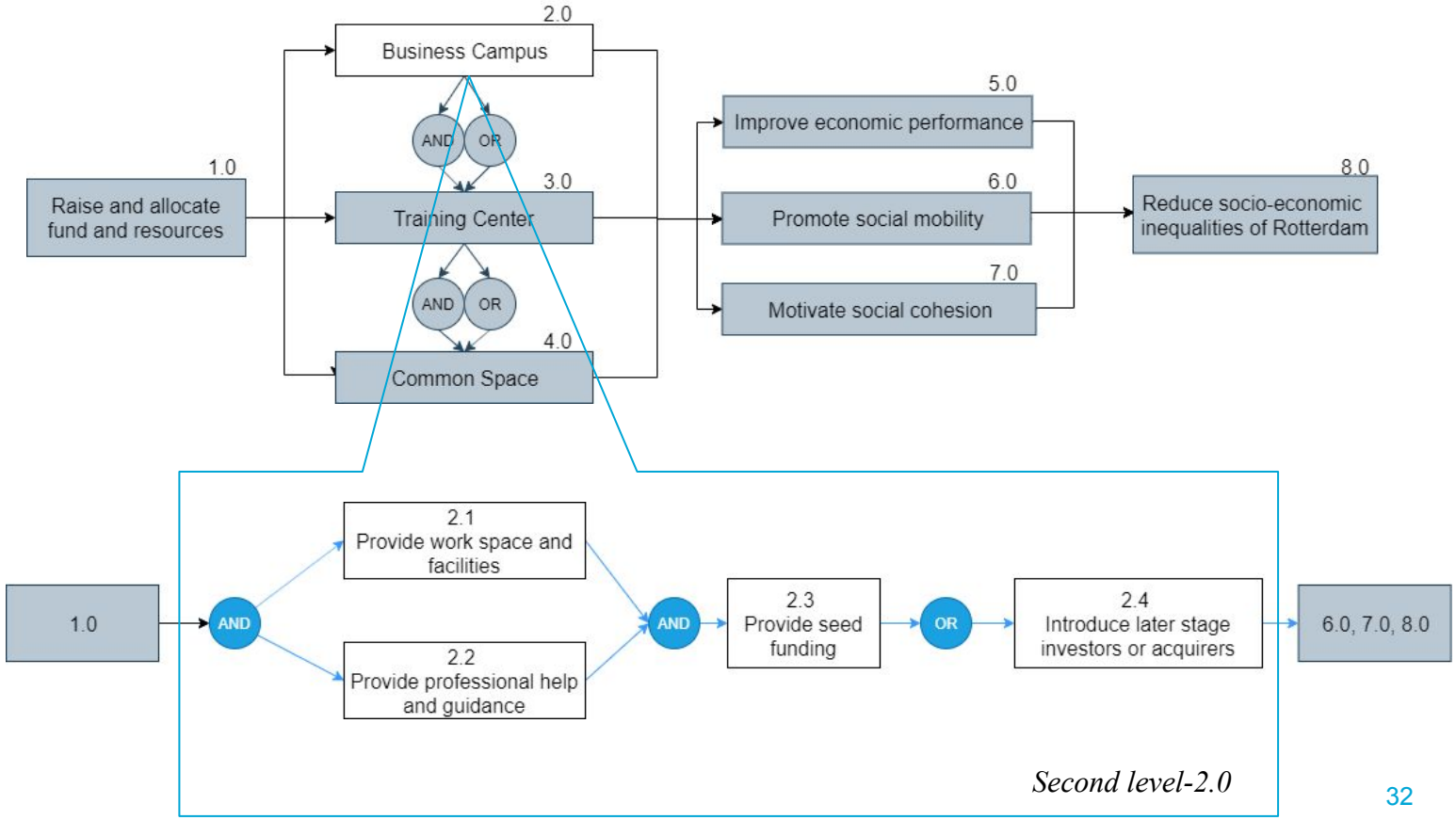
Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# FFBD - Raise and allocate fund & resources



