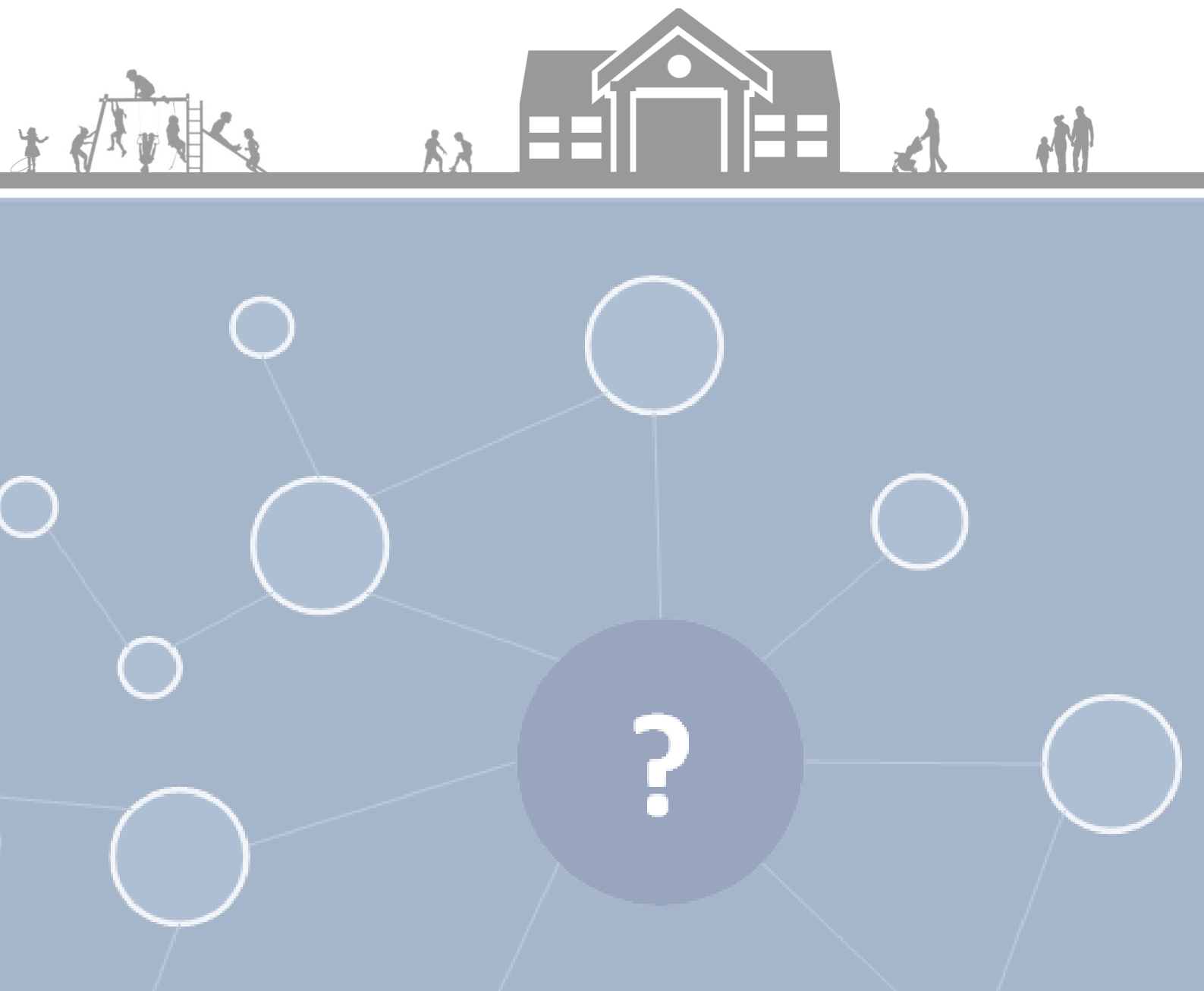


# Ownership and real estate management for community schools in the Netherlands

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Eindhoven University of Technology  
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An exploratory study towards the structure of the decision-making process towards an ownership and building management and operation model in the Dutch community school sector

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## Paraphrase

This thesis is the result of the 8 months I have spent studying the subject of ownership and BM&O in the community school sector in the Netherlands. First of all I want to thank Ms. Dane, my 1<sup>st</sup> supervisor from the technical university in Eindhoven, and Ms. Han, 2<sup>nd</sup> supervisor from the technical university Eindhoven, for their guidance during my graduation research. Both helped me to focus on the scientific side of my research project. I especially want to thank Ms. Dane for helping me with defining the scope, methodology and depth of the research. My perfectionistic mind often causes me to want to do everything. When this happened Ms. Dane debated with me about why and how I could carry this out. I am very thankful for that!

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Enjoy reading,

Esther Penders

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## Summary

Although a lot of community schools are being built in the Netherlands, and BM&O and ownership is a reoccurring problem, only limited information about community school ownership and BM&O can be found in Literature. There are some publications, but most of them date before 2015 when major changes in the law and legislation that influences community school users took place. The aim of this study is to get more insight in the structure of the decision-making process towards an ownership and BM&O model. By doing this, the aim is to start researching the subject of ownership and BM&O in the Dutch community schools sector, and lay the foundation for the development a decision support tool that can help deciding on a BM&O and ownership model early in the process of developing a community school. By deciding on a BM&O and ownership model early in the process it is expected that a lot of problems can be prevented in a later stage, since the building design can be better adapted to the buildings' use. To study the decision-making process towards an ownership and BM&O model first a literature review has been carried out to study the subject. Secondly, a fuzzy Delphi (FDM) experiment has been carried out and at last a directed acyclic graph (DAG) has been constructed that shows the graphical structure of the decision- making process.

In the Dutch community school sector, different ownership and BM&O models are being used. Concerning ownership in general a differentiation is made between split ownership and ownership in the hands of one party. In case of ownership in the hands of one party, the possible owners are: the municipality, one of the primary users, a foundation/cooperation or a third-party. In case of split ownership, there is either a split in apartment rights or the building has been completely split in the land registry. Concerning BM&O in general four main models can be distinguished: No regulated BM&O, Split BM&O, Combined BM&O and outsourced BM&O. Concerning combined BM&O, either a BM&O foundation/cooperation consisting of the different building users is setup, or one of the primary users within the building is responsible for BM&O on behalf of all the other users. Concerning outsources BM&O either a third-party owner, or a professional organization is responsible for BM&O.

To study the structure of the decision-making process, insight had to be gained in which variables effect the decision-making process towards an ownership and BM&O model. To do this an FDM approach has been used. Based on the literature review four variable categories have been selected that have an influence on the decision-making process:

- I. Financial factors
- II. Legal factors
- III. Organizational factors
- IV. Psychological factors

Because of the indistinctness of these categories and the limited number of variables found in literature, a brainstorm session has been held with public real estate (PRE) advisors who are experts in the field of ownership and BM&O of community schools. Based on this brainstorm session, a second evaluation by the advisors and the literature review, an overview of 34 variables influencing the decision towards an ownership model, and 28 variables influencing the decision towards a BM&O model has been created. To determine which factors are most important to the decision-making process, a survey has been held under the most common community school organizations and PRE-advisors.

	<i>Financial</i>	<i>Legal</i>	<i>Organizational</i>	<i>Psychological</i>
<b>Ownership</b>	<ul style="list-style-type: none"> <li>Financial carrying capacity</li> <li>Risk Profile</li> </ul>	<ul style="list-style-type: none"> <li>Mandatory law</li> </ul>	<ul style="list-style-type: none"> <li>Organization types</li> <li>Organizational carrying capacity</li> <li>Collaboration model</li> <li>Size independent organizations</li> <li>Number of organizations</li> </ul>	<ul style="list-style-type: none"> <li>Synergy</li> <li>Willingness to be owner</li> <li>Importance of influence and say on tasks owner</li> </ul>
<b>BM&amp;O</b>	<ul style="list-style-type: none"> <li>Financial Carrying Capacity</li> <li>Economies of scale</li> <li>Financial flexibility BM&amp;O model</li> </ul>	<ul style="list-style-type: none"> <li>Mandatory law</li> </ul>	<ul style="list-style-type: none"> <li>Collaboration model</li> <li>Knowledge about building management</li> <li>Organizational carrying capacity</li> <li>Size independent organizations</li> <li>Number of organizations</li> <li>Organization types</li> </ul>	<ul style="list-style-type: none"> <li>Synergy</li> <li>Importance influence and say BM&amp;O</li> <li>Willingness to be responsible for the building management</li> </ul>

*Table 1. Variable influencing the decision-making process towards a BM&O and ownership models in the Dutch community school sector*

Based on the analysis of the survey results can be concluded that in general the organizational factors and psychological factors are most important in the decision-making process towards an ownership and BM&O model. Furthermore, for both decision-making process, an overview of the importance scores showed that a lot of different variables are almost equally import for the decision-making process. This could show that these decision-making processes are very complex since a complicated assessment of the situation has to be made. Based on the results of the survey and FDM analysis, 11 variables concerning the decision for an ownership model, and 13 variables concerning the decision for a BM&O model have been selected (see Table 1).

Within the FDM survey also the connection between the decision towards an ownership model and BM&O model has been studied. Two types of questions were used to determine which of the decisions should be made first. Unfortunately, the questionnaire did not unambiguously show which decision is made first. Therefore it was not possible to connect the BM&O and ownership DAG that was created in the next phase of this study to create one graphical structure.

After selection of the most important variables that influence the decision towards a BM&O and ownership model, a second survey phase has been held that used a matrix questionnaire to collect data about the relationships between the different variables. After analyzing the results of the matrix questionnaire and validating the results in expert interviews, two DAGs have been constructed. The DAGs show the structure of the decision-making processes. Based on the graphical DAGs an analysis of the structure of the decision-making process has been carried out. This analysis showed that in case of the decision-making process towards an ownership model, 5 variables have a prominent effect on the choice for an ownership model: Financial carrying capacity, Organization types, Importance of influence and say owners' tasks , Risk profile and Organizational carrying capacity. For the BM&O DAG a less clear distinction could be made and more variables have a prominent effect on the ultimate decision for a BM&O model. This could show that in case of the decision towards a BM&O model more variables play a vital role in the consideration for either one of the BM&O models.

This research aimed on studying the structure of the decision-making process towards a BM&O and ownership model in the Dutch community school sector, and consequently provide the foundation for the development of a decision support tool.

## Samenvatting

Alhoewel er in de afgelopen jaren veel multi-user schoolgebouwen gebouwd zijn blijkt in de praktijk dat eigendom, beheer en exploitatie van de gebouwen een probleem is. Ondanks deze problemen is er maar minimale informatie over het onderwerp te vinden in literatuur. Daarnaast dateren de publicaties die beschikbaar zijn vaak van voor 2015, toen grote veranderingen in de wet en regelgeving plaatsvonden. Het doel van deze studie is om de literatuur over eigendom, beheer en exploitatie van multi-user schoolgebouwen aan te vullen, inzicht te verkrijgen in de structuur van het beslissingsproces om een eigendoms-, beheer-, en exploitatiemodel te selecteren, en om de fundering te leggen voor een decision support tool die kan helpen om de keuze voor een eigendoms-, beheer- en exploitatiemodel vroeg in het proces tot het opzetten van een multi-user schoolgebouw richting te geven. Door vroeg in het proces een eigendoms-, beheer- en exploitatiemodel te selecteren wordt er verwacht dat problemen tijdens de gebruiksfase van het gebouw voorkomen kunnen worden omdat het gebouwwontwerp dan beter aansluit bij het gebruik. Om de structuur van het beslissingsproces inzichtelijk te maken is er eerst een literatuurstudie uitgevoerd. Daarna is er een fuzzy delphi methodologie (FDM) studie uitgevoerd waarna er een directed acyclic graph (DAG) gemaakt is die inzicht verschaft in de structuur van de besluitvormingsproces.

In de Nederlandse multi-user schoolgebouwen worden er verschillende type eigendoms-, beheer- en exploitatiemodellen gebruikt. Wat betreft eigendom wordt er meestal onderscheid gemaakt tussen eigendom in de handen van één partij en gesplitst eigendom. In geval van eigendom in de handen van één partij zijn de mogelijke eigenaren: de gemeente, een hoofdgebruikers, een stichting/coöperatie of een derde. In geval van gesplitst eigendom kan men kiezen tussen een opsplitsing van het gebouw in appartementsrechten of een kadastrale opsplitsing. Wat betreft beheer en exploitatie (B&E) worden er vier hoofdmodellen gebruikt: Geen afspraken over B&E, gesplitst B&E, gecombineerd B&E en uitbesteed B&E. Met betrekking tot gecombineerd B&E kan er een B&E stichting/coöperatie bestaande uit de verschillende gebouwgebruikers opgericht worden, of één van de hoofdgebruikers is verantwoordelijk voor B&E namens alle andere gebruikers. Met betrekking tot uitbesteed B&E kan er een professionele organisatie gecontracteerd worden of de eigenaar/derde is verantwoordelijk voor B&E.

In deze studie is het doel om de structuur van het besluitvormingsproces voor een eigendom-, beheer- en exploitatiemodel inzichtelijk te maken. Ten behoeve van dit doel moeten de variabelen die invloed hebben op de beslissing inzichtelijk gemaakt worden. Op basis van de literatuur studie zijn er vier categorieën betreffende variabelen die invloed hebben op de beslissingen bepaalde:

- I. Financiële factoren
- II. Juridische factoren
- III. Organisatorische factoren
- IV. Psychologische factoren

In literatuur wordt geen omschrijving gegeven van variabelen die binnen deze categorieën vallen. Daarom is er een brainstormsessie gehouden met maatschappelijk vastgoed (MV) adviseurs. Op basis van deze brainstormsessie, de literatuur studie en een tweede evaluatie van de variabelen door de MV adviseurs is er, een overzicht van 34 variabelen die invloed hebben op de keuze voor een eigendomsmodel, en 28 variabelen die invloed hebben op de

	<i>Financieel</i>	<i>Juridisch</i>	<i>Organisatorisch</i>	<i>Psychologisch</i>
<i>Eigendom</i>	<ul style="list-style-type: none"> <li>- Financiële draagkracht</li> <li>- Risico profiel</li> </ul>	<ul style="list-style-type: none"> <li>- Wet en regelgeving rechtsvormen</li> </ul>	<ul style="list-style-type: none"> <li>- Type organisaties</li> <li>- Organisatorische draagkracht</li> <li>- Samenwerkingsmodel</li> <li>- Grootte organisaties</li> <li>- Aantal organisaties</li> </ul>	<ul style="list-style-type: none"> <li>- Synergie</li> <li>- Bereidheid om eigenaar te zijn</li> <li>- Belangrijkheid van invloed en zeggenschap taken eigenaar</li> </ul>
<i>B&amp;E</i>	<ul style="list-style-type: none"> <li>- Financiële draagkracht</li> <li>- Schaalvoordeel</li> <li>- Financiële flexibiliteit model</li> </ul>	<ul style="list-style-type: none"> <li>- Wet en regelgeving rechtsvormen</li> </ul>	<ul style="list-style-type: none"> <li>- Samenwerkingsmodel</li> <li>- Kennis over B&amp;E</li> <li>- Organisatorische draagkracht</li> <li>- Grootte organisaties</li> <li>- Aantal organisaties</li> <li>- Type organisaties</li> </ul>	<ul style="list-style-type: none"> <li>- Synergie</li> <li>- Belangrijkheid invloed en zeggenschap B&amp;E</li> <li>- Bereidheid om verantwoordelijk te zijn voor B&amp;E</li> </ul>

Table 2. Variabelen die invloed hebben op het besluit voor een eigendoms-, beheer- en exploitatiemodel voor Nederlandse multi-user schoolgebouwen.

keuze voor een B&E model gemaakt. Om vast te stellen welke variabelen het meest belangrijk zijn is er een enquête gehouden onder de meest voorkomende multi-user schoolgebouwen gebruikers en maatschappelijk vastgoed adviseurs.

Op basis van de analyse van de enquêteresultaten kan geconcludeerd worden dat over het algemeen de organisatorische en psychologische factoren het meest belangrijk zijn in het beslissingsproces. Verder blijkt dat voor beide besluitvormingsprocessen veel variabelen een vergelijkbare belangrijkheidsscore krijgen. Dit zou kunnen betekenen dat het maken van een beslissing een complex proces is dat beïnvloed wordt door veel variabelen van een vergelijkbare belangrijkheid. Op basis van de enquêteresultaten zijn er 11 variabelen die invloed hebben op de beslissing voor een eigendomsmodel, en 13 variabelen die invloed hebben op de beslissing voor een B&E model geselecteerd (zie Table 2).

Met behulp van de vragenlijst is ook de relatie tussen de beslissing voor een eigendomsmodel en een beheer- en exploitatiemodel onderzocht. Twee vragen zijn opgenomen in de vragenlijst om te bepalen welke beslissing eerst gemaakt moet worden. Helaas gaf de vragenlijst geen eenduidig antwoord op deze vraag. Jammer genoeg kunnen daarom de eigendoms en B&E DAG die in de volgende fase van dit onderzoek gemaakt zijn niet aan elkaar gekoppeld worden.

Na de selectie van de meest belangrijke variabelen die invloed hebben op het beslissingsproces is er een tweede enquêteronde gehouden waarin een matrix vragenlijst gebruikt is om data te verzamelen over de relaties tussen de verschillende variabelen. Na analyse van de enquêteresultaten, en validatie van de resultaten in interviews, zijn er twee DAGs gemaakt. De DAGs geven de structuur van het beslissingsproces grafisch weer. Op basis van een analyse van de eigendoms DAG kan geconcludeerd worden dat 5 variabelen een groot effect hebben op de keuze voor een eigendomsmodel: Financiële draagkracht, type organisatie, risico profiel en organisatorische draagkracht. In het geval van de B&E DAG kan er een minder duidelijk onderscheid gemaakt worden tussen de variabelen wat betreft invloed op de besluitvorming. Dit zou kunnen betekenen dat in de beslissing voor een B&E model meer variabelen een belangrijke rol spelen.

Het doel van deze studie was om de structuur van het besluitvormingsproces voor een eigendoms-, beheer- en exploitatiemodel in Nederlandse multi-user schoolgebouwen inzichtelijk te maken, en dientengevolge de fundering te leggen voor de ontwikkeling van een decision support tool.

## **Abstract**

This study provides a first glance at the structure of the decision-making process towards a BM&O and ownership model in the Dutch community school sector. This decision-making process is a multi-actor decision-making process. Studies show that in practice a lot of problems arise from the way ownership and BM&O are arranged in Dutch community schools. The general idea in practice is that a lot of these problems are caused by the fact that ownership and BM&O structures are discussed too late in the process of developing new community schools. By discussing the ownership and BM&O in a late stage of the process the building is not adapted to its use.

To enable organizations to discuss and decide upon a BM&O and ownership structure in the beginning of the process (before the program of requirements, design and construction of the building has been carried out) of developing a new community school this study aims on developing a graphical representation of the decision-making process itself. Such a graphical structure assists in understanding the decision-making process and lays grounds for the development of a decision support tool. In this study a combination of Fuzzy Delphi Method (FDM) and an Bayesian belief network based on expert opinions (adjacency matrix questionnaire and validation interviews) has been used to reach this objective.

The FDM approach allows for selection of the most important variables influencing the decision towards an ownership and BM&O model in the Dutch community school sector. By conducting a survey among the organizations that are often part of the community school initiative, that have made these decisions in the past, an overview of the decision-making factors is obtained. By conducting a second survey that aims on finding the relationships between the variables that influence the decision-making process a directed acyclic graph (DAG), of the decision-making process has been made.

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## List of Abbreviations

BM&O	: Building management and operations
BSVS	: Bouwstenen voor sociaal
CC	: Carrying capacity
CPT	: Conditional probability table
CREM	: Corporate real estate management
e.g.	: Exempli gratia (for example)
etc.	: Etcetera
ICC	: Integral child care center
ICT	: Information and communication technology
LSBS	: Landelijk steunpunt brede scholen
MFA	: Multifunctional accommodation
NEN	: Nederlandse norm
NP-hard	: Non-deterministic polynomial-time hard
OZB	: Onroerende zaakbelasting
PO	: Primair onderwijs
PRE	: Public real estate
PREM	: Public real estate management
PS	: Partnership school
REM	: Real estate management
VNG	: Vereniging Nederlandse gemeenten
VvE	: Vereniging van eigenaren
WPO	: Wet primair onderwijs





## **1. Introduction**

The introduction presents the topic and aim of this thesis and how the study will be conducted. To do this the introduction will present the problem framework and definition, research goal, research boundaries, research design, the social and scientific importance of this study and the reading guide.

## **1.1 Problem framework**

In recent years, the number of community schools within the Netherlands is increasing. Where in the past typically stand-alone school buildings were being built, nowadays a lot of new schools are being (re)developed as community schools (Sardes, 2008). Community schools are described as school building in which there is a certain collaboration amongst different sectors (Provincie Zuid Holland, 2007). Key in this definition is the collaboration amongst different participants and sectors. Collaborations one can think of are, for example, a combination of a school, childcare organizations, library and other community services. In general, multiple community-based activities (public or private) and services are integrated in one building. By combining facilities and services within a joint building, or service network, the services become more easily accessible for the community, and in particular for children and parents (Nederlands Jeugdinstituut, 2010). A community school often acts as a network of connecting services for children and parents (Oberon/Sardes, 2007).

The development towards community schools in the Netherlands started in the mid-nineties. Influenced by the need for more focused attention for children, the development became increasingly important (Oberon/Sardes, 2007). It is expected that in coming years almost ⅓ of all schools within the Netherlands will become a community school (Kindcentra 2020, 2015). The province of Zuid Holland (2007) expects that this growth is caused by the increasing influence of local government (municipalities and provinces) on the educational, youth and social policy. Because of this growing influence, the municipality can stimulate these different sectors to collaborate. Because of collaboration among different partners within a community school it is possible to setup a more focused child/youth care program, which can help decrease learning deficits among children. Furthermore, qualitative childcare (day programs) can be provided, and the combination of services can influence the livability of neighborhoods in a positive way (Provincie Zuid Holland, 2007). A community school therefore creates a certain social return on investment (The Childrens Aid Society, 2013).

Although there are numerous success factors when considering community schools, there are also a few bottlenecks that are often mentioned:

- I. Financing the community schools (total cost of ownership) → 38% of the cases
  - II. Lack of collaboration among the partners → 15%
  - III. Housing and real estate management → 13% of the cases
  - IV. Restricting law and legislation → 11% of the cases
- Regioplan (2014) , Oberon (2016)

In this study the aim is to examine one of these problems, the real estate management of community schools. Because of recent changes in law and legislation concerning the responsibility for real estate management of community schools, this subject is becoming increasingly important for schools. In the past municipalities were responsible for the outside maintenance of school buildings. Since the first of January 2015 this responsibility has been shifted towards the schools. Lots of tasks are being decentralized, which necessitate schoolboards to become more professional (PO Raad, 2015). Although a lot has been written about real estate management of (community) schools, the current shift in law and legislation requires to take a new look at how to arrange this management. Most publication about the subject date before the shift took place, which makes it very

interesting to look at the subject two years after the change has happened. Furthermore, because of this shift the real estate management of (community) schools is something that is high up on the agenda of schoolboards and educational foundations.

Next to the renewed attention/difficulties to real estate management since January 2015, the real estate management of community schools has always been a problem (Regioplan, 2014; Oberon, 2016; Oberon, 2009). Annual reports in which the development of community schools in the Netherlands is being discussed report year after year that real estate management is a problem. Most likely this is caused by the fact that community school real estate management requires collaboration and clear agreements about responsibilities among the participants within the building (VNG/Oberon, 2006). In 2006 almost half of the community schools however had not arranged anything in relation to real estate management (VNG/Oberon, 2006). More recent numbers show that this is still the case and municipalities even see community school buildings and other multifunctional community building as problematic because of the building management and operations (Gemeente.nu, 2016). In case nothing has been arranged concerning building management and operations (BM&O) the chance on friction within the community school initiative is the largest since there are no agreements or contracts to fall back on (VNG/Oberon, 2006).

Something that makes the real estate management of community schools even harder is that within the building often public (schools, libraries etc.) and private (Childcare) organizations are housed. These parties have different goals, different funding mechanisms and the municipality has different obligations towards the different types of participants. One of the main differences between obligations of the municipalities towards public and private parties is the financial responsibility. The municipality is responsible to finance the construction of new school buildings. In case of a community school however the building also consists of parts that are not being used by the school, in that case the municipality is not obliged to finance these parts of the building. This creates a difficult situation, not only in relation to the real estate management, but also in relation to the ownership of the building.

In practice, there are numerous ways of arranging the real estate management of a community school buildings. There is however no consensus about which way is the best. This is mainly caused by the fact that there is no research conducted that look at the best possible real estate management model, and because what is best is depended on different factors such as how the different participants within the community school work together.

As discussed in the previous paragraphs real estate management of community school is a complex problem. Directly linked to the BM&O of the building is also the ownership of the building. Real estate management cannot be researched without looking to the ownership situation. In community schools the ownership situation is more complicated than in case of the development of a stand-alone school. Once more there are numerous different possibilities and there is no consensus about the best way to arrange the ownership of the community school buildings.

## **1.2 Problem definition & Research goal**

Because of the recent shift in responsibilities concerning real estate management, the different types of users, different municipal obligations and the lack of professionalization within community schools, real estate management and ownership is a reoccurring problem in the development and day to day use of community school buildings. There are numerous different real estate management models and ownership models for community sc, there however is no consensus about which models fits certain initiatives.

*In this study the aim will be to get insight in the variables that influence the choice, and fit, of different BM&O and ownership models. Furthermore, the goal is to determine how these variables influence the decision for a BM&O and ownership model. Based on this information the aim of the study will be to better understand the process of choosing a BM&O and ownership model in case of community school initiatives.*

By getting insight in the variables that influence the choice and fit for a certain ownership model it is possible to better understand the complex decision-making process in relation to a BM&O models and ownership models for community schools. Furthermore, having insight in the decision-making process enables us to make better decisions for future project. At last it is possible to develop a tool that can be used to determine the best BM&O and ownership model in an early stage of the initiative to develop a community school (before the design and construction of the building). This is important because the choice for a BM&O and ownership model influences how the building will be used and thus the design must match the use of the building. Developing a tool is however not the aim of this study since too little information about the decision-making process is available to develop a tool in the time period standing for this research project.

## **1.3 Research question**

The following research question is central to this research:

*How is the decision-making process towards an ownership and BM&O model in the Dutch community school sector structured?*

To answer this question the following sub-questions have to be answered:

- I. Which different types of community schools are there in the Netherlands?
- II. Which different types of ownership models and real estate models can be defined for community schools?
- III. Which attributes influence the decision towards a certain real estate and ownership model for community schools?
- IV. What is the effect of the different attributes on the decision for an ownership and BM&O model?

#### **1.4 Research boundaries**

Although community schools also occur in other countries such as Belgium, Germany and America, this research will only focus on community schools within the Netherlands. In every country there are differences in law and legislation concerning schools and the way schools are funded. Because the law and legislation and the culture within a country can have great influence on the decision-making process towards a certain real estate management and ownership model (Knaap, 2009) it is best to only focus on one country, the Netherlands.

Next, the study will only consider community schools in which primary education is given. In the Netherlands there are also community schools in which secondary education is given, however the biggest group of community schools focuses on primary education in combination with services for children between the age of 0-12 (Nederlands Jeugdinstituut, n.d.). In some cases, the primary education is combined with services for preadolescents (under 18 years old), also these community schools are considered in this study. Community schools in which no primary education is given, or in which a combination of primary and secondary education is given, are not considered in this study.

#### **1.5 Research design**

The research will consist of four different parts

- I. Orientation: Literature review
- II. Filling the gaps in literature: Fuzzy Delphi Method
- III. Research application: Bayesian Belief Network
- IV. Completion: Conclusion

The schema in Figure 1 shows the research setup. The first phase consists of five different subjects that will be researched to orientate on the subject and the literature concerning the subject. The subjects that will be discussed in this orientation phase are the Dutch community school sector, real estate management (BM&O), law and legislation influencing the subject, the different ownership and BM&O models used in practice and the variables influencing the decision towards a BM&O and ownership model. This phase aims at answering sub questions I and II and will partially answer sub question III.

It is expected that not all information needed to answer research question III can be found in literature and thus the second phase will focus on filling these gaps in literature. This will be done by first selecting variables that influence the decision towards a BM&O and ownership model based on literature, and then complement this list based on a brainstorm session with experts. To validate this list, and select the most important attributes for the different participants within a community school, a survey will be held. Next the most important attributes will be selected based on the outcome of the survey. This part of the research will be carried out by using the Fuzzy Delphi Method.



Figure 1. Research setup

When the most important attributes are selected a second survey will be held. This survey aims on gathering information about the relationships of the most important variables on the decision for a BM&O and ownership model and on each other. The aim of this phase is to map the decision-making process towards a BM&O and ownership model for a new community school initiative. By doing this a DAG (or graphical BBN) can be developed that can serve as a first setup for a tool (predictive BBN) that could be used in the future to select a suitable BM&O and ownership model in the beginning of the process of developing a community school (before the program of requirements, design and construction of the community school have been completed. A predictive BBN can eventually be used to study the effect of certain variables on the real estate management and ownership model choice. Furthermore, in the future the DAG can be extended and used to predict the most likely real estate model and ownership model in case of a new community school. This phase aims on answering sub question IV.

### 1.6 Social and Scientific importance

Within the Netherlands it is expected that in the coming years the number of community schools keeps increasing. In 2013 three tenth of all schools within the Netherlands were community schools (Regioplan, 2014). It is expected that in coming years almost 2/3 of all schools within the Netherlands will become a community school (Kindcentra 2020, 2015).

Furthermore, within the community school sector the partners starting to collaborate more closely in terms of content. Because of this closer collaboration among the different organizations it is becoming increasingly important that this collaboration is not being disrupted by problems caused in relation to the BM&O.

History shows that real estate management and ownership are however a problem in lots of community school initiatives. Learning from the past to ensure a better decision will be made in the future can prevent trouble in case of the numerous new community school developments, prevent problems and can help in fine-tuning the methods used in existing community schools. This new information can make the new community school initiatives a bigger success.

Furthermore, the study can also close the information gap between scientific literature and publications from consultancy firms, public research organizations and governments. At the moment, most publications on the subject are very general and most research dates from before 2015, when some major changes in law and legislation concerning real estate management of school buildings took place. Also, most research that has been conducted is based on expert opinions and interviews (qualitative research) and almost no quantitative research can be found on the subject. This research tries to connect and test the conclusions from the qualitative research that has been conducted in the past based on quantitative research, and complement the older research that has been conducted by looking at the subject in current times.

## **1.7 Reading guide**

Just as the research design this report will consist of four parts. The first part (chapter 2) will introduce relevant literature to the subject. After this orientation phase the second phase of the research will be discussed. In part two (chapter 3) of the report the setup of the Fuzzy Delphi experiment and the results will be discussed. The goal of this experiment is to select important attributes that influence the decision towards a certain real estate management and ownership model. Based on the results of the FDM experiment a list of important attributes influencing the decision towards a BM&O and ownership model is constructed. In phase three (chapter 4) the DAG will be constructed. In this chapter the BBN methodology that is used to construct a DAG, data gathering, validation and the final DAG will be discussed. The last part of the report, the conclusion, will discuss the findings that emerge from the DAG, and discuss possibilities concerning future research into the subject.





## **2. Literature review**

In this chapter literature relevant to the study will be discussed. First the definition and different types of community schools within the Netherlands will be discussed. Next there will be deliberated on the real estate management in the public domain. By doing this the scope of the research can be defined. Next developments concerning real estate management, and more specific BM&O, in the community school sector will be presented to you. Part of this is also discussing the law and legislation influencing the community school sector. Considering the developments within the field, and law and legislation influencing ownership and BM&O, helps sketching the playing field in which the decision for an ownership model and BM&O model had to be made. Afterwards the different BM&O and ownership models used within the community school sector, including their advantages and disadvantages will be discussed. By exploring the different models a better view of factors influencing the decision for an ownership and BM&O model can be created. At last the factors influencing the decision towards an ownership and BM&O model that can be found in literature will be presented.

## 2.1 Community schools within the Netherlands

### 2.1.1 *Public real estate – Community school buildings*

Bouwstenen voor sociaal (BSVS) defines public real estate (PRE) as a collective term used for real estate that serves the public domain. Within PRE not only the functional aspects of the real estate is important, but also cultural and political aspects since these contribute to societal goals (BSVS, n.d.). In general PRE is real estate with an educational, sports, cultural, welfare, social care or healthcare function (BSVS, n.d.). (Community) schools therefore are PRE. Community schools are often collective buildings in which multiple public, and private, services are located (BSVS, n.d.). Community schools differentiate from stand-alone school building, or commercial collective buildings, because of the combination of spatial and substantive collaboration among different partners within the building (Willems, Hilgenga, & Schouten, 2008). In Figure 2 the difference between the stand-alone school and community school is explained graphically. In recent years the amount of collaboration among the parties within a joint school building increases (van Rosendaal & Vaes, 2015). A trend towards intensive substantive collaboration among partners can be observed (Kindcentra 2020, 2015).

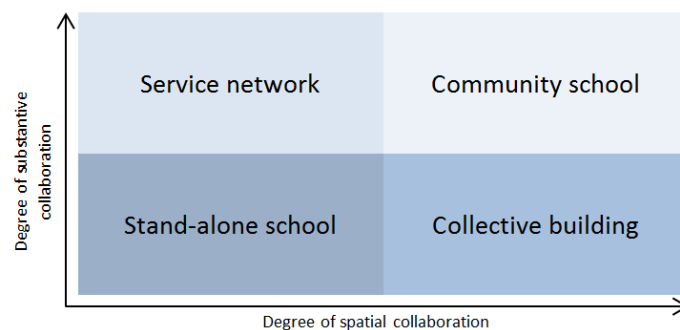


Figure 2. Definition of community school buildings explained (Willems, Hilgenga, & Schouten, 2008)

Within the Netherlands there is a lot of PRE. A study conducted by BSVS & BBN (2011), showed that the total square-meterage of PRE in the Netherlands was more than the square-meterage of offices and shops combined. Furthermore, in 2011 70% of all PRE had an educational or healthcare function (BSVS/BBN, 2011). Because of the size and societal importance of the PRE sector it is important to ensure the long term management of the buildings is well organized. Studies however show that the long term management of the buildings is one of the main problems within the community school sector (Regioplan, 2014).

### 2.1.2 *Types of community schools*

In the Dutch practice five different types of community schools can be distinguished (LSBS, 2013).

- I. The classical partnership school: Within the partnership school a common vision towards the development of the child is formulated, but the different organizations that are part of the partnership school are still autonomous organizations. Generally the different organizations are located within one building.
- II. The network school: This community school type is not located in one building but consist of a network of collaborating organizations within a neighborhood.

- III. A multifunctional accommodation (MFA): Within a MFA different organizations are located in a joint building. The main aim of the organizations participating in a MFA is offering a service center to the inhabitants of a neighborhood. The collaboration therefore is focused on the building management and not on a pedagogical vision.
- IV. The compact partnership school: A compact partnership school is similar to a classical partnership school although the classical partnership school is often a lot bigger. In a compact partnership school often only three partners are collaborating namely the school the preschool and the childcare organization. A common vision towards the development of the child is formulated, but the different organizations that are part of the partnership school are still autonomous organizations.
- V. The integrated childcare center (ICC): The main aim of an integrated childcare center is that there is one business model and one established (pedagogical) vision within the community school. Sometimes even a combined organization is formed in which HR and the management is combined. The continuous line of childcare, education, leisure time and the central management of the organizations are the main drivers of this community school type.

Although in the literature five different community school types are distinguished, in this study the network school is not considered of importance since in these organizations the collaboration is mainly focused on the pedagogical vision and not the building management since the organizations are not located in one building. Concerning the classical partnership school and the compact partnership school a lot of similarities can be seen, these two community school types therefore will be combined to one type: the partnership school. The school types that will be considered in this study therefore are:

- I. Partnership school (combination of classical and compact partnership school): PS
- II. Multifunctional accommodation: MFA
- III. Integrated childcare center: ICC

### 2.1.3 Collaboration types community schools

In Dutch literature four different collaboration models within community schools can be distinguished (Quintis, 2010; LSBS, 2007; Provincie Zuid Holland, 2007):

- I. Individual (Back to Back): In this collaboration form there is minimal cooperation. The different participants share the building but maintain their own independence and do not engage in joint arrangements. Services within the building are spatially matched to each other but there is no multifunctional use of the services. In principle this collaboration form is not in line with the underlying idea of community schools.
- II. Collective (Face to Face): In contrast to the Back to Back collaboration form, in this collaboration form there is an open attitude towards each other. In general participants search for coherence between spatial aspects and activities within the community school. Participants use each other's facilities and spaces within the building. The result of this collaboration form is that participants can more easily fulfil their core functions. The main objective within the face to face collaboration form is to share the building, and to ensure that the different activities carried out in the building have a reinforcing effect on each other.

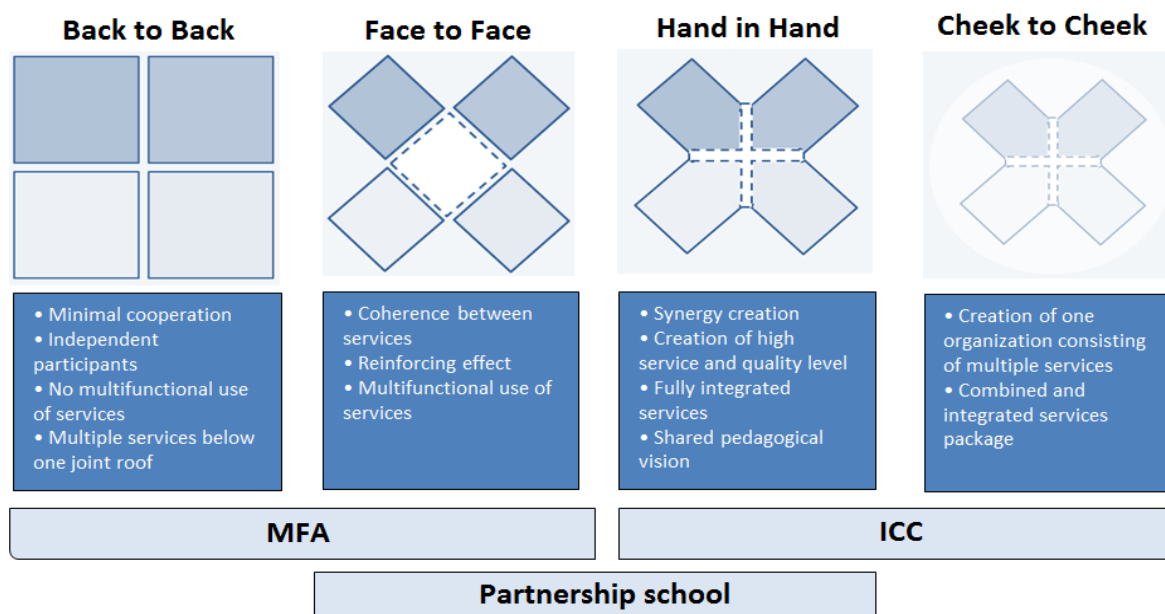


Figure 3. Community School types and collaboration forms – Dutch literature (LSBS, 2007)

- III. Integration (Hand in Hand): In comparison to the first two collaboration models in the Hand in Hand collaboration form the creation of synergy is key. The collaboration consists of more than the sum of the parts. Participants within the community school create a qualitative high level of facilities within the building because of their close collaboration. The facilities within the building are fully integrated. The main objective within the hand in hand collaboration form is to integrate activities below one roof.
- IV. Extensive integration (Cheek to Cheek): The Cheek to Cheek collaboration is the collaboration form in which the collaboration is most extensive. Where in case of Hand in Hand collaboration there is creation of synergy, in this collaboration form participants give up some of their autonomy and form a new integral organization. This new organization ensures a combined and integrated service package.

These four collaboration models are discussed in numerous different types of publications (Quintis, 2010; LSBS, 2007; Provicie Zuid Holland, 2007). Although you could expect a certain differentiation between the different (Dutch) publications this is not the case. Between the publications there is consensus about the collaboration types, and the explanation of the collaboration type. Furthermore, In a study conducted by Oberon participants from different organizations involved in community school developments were asked how they would classify the abovementioned collaboration models. The study from Oberon showed that even when actors within community school developments are asked to explain the different collaboration types their explanation is in line with the explanations given in the different publications (Oberon, 2016).

Although the above mentioned collaboration models are defined in Dutch literature, in American literature the terms Co-Location, Partnership and Intense Collaboration are used (Coalition for Community Schools, n.d.). The American explanation of different collaboration models is more in line with the main types of different community school types in Dutch practice. In Figure 3 the comparison between the terms used in Dutch literature and main types used in practice is shown. In Figure 4 the comparison between main types in practice and the American literature is shown. Because of the practical usability of this research the Community school types that are used in practice will also be used in this study.