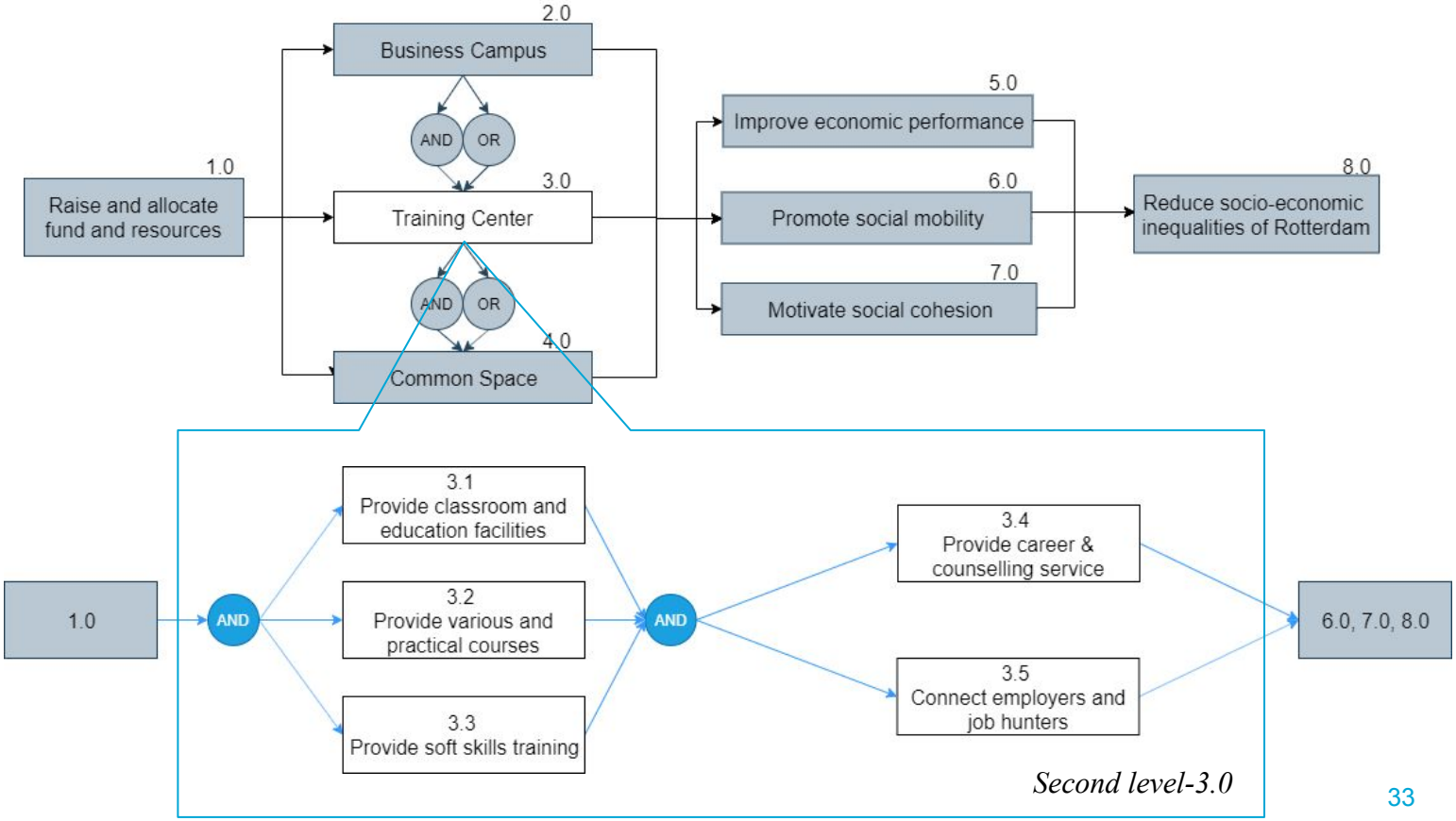
Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# FFBD - Business Campus