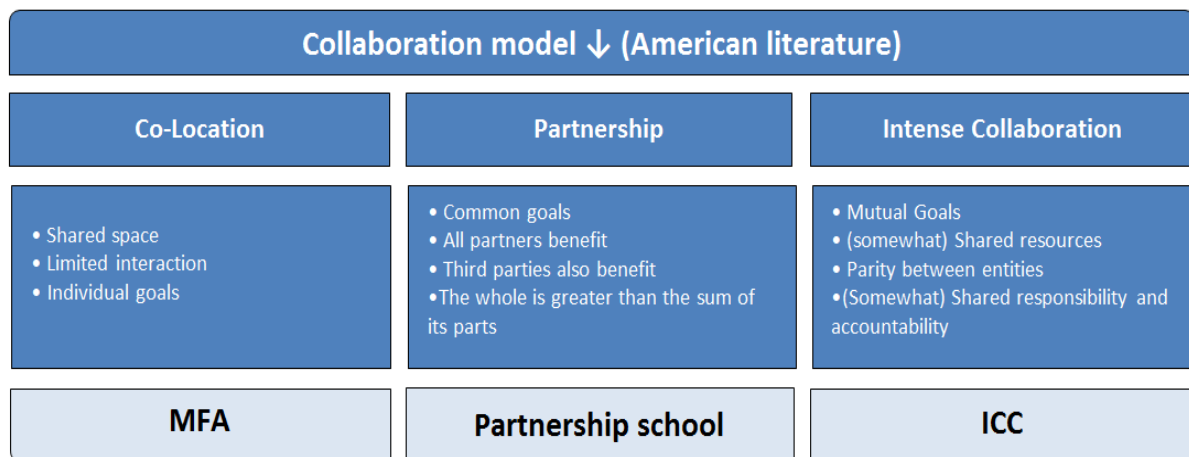


Figure 4. Community school types and collaboration forms – American literature (Coalition for Community Schools, n.d.)

## 2.2 Real estate management

### 2.2.1 The different types and levels of real estate management

The management and maintenance of a building during the user phase is often referred to as real estate management. BM&O is part of the real estate management. To define what is meant by a BM&O, and what is the scope of this type of management, first the three different levels on which real estate management is practiced will be explained (Institutional Real Estate Inc., n.d.):

- I. Operational level: Focuses on managing the day to day operations at the property and organizational level. Tasks on the operational level are, for example, arranging maintenance, maintaining tenant relationships, on-site construction management, property-level accounting, arranging, ordering and managing office supplies etc. This type of management is also called property management and facility management.
- II. Tactical Level: Focuses on managing a collection of assets (opposed to portfolios) on a more strategic level. The goal is to achieve the portfolio strategy set by the portfolio management by coordinating activities of local property managers within a specific submarket. This type of management is also called asset management.
- III. Strategic level: Focuses on the development and clarification of real estate strategies based on market conditions, return objectives and portfolio performances. Portfolio managers operate on the strategic level. This type of management is also called portfolio management.

In Figure 5 the relationship between the different real estate management levels and the different types of real estate management is shown.

On the strategic real estate management level there are two different approaches used:

- I. REM: Real estate management
- II. CREM/PREM: Corporate/Public real estate management (PREM)

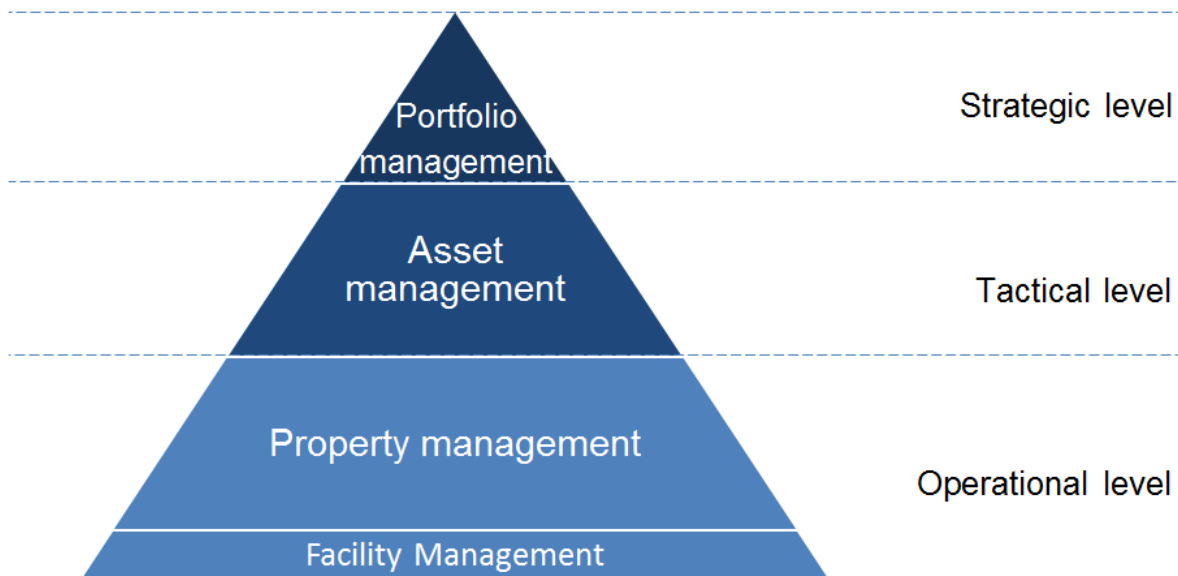


Figure 5. Different types and levels of real estate management (Driel & Zuijnen, 2003)

REM mainly focusses on managing the real estate portfolio in such a way that the real estate itself yields the highest results (Olde-Bijvank, 2009). In REM the real estate strategy therefore is not linked to the primary goals of the organizations, but the main goal is to develop a strategy that yields the highest return on investment in terms of real estate (Olde-Bijvank, 2009). REM mainly focusses on the strategic management of the real estate portfolio itself and less on the strategic management of real estate in the light of all corporate assets (Olde-Bijvank, 2009).

Dewulf et al. (1999) defined that CREM/PREM consists of more than just managing the real estate in such a way that the real estate itself yields the highest results. In CREM the formulation of a real estate strategy is linked to the formulation of a corporate strategy or policy. The main aim of CREM/PREM is that real estate complements the primary business processes. Keeping in mind the business perspective and the real estate perspectives ensures alignment between the two (Dewulf, den Heijer, & Puy, 1999). In contrast to REM, CREM/PREM focusses on value creation through this alignment instead of only creating value through the real estate. In CREM, for example, a higher productivity, branding through real estate or more satisfied building users is also a creation of value since it has a direct effect on the result of a corporation. For PREM the creation of value can, for example, be achieved to use real estate to implement certain policies or political goals (Schaaf, 2002).

### 2.2.2 BM&O in the light of the different levels of real estate management

As discussed before real estate management consists of different levels. It is best to integrate the different types of real estate management within one combined real estate strategy (REM), or even aligning the corporate strategy with the real estate strategy (CREM/PREM). By using CREM, or PREM, within an organization the total organization can yield a higher result.

In case of community schools the responsibilities for the day to day real estate management and the strategic planning of real estate is split between different organizations (municipality and users of the building) and organization levels (The next paragraph 2.3.2 will elaborate on these split responsibilities). Where the municipality focusses on the strategic management,

and thus the CREM/PREM side of real estate management, the users of the building are responsible for the day to day management of the building. In principle the municipality decides whether a new school building will be build and which schools uses which buildings within their municipality (Seakle Satter, 2016). Although schools, and other community school users, are responsible for the maintenance of the buildings this is only a small part of CREM/PREM and the main strategic decision will be made by the municipality.

Although it is possible for school and other users of the building to create their own CREM/PREM strategy, in case of the primary school foundations (which is often the biggest party within the initiative) this is often not the case. Within the public real estate field the professionalization of real estate management is not yet of such a level that the focus of the management is on creating a PREM strategy. Primary school foundations are mainly focusing on the day to day management of their buildings and day to day operations. The day to day management of the building is part of the operational real estate management level (property management and facility management). A BM&O model describes how the responsibilities for the day to day management and maintenance of the building is arranged between the different building users.

## **2.3 Building management and operations**

### ***2.3.1 Components of building management and operations***

As discussed in the previous paragraph this study will focus on the operational level of real estate management. More specifically the study will focus on the building management and operations (BM&O) of the building. The Dutch standard code NEN 2699 defines BM&O costs/tasks as all recurring costs/tasks that are caused by owning real estate, maintaining real estate and the use of real estate (NEN, 2013). BM&O consist of different components (Wentzel, et al., 2004; HEVO, 2015):

- I. Management for building preservation
- II. Facility management
- III. Organization management

The preservation management (I) consist of technical BM&O (maintenance) and day to day BM&O (cleaning maintenance). The facility management consists of activities that are connected to managing the building, for example, energy management (Wentzel, et al., 2004). The organization management consist of arranging inventory, administration, cafeteria, buying certain resources, arranging ICT etc. (HEVO, 2015).

In the Dutch NEN 2699 codes the different components of (I) building preservation management and (II) facility management are discussed. The NEN 2699 has defined these components in terms of costs, these costs however also reflect certain tasks. The building preservation costs and facility management cost can be divided into the fixed costs, energy cost, maintenance costs, administrative management costs and Specific organizational cost (NEN, 2013; Dukers, 2004):

- I. Fixed costs: The fixed cost are approximately 70% of the total building management and operations cost. The fixed cost consist of depreciation and interest, real estate tax (OZB), government taxes, annual lease payments (if applicable) and insurance.
- II. Energy cost: The energy cost consist of energy, gas and water cost.



- III. Maintenance cost: The maintenance cost consist of all cost related to keeping the condition of the building and installations within the building up to the mark. The maintenance cost can be divided into technical maintenance and day to day maintenance (cleaning, gardening etc.)
- IV. Administrative management cost: Administrative management cost are all cost the owner and user makes for the management of the building. Examples of administrative management cost are contract fees, cost caused by renting, marketing cost etc.
- V. Specific organizational cost: The specific organizational costs result from the operation and use of the building. These cost are, for example, surveillance and security cost.

### 2.3.2 Connection building management and operations and ownership

Not all BM&O cost, and tasks, are the responsibility of the building owner (Dukers, 2004). In Table 3 the difference in responsibility between building owner and building user for the different building preservation cost/tasks and facility management cost/tasks are shown. In addition to the tasks/costs within this table, the building user is also responsible for the organization management and the associated cost. This split in responsibilities shows that ownership of the building is tightly connected to the choice for a BM&O model.

The division of tasks between the owner and the user of the building, and the fact that the organization management of the building is part of the BM&O, causes that the partners within a community school need to collaborate. By collaborating instead of all carrying out the BM&O responsibilities by themselves BM&O can be carried out more efficiently. To collaborate the partners have to make a certain decision towards a BM&O methodology.

According to the VNG and Oberon (2006), determining and agreeing on a certain ownership and BM&O model takes approximately 2 years in new community school developments. Determining an ownership and BM&O model therefore has to be done in the beginning of the process to develop a new community school (the initiative phase, before the program of requirements, design and construction have been completed). When the ownership and BM&O model is not kept in mind during the design phase of a new community school this sometimes can lead towards problems that are difficult to dissolve or can even be insurmountable (VNG/Oberon, 2006).

In community school literature signs can be found that to select a certain BM&O model the ownership situation is important. In the rent act, for example, is stated that, legally speaking, the owner of a building that leases the building is obligated to maintain the leased property in such a condition that it is, and will be, appropriate for the function for which it is rented (Knaap, 2009). Because of this obligation it is clear that ownership model is linked to the responsibility for the owners part of the building management and operations. Furthermore, in the publication by van der Knaap (2009) is mentioned that in case of multiple owners of the building, the building management and operations models often become more complex. Because the ownership model an BM&O models are connected to each other this study will focus on both.

Building owner BM&O	Building User/tenant BM&O
<b>Fixed cost</b>	
Interest	Interest for user facilities
Depreciation	Depreciation for user facilities
Leasehold	Lease (If applicable)
Owners part OZB	Users part OZB
Water board taxes	Pollution charges
Municipal taxes real estate (Precario)	Waste charges
Government taxes	Sewage charges
Building insurance	Environmental charges
Fire insurance	Municipal taxes user (Precario)
Storm insurance	Home content insurance
Liability insurance	
<b>Energy cost</b>	
-	Energy
	Gas
	Water
<b>Maintenance cost</b>	
Technical maintenance (common areas, outside and big repairs)	Technical maintenance user facilities
Installation maintenance (heating, ventilation, cooling)	Installation maintenance user facilities (lights, security, electronics etc.)
	Maintenance inventory
	Cleaning maintenance (inside and outside)
	Garden maintenance
<b>Administrative management cost</b>	
Rental cost	Agency fee (in public real this fee estate not very common)
Accountancy	Accountancy
Personnel building management owners part	Personnel building management users part
<b>Specific organizational cost</b>	
Surveillance (owners part)	Surveillance (users part)
	Security

Table 3. Fixed cost and responsibilities dived between owner and user (Dukers, 2004; Wentzel, et al., 2004)

In publications by Oberon, Sardes and VNG, which are all respectable research organizations, or foundations, involved in the formulation of law and legislation towards public subjects, also the ownership, building management and operations models are often mentioned in relation to each other. In the guide for the development of community schools (Oberon/Sardes, 2007) is, for example, stated that part of choosing a BM&O model is to choose an ownership model (Oberon/Sardes, 2007).

In the publication by Verspeek (2010) also the ownership models and the BM&O models are linked to each other. The aim of the research by Verspeek was to make a decision tree to help municipalities, but also other participants connected to a community school, in making a decision concerning ownership and building management. The decision tree has been made based on a literature review, interviews with experts and participants within community schools. In her model she mainly focused on whether participants or the municipality want, and can be, the owner of the building and want to be responsible for the building management and operations. Although this of course is an important question the factors that influence the “want and can be” question are not specified within the decision tree model.

For this study it is important to know in which direction the causality between the choice for and ownership model and BM&O model exists (BM&O → ownership or ownership →

BM&O). If the direction of this relationship is known the ownership DAG and BM&O DAG can be linked to each other. In the literature that has been reviewed the comments about the direction of the relationship are inconsistent and experts on the subject of this study do not all agree on the direction of the relationship (Verspeek, 2010; VNG/Oberon, 2006; Knaap, 2009). In general therefore it can be concluded that there is no consensus in literature and practice about the causality of choosing an ownership model and choosing a BM&O model. Which decision influences the other decision is not clearly and unambiguously stated. It is however clear that it is important to choose a ownership and BM&O model that suits the organization to prevent problems during the existence of the community school.

## **2.4 Law and legislation influencing community schools**

### **2.4.1 Law and legislation educational accommodation**

Schools, and some of the other organizations within a community school initiative, are bound by law and legislation that influences their responsibility for the investment in a new building, and the responsibility for certain BM&O tasks. In recent years a lot has changed concerning these law and legislation for schools. In 2015 a radical shift took place in the tasks and responsibilities for municipalities and primary schoolboards. Lots of tasks are being decentralized, which causes that primary schoolboards need to become more professional (PO Raad, 2015). Primary Schools have gotten more responsibilities concerning the maintenance of the building, but they also inherited the consequences of backlog in the outside maintenance of school buildings because of a “cold transfer” of responsibilities from municipalities to schoolboards. Furthermore, schoolboards almost never have any reserves for big maintenance tasks that are often due in the coming years because of the age of the school buildings. Next to the issues regarding ownership, BM&O that were already present before the changes in law and legislation, these problems causes the subject of ownership, building management and operations to be very present again in the primary school sector.

The WPO is the law that applies to the development and maintenance of primary school buildings. Within this laws the funding and responsibilities for primary education are set out (Rijksoverheid, n.d.). Based on the WPO the municipalities gets funding from the ministry of internal affairs to finance their responsibilities and the schoolboards get funding from the ministry of education, Science and Culture (lumpsum budget and presetatiebox) (Rijksoverheid, n.d.).

Next to these laws the VNG (Vereniging Nederlandse Gemeente) has also formulated certain municipal model regulations. Municipalities can choose to adopt these model regulations but are not obliged to adopt them without changes. Therefore it is possible that these regulations are not the same in every municipality. The model regulations that can apply to the development of new school buildings are:

- I. Model regulations educational accommodations (Dutch: Modelverordening voorzieningen huisvesting onderwijs)
- II. Model policy guidelines for physical education rooms for primary education, special primary education, special education and secondary special education (Dutch: Modelbeleidsregel bekostiging lokalen bewegingsonderwijs voor basisonderwijs, special basisonderwijs, speciaal onderwijs en voortgezet special onderwijs)

In the next paragraphs the content of these laws and model regulations, relevant to this study, will be discussed. In Figure 6 an overview is given of the general responsibilities for municipalities and schoolboards based on these laws and model regulations.

#### 2.4.2 Law and legislation new construction of primary education school buildings

Based on the WPO the municipality has duty of care for the following tasks:

- I. Development and expansion of (new) school buildings
  - II. Development of temporary buildings
  - III. Shared use of school buildings (lease)
  - IV. Construction errors (For example ,asbestos)
  - V. Recovery in case of special circumstances (For example, theft, fire, storm etc.)
  - VI. One time care for inventory at the completion of construction
  - VII. Insurance and OZB (linked to BM&O)
- (PO Raad, 2015; HEVO, 2015)

Duty of care means the municipality is financial responsible for these tasks and has to accommodate these tasks. Although the municipality has duty of care for these tasks that relate to the construction of a new community school the schoolboard however is the client (Dutch: bouwheer) in case of the development of a new school (PO Raad, 2015). In more complex community schools (many different partners) the responsibility of the schoolboard is sometimes shifted towards the municipality (PO Raad, 2015). In some community school developments another partner than the municipality or schoolboard is financing and constructing the new school building. In this last case the municipality still has duty of care for the above mentioned responsibilities and can, for example, lease the square-meters educational space within the building from this partner or third-party (VNG, 2016). In general however the municipality provides funding for new school developments and the schoolboard is the client and therefore determines the requirements for the school building (PO Raad, 2015).

In recent years also a new shift towards complete decentralization is occurring (Oberon, 2012). In case of complete decentralization the budget the municipality provides for new school developments is transferred towards the school board (PO Raad, 2015). The schoolboard can decide for themselves how to use the budget within certain boundaries (PO Raad, 2015). If a schoolboard and municipality choose for complete decentralization the municipality still has duty of care (financial responsibility) for its assigned tasks, the schoolboard however has the responsibility to carry out the tasks (PO Raad, 2015). When the municipality and schoolboard agree on complete decentralization the schoolboard has to become more professional and proof they satisfy certain quality requirements concerning knowledge about finance, good management and making clear agreements (PO Raad, 2015).

#### 2.4.3 Ownership of primary education school buildings

In the general situation (municipality finances new school building and schoolboard is client) the ownership of the building has to be transferred from the municipality towards the schoolboard before or after the construction of the new school building. Based on the WPO the basic principle is that the schoolboard becomes owner of the building (Seakle Satter, 2016). The municipality and the schoolboard can however arrange the ownership in a

different way. Especially in community school developments, in which a lot of actors are involved this often happens (VNG, 2016).

In practice a distinction is made between legal ownership and economic ownership (claim rights) of school buildings (VNG/Oberon, 2006). In the law (WPO) this distinction is not made (VNG/Oberon, 2006). The confusion is caused by the fact that in the WPO is stated that at the moment the school building is not used for educational purposes, the ownership will automatically transfer towards the municipality (the municipality can claim the building) (Ruimte-OK, 2012). In case the municipality leases the school building this claim right of course does not apply since in that case the building is owned by another party than the municipality or the schoolboard.

#### 2.4.4 Building management and operations

Concerning building management and operations of primary school buildings a shift took place in 2015 (PO Raad, 2015). Until 2015 municipalities were responsible for outside maintenance of school buildings and schoolboards were responsible for inside maintenance. From 2015 onwards schoolboards are responsible for both inside and outside maintenance (PO Raad, 2015). Next to inside and outside maintenance of school buildings, schoolboards are also responsible for cleaning (costs), depreciation cost of furniture, personnel cost etc. (Rijksoverheid, n.d.). To finance these activities the government provides the schools with the Lumpsum budget (Rijksoverheid, n.d.). The height of the Lumpsum budget depends on the number of students, the age of the students, type of education etc. (Rijksoverheid, n.d.). The Lumpsum budget can be freely used by the schoolboards within boundaries set by the government (Rijksoverheid, n.d.). This means the budget has to be spend on maintenance and personnel, but the exact distribution of the funding between these activities is not obligatory. In general the part of the Lumpsum budget that is meant for maintenance is very limited and often not enough to carry out the maintenance in a sufficient way (Segment, 2016). In addition to this, because of the freedom in how to spend the budget, often parts of the Lumpsum meant for maintenance are used for personnel (Segment, 2016). Because the budget is already limited and sometimes used for the primary process of the school, maintenance is often postponed or not carried out sufficiently (Segment, 2016).

To summarize this paragraph, in Figure 6 the different responsibilities between municipality and schoolboard, and the budgets accompanying these responsibilities are shown.

#### 2.4.5 Law and legislation: Responsibility for other services within community schools

Within community schools not only a school is present, but there also other services are located within the building. Although the municipality is responsible for the development of new school buildings or expansion of existing school buildings it is not responsible for providing space for some of the other (private) partners. Often however the municipality does benefit from this combination of services within one building (Oberon/Sardes, 2007).

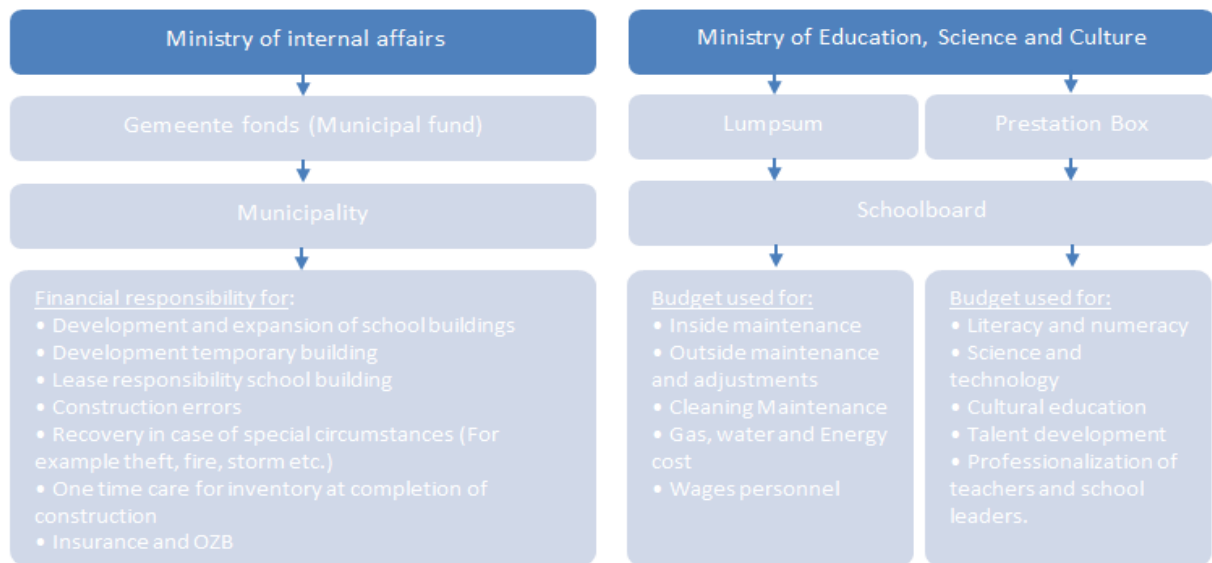


Figure 6. Responsibilities municipality and Schoolboard concerning funding school building, building management, operations and primary processes (Rijksoverheid, n.d.; VNG, 2014; HEVO, 2015)

Concerning these other parties within the community school the municipality has no duty of care for providing/funding space. In some cases however there is a possibility for subsidy, the activities of participants are covered by a specific law or regulation or the organizations get indirect funding (Childcare for example). These subsidies for participants are sometimes linked towards the development of new accommodations and sometimes meant for certain activities or services. For example, historically speaking municipalities often provide subsidies towards public libraries in case of the construction of a new library or for the building management and operations of the building (Vereniging van Nederlands Gemeenten, 2011). In Table 4 a list of participant/services that are often, or sometimes, included in community schools is shown. In this list is stated which duties municipalities, provinces and the national government have towards these service providers. In this table the indirect funding has not been included.

Next to the duties municipalities have towards participants based on law and regulations, and the subsidies they provide, it is also possible to provide state aid in the development of a community school by, for example, selling land for a lower price. Lots of municipalities own land within their own municipal borders. There are different reasons why municipalities would do this, but one of them is to stimulate the development of public goods such as social housing, infrastructure etc. (Buitelaar, 2010) or to stimulate a development that can have a positive influence on the livability of neighborhoods or certain social groups (such as a community school). When a municipality wants to provide state aid they have to keep in mind the Minimis threshold or they have to report the transaction to the European commission (Europa decentraal, n.d.).

Sector	Possible participants	Responsibility or support		
		Municipality	Province	National government
Education	Primary education	X (WPO)	-	X (Lumpsum)
	Special primary education	X (WPO)	-	X (Lumpsum)
Community	Community centre	X (Subsidy)	-	-
	Youth work	X (Subsidy)	-	-
	Community work	-	-	-
Childcare	Childcare 0-4 years	-	-	-
	Afterschool care 4-12 years	-	-	-
	Lunchtime supervision	-	-	-
	Day arrangements	-	-	-
Preschool	Preschool 2-4 years	X (Subsidy)	-	-
	Preschool and early childhood education	X (Subsidy)	-	-
Healthcare	Youth healthcare	X (WMO)	-	-
	GGD (Public health service)	X (WMO)	-	-
	Social work	X (WMO)	-	-
	Youth Care Office	X (WMO)	-	-
	Centre for youth and families	X (WMO)	-	-
Culture	Library	X (Wsob and Subsidy)	X (Wsob)	X (Wsob)
	Centre for the arts	X (Subsidy)	X (Subsidy)	X (Subsidy)
	Institution for arts education	X (Subsidy)	X (Subsidy)	X (Subsidy)
	Musical education	X (Subsidy)	X (Subsidy)	X (Subsidy)
	Museum	X (subsidy)	X (Subsidy)	X (Subsidy and collection management)
	Dance and theatre groups	X (Subsidy)	X (Subsidy)	X (Subsidy)
Sports	Sports club	X (Subsidy)	X (Subsidy)	X (Subsidy)
	Professional sports club	-	-	-
	Municipal sports and recreation service	X (Subsidy)	X (Subsidy)	X (Subsidy)
Government	Municipality	X	-	-
	Province	-	X	-
	National government	-	-	X

Table 4. Possible participants within community schools and the duties of municipalities towards these participant (VNG/Oberon, 2006) (and multiple references about government funding)

## 2.5 Ownership models community schools

### 2.5.1 Different types of ownership models

Because of the multiple public and private users within a community school building, and the split responsibility between municipality and schoolboard for the development and management/maintenance of school buildings, choosing an ownership model for a community school can be quite challenging. Choosing an ownership model is very important since it is expected that the choice for a BM&O model is influenced by the chosen ownership model (Oberon/Sardes, 2007). Furthermore, the owner of a leased (school) building legally has certain responsibilities such as maintaining the building, and is responsible for certain risks, for example, vacancy risk (Knaap, 2009). Not all participants are willing to be responsible for these tasks and risks. In literature different ownership models for community schools are discussed. In most literature a distinction is made between:

- I. ownership in the hands of one party
- II. split ownership

(VNG/Oberon, 2006; Stichting Brede School Nederland, 2006; Verspeek, 2010; Knaap, 2009).

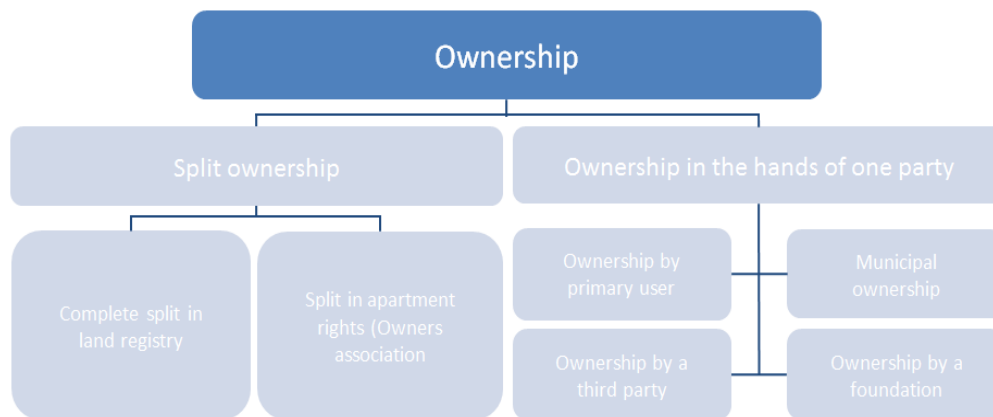


Figure 7. Ownership models (figure based on: VNG/Oberon (2006), SBSN (2006), Verspeek (2010) & van der Knaap (2009))

In case of ownership in the hands of one party the possible owners are: the municipality, one of the primary users, a building management foundation or a third-party (in most cases a Housing corporation) (VNG/Oberon, 2006; Stichting Brede School Nederland, 2006; Verspeek, 2010; Knaap, 2009). In case of split ownership there is either an owners association, or the building has been completely split in the land registry (Dutch: Kadaster) (SBSN, 2006). The completely split ownership is a bit out of date. In more recent publications (Oberon/Sardes, 2007; Knaap, 2009; Verspeek, 2010) this ownership model is not included anymore.

In the publication by Verspeek (2010), next to the distinction in ownership in the hands of one party and split ownership, also a distinction is made between ownership of the land and ownership of the building. In this case the ownership of the building is different from the ownership of the land. The building owner(s) leasehold the land from the landowner (often the municipality) for a certain amount of time (Verspeek, 2010). Depending from the leasehold conditions it is possible that when the leasehold ends the landowner/municipality becomes the owner of all the real estate build on the land (Bouwhuijsen, 2016)<sup>1</sup>. According to Verspeek (2010) a reason for municipalities to leasehold land to a community school is to ensure a certain influence on the community school building and organizations during and after the leasehold period. How this influence is given shape is depended from the contracts and conditions between the landowner and leasehold party (Bouwhuijsen, 2016). In this study the leasehold scenario is not considered because this does only apply to a limited number of community schools (mainly in Amsterdam). In Figure 7 an overview of the different ownership models discussed in the next paragraphs can be seen.

The different ownership models all have pro's and con's. In Table 5 the pros and cons for the six different models are shown. In the next few paragraphs the different ownership models are explained more extensive. In Figure 8, Figure 9, Figure 10, Figure 11, Figure 12 and Figure 13 the different ownership models are shown schematically.

<sup>1</sup> Van den Bouwhuijsen is specialized in construction law, tenancy law, procurement law and contract law. Within HEVO she is involved with the construction of ownership models for community schools and specifying the contracts associated with these models. 19 September 2016 an interview took place in which she elucidated the legal side associated with community schools.



### 2.5.2 Ownership in the hands of one party: The Municipality

In case of municipal ownership of the community school building, a lease agreement will be made with all the users within the building, with an exception for the school (since the municipality has a care of duty towards the educational function) (Oberon, 2006). The municipality and school often make an agreement in which the school gets user rights for the building that are similar to the right they would have in case of ownership (Oberon, 2006).

Normally the owner of the building is responsible for the owners part of BM&O. In the WPO is however stated that the school is responsible for inside and outside maintenance of the building and gets funding to carry out this maintenance (PO Raad, 2015). Because of these responsibilities, additional agreements have to be made concerning maintenance in case of municipal ownership. In some cases the schoolboard transfers the money for inside and outside maintenance towards the municipality (Houët, 2016)<sup>2</sup>. The municipality than will carry out of the maintenance. A downside of this agreement is that the schoolboard has little influence on the inventory of the school (Houët, 2016). In other cases a more common tenant/landlord agreement is made in which the landlord (municipality) is responsible for the maintenance of all immovable property and the tenants are responsible for the movable properties within the building (Houët, 2016). In this case only a small part of the maintenance budget of the schoolboard is shifted towards the municipality (Houët, 2016).

In this ownership model the municipality is responsible for the risks associated with owning, and leasing a building. In return the municipality gets influence on the composition of users within the building and the users part of the BM&O (Knaap, 2009). Other users of the building therefore have less influence.

### 2.5.3 Ownerships in the hands of one party: Primary User

In case of ownership by one of the primary users mostly the ownership is in the hands of the biggest and most decisive user (Knaap, 2009). The other users of the building lease from the primary user. Often the schoolboard is the primary user that owns the building. It is however also possible that, for example, a big childcare organizations is the primary user, or one of the other main participants. In case another party than the schoolboard is the owner of the building, the municipality leases the spaces needed for education, and the school lease-lends these spaces from the municipality (Gemeente Oss, 2014). The other users within the building will lease their space from the primary user.

In this ownership model the primary user is responsible for the legal responsibilities of the building owner and the risks associated with owning, and leasing a building (Knaap, 2009). In return the primary users gets more influence on the composition of users within the building, the users part of the BM&O and possible profits are to the benefit of the primary user. Depended from the chosen BM&O model (paragraph 2.6) it is possible for the municipality to keep influence on the community school development during the user phase.

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<sup>2</sup> Wouter Houët is advisor/consultant at HEVO. He is specialized in helping schoolboards, municipalities etc. with their accommodation issues, especially in case of the development of community schools. He is also the company supervisor from HEVO connected to this research.

Pros	Cons
<b>Ownership in the hands of one party: The municipality</b>	
The municipality has control over land and building.	Because of the investment in real estate the municipality cannot use the financial resources for the primary process of the municipality.
The municipality can control which organizations are using the building and thereby controlling the social character of the community school.	The municipality has to establish a (lease) administration. This is something that is not part of their primary process.
The municipality can define the rent and thereby influence social organizations to join the initiative.	Depreciation of real estate is completely charged on the municipality.
Appreciation of real estate is completely in favor of the municipality.	Other participants within the community school have limited influence.
<b>Ownership in the hands of one party: Primary User</b>	
The primary user has a lot of influence on the formation of organizations within the building.	In case the schoolboard is owner this has effect on the position of the other tenants in the building.
The primary user has a lot of influence on the structure of the community school, the owners part of BM&O.	The owners park BM&O risk, in case of vacancy lies with the primary user.
Lease profits are completely in favor of the primary user (except when the schoolboard is owner).	The municipality has limited influence on the formation of organizations within the building.
<b>Ownership in the hands of one party: Third Party</b>	
Often third parties that invest in real estate have knowledge about managing and owning a building. This causes third parties to be a solid partner.	Process often takes longer because many things need to be arranged (contracts).
Municipality and organizations transfer responsibility/risk for vacancy, owners part BM&O towards a third-party.	Municipality and participants transfer influence on selection of organizations and the owners part of BM&O to a third-party.
<b>Ownership in the hands of one party: A building management foundation</b>	
Possibility to include municipality in foundation and therefore give some influence on the structure of the community school towards the municipality (this is however not obligatory).	Complicated ownership structure.
All (major) tenants within the building have the possibility to have a say towards the owners part of BM&O and community school structure.	Amount of actors, and conflicts of interest, within the foundation can have a negative effect on the decision-making process.
<b>Split ownership: Building split in apartment rights in combination with an owners Association (VvE)</b>	
All organizations have a say about their own part of the building.	Complicated ownership structure in comparison to most of the constructions in which one party is owner.
The owners Association is forced to make a fund for maintenance of the building (can also be considered negative).	Notarial splitting the building and the foundation of an owner association costs money.
The building management and operations can be carried out by the VvE, no other organization or foundation has to be founded to do this.	An owners association is entitled to mandatory law. This can limit the flexibility of the organization.
A lot of the agreements between the different participants are already given based on mandatory laws for owners associations. This means the process of agreeing on certain things will be shorter.	Organizations can sell their apartment right which causes a new organization to become part of the owners association. This can have a negative effect.
	In case the voting ratio is based on floor ratio, one of the primary users can determine the decision-making process.
	Every apartment right owner is responsible for its own building part. Collaboration between the owners is not always necessary and can be limited. This does not suit the idea of a community school.
<b>Split ownership: Complete split</b>	
A split of the building in the land register can be a good option in case of multiple buildings that form one community school campus in which collaboration between partners is minimal.	Does not connect to the idea of a community school.
	Building design has to complement this type of split.

Table 5. Pros and cons of the various ownership models (Oberon/Sardes, 2007; Knaap, 2009; Segment, 2016)

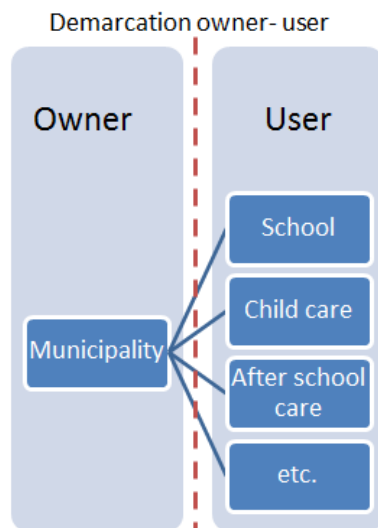


Figure 8. Ownership by the municipality (HEVO, 2016)

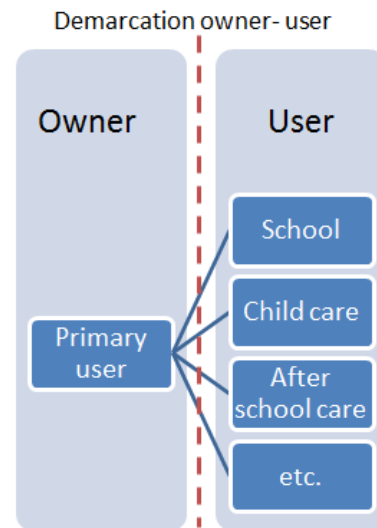


Figure 9. Ownership by a primary users (HEVO, 2016)

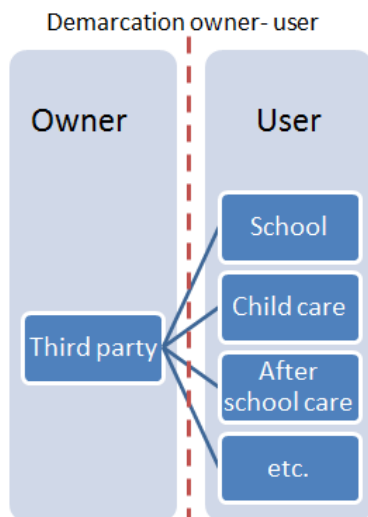


Figure 10. Ownership by a third-party (HEVO, 2016)

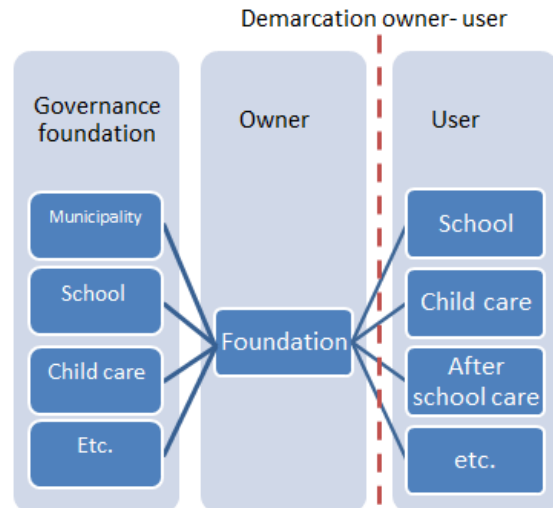


Figure 11. Ownership by a building management foundation (HEVO, 2016)

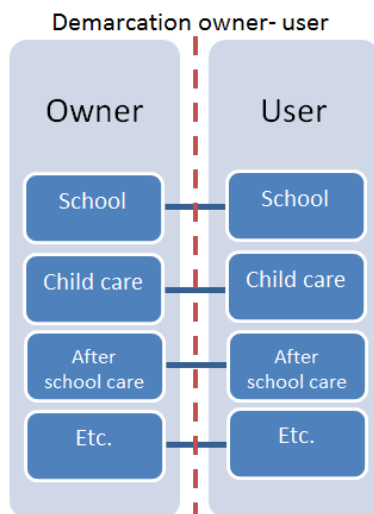


Figure 12. Ownership complete split (SBSN, 2006)

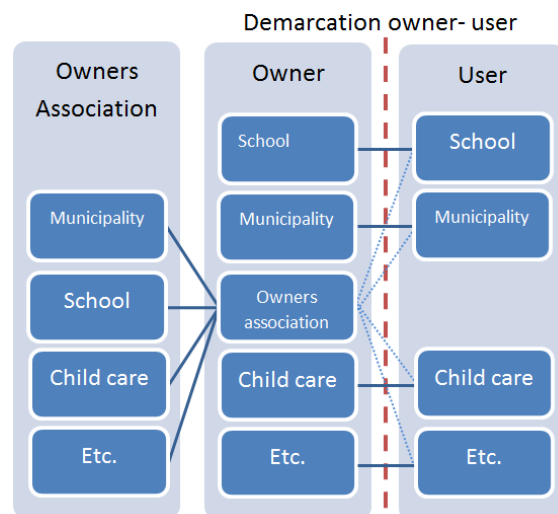


Figure 13. Ownership by an owners association (edit based on (HEVO, 2016))

In case the schoolboard is the primary user, of the building, the shared use regulations of the housing facilities regulation of the municipality (Dutch: mede gebruiksregeling verordening voorzieningen) and the WPO have to be kept in mind (VNG/Oberon, 2006). In this law a distinction is made between lease and shared use. Parties that can use a school building based on shared use are other schools, cultural organizations, social organizations or organizations with a recreational function (Baas, 2011). The participants that can use the building based on shared use pay a break-even charge. Private parties, such as childcare organizations, have to lease space within the school and thus pay a lease fee instead of a break-even charge (Baas, 2011).