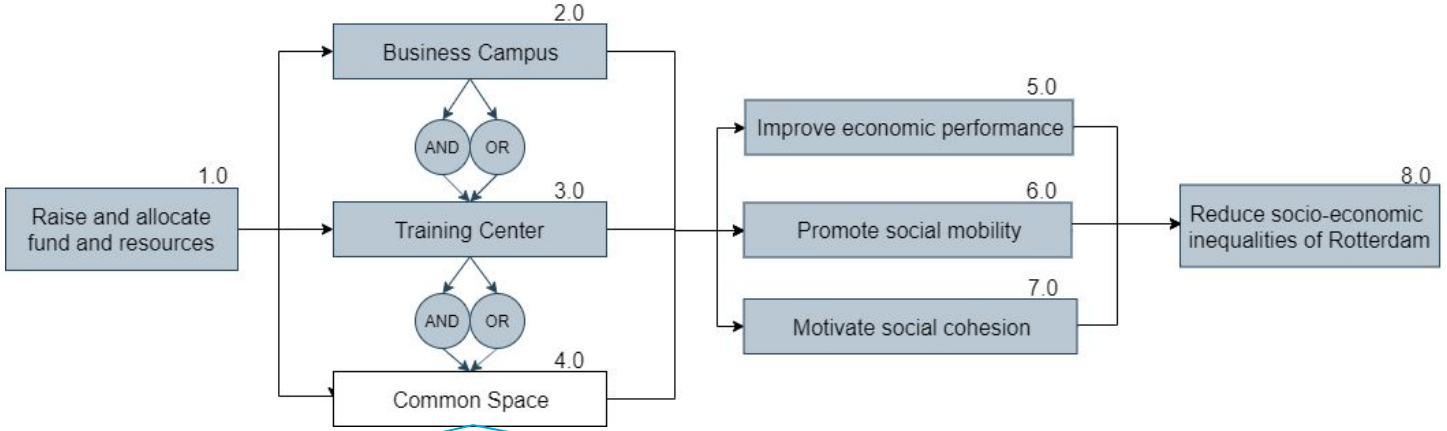
Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