#### 2.5.4 Ownership in the hands of one party: Third-party

In most literature ownership in hands of a third-party is explained as ownership by a housing corporation. Recently (2015) however law and legislation towards the tasks of housing corporations has changed (Aedes, 2015). Because of this change in law and legislation housing corporations are no longer allowed to build or manage new community school buildings (Aedes, 2015). Ownership of community school by housing corporation is comparable to the ownership by a third-party (Knaap, 2009; VNG/Oberon, 2006; Verspeek, 2010). This third-party can either be a housing Corporation (before 2015), or in more recent developments (after 2015), an investor or private organization (Verspeek, 2010). In practice however there are almost no third parties (investors or private organizations) that invest in community school buildings. Housing corporations still had a public interest in the developments. The investors and private parties however only focus on making profit. Since this focus on making profit does not connect to the vision of public parties and public real estate, and housing corporation are not allowed to own new community schools (Knaap, 2009), this ownership model does not occur that often after 2015.

In case of ownership in the hands of a third-party the users of the building pay rent to the building owner (Knaap, 2009). Just as in the ownership model in which a primary user other than the schoolboard owns the building, the municipality will lease the space needed for education and will lease-lend it to the school. In case of ownership by a third-party, the third-party is responsible for owners part of BM&O and thus carries the risks of the investment. A downside to this ownership model is that the users of the building or the municipality do not have any influence on the user part of BM&O or which function will be included in the building (Verspeek, 2010).

In case of lease in a multi-user building often the lease sum is constructed of a lease sum for the rooms that are used individually, and the lease sum for the space that is used collectively (Gemeente Oss, 2014). Furthermore, in the rent also a compensation for the cost of maintenance of the building and other service cost are included. In this case, the municipality and schoolboard have to make additional agreements about which part of the rent is the responsibility of the municipality (Duty of care) and which part of the rent is the responsibility of the schoolboard (maintenance). Another option is to transfer the budget for school accommodations from the municipality towards the schoolboard (schoolboard pays rent + service charge), or transfer a part of the budget for maintenance of the schoolboard towards the municipality (municipality pays rent + service charge).

In this ownership model the third-party is responsible for the legal responsibilities of the building owner and the risks associated with owning, and leasing a building (Knaap, 2009). In return the profits are to the benefit of the third-party. Building users and the municipality don't have much influence on the users part of the BM&O or users composition of the building.

#### 2.5.5 Ownership in the hands of one party: A building management foundation

In literature this ownership model is not yet included. In practice however this ownership model sometimes occurs. The ownership model in which a building management foundation, or other legal form, is founded, is quite new and innovative. This model is, for example, used in Community school Culemborg Oost (Stichting Maatschappelijk Vastgoed, 2016). In case of ownership in the hands of a building management foundation, a legal form is founded in which the governance of the foundation is arranged by the (primary) users of the building and sometimes the municipality (HEVO, 2016). A reason for the municipality to be part of such a foundation is to have a certain influence and say in the user composition of the building and the users part of the BM&O of the building.

The users of the building lease from the foundation. All users have to pay rent to the foundation and thus also the municipality has to pay rent for the space the school leases. In case of the school either the school pays the rent (complete decentralization), or the municipality pays the rent and additional agreements have to be made about the part of the rent that is meant for maintenance. The foundation will finance the owners part of the BM&O and be responsible for the risk associated with ownership. When a building management foundation is founded it appears that the risk of leasing the building, and the risk of building management and operations is hedged by a third-party, however, in reality, users are leasing of their own (HEVO, 2016). Therefore it is important to make arrangements about risk distribution within the foundation (HEVO, 2016).

Ownership by a building management foundation gives the users of the building the possibility to divide the risks associated with owning a building, work together in relation to the owners part of the BM&O and it is possible to use the foundation for other purposes than only owning the building (for example, to arrange substantive collaboration). When setting up a foundation, or other legal form, the mandatory laws influencing the legal form have to be kept in mind. In case of a foundation for example, profits may not be distributed (Ondernemersplein, n.d.). Furthermore, the more organizations that are part of the foundation, the harder it is to reach agreements on certain issues.

#### 2.5.6 Split ownership: Complete split

In older literature this model is still included but side notes are being made about whether complete split ownership fits the idea of a community school (SBSN, 2006). In newer publication this model is not mention anymore (Oberon/Sardes, 2007; Knaap, 2009; Verspeek, 2010).

In case of completely split ownership every user owns their own building part, and in general there are no common areas or shared uses. Because of the structure of this ownership model, it does not really fit the idea of a community school (SBSN, 2006). Furthermore, the

building design has to accommodate this ownership model. When, for example, installations within the building are being shared or the building has multiple floors (and therefore common entrances and installations) this ownership model is not sufficient since secondary agreements between the building users have to be made about the ownership and management of the shared building parts (Bouwhuijsen, 2016).

When choosing for a complete split of ownership all the users own their own part of the building which means they have less locational flexibility. In case of a lease contract it is easy to terminate the lease. In case of ownership selling the real estate can be challenging since community school buildings are often designed specifically for a certain user and are therefore not very flexible.

#### **2.5.7 Split ownership: Building split in apartment rights in combination with an owners Association (VvE)**

In case of split ownership in combination with an owners association the building is split into apartment rights (Knaap, 2009). Every owners has exclusive use for their building part that is owned by them based on their apartment right (Knaap, 2009). When there are also common areas within the building, the ownership of these spaces is divided between the building owners and managed through the owners association (VvE) (Knaap, 2009).

As discussed by HEVO (2016), in community schools it also occurs that the schoolboard owns the educational areas, and the municipality owns the other building parts. The other users within the building than lease these common areas from the municipality. The common areas are still managed through the VvE. Another option is that the municipality only owns the common areas of the building and the users own the part of the building they use individually (Segment, 2016). By doing this the municipality keeps influence and say on the user composition and users within the building and the BM&O through the VvE.

In this ownership model the building users are fully responsible for their own building part and therefore they have full control (Knaap, 2009). Furthermore, all apartment right owners have a say in what will happen with the common parts of the building (Verspeek, 2010). The downside of this model is that the model is quite complicated and sometimes coming to an agreements within the VvE will costs a lot of time (Knaap, 2009). When splitting a building into apartment rights automatically a VvE will be established and therefore the BM&O model will automatically also be the VvE model. Establishing a VvE when splitting a building in apartment rights is part of mandatory law in the Netherlands (Nederland VvE, n.d.)

## **2.6 Building management and operations models**

### **2.6.1 Different types of building management and operations models**

In literature four different BM&O models are presented:

- I. No regulated BM&O
- II. Split building BM&O
- III. Combined building BM&O
  - a) Combined BM&O in a foundation or cooperation
  - b) One primary user arranges BM&O on behalf of all users

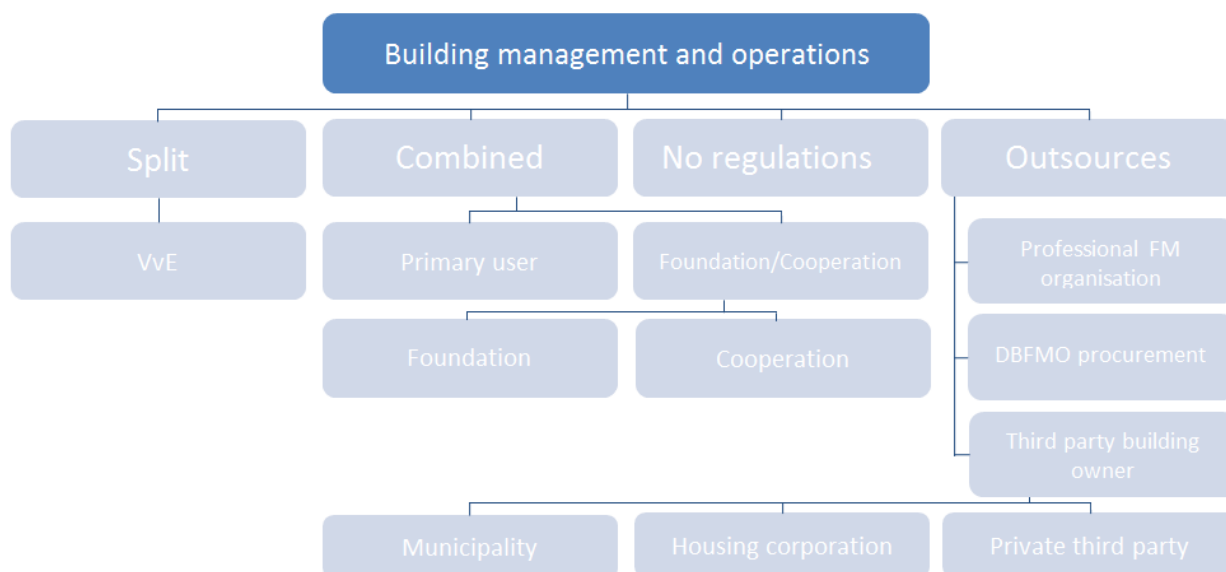


Figure 14. Building management and operations models (Verspeek, 2010)

#### IV. Outsources BM&O

- a) Outsources (DBFMO or contracting a professional organization after construction)
- b) Outsources towards an third-party owner

(VNG/Oberon, 2006; Oberon/Sardes, 2007; Verspeek, 2010)

Choosing the right BM&O model is important because it can either improve the collaboration within the building or cause friction between the community school users (VNG/Oberon, 2006). In case nothing has been arranged concerning BM&O the chance on friction is the largest since there are no agreements or contracts to fall back on (VNG/Oberon, 2006). In 2006 and 2016 it seemed that BM&O models in which the building was managed together (combined BM&O) were most successful since this also connects to the idea of collaboration between the different users within the community school (VNG/Oberon, 2006; Oberon, 2016). When splitting the BM&O between the different participants this does not connect to the idea of a community school. Furthermore, cost benefits because of economies of scale disappear (Verspeek, 2010; Oberon, 2012). In case of outsourcing the autonomy and control of the building is partially handed over to another party (Verspeek, 2010; Oberon, 2006). Often the collaboration within the community school does not benefit from this since the partners within the school have to collaborate less when the BM&O is outsourced (Verspeek, 2010). Outsourced in this case means that none of the building users is involved in the BM&O. Therefore, when a third-party is the building owner and responsible for the management of the owners and users part of the building, BM&O is considered outsourced.

Important to note is that in case of a split between owner and building manager (either outsourced, transferred to a primary user or executed by a foundation or association) some tasks of the owner can be transferred to the building manager. As discussed in paragraph 2.3.2, there is a certain split between the responsibilities for the building owner and building user. In case the building owner outsources or transfers the responsibilities to another party

this however does not mean he is not financially responsible anymore for these tasks. In every models additional agreements have to be made about the transference of responsibilities about the owners, users and organizational part of the BM&O, and the division of cost between the different actors involved in the organizational model.

Important to note is that, as discussed in paragraph 2.3.2, the choice for an ownership models and BM&O model influences each other. When ,for example, a foundation has been established that becomes owner of the building this does not necessarily mean that the BM&O also must be arranged in a BM&O foundation (except in case of a split of the building in apartment rights and the establishment of a VvE). Choosing for another BM&O model does however make the construction very complicated. Choosing for a complicated construction can cause that the actors involved lose sight on the arrangements that have been made in the past, or lose sight on which arrangements still have to be made. A complicated construction can cause more conflicts regarding BM&O emerge during the user phase of the building. In general therefore it is best to match the ownership models with the BM&O model to keep the construction as simple as possible.

Every model has pros and cons and fits better with a certain ownership structure. In Table 6 the pros and cons of every model are shown. In Figure 15, Figure 16, Figure 17, Figure 18, Figure 19 and Figure 20 the different BM&O models are graphically explained.

#### 2.6.2 Split BM&O: VvE

VNG/Oberon (2006) have discussed this BM&O model in their publication “Beheer & Exploitatie van brede scholen”. In this publication is stated that in case of split BM&O every participant within the community school takes care of the BM&O of their own apartment right. Every organization will contract its own contractors, suppliers and service providers. In general the VvE is responsible for the owners part of the BM&O for the entire building and the users part of the BM&O of the common building parts. Additional agreements about joining forces for the BM&O of the individual apartment rights, or for example, the organizational BM&O, can always be made. The VvE consist of all the different apartment right owners (Nederland VvE, n.d.).

A VvE is established when a building is split in apartment rights. The VvE is subject to mandatory law (Nederland VvE, n.d.). A VvE has to make a fund for maintenance of the building, which means that all apartment right owners are obliged to pay a certain contribution to the VvE to save money for maintenance (Rijksoverheid, n.d.). Furthermore, a VvE is obliged to have a members meeting once a year.

When choosing for this BM&O model the choice for an ownership model is immediate. When splitting up a building into apartment rights a VvE is established automatically. It is also possible to setup a VvE like organization to manage the BM&O when the building is owned by one party and the users lease the building, but in that case the BM&O model shows more similarities to “combined BM&O: Foundation/Cooperation” since one of the basics for a VvE is that the building has been split in apartment rights and the building is therefore owned by separate entities.



Pros	Cons
Split BM&O (VvE)	
Every organization within the building can make their own organizational and financial decisions about building management and maintenance of their own apartment right, and has influence and say in the BM&O of the common areas.	This type of BM&O is not very cost and time efficient since everyone is carrying out the BM&O of their apartment right individually. The financial benefits caused by carrying out the maintenance of common building parts is minimal.
There is no need for the foundation of a complex BM&O foundation since a VvE can be set up based on model agreements.	Agreeing on certain topics can be hard when there are a lot of actors involved in the VvE.
The model (partially) fits the idea of a community school (collaboration between the participants)	A VvE is obliged to make a maintenance fund which has a negative influence on the financial flexibility of some of the community school actors.
There is a possibility for the municipality to keep influence and say on the community school during the user phase of the building.	
The scope of the VvE can be agreed upon between the different actors which can cause that the BM&O becomes more combined than split between the actors.	
Combined BM&O: Primary user on behalf of all users	
Combined building management is cost and time efficient because not every organization has to take care of it by themselves.	Other actors have less influence on the BM&O in comparison to the model in which the responsibilities are split.
There is one organization responsible for the BM&O, which makes it clear who is responsible for the BM&O of the building.	There is an unequal situation between the different users. Some users might not like this.
This model is easy to realize and coming to an agreement about a subject is very easy since there is only one party that is responsible for the decision.	Not every community school is suitable for this model. The model mainly works in case of one big primary user with knowledge about BM&O.
	The cost advantages that can be created because of economies of scale are relatively small since the organization/building is often not that big.
Combined BM&O: Building management foundation/Cooperation	
Depended from the agreed upon scope of the foundation this model can ensure a more cost and time efficient BM&O.	Organizations have less influence on the BM&O in comparison to the model in which the responsibilities are split.
Within a foundation mostly one contact person is assigned with the tasks of communicating about BM&O	Making agreements can take a long time and be very complex because of the shared responsibilities and authorities.
All users are involved in the BM&O. This enhances the collaboration within the organization. Furthermore, the foundation can also be used for other purposes such as creating a pedagogical vision	The cost advantages that can be created because of economies of scale are relatively small since the organization/building is often not that big.
In contrast to a VvE a BM&O foundation can be easily customized to the specific situation and is, depended from the chosen legal form, less influenced by mandatory law.	Establishing a BM&O foundation and agreeing on the division of tasks and setup of the organizational structure can be complicated and take a long time.
No regulated BM&O	
This model is easy to realize.	When "choosing" for this model the risk of failure of the community school is bigger since there are no agreements to fall back on.
Users are heavily involved in the BM&O of their own building part	Participants are less involved in the community school, there is less collaboration. And thus this type of BM&O does not connect to the idea of a community school.
	This type of BM&O is not very cost and time efficient since everyone is doing things individually that could be done smarter and cheaper when done together. There are no benefits caused by economies of scale.
	There is confusion about responsibility for BM&O of the common rooms.
Outsourcing	
Outsourcing to a third-party that has experience concerning BM&O causes the number of tasks organizations within the community school have to carry out to reduce and thus the actors can focus on their primary business process.	Outsourcing to a public party can be a bit more expensive since they will try to make a profit.
Combined BM&O is cost and time efficient because of economies of scale.	The users of the building are less involved with each other.
A third-party can ensure more continuity and quality concerning BM&O.	It is important that the users of the building make good agreements with the third-party about the scope of the BM&O and the performance.
A facility management organization can also take over administrative tasks.	The third-party often has a weird position between the users and owners of the building.

Table 6: Pros and cons of the various building management and operations models (Oberon/Sardes, 2007; Knaap, 2009; Segment, 2016)

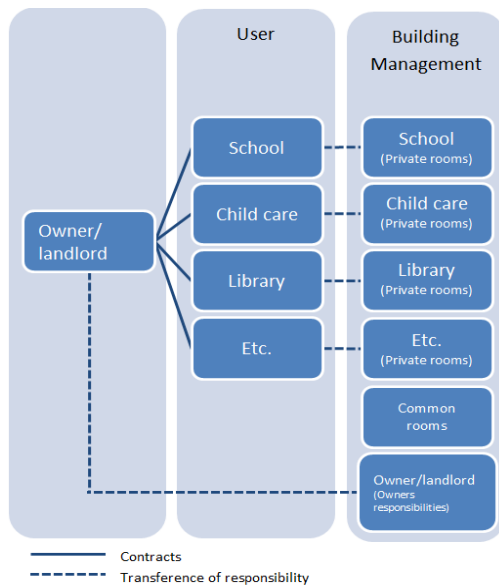


Figure 15. No arranged building management (Edited based on van der Knaap (2009))

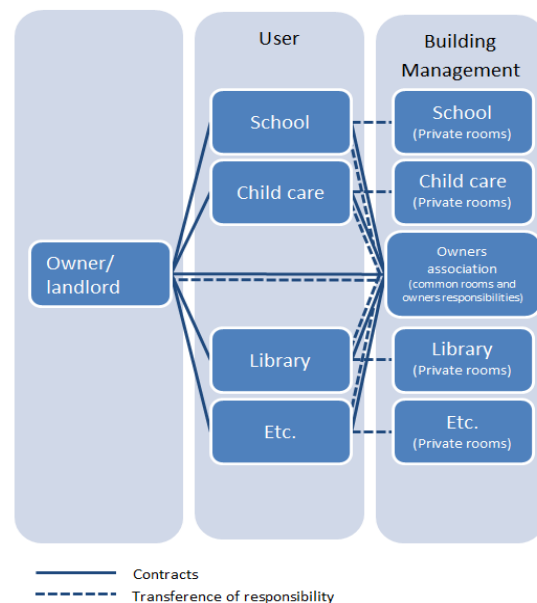


Figure 16. Split building management (VvE) (Edited based on van der Knaap (2009))

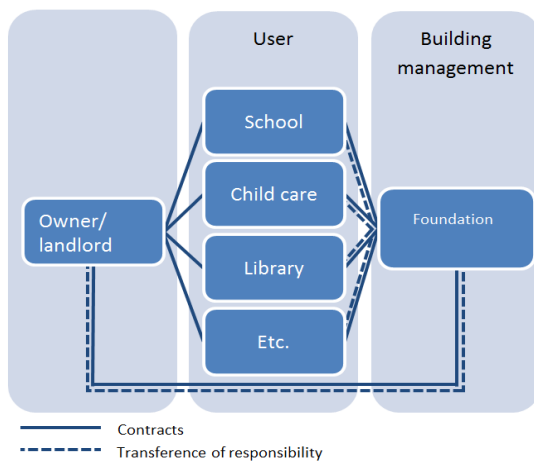


Figure 17. Combined building management: Building management foundation (Edited based on van der Knaap (2009))

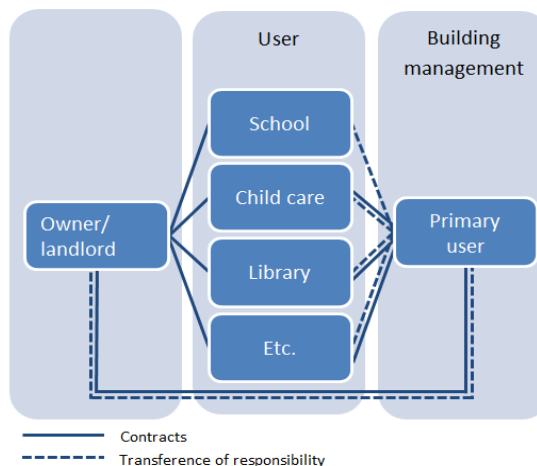


Figure 18. Combined building management: Primary user (Example shows school as primary user) (Edited based on van der Knaap (2009))

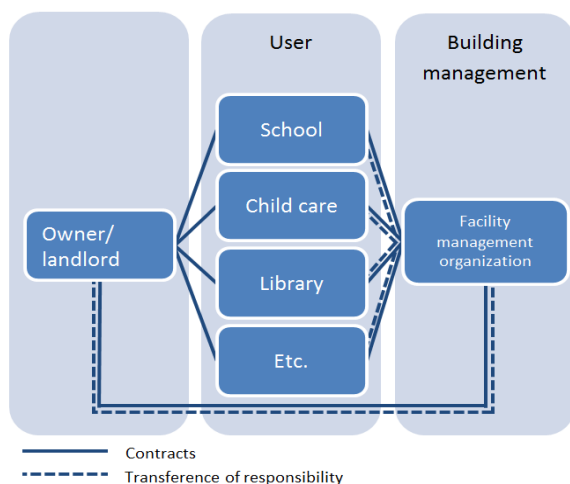


Figure 19. Outsourced building management: FM organization or DBFMO (Edited based on van der Knaap, 2009 and Verspeek 2010)

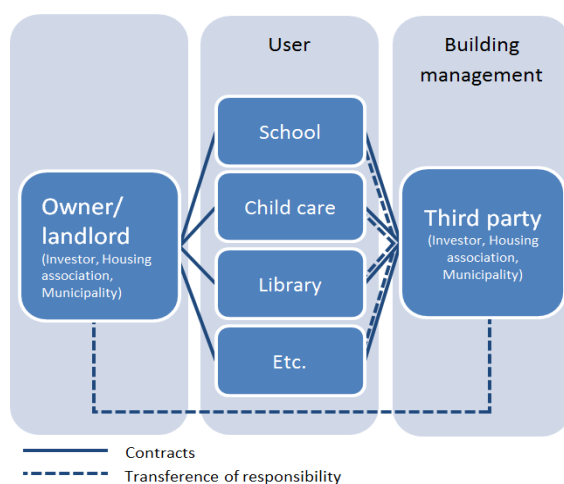


Figure 20. Outsourced building management: Building management by third-party owner (Edited based on van der Knaap, 2009 and Verspeek, 2010)

In “Beheer & Exploitatie van brede scholen” by VNG/Oberon (2006) is stated that a great advantage of this model is that the users within the building have one contact person within the building, although it is possible the primary user will outsource some of the tasks towards contractors. The fact that one building user is responsible for the BM&O has to be accepted by the other building users. The other building users will have less influence on the process (VNG/Oberon, 2006). For some actors this will be an advantage, others might not like this. One of the main advantages of this model is that it can lead to cost reduction because of economies of scale, however this advantage is often very small since the community school organizations are often not that big (VNG/Oberon, 2006).