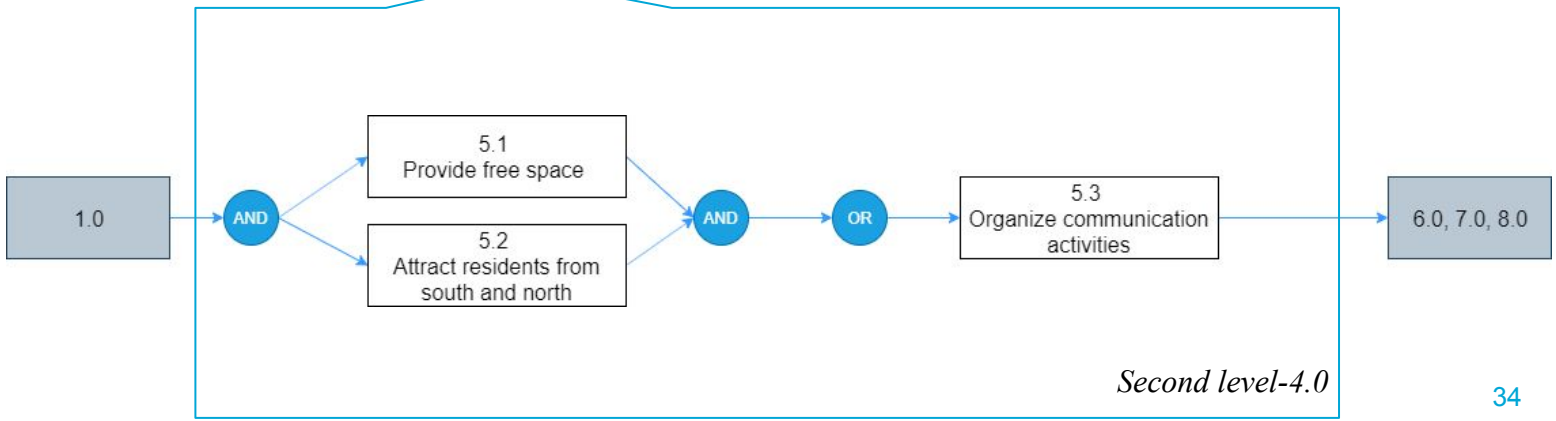
# FFBD - Training Center



Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

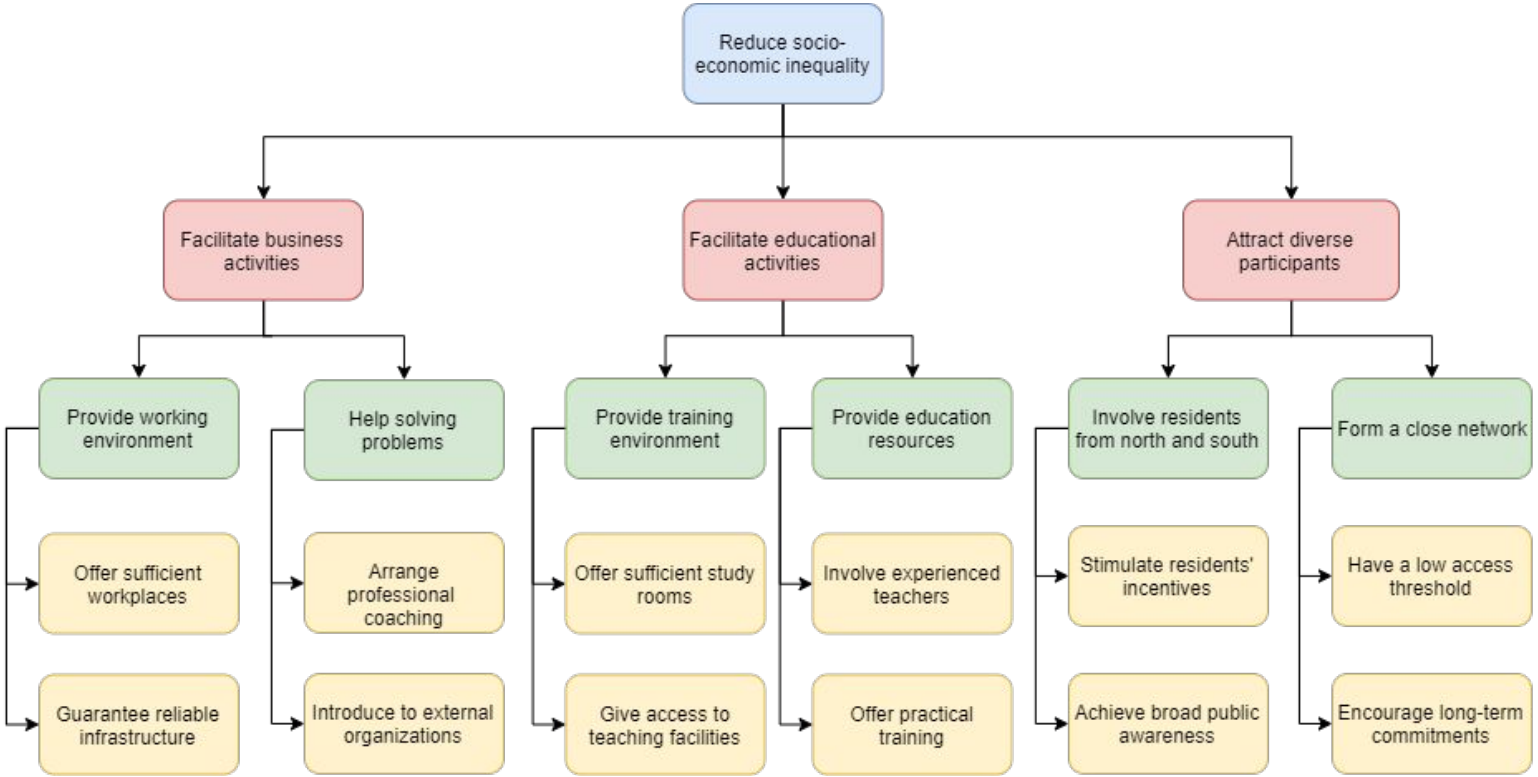
# FFBD - Communal Space



Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# System Requirement Breakdown Structure



Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

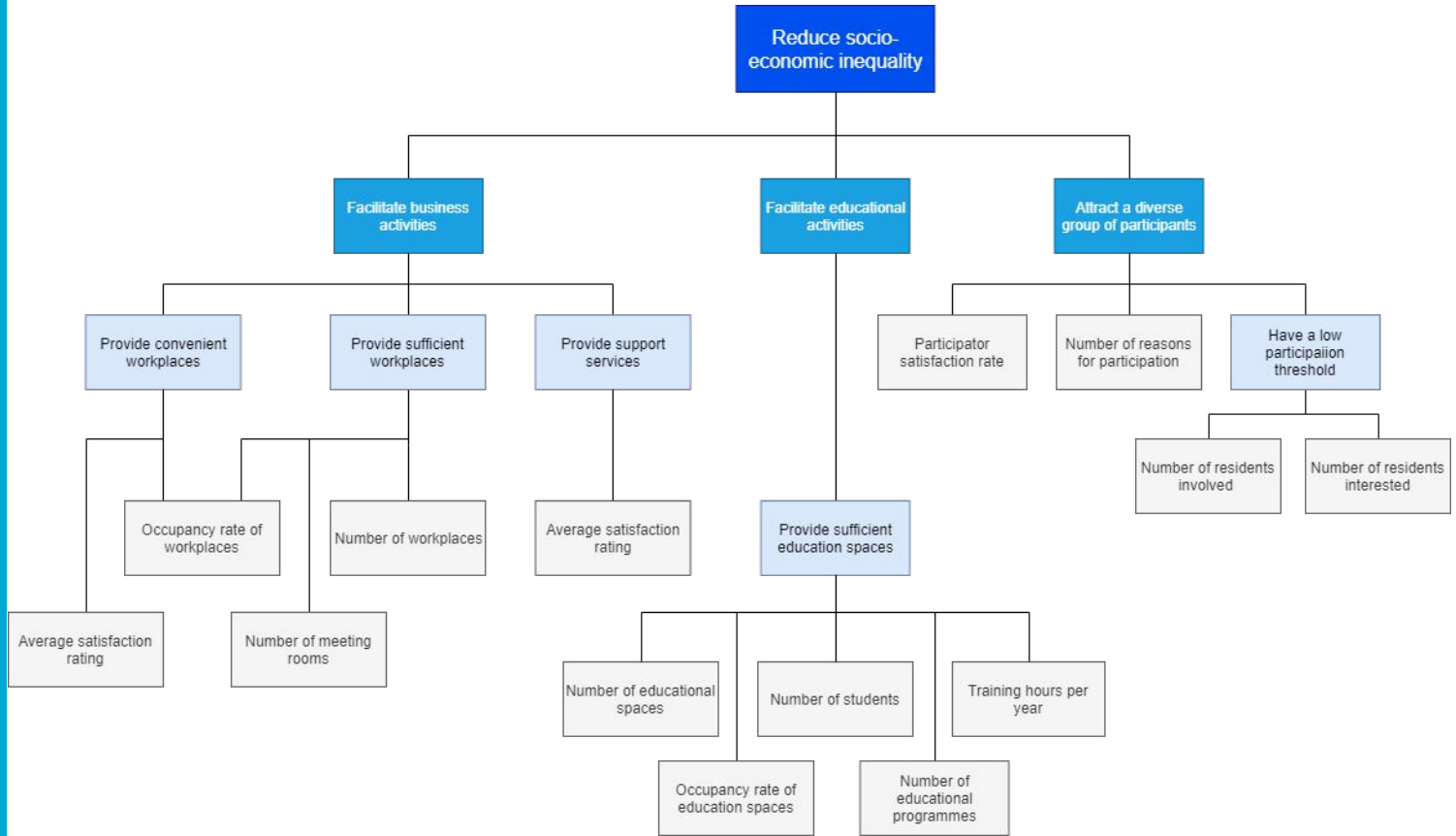
# Performance Requirements

In order to validate whether the system serves the stakeholders' needs correctly, and to verify whether it does so sufficiently, a number of criteria have been defined.