#### 2.6.3 Combined BM&O: Primary user

In case the responsibility of BM&O lies with one primary users the responsibility for this task is transferred from all individual users towards one user (VNG/Oberon, 2006). Agreements have to be made about the scope of the transference of responsibility (Owners, users and organizational part of BM&O). The primary user coordinates and arranges the BM&O for all the building users. Because the primary user is responsible he will also carry the highest risk in relation to BM&O (VNG/Oberon, 2006). When one of the primary users is responsible for the BM&O often one person within this organization is assigned as main contact person concerning BM&O.

In “Beheer & Exploitatie van brede scholen” by VNG/Oberon (2006) is stated that a great advantage of this model is that the users within the building have one contact person within the building, although it is possible the primary user will outsource some of the tasks towards contractors. The fact that one building user is responsible for the BM&O has to be accepted by the other building users. The other building users will have less influence on the process (VNG/Oberon, 2006). For some actors this will be an advantage, others might not like this. One of the main advantages of this model is that it can lead to cost reduction because of economies of scale, however this advantage is often very small since the community school organizations are often not that big (VNG/Oberon, 2006).

#### 2.6.4 Combined BM&O: Foundation/Cooperation

As discussed by VNG/Oberon (2006) a BM&O foundation is founded by the users of the building. The users share responsibility for the BM&O. Within this foundation the users of the building, sometimes the owner of the building and sometimes the municipality, are represented. Which actors are part of the foundation is dependent from their wanted influence and say and the scope of the foundation. Within the foundation mostly one main contact person is assigned that can be contacted regarding BM&O matters.

Tasks of the BM&O foundation can be the owners part of BM&O, the users part of the BM&O and/or the organizational part of the BM&O. Furthermore, it is possible to discuss and arrange other things than BM&O within the foundation. The scope of the responsibilities of the foundation has to be agreed upon. In addition to the scope also additional agreements have to be made about the division of cost between the different building users, and in optionally with the building owner.

The BM&O foundation model shows similarities to the VvE model, however in case of a foundation the building users have more freedom in how to arrange the BM&O. Furthermore, in case of a VvE the building has been split in apartment rights, in case of a foundation this is not the case.

In literature this model is mostly linked to the legal form foundation, however it is also possible to setup a similar organization model with another legal form, for example, a cooperation. For which legal form the community school chooses can depend from the mandatory law that influence a legal form. A foundation, for example, is a non-profit legal form.

#### *2.6.5 No regulated BM&O*

In 2006 almost half of all community schools had not arranged anything concerning BM&O (Oberon/Sardes, 2007). Often the subject had been discussed during the development of the building but in the end the subject was set on hold. In “Beheer & Exploitatie van brede scholen” by Oberon/Sardes (2007) the effect of not arranging anything concerning BM&O is discussed. Not arranging anything is risky since there are no agreements about cost and use of the building to fall back on in case of friction. The risk of failure for the community school therefore will be bigger (Oberon/Sardes, 2007). Furthermore, the different participants within the building do not collaborate to arrange BM&O which can cause fragmentation between the different users. Because the users do not have to work together this model does not suit the typical idea of a community school.

When the users of a community school have not arranged anything concerning BM&O every participant within the community school takes care of the BM&O of their own building part. Every organization will contract its own contractors, suppliers and service providers. Concerning the common areas of the building no agreements have been made and thus there is no insight in who’s responsibility this will be (Oberon/Sardes, 2007). Although this model is not ideal it is easy to realize since no action has to be taken such as making agreements etc. In the short term this might be easier but in the long term this can cause a lot of trouble (Oberon/Sardes, 2007).

#### *2.6.6 Outsourcing*

When the building users and owners decide they want to outsource the BM&O there are different option concerning parties to engage with. Two options are integrated procurement through a DBFMO contract (Design, Build, Finance, Maintain and Operate), or contracting a professional facility management organization (Verspeek, 2010). Another option, in case of ownership by a third-party, is that this third-party also takes over the users part of the BM&O (VNG/Oberon, 2006). The users of the building than outsource their tasks towards the municipality, housing corporation (before 2015) or an investor. In case of outsourcing it is important that the party to which the BM&O is outsources is sufficiently large (economies of scale) and professional enough to carry out the tasks (VNG/Oberon, 2006).

One of the main advantages of this model is that in case a bigger and more experienced party is responsible for the BM&O this often leads to time and cost efficient management (VNG/Oberon, 2006). However, if a private party is contracted they will also try to make

profit on the task, which will influence the price paid by building users for BM&O (Knaap, 2009). Although a third-party responsible for building management and maintenance can bring a lot of continuity and quality, good agreements have to be made about the management between the tenants/users of the community school and this third-party. Agreements, for example, include the scope of the agreement (owners, users and organizational part of BM&O) and the wanted performance. When the BM&O is outsourced, the organizations within the community school can focus on their primary business processes (Knaap, 2009). A note to make is that, although outsourcing is a very good way of professionalizing BM&O of a building, some schools are not willing to do this because then they lose budget flexibility.

## **2.7 Factors influencing the decision towards an ownership en BM&O model**

When choosing an ownership and BM&O model there are certain factors that can influence the decision towards a specific methodology. In literature is stated that the choice for a certain ownership and BM&O model is influenced by:

- I. Financial factors
  - II. Legal factors
  - III. Organizational factors
  - IV. Psychological factors
- (Knaap, 2009)

Although in literature these four considerations are mentioned, these are not explained in depth. In other publication there are however hints in the direction of certain factors. In the guide by Oberon/Sardes (2007) a connection is made between the collaboration type and the choice for a BM&O model. In the document is mentioned that one of the criteria influencing the decision towards a certain model is the content of the community school concept (Oberon/Sardes, 2007). The content of the community school concept is explained as: The vision, goals and activities of the community school that have been formulated by the different participants within the school (Oberon/Sardes, 2007). This statement implies that the activity within the building, and thus the collaboration within the building, is an important factor in choosing a certain BM&O model.

Next to the influence of the collaboration type on the choice of a building management and operation model also the following criteria have been mentioned by Oberon/Sardes to have an influence:

- I. The size and type of community school
  - II. Type of BM&O (long-term vs. short-term lease)
  - III. Continuity of the model
  - IV. Possible building management and operation quality the model can offer
  - V. What is the most preferred model for the different partners
  - VI. What are the financial consequences of choosing for a certain model
- (Oberon/Sardes, 2007)

Although literature gives some answers to the question of which factors influence the decision towards a certain ownership and BM&O model, the number of factors found in literature is very little and the description of the variables is generalized (financial, legal, organizational and psychological). Because of this vagueness and the general description of

the factors it expected that these factors comprehend many factors under them. Although in the study of Oberon/Sardes (2007) a start has been made with defining the factors more specifically it is expected that literature does not give a complete overview because factors that, for example, can be derived from the pro's and con's list in paragraph 2.5.1 and 2.6.1 are not mentioned as factors that influence the decision. An overview of the factors influencing the decision for one of the models is however very important for the study, since these factors are the building blocks of the DAG that will be created later in this study to research the decision-making process towards a BM&O and ownership model in the Dutch community school sector.

## **2.8 Conclusion literature review**

In this literature review the focus was mainly on clarifying the scope of the study, researching BM&O within the community school sector, researching the different collaboration models, ownership models and BM&O models used in the community school sector, and finding certain factors that influence the decision towards and ownership model and a BM&O model.

### **2.8.1 Scope**

Based on the literature review the scope of the study has been specified towards community schools in which at least one school that gives primary education is located, and no schools for secondary education are located. Based on the different types of community schools in practice, the difference between these types, and the suitability of these types for this study, three different community school types are considered. Based on the explanation of the community school types they have been linked to the collaboration types Back to Back, Face to Face, Hand in Hand and Cheek to Cheek. Based on the literature review the following community school types, with their accompanying collaboration types, will be considered in:

- I. Multifunctional accommodation → Back to Back and Face to Face
- II. Partnership school → Face to Face and Hand in Hand
- III. Integral childcare center → Hand in Hand and Cheek to Cheek

Concerning real estate management the scope has been set towards the Building management and operations, which is part of the operational management level of the real estate management. The BM&O consist of:

- |                                         |   |                        |
|-----------------------------------------|---|------------------------|
| I. Management for building preservation | } | Users and owners' part |
| II. Facility management                 |   |                        |
| III. Organization management            | } | Users part             |

### **2.8.2 Ownership and BM&O models community school sector**

In this study six different types of ownership models will be considered in which the main division between the models is made based on the fact whether the ownership is in the hand of one party, or in the hand of multiple parties (split ownership). The following models are considered:

- I. Ownership in the hands of one party
  - a. The municipality
  - b. Primary user

- c. Third-party
- II. A building management foundation
  - a. Split ownership
  - b. Building split in Apartments rights with an owners association (VvE)
- III. Complete split ownership (Split in land registry)

In this study five different types of BM&O models will be considered:

- I. No regulated BM&O
- II. Split building BM&O
- III. Combined building BM&O
- IV. Combined BM&O in a foundation or cooperation
- V. One primary user arranges BM&O on behalf of all users
- VI. Outsources BM&O

As discussed in the different publications the decision towards an ownership models, and the decision towards a BM&O model influence each other (Knaap, 2009; Verspeek, 2010; Oberon/Sardes, 2007; VNG/Oberon, 2006). Literature however does not unambiguously states what is the causality between the two decisions (decision ownership influences decision BM&O or decision BM&O influences decision ownership). To fully study the structure of the decision-making process towards a BM&O and ownership model in the Dutch community school sector, this is an important question that unfortunately has not been answered in the literature study. Since this is an important question for this study this gap in literature has to be further clarified.

### 2.8.3 Factors influencing the decision towards an ownership model

Although one of the aims of the literature review was to identify factors influencing the decision towards a certain ownership and BM&O model, the literature study proved that this subject is not yet studies thoroughly. Some factors were identified, but it is expected that this list of factors is not complete, since in literature also signs for factors that were not mentioned could be found (for example, based on the pro's and con's list in paragraph 2.5 and 2.6). Based on literature it could be identified that the factors influencing the decision towards a certain ownership and BM&O model can be subdivided into:

- I. Financial factors
- II. Legal factors
- III. Organizational factors
- IV. Psychological factors

Furthermore, based on the publication by Oberon/Sardes (2007) it can be concluded that the following attributes have influence on the decision-making process for a BM&O model (Oberon/Sardes, 2007):

- I. The size and type of community school
- II. Type of BM&O(long-term vs. short-term lease)
- III. Continuity of the model
- IV. Possible building management and operation quality the model can offer
- V. What is the most preferred model for the different partners
- VI. What are the financial consequences of choosing for a certain model

Furthermore, based on the pro's and con's for the different types of ownership and BM&O model, and the in depth discussion of the different models, certain other factors can be distinguished. These factors are shown in Table 7.

It is expected that the factors influencing the decision towards an ownership and BM&O model could not be found in literature because little effort has been made in the past to develop decision support tools that make use of such a factors to determine the best ownership and BM&O model in a specific case. Most publications mainly discuss the different BM&O and ownership models that are used in practice very generally and do not engage in advising the readers about these models and why the some models are a better fit in certain cases.

The literature review has answered sub question I and II, but did not completely answer sub question III (factors influencing the decision). To continue the research, this gap in literature first has to be researched. These factors are the foundation of the DAG that will be constructed further on in this study, and getting a complete overview of the most important factors influencing the decision towards a BM&O and ownership model therefore is very important. To do so a Fuzzy Delphi experiment will be set up and conducted in the next part of this research. A fuzzy Delphi experiment allows for selection of the most important factors based on the opinions of experts on the subject.

Ownership model	Building management and Operations model
Influence and say on owners part BM&O	Economies of scale
Influence and say on lease composition building	Mandatory law
Risk profile of the community school	Influence and say BM&O
Complexity of the model	Ownership model
Locational flexibility	Complexity of the model
Influence shared use regulation	Complete decentralization
BM&O model	
Complete decentralization	

*Table 7. Factors influencing the decision towards a certain ownership and BM&O model based on pro's and con's list and in depth discussion of the different ownership and BM&O models.*





### **3. Fuzzy Delphi method: Selection of variables**

This chapter focusses on the selection of variables influencing the decision towards an ownership model and BM&O model. The literature review gave guidelines for these factor, but only gave a limited overview of the variables itself. To obtain an overview of the most important variables influencing the decision towards a BM&O and ownership model in the Dutch community school sector a Fuzzy Delphi experiment (FDM) has been carried out. In this chapter the FDM methodology, the setup of the FDM part of this research and the results of the FDM experiment will be explained. Furthermore, the FDM questionnaire has also been used to shed light on the causality between the decision for an ownership model and BM&O model since literature does not unambiguously state in which direction the relationship between the two decision exists.

### **3.1 Fuzzy Delphi Methodology and Set-up experiment**

#### **3.1.1 Methodology– Fuzzy Delphi Method**

To select the most important variables influencing the decision towards a certain ownership and BM&O model Fuzzy Delphi Method (FDM) will be used. A survey will be conducted to select the attributes that are important for the most common actors participating in a community school initiative.

FDM is derived from the traditional Delphi method in combination with fuzzy set theory. The methodology is mainly used to gather information in a structured way to find consensus about a certain subject within an panel of experts (Adler & Ziglio, 1996; Gupta & Clarke, 1996; Rijksoverheid, n.d.). Numerous researchers contributed to the development from the traditional Delphi method towards the FDM (Hsu & Chen, 1996; Ishikawa, et al., 1993; Murray, Pipino, & van Gigch, 1985; Noorderhaven, 1995).

The traditional Delphi method was used as a forecasting technique that elicits, refines, and draws upon the collective opinion and expertise of a panel of experts (Gupta & Clarke, 1996). Different from other methodologies used in scientific research, Delphi method uses a panel of experts on a certain topic instead of a sample that represents a population. Conclusions are therefore based on the thorough knowledge of experts on a topic (Glumac, Schaefer, & Han, 2012). Because every human being has its own opinion the conclusion of a traditional Delphi experiment often has the tendency to be vague. The human factor involved in evaluating the importance of a certain attribute makes the conclusion of the experiment uncertain, fuzzy and vague. This fuzziness or vagueness results from the lack of definite distinction (Glumac, Schaefer, & Han, 2012). To solve this problem Murray et al. (1985) first proposed to apply the fuzzy theory to the Delphi method. The FDM takes into consideration the fuzzy concepts in opinions of experts about a specific subject. The human perception and feelings are vague, to describe the feelings more precisely the FDM can be applied (Chuang & Lin, 2012). In the years after Murray et al. (1985) proposed to combine fuzzy theory and the Delphi method several additions or changes have been made to the methodology. In 1993, for example, Ishikawa et al. proposed a maximum-minimum method (asking the expert panels to give a max min and most likely score) together with cumulative frequency distribution and fuzzy scoring to compile the expert's opinions into fuzzy numbers. Another ways of converting the expert's opinions into fuzzy numbers is by using a triangular fuzzy scale (Cortés, Serna, & Jaimes, 2012).

By combining the Delphi method with the fuzzy theory a more updated exchange of scientific or technical information can be provided than when only conducting a literature study (Delbecq, van de Ven, & Gustafson, 1975). One of the conclusions of the literature review of this graduation study was that the available literature on the topic does not give a complete overview of the information needed for the research. Therefore information from experts on the subject of BM&O and ownership has to be collected. FDM is considered to be a good method to do this since the judgement of a larger group of people can be reviewed by conducting an FDM experiment. Furthermore, experts and other actors within the community school sector do have the thorough knowledge about the topic that is needed to make a sensible judgement about the factors influencing the decision-making process towards an ownership model and BM&O mode since they have been involved in the decision-making process themselves. Another option would be to conduct expert interviews

to collect the data. It is expected that by only conducting expert interviews not enough people can be interviewed and it is harder to make an impartial judgement about the factors influencing the decision towards an ownership model and BM&O model.

FDM consists of four steps, these steps will be explained more elaborate in the next paragraphs (Yu, Cheng, & Kreng, 2010):

- I. Collect opinions of expert groups;
- II. Set up overall triangular fuzzy number;
- III. Defuzzification;
- IV. Screen evaluation indexes.

### 3.1.2 Collect opinions of expert groups – Set up questionnaire

To select the different variables influencing the decision towards a certain ownership model and BM&O model expert opinions and the literature review will be used. To gather the opinion of experts a brainstorm session with experts on the topic has been held. Next the attribute list, resulting from the brainstorm session and literature review, has been shown to all of the experts that were part of the brainstorm session to ask whether the list is complete or if attributes should be added. The brainstorm session has been held within HEVO. HEVO is a project management and real estate consultancy firm that has assisted different users of community schools and municipalities in the process of setting up a new community school initiative. A total of five persons were part of the brainstorm session:

- I. *Hans Heijltjes*: Senior advisor primary and secondary education within HEVO, and involved in the primary education board (PO raad).
- II. *Mireille Uhlenbusch*: Partner within HEVO and involved in numerous primary education real estate projects.
- III. *Niels Delemarre*: Strategic policy consultant for municipalities, school administrators and other civil societies. Working for HEVO one day a week.
- IV. *Wouter Houët*: Advisor within HEVO for educational real estate projects.
- V. *Yvon Ketelaars*: Advisor and project manager within HEVO, specialized in educational real estate projects.

These five advisors are involved in the entire process of developing new community schools, from determining the policies to the actual use of the school. The advisors know the different actors involved in the process and are up to speed about their considerations when choosing a certain ownership and BM&O model. Because of the overview the advisors have, and the numerous projects they are involved in, they are the perfect people to involve in the brainstorm session. The users of the community schools and the municipality are not involved in process of constructing a list of attributes because they often only have one or two projects they can relate to. The community school users and municipalities miss the needed overview and experience with the subject to create a complete list of attributes.