The criteria can be used to measure the performance of the system in relation to the functional and nonfunctional requirements. An overview of these relations is presented on the next slide, and a more detailed breakdown thereafter.

Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# Validation Criteria (expanded)



Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# Requirement Verification

| ID | Requirement | Performance measure | Verification measure |
|---|---|---|---|
| F1 | Provide sufficient workplaces | Low rate of unavailability of workplaces | Number of workplaces / occupancy rate |
| F2 | Provide support services | Low need for external services | Average user satisfaction |
| F3 | Provide sufficient education spaces | Low rate of unavailability of education spaces | Number of education spaces / occupancy rate |
| F4 | Provide education tools | High efficiency of educational activities | Average user satisfaction<br>Number of training hours |
| F5 | Actively encourage participation | High usage of system facilities | Occupancy rates of system facilities |

Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# Requirement Verification

| ID | Requirement | Performance measure | Verification measure |
|---|---|---|---|
| NF1 | Have a low access cost | Large amount of interested users using the system | Number of participants / number of interested residents |
| NF2 | Be convenient to use | High user satisfaction | Average user satisfaction rating * (overall) occupancy rate |
| NF3 | Provide convenient workplaces | High usage of business facilities | Average user satisfaction rating * occupancy rate |

Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

| ID | Requirement | Rationale |
|---|---|---|
| F1 | Provide sufficient workplaces | Providing sufficient workplaces makes it possible to meet and work in person without having to rent a place. |
| F2 | Provide support services | Providing support services will create a safe environment where contestant can make mistakes and help solve their problems. |
| F3 | Provide sufficient education spaces | Providing education spaces will enable the educators to educate the (southern) people who want develop skills in person. |
| F4 | Provide education tools | Providing education tools will help the (southern) people to improve their position on the market by developing skills. |
| F5 | Actively encourage participation | By actively encouraging participation the potential participants will actually take a shot and help us decrease the SE gap. |
| NF1 | Have a low access cost | By having low access cost the potential participants with low budget will also be able to develop skills. |
| NF2 | Be convenient to use | By making the system convenient to use potential participants will see the value it adds to their lives and prevent dropping out. |
| NF3 | Provide convenient workplaces | Providing convenient workplaces will make the system effective and attract various stakeholders. |

Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# Technical Performance Measures

The technical performance measures (TPM) are defined by selecting the most important performance and verification measures, which are described in the Verification Criteria. The TPM('s) should be monitored throughout the whole project, to review system performance at various stages.

| ID | Requirement | TPM |
|---|---|---|
| F1 | Provide sufficient workplaces | Low rate of unavailability of workplaces. |
| F3 | Provide sufficient education spaces | Low rate of unavailability of education spaces. |
| NF1 | Actively encourage participation | High usage of system facilities. |
| NF2 | Have a low access cost | Large amount of interested users using the system. |

# System Synthesis

Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# System Synthesis

In the following section system synthesis is performed:

- Several alternatives are proposed based on the conceptual design.
- The alternatives are analysed in terms of fulfillment of the system requirements according to the validation criteria.
- A preferred solution from among the alternatives is selected.

Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

| Means / Functions | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| *Provide business facilities* | Allocated workspaces and meeting rooms | Flexible shared workspaces | Online business cooperation environment | Contracts with shared workspace companies |
| *Provide education facilities* | Allocated classrooms and course programmes | Flexibly usable classrooms | Online course and study environment | Cooperation contracts with educational institutes |
| *Attract participants from the north of R.* | Entrepreneurial mentorship programmes | Remunerated tutoring of students | Cheap membership for events | Free access to facilities |
| *Attract participants from the south of R.* | Entrepreneurial traineeship programmes | After School programmes | Community events | Internship programmes |
| *Attract local businesses* | Affordable workspaces | Employer / employee meetup events | Job recruitment Fairs | Businesses & Investors Meeting |

Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

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*Startup Incubator*

Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# Design Alternative 1

## Startup Incubator

The Startup Incubator is a facility aimed at providing opportunities for forming new businesses and expanding existing (small) businesses.

Residents from the north of Rotterdam are expected to assume a mentorship position for interested participants from the southern parts of the city.

Businesses and entrepreneurs meet at special events aimed at matchmaking investors and initiatives looking for funding.

| Means / Functions | 1 | 2 | 3 | 4 |
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*Business Network*

Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# Design Alternative 2

## Business Network

The Business Network relies on existing resources, networks and knowledge to provide opportunities for participants.

Industry professionals from local businesses provide training in their respective occupations, thereby reducing the shortage of qualified personnel.

Residents from the northern parts of the city fill an educational role and, in return, can make free use of the facilities provided by the system.

Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

| Means / Functions | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
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*Youth Education Programme*

Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# Design Alternative 3

## Youth Educational Programmes

The youth educational programmes are aimed at young adults, who want to further develop themselves, but lack the opportunities to do it on their own.

The goal is to combine businesses using an online platform, who are searching for employees, together with educational institutes, to educate the young adults, so that they are qualified to fill in a position at a business.

The education is done using the help of experienced people of the northern part, to tutor the young adults.

Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# Best of Class

| Alternative<br>Constraints<br>Objectives | *Startup Incubator* | *Business Network* | *Youth Educational Programmes* |
|---|---|---|---|
| *(C) Budgetary constraints* | | | |
| *(C) Location constraints* | | | |
| *(C) Compliance constraints* | | | |
| *(O) Attractive to businesses and entrepreneurs* | 2 | 1 | 3 |
| *(O) Increasing job availability* | 1 | 2 | 3 |
| *(O) Improving education* | 3 | 2 | 1 |
| *(O) Improving job accessibility* | 2 | 1 | 1 |
| *(O) Improving social cohesion* | 1 | 2 | 1 |

Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# Best of Class - Ties Resolved

| Alternative<br>Constraints<br>Objectives | *Startup Incubator* | *Business Network* | *Youth Educational Programmes* |
|---|---|---|---|
| *(C) Budgetary constraints* | | | |
| *(C) Location constraints* | | | |
| *(C) Compliance constraints* | | | |
| *(O) Attractive to businesses and entrepreneurs* | 2 | 1 | 3 |
| *(O) Increasing job availability* | 1 | 2 | 3 |
| *(O) Improving education* | 3 | 2 | 1 |
| *(O) Improving job accessibility* | 3 | 1.5 | 1.5 |
| *(O) Improving social cohesion* | 1.5 | 3 | 1.5 |

Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# Alternative Evaluation

| Alternative | Target Audience | Incentives |
|---|---|---|
| *Startup Incubator* | Entrepreneurial residents from the South and North looking to start or expand a business. | Entrepreneurship & business coaching.<br>Investor meetings. |
| *Business Network* | Local employers, and job seekers willing to re-educate themselves. | Job fairs and internships<br>Affordable business facilities |
| *Youth Education Programme* | Educational institutes and low-educated youngsters. | Internships & after-work education<br>Affordable education |

**Key Differences**

- Creating vs. filling employment opportunities vs. education focussed approach.
- Focus on private citizens vs. reliance on businesses and educational institutes.

Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# Alternative Selection

Based on the best-in-class chart, the three alternatives each score well on different aspects. The YEP alternative provides the best educational opportunities and social cohesion, while the Incubator's main strength is to provide opportunities that do not necessarily require (re)education. The Business Network alternative, on the other hand, scores well in both education and economic participation, but less so on social cohesion.

Economic participation acts as a gateway to social cohesion by improving the overall opportunities of residents. Therefore, the proposed solution is the Business Network alternative, which scores well in both improving education and economic participation.

Introduction
Problem Owner
Stakeholders
System Scope
System Requirements
System Synthesis
Conclusion

# Conclusion

The city of Rotterdam is soliciting a system meant to reduce the socio-economic gap between the northern and southern parts of the city.

The main stakeholder groups and their needs and power dynamic were analyzed. Three main functions were identified in the conceptual design phase; facilitating business activities, educational activities, and incentivising participation by, and cooperation between, citizens from the northern and southern parts of the city.

Several design alternatives have been proposed. The Business Network, with a strong focus on economic prospects and (re)education opportunities, is presented as the preferred alternative.

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