As discussed in paragraph 2.7 there are four different types of variables influencing the decision towards an ownership model and a BM&O model. Namely:

- I. Financial factors
- II. Legal Factors
- III. Organizational Factors
- IV. Psychological Factors

When conducting the brainstorm session therefore the framework of these four categories has been used. A list of 62 attributes has been made base on the brainstorm session and literature review. This list has been approved by the 5 experts within HEVO. In Table 8 and Table 9 a complete list of the attributes can be found. In Appendix A and Appendix B a more detailed explanation of the attributes has been given. The 62 attributes are divided into two different types:

- I. Attributes influencing the decision towards an ownership model: 34 Attributes divided into the categories financial attributes, legal attributes, organizational attributes and psychological attributes.
- II. Attributes influencing the decision towards a BM&O model: 28 Attributes divided into the categories financial attributes, legal attributes, organizational attributes and psychological attributes

After the list of possible attributes influencing the decision towards an ownership and BM&O model has been completed (brainstorm session, literature review and check by HEVO experts) the second part of the FDM experiment is started. In this phase different actors involved in the process of developing a community school are asked to score the different attributes on a 9 point Likert scale. The actors that are asked to fill in the questionnaire are divided into 4 groups:

- I. Advisors
- II. Schoolboard/ education foundation
- III. Municipality
- IV. Childcare

In Figure 21 the likert scale that is used is shown including its triangular fuzzy numbers. To ensure the scale is understandable the 9 different scores are supported by text and the scores are translated to minus and plus scores. The nine point scale has been used because it gives people the possibility to give a more precise answer that fits their ideas than when using a 7 or 5 point likert scale since in case of a 5 or 7 point scale there is less differentiation between the answer possibilities. In this case the min max method (asking respondents to give a range for each of the attributes) has not been used. It was not appropriate to use this method because of the size of the survey and the risk of actors not finishing the survey.

Based on the questionnaire set up that is explained above a questionnaire including the 62 different attributes is presented to the respondents. The questionnaire was designed with skip-logic. This means that certain irrelevant questions were automatically skipped. Based on questions about their involvement in the process of choosing an ownership model and a BM&O model different parts of the questionnaire are shown to the respondents. When people are not involved in the process of choosing either one of the models, the questions about this model are not shown to the respondent. The full questionnaire can be found in Appendix C.

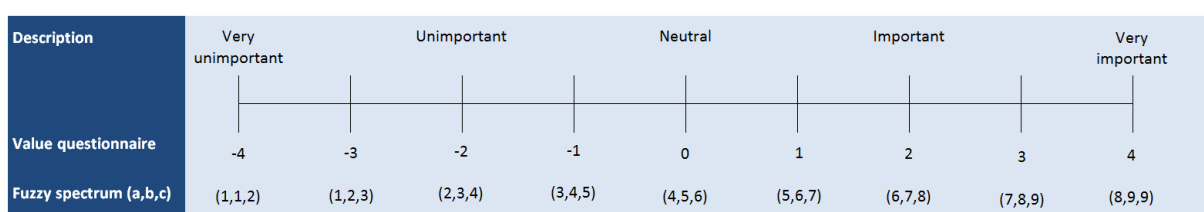


Figure 21: 9 point Likert scale and the accompanying fuzzy numbers (Maritan, 2015)

## Attributes influencing the decision towards an ownership model

Financial Attributes	Legal Attributes
<ul style="list-style-type: none"> <li>Financial carrying capacity</li> <li>Complete decentralization</li> <li>Financial flexibility ownership model</li> <li>Height of the investment</li> <li>Duration possible lease contracts</li> <li>Risk Profile</li> <li>BM&amp;O cost owners part</li> </ul>	<ul style="list-style-type: none"> <li>Mandatory law</li> <li>Possible Tax benefits</li> <li>Influence of Medegebruiksregeling</li> </ul>
Organizational Attributes	Psychological Attributes
<ul style="list-style-type: none"> <li>Collaboration model</li> <li>Size independent organizations</li> <li>Organization types</li> <li>Organizational carrying capacity</li> <li>Complexity of the model</li> <li>Presence of a facility management department</li> <li>Amount of building sharing</li> <li>Apartments above school</li> <li>Size of the building</li> <li>Number of organizations</li> <li>Client (Bouwheerschap)</li> <li>Chosen building management model</li> <li>Municipal policy ownership</li> <li>Public versus private ratio</li> <li>Locational flexibility</li> <li>Frequently used ownership models within the organizations</li> </ul>	<ul style="list-style-type: none"> <li>Personal Synergy</li> <li>Content Synergy</li> <li>Willingness to be owner</li> <li>Willingness to collaborate</li> <li>Previous experiences with ownership models</li> <li>Wanted influence and say on lease composition</li> <li>Wanted influence and say on owners part of BM&amp;O</li> <li>Importance of being owner</li> </ul>

Table 8. List of attributes influencing the decision towards an ownership model for community schools

## Attributes influencing the decision towards a BM&O model

Financial Attributes	Legal Attributes
<ul style="list-style-type: none"> <li>Financial Carrying Capacity</li> <li>Complete decentralization</li> <li>Economies of scale</li> <li>Financial flexibility BM&amp;O model</li> <li>BM&amp;O cost users part</li> </ul>	<ul style="list-style-type: none"> <li>Mandatory law</li> </ul>
Organizational Attributes	Psychological Attributes
<ul style="list-style-type: none"> <li>Collaboration model</li> <li>Number of organizations</li> <li>Organization types</li> <li>Size independent organizations</li> <li>Complexity BM&amp;O model</li> <li>Presence of facility management department</li> <li>Amount of building sharing</li> <li>Apartments above building</li> <li>Building size</li> <li>Frequently used BM&amp;O models within the organizations</li> <li>Municipal policy towards building management</li> <li>Knowledge about building management</li> <li>Chosen ownership model</li> <li>Organizational carrying capacity</li> <li>Public versus private ratio</li> </ul>	<ul style="list-style-type: none"> <li>Personal Synergy</li> <li>Content Synergy</li> <li>Willingness to collaborate</li> <li>Previous experiences with BM&amp;O models</li> <li>Wanted influence and say BM&amp;O</li> <li>Importance of being responsible for building management</li> <li>Willingness to be responsible for the building management</li> </ul>

Table 9. List of attributes influencing the decision towards a BM&O model for community schools

### 3.1.3 Overall triangular fuzzy number and defuzzification

The outcome of the second survey will result in a matrix that shows the importance score for the attributes for all the different respondents:

$$\begin{matrix} & R_1 & R_2 & \dots & R_n \\ \begin{matrix} C_1 \\ C_2 \\ \dots \\ C_m \end{matrix} & \begin{bmatrix} L_{11} & L_{12} & \dots & L_{1n} \\ L_{21} & L_{22} & \dots & L_{2n} \\ \dots & \dots & \dots & \dots \\ L_{m1} & L_{m2} & \dots & L_{mn} \end{bmatrix} \end{matrix}$$

Where

$R_i$  = The  $i^{th}$  respondent,  $i = 1, 2, \dots, n$

$C_j$  = The  $j^{th}$  attribute,  $i = 1, 2, \dots, n$

$L_{ij}$  = The linguistic evaluation of criterion  $j$  by respondent  $i$

To calculate the evaluation of each of the attributes  $j$  the centroid method (also called center of area of center of gravity) will be used (Klir & Yuan, 1995). When using the centroid method first the evaluation value of one of the attributes by a single respondent is expressed as a triangular fuzzy number (Figure 21):

$$\tilde{w}_{ij} = (a_{ij}, b_{ij}, c_{ij})$$

where factor  $j$ , attribute, given by factor  $i$ , respondent, of  $n$  respondents where  $i = 1, 2, \dots, n$ ,  $j = 1, 2, \dots, m$ . Then the fuzzy weighting  $\tilde{w}_{ij}$  of  $j$  is:

$$\tilde{w}_j = a_j + b_j + c_j, \text{ where } j = 1, 2, \dots, m \text{ and,}$$

$$a_j = \min_i \{a_{ij}\}, \quad b_j = \frac{1}{n} \sum_{i=1}^n b_{ij}, \quad c_j = \max_i \{c_{ij}\}$$

The next step in the process is converting the fuzzy numbers into single real crisp numbers. In this case the simple centroid method by Klir & Yuan (1995) will be used for the conversion of the fuzzy weights -  $\tilde{w}_j$  - to single derived numbers -  $s_j$  -.

$$s_j = \frac{(a_j + b_j + c_j)}{3}, \text{ where } j = 1, 2, \dots, m$$

### 3.1.4 After Screen evaluation indexes

To select the attributes that are most important in the decision-making process of selecting an ownership model and BM&O model for a community school the single derived numbers are tested against a threshold ( $\alpha$ ). If the single derived number is lower than this threshold the attribute is not selected, if the value of the single derived number is higher than the threshold the attribute is selected.

If  $s_j \geq \alpha$  factor  $j$  is very important and included in the DAG questionnaire

If  $s_j \leq \alpha$  factor  $j$  is less important and not included in the DAG questionnaire

In literature there is no standard for setting a threshold. The threshold therefore has to be set based on the needs of the study (Hsu & Chen, 1996). In scientific research a commonly used threshold is 0,7 (Habibi, Jahantigh, & Sarafrazi, 2015). Another common way of determining the threshold is to calculating the mean of the single derived numbers and test these crisp numbers against this mean. In different scientific research however the threshold varies and is mostly based on the researchers opinion (Habibi, Jahantigh, & Sarafrazi, 2015). Although the threshold is a guideline to select variables it is also possible to select an attribute regardless of the value for the threshold. This can be done when literature or other signs show the attribute is indeed important. If this is the case this decision has to be substantiated thoroughly.

### **3.2 FDM results**

#### **3.2.1 *Data gathering FDM***

The questionnaire for the FDM experiment has been designed using the Berg enquete system of the TU/e and has been send to respondents as a link in an email after they had been contacted by telephone to ask whether they were willing to fill in the questionnaire. Because possible respondent organizations have been approached via telephone it was easier to send the questionnaire directly to the person within the organizations that knows about, or was involved in BM&O and ownership decision-making processes. By doing this the quality of the respondents answers has been monitored.

The questionnaire has been sent to 62 organizations and an additional 66 have been contacted but were not willing to fill in the questionnaire. The reasons organizations gave for not wanting to participate were either “Being too Busy”, “Survey fatigue” or “Not involved in the decision-making process”. From the 62 organizations that agreed on filling in the questionnaire a total of 37 actually filled in the questionnaire. A total of four different actor groups filled in the questionnaire namely advisors, school, municipality and childcare organizations. In Table 10 the frequency table that shows the type of respondents and the process they were involved in can be seen.

From the 37 respondents 29 were involved in the decision-making process for both the ownership model and the BM&O model, one was only involved in the decision-making process for an ownership model (municipality), four were only involved in the decision towards a BM&O model (schools and childcare organizations ) and three respondents were not involved in the process at all and thus excluded from the results (all childcare organizations ). A concerning factor in the number of respondents is the number of childcare organizations that is involved in the decision-making process towards an ownership and BM&O model, which is two and five. Although a lot of childcare organizations have been contacted via telephone most of them reacted that they were not involved in the decision-making process and they were added to the initiative after these decisions had been made. Therefore in total there are 30 respondents that were involved in the decision-making process towards an ownership model and 34 respondents that were involved in the decision-making process towards a BM&O model.



Involvement in decision-making process					
Respondent types	#	Both	Ownership	BM&O	None
Advisors (total)	10	10	-	-	-
Perspective School	1	1	-	-	-
Perspective municipality	2	2	-	-	-
Perspective childcare organization	0	-	-	-	-
Perspective other users	0	-	-	-	-
Perspective all users	7	7	-	-	-
Schools	9	8	-	1	-
Municipality	10	9	1	-	-
Childcare organizations	8	2	-	3	3
Other	0	-	-	-	-
<b>Total</b>	<b>37</b>	<b>29</b>	<b>1</b>	<b>4</b>	<b>3</b>

Table 10. Frequencies Fuzzy Delphi Network questionnaire

Ownership model Factors ( $\alpha > 0,66$ )					
	Financial	Legal	Organizational	Psychological	Total
All	3	1	6	6	16
Advisor	3	1	6	4	14
School + Advisors Schools	3	2	6	5	16
Municipality + Advisors Municipalities	0	1	6	6	13
Childcare	2	1	8	6	17

Table 11. Frequency table attributes Sj above threshold, ownership model

Organizational Factors ( $\alpha > 0,68$ )					
	Financial	Legal	Organizational	Psychological	Total
All	4	1	6	6	17
Advisor	5	1	7	7	20
School + Advisors Schools	5	1	9	7	22
Municipality + Advisors Municipalities	4	1	3	6	14
Childcare	3	0	5	5	13

Table 12. Frequency table attributes Sj above threshold, BM&O model

### 3.2.2 Overview Results questionnaire

After the results from the questionnaire were converted to single derived numbers, they had to be tested against the threshold value. The variables have been tested against the mean threshold. For the ownership model FDM this threshold was 0,66, and for the BM&O FDM this threshold was 0,68. The frequency results of the threshold-test, for the different actor groups, can be seen in Table 11 and Table 12. In the next paragraphs the nature of the selected variables will be discussed and the results will be evaluated. In some cases the result of the questionnaire shows irregularities with information from literature or the brainstorm session. In case an irregularity is detected a decision towards the selection of the variable will be made based on literature, common knowledge and input of the HEVO advisors.

Within the frequency tables (Table 11 and Table 12) the results of the threshold test have been subdivided based on the different actor groups. As discussed in paragraph 3.2.1 some of these groups are very small (for example, the actor group childcare organization). Literature (Delbecq, van de Ven, & Gustafson, 1975) suggests that with a homogeneous

group of 10-15 respondents the outcome of an FDM questionnaire might be reliable. It is therefore not possible to draw conclusion based on the results of these independent actor groups. To determine which variables will be selected for the next phase of this research therefore the results of all the respondents (top row in Table 11 and Table 12) will be used. To determine whether the decision to select a variable based on all the respondents is suitable also the variance within the respondents group all has been reviewed. In general the variance lies between 0,4 and 0,2 which means that the answers of the respondents are fairly the same. Therefore using the results of all the respondents groups together to select the variables is considered to be better than using the limited observations for the actor groups School, Municipality and Childcare to determine the selected variables per group.

What is striking to see is that in both cases (ownership and BM&O model choice) a lot of attributes in the category “organizational” and “psychological” are selected. Although these categories were the biggest two categories in the variable list it was still possible that the respondents did not think they were very importance. Both the organizational and psychological categories contain “softer” attributes that relate directly or indirectly to feelings (for example, synergy and collaboration model). When looking to research that focuses on decision-making processes this emotional factor in the process is being emphasize (Zeelenberg, Nelissen, Breugelmans, & Pieters, 2008; Bosse, et al., 2013). Therefore it is interesting to see that the results from the FDM questionnaire relate to these studies on the decision-making process.

### 3.2.3 Overview FDM analysis – ownership model

Based on the threshold test a total of 16 variables are selected that influence the decision towards an ownership model. 18 variables have not been selected. In Table 13 the variables that are selected and rejected can be seen. The variables have been ranked according to their single derived numbers.

What is compelling to see is that all the variables that have been presented to the respondents during the FDM questionnaire are to a greater or lesser extent important to the responders. For example, the variable with the lowest single derived number “Apartment above school” still gets a score of 50,33%. This score corresponds to a neutral score but also shows a tendency towards importance. Since this is the lowest score it could be said that the list of variables presented to the respondents showed a good overview of variables that are indeed important to make a decision about an ownership model.

Another observation based on the raking shown in Table 13 is that, next to the fact that there are almost no low scores, there are also no very high scores. The variable “Mandatory law” has a single derived number of 78,56%, which is the highest score within the set of variables. The fact that there are no very high scores might be a sign that the decision towards an ownership model in the Dutch community school sector is very complex and a results of a combination of many different variables that are, based on the outcome of the FDM questionnaire, almost equally important.

Variable	Type	Sj	Accepted/ Rejected
Mandatory law	Legal	78,56%	Accepted
Willingness to collaborate	Psychological	77,44%	Accepted
Importance of influence and say on owners part BM&O	Psychological	74,78%	Accepted
Risk Profile	Financial	74,11%	Accepted
Collaboration model	Organizational	73,78%	Accepted
Importance of influence and say on lease composition	Psychological	73,78%	Accepted
Municipal policy towards ownership	Organizational	73,22%	Accepted
Content synergy	Psychological	72,00%	Accepted
Building management model	Organizational	71,33%	Accepted
Organizational Carrying Capacity	Organizational	70,44%	Accepted
BM cost ownership Model	Financial	69,78%	Accepted
Willingness to be Owner	Psychological	69,56%	Accepted
Personal Synergy	Psychological	68,67%	Accepted
Building Sharing	Organizational	68,33%	Accepted
Financial Carrying Capacity	Financial	66,56%	Accepted
Organization type	Organizational	66,44%	Accepted
Decentralization	Financial	65,56%	Rejected
Medegebruiksregeling	Legal	65,44%	Rejected
Complexity model	Organizational	64,33%	Rejected
Number of Organizations	Organizational	64,33%	Rejected
Locational Flexibility	Organizational	62,67%	Rejected
Height of the investment	Financial	62,67%	Rejected
Financial flexibility Ownership Model	Financial	62,11%	Rejected
Duration possible lease contracts	Financial	62,11%	Rejected
Bouwheerschap	Organizational	60,78%	Rejected
Previous experiences	Psychological	59,78%	Rejected
Presence of a facility management department	Organizational	59,67%	Rejected
Public vs Private parties	Organizational	59,44%	Rejected
BTW	Legal	59,22%	Rejected
Importance of being owner	Psychological	58,44%	Rejected
Size independent organizations	Organizational	56,78%	Rejected
Frequently used models	Organizational	55,11%	Rejected
Size Building	Organizational	54,67%	Rejected
Apartments above school	Organizational	50,33%	Rejected

Table 13. Ranking single derived numbers variables ownership model

### 3.2.4 Overview FDM analysis – BM&O model

Based on the threshold test a total of 17 variables are selected that influence the decision towards an ownership model. 11 variables have not been selected. An overview of the variables that are selected and rejected based on the thresholds test are shown in Table 14. The variables have been ranked according to their single derived numbers.

Again in this case the ranking shows that the respondents did not give very extreme scores. Almost all variables are to greater or lesser extend important to the decision-making process and no variable has an extreme high importance score. Also in this case this might show that that the decision towards a BM&O model is very complex and a result of a large combination of factors.

Variable	Type	Sj	Accepted/ Rejected
Willingness to be responsible for BM	Psychological	79,09%	Accepted
Willingness to collaboration BM	Psychological	77,44%	Accepted
Collaboration model	Organizational	77,37%	Accepted
Influence and Say	Psychological	75,96%	Accepted
Content Synergy	Psychological	75,56%	Accepted
Carrying Capacity	Financial	73,64%	Accepted
Personal Synergy	Psychological	73,64%	Accepted
Importance of being responsible for BM	Psychological	73,54%	Accepted
Building Management Cost	Financial	73,03%	Accepted
Mandatory Law	Legal	71,92%	Accepted
Organizational Carrying Capacity	Organizational	71,41%	Accepted
Financial Flexibility	Financial	71,31%	Accepted
Knowledge about building management	Organizational	70,91%	Accepted
Economies of scale	Financial	70,71%	Accepted
Building Form Sharing	Organizational	68,18%	Accepted
Municipal policy building management	Organizational	67,98%	Accepted
Complexity BM model	Organizational	67,78%	Accepted
decentralization	Financial	67,37%	Rejected
Number of organizations	Organizational	66,36%	Rejected
Chosen ownership model	Organizational	66,26%	Rejected
Organization Type	Organizational	65,56%	Rejected
FDM Department	Organizational	64,04%	Rejected
Experience with BM models	Psychological	62,73%	Rejected
Size Organizations	Organizational	57,78%	Rejected
Frequently used models	Organizational	56,57%	Rejected
Public versus Private parties	Organizational	55,76%	Rejected
Building Size	Organizational	54,55%	Rejected
Apartments above building	Organizational	47,07%	Rejected

Table 14. Ranking single derived numbers variables BM&O model

### 3.3 Variable selection DAG

#### 3.3.1 Interpretation FDM analysis – Variable selection DAG ownership model

In general the threshold test did not show any irregularities with the literature review. It was however expected that the organizational factors “size independent organizations ” (Sj = 56,8%) and “number of organizations ” (Sj = 64,3%) would be selected. In the publication by Oberon/Sardes (2007) these factors are mentioned to be of importance for the decision towards an ownership and BM&O model. Additionally in both cases the actor group Advisors, which are considered to be experts on the subject of this study, give very high importance scores to these variables. The users of the buildings and the municipality however give lower scores which causes the mean Sj value lies just below the threshold test value. Because the expert actor group Advisors and literature show that both of the variables are important the variables “Size independent organizations ” and “number of organizations ” will be included as a factor in the next phase of this study. Based on these conclusion and the threshold test a total of 18 variables are selected.

Variable removed	Reason for removing
BM&O cost owners part	<b>Reason II:</b> The tool that is developed is a quick scan that can be used in the beginning of the process of developing a community school. At this time of the process BM&O cost are still determined based on key figures that are almost the same in every case. Therefore it is expected that this variables, although it is important further on in the process, at the time of using the tool that can be developed based in the DAG will not be of great importance.
Amount of building sharing	<b>Reason II and IV:</b> Within the list of selected variables also the collaboration model is selected. In the beginning of the process of developing a community school mostly the collaboration model is the guideline of the amount of building sharing. The variable therefore shows overlap with the variable collaboration model.
Municipal policy	<b>Reason IV:</b> The municipal policy is a form of willingness of the municipality to become owner of the building. This variable therefore shows overlap with the variable willingness to be owner.
Personal synergy	<b>Reason III:</b> An initiative can only succeed when the parties involved in developing the community school get along, the greater good is kept in mind and personal synergy is present. Personal synergy therefore is considered to be a key variables in the development of a community school and without it the initiative will (most of the time) fail. The variable will therefore not affect the outcome of the model because it is considered to be key in the development and thus always present.
Willingness to collaborate	<b>Reason IV:</b> The willingness to collaborate shows overlap with the variable collaboration model. When the parties choose for an extensive collaboration model (for example, Cheek to Cheek) it is expected that they are willing to collaborate, also when it comes to ownership.
Wanted influence and say on lease composition/ Wanted influence and say on owners part of BM&O	<b>Reason IV:</b> These two variables show overlap with each other and can be expressed into one variable. Therefore these two variables have been replaced by Importance influence and say ownership tasks.

Table 15. Re-evaluation selection variables ownership model: reasons for removing

18 variables is still a lot. When making a DAG every variable will form a node. The more variables the more complex the network and the more computational power is needed to predict the outcome of a possible predictive BBN that can be created based on the DAG. Furthermore, 18 variables cause that a questionnaire that gathers information that is needed to construct the DAG becomes very long and the possibility of people not finishing the questionnaire becomes very high. At last the network also has to be understandable for people that are interpreting the results. When including 18 variables that can possibly be all linked together makes this very hard. The number of variables therefore has to be reduced.

A possible way to reduce the number of accepted variables is by testing the single derived numbers against a higher threshold. When making the threshold higher (for example to 0,7) however a lot of variables are excluded from the list that are considered to be of great importance for the decision-making process towards an ownership model based on the brainstorm session with experts and literature (Oberon/Sardes, 2007; Knaap, 2009). For example, variables that will be excluded when testing against a higher threshold are Willingness to be owner and organizational carrying capacity. When looking further into the importance scores the different actor groups have given in both of these cases the variable gets scores above a 0,7 threshold from the actor groups "Municipality", "Childcare" and "Advisors" but because of low scores from the actor groups "School" these variables would be rejected. Because using a higher threshold causes that a lot of variables have to be excluded that, based on the brainstorm session, importance scores from the export advisor group and literature, are very important to the decision-making process it is consider to be better to re-evaluate the variables that are selected.

Variable removed	Reason for removing
BM&O cost users part	<b>Reason II:</b> The tool that is developed is a quick scan that can be used in the beginning of the process of developing a community school. At this time of the process BM&O cost are still determined based on key figures that are almost the same in every case. Therefore it is expected that this variables, although it is important further on in the process, at the time of using the tool that can be developed based on the DAG will not be of great importance.
Complexity BM&O model	<b>Reason I:</b> The DAG used the basic BM&O models as outcome. These basic models don't differentiate that much in complexity. The complexity of the models is mostly added when additional agreements are added to the model.
Amount of building sharing	<b>Reason II and IV:</b> Within the list of selected variables also the collaboration model is selected. In the beginning of the process of developing a community school mostly the collaboration model is the guideline of the amount of building sharing. The variable therefore shows overlap with the variable collaboration model.
Municipal policy	<b>Reason IV:</b> The municipal policy is a form of willingness of the municipality to be responsible for BM&O. This variable therefore shows overlap with the variable willingness to be responsible for the building management.
Personal synergy	<b>Reason III:</b> An initiative can only succeed when the parties involved in developing the community school get along, the greater good is kept in mind and personal synergy is present. Personal synergy therefore is considered to be a key variables in the development of a community school and without it the initiative will (most of the time) fail. The variable will therefore not affect the outcome of the model because it is considered to be key in the development and thus always present.
Willingness to collaborate	<b>Reason IV:</b> The willingness to collaborate shows overlap with the variable collaboration model. When the parties choose for an extensive collaboration model (for example, Cheek to Cheek) it is expected that they are willing to collaborate, also when it comes to BM&O.
Importance of being responsible for building management	<b>Reason IV:</b> The importance of being responsible for the users part of BM&O shows overlap with the "willingness to be responsible for the users part of BM&O" and the "wanted influence and say BM&O". Although you could argue that the importance can be used as a measure of value of how much the parties are willing to be responsible it is expected that because of the risks and work involved in being responsible for the users part of BM&O, organizations will only indicated that they are willing to be responsible when they really want this.

Table 16. Re-evaluation selection variables BM&O model: reasons for removing

The list of variables has been reviewed a second time and certain variables have been removed. Reasons for removing variables were:

- I. Re-evaluations of the definition of the variable in the light of the outcome of the model
- II. Re-evaluation of the variables in the light of the use of the model
- III. Re-evaluation of the variables in the light of the decision-making process in practice
- IV. Overlap between two variables that were selected

After re-evaluating the variable list a total of 6 variables have been removed. In Table 15 the variables that have been removed, and the reason why they have been removed is explained.

### 3.3.2 Interpretation FDM analysis – variable selection DAG BM&O model

In general the threshold test did not show any irregularities with the literature review. It was however expected that the organizational factors "size independent organizations " ( $S_j = 57,8\%$ ), "organization types" ( $S_j = 65,6\%$ ) and "number of organizations " ( $S_j = 66,4\%$ ) would be selected. In the publication by Oberon/Sardes (2007) these factors are mentioned to be of importance for the decision towards an ownership and BM&O model. Additionally in all three of the cases the actor group Advisors, which are considered to be experts on the subject of this study, give very high importance scores to this variable. The users of the

buildings and the municipality however give lower scores which causes the mean Sj value lies (just) below the threshold test value. Because the expert actor group Advisors and literature show that both of the variables are important the variables “Size independent organizations”, “organization types” and “number of organizations” will be included as a factor in the next phase of this study. Based on these conclusion and the threshold test a total of 21 variables are selected.

Also in this case the total number of selected variables is still considered too much. Therefore the list of variables has been reviewed and certain variables have been removed. After re-evaluating the variable list a total of 7 variables have been removed. In Table 16 the variables that have been removed, and the reason why they have been removed, is explained.

### **3.4 Results causality ownership model and BM&O model**

One of the subjects on which literature was not entirely clear was the causality between the decision for an ownership model and the decision for a BM&O model. This causality is important because when this causality is clear it is possible to connect the ownership and BM&O DAG, that will be constructed in the next phase of this study, to each other. Literature does show that the decision are connected to each other, but in which direction is not unambiguously stated. To shed light on this dilemma three questions within the FDM survey were designed to find an answer to this question:

- I. Which connection do you think exist between the ownership and BM&O model? Should you choose first the BM&O model, or first the ownership model?
- II. How important is the factor “chosen BM&O model” to select an ownership model
- III. How important is the factor “Chosen ownership model” to select a BM&O model

In Table 17 the respondents answers to the first question are shown. Based on these results the causality between the two models should be: First decide on the ownership model, than decide on the BM&O model. When looking to the results of question II and III, based on the threshold test, “Chosen ownership model” is not considered to be of importance to decide on a BM&O model. In case of the decision-making process towards an ownership model the variable “Chosen BM&O model” does pass the threshold test and thus is considered to be of importance. This observation shows that it is likely that the direction of the causality between the ownership model and the BM&O model is: First decide on a BM&O model, than decide on an ownership model. These results of question II and III therefore show different sings than the results from question I. Because there is no clear answer to the causality question the BM&O model and Ownership model DAG, that will be constructed in the next phase therefore cannot be connect to each other. This also means that the organizational variable “Chosen BM&O model” that passed the threshold test will not be included in the next phase of this research.

Answer option	Frequency
First the ownership model, than the BM&O model	21
First the BM&O model than the ownership model	7
This does not matter	6
I don't know	0

*Table 17. Causality ownership model vs. BM&O model*



### 3.5 Conclusion FDM experiment

The main aim of the FDM experiment was determining which variables were most important for the decision-making process towards and ownership and BM&O model in the Dutch community school sector.

#### 3.5.1 Variable selection

After considering the causality between the choice for an ownership model and BM&O model, testing the single derived numbers of the FDM experiment against the threshold, looking for irregularities in the results and re-evaluate the selected variables, the final list of selected variables that influence the decision towards a ownership model and BM&O model can be made. In Table 18 and Table 19 the variables that have been selected are shown. These variables will be used to construct the DAG in the next phase.

Important conclusion based on this phase of the research are that, based on the FDM questionnaire, the psychological and organizational attributes often have a more prominent effect on the decision towards an ownership model and BM&O model. Although these variables did not always scored the highest in the FDM questionnaire a lot of these two types of variables have been selected based on the answers of the respondents. Furthermore, based on the absence of very low and high single derived numbers in both the ownership FDM questionnaire and the BM&O FDM questionnaire, it can be expected that the a lot of different factors play a somewhat equal importance role in the decision-making process towards a BM&O and ownership model. In both cases there is not one variable that scores very high and has a very high impact on the decision. This might show that the decision-making process is very complex.

Selected attributes influencing the decision towards an ownership model	
Financial Attributes	Legal Attributes
<ul style="list-style-type: none"> <li>Financial carrying capacity</li> <li>Risk Profile</li> </ul>	<ul style="list-style-type: none"> <li>Mandatory law</li> </ul>
Organizational Attributes	Psychological Attributes
<ul style="list-style-type: none"> <li>Organization types</li> <li>Organizational carrying capacity</li> <li>Collaboration model</li> <li>Size independent organizations</li> <li>Number of organizations</li> </ul>	<ul style="list-style-type: none"> <li>Content Synergy</li> <li>Willingness to be owner</li> <li>Importance of influence and say on tasks owner</li> </ul>

Table 18. Selected attributes influencing the decision towards an ownership model

Selected attributes influencing the decision towards a BM&O model	
Financial Attributes	Legal Attributes
<ul style="list-style-type: none"> <li>Financial Carrying Capacity</li> <li>Economies of scale</li> <li>Financial flexibility BM&amp;O model</li> </ul>	<ul style="list-style-type: none"> <li>Mandatory law</li> </ul>
Organizational Attributes	Psychological Attributes
<ul style="list-style-type: none"> <li>Collaboration model</li> <li>Knowledge about building management</li> <li>Organizational carrying capacity</li> <li>Size independent organizations</li> <li>Number of organizations</li> <li>Organization types</li> </ul>	<ul style="list-style-type: none"> <li>Content Synergy</li> <li>Wanted influence and say BM&amp;O</li> <li>Willingness to be responsible for the building management</li> </ul>

Table 19. Selected attributes influencing BM&O



### 3.5.2 Causality

One of the unanswered questions based on the literature review was in which direction the causality between the decision for an ownership model and the decision for a BM&O model exists. In the FDM questionnaire two types of questions (one direct, and two indirect question) were included that gathered data about the causality:

- Question 1: Which decision should be made first?
- Question 2: Does the choice for an ownership model influence the choice for a BM&O model?
- Question 3: Does the choice for a BM&O model influence the choice for an ownership model?

Unfortunately, the answer on question one was that first an ownership model has to be chosen, but based on question 2 and 3 only the decision for a BM&O model had an influence on the choice for an ownership model. If the decision for an ownership model has to be taken first it is not possible to already know the selected BM&O model. Therefore, these two answer sets were contradictory. Since therefore the causality is not unambiguously stated the ownership and BM&O DAG that will be constructed in the next phase of this research will not be connected to each other

#### **4. Directed Acyclic graph: Study of relationships**

In the previous chapter FDM had been used to determine factors that influence the decision towards an ownership model and BM&O model in the Dutch community school sector. Based on these factors and the relationships between these factors a directed acyclic graph can be made. A DAG enables us to better understand the structure of the decision-making process towards an ownership and BM&O model. To develop a DAG first the relationships between the factors have to be studied. This can be done in different ways. In this study methods similar to the construction of a graphical BBN are being used. Therefore first the BBN methodology will be discussed and why in this study the expert opinions will be used to determine the relationships between variables instead of data. Next the setup of the DAG experiment will be discussed. Consequently the results of the experiment and the interpretation of these results will be presented.

## 4.1 Construction of a DAG using Bayesian Belief Network methodology

### 4.1.1 What is a Bayesian belief network

Bayesian belief network (BBN) is a methodology that is derived from the Bayesian theorem and network theory. By combining the essence of Bayes' theorem and network theory a BBN can be derived (Grover, 2016). BBN's aim on predicting and studying the construction and outcome of a complex problem. A BBN can represent numerous of different types of complex problems. Often the model is used to explain, predict and study (human) behavior, within certain systems. BBN's are often applied in the computer algorithm community. The method gives a clear overview of a complex problem through a graphical simplification, and tries to predict the outcome of the problem based on conditional probabilities that are connected to the network. The graphical simplification of a problem is also known as a directed acyclic graph (DAG). In this study a DAG will be constructed that shows the graphical representation of a decision-making problem.

### 4.1.2 Graphical BBN - DAG

Within a graphical BBN certain cause-effect relationships are graphically represented within sets of nodes and directed arcs (Smid, Verloo, Barker, & Havelaar, 2010). The nodes represent variables and the arcs represent the directed causal influences between linked nodes (Grover, 2016). A child node is dependent on its parent node, but it is conditionally independent of others (Zhang, 2017). Every node has states, or a set of probable values for each variable.

Bayesian belief networks, or DAGs, can support different direction of reasoning. In general four different types of reasoning are distinguished (Korb & Nicholson, 2004) (see Figure 22 for graphical representation of types of reasoning):

- I. **Diagnostic reasoning:** This reasoning goes against the direction of the causal links. Certain evidence strengthens the believe that a variable has an effect on the outcome. For example, observing fever makes us believe that cold is the cause of a runny nose, thereby reducing our belief that allergies cause the runny nose.
- II. **Predictive reasoning:** This type of reasoning follows the direction of the causal links within the network. A certain observation (cause) influences the probability for the state of another variable (effect). For example, a cold causes a runny nose and a fever.
- III. **Intercausal reasoning:** Intercausal reasoning involves reasoning about the mutual causes of a common effect. A special type of intercausal reasoning is explaining away. An example of explaining away is: Wet grass causes shinny cold grass and wet shoes, however the cause for wet grass can be either rain or the sprinkler system.
- IV. **Combined:** The above explained ways of reasoning can also be combined in any way possible. For example, the presence of dyspnoea and smoking strengthen the assumption of cancer. And smoking causes cancer which causes dyspnoea. In this example both diagnostic and predictive reasoning is used.

Important to note is that circular relationships cannot be present within a DAG (thus from node A to node B and from Node B to node A). Although it is possible to include such relationships in the network the network should than compute the outcome for the different nodes in multiple steps, also known as disaggregation of the variables over time (Nadkarni & Shenoy, 2004). Generally however a BBN experiences time linearly.

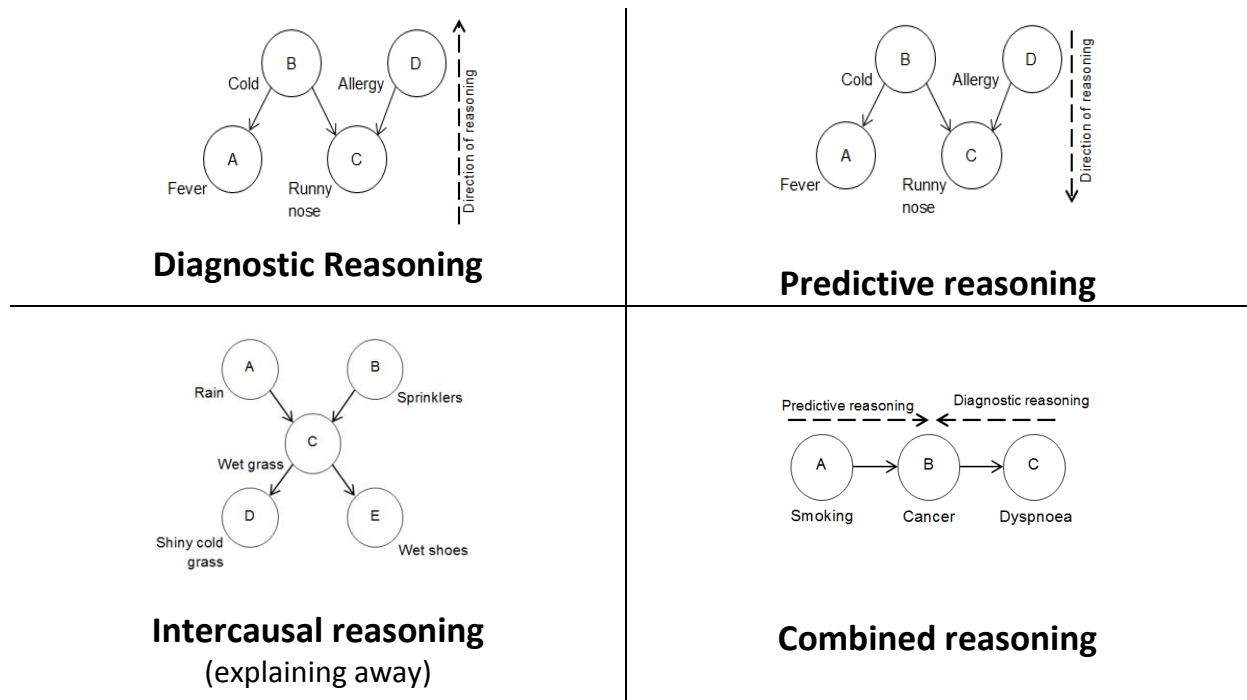


Figure 22. Different types of reasoning supported by BBN's and DAGs (Constructed based on (Korb & Nicholson, 2004))

The graphical structure of a BBN, or DAG, can be derived from data or can be based on expert opinions (Fenton & Neil, 2000). The aim is to develop the best network to represent the complex problem that you are trying to structure. The more nodes and arcs are present in the network the more possible networks, and thus deriving the best possible network from all possible networks becomes increasingly harder. For these very complex networks therefore certain algorithms that automatically structure the network based on data can be used. This is called automatic learning. The idea of this automatic learning algorithm goes back to a recovery algorithm developed by Rebane and Pearls (1987) and rests on the distinction between the three types of adjacent triplets allowed in a direct acyclic graph (DAG) (Rebane & Pearl, 1987).

When such data is not available a graphical BBN, or DAG, can also be constructed based on expert opinions. Based on the article of Kuhnert (2011), in which four case studies are used to determine the usability and suitability of expert opinions to construct a (graphical) BBN, can be concluded that experts can provide a valuable source of information. This is especially the case when there is only limited or no data available (Kuhnert, 2011). Although Kuhnert concludes that expert opinions can be used to construct a the graphical BBN, he comments that when using this methodology extra attention should be payed to biased opinions since this can make the DAG less accurate.

When constructing a DAG based on expert opinions there are several different methodologies that can be used. Sometimes structured interviews are held to determine the nodes and the causal relations within that are represented in the DAG, in other cases fuzzy Delphi method and a adjacency matrix questionnaire is used to determine the nodes and causal relations within the BBN. In general the methodology in which FDM and a matrix questionnaire is used can decrease the probability of a biased network since the opinion of more people can be reviewed and the interviewer does not have to assess and process the

answers given in the interview (Nadkarni & Shenoy, 2004). Other ways of testing whether a network constructed based on expert opinions is biased is using case studies to check the model structure or by validating the network with other experts than the ones that constructed the network.

#### 4.1.3 Suitability graphical BBN for structuring decision-making problem

Most graphical BBN's, or DAGs, try to map a complex problem. Less DAGs try to map a decision-making problem as is the case in this study. A graphical BBN is however a tool that can be used for such an aim (Grover, 2016). The structure of DAGs are, for example, used to develop artificial intelligence systems. The aim of these systems is to mimic human decision-making behavior. As discussed by Stassopoulou et al (1998) the advantage of mapping a decision-making problem by using a DAG is that information in a predictive BBN (that can be developed based on a DAG) flows in both forwards and backward directions through a link. Because of this characteristic of the predictive BBN the user of the network is provided with the opportunity to draw both predictive and diagnostic conclusions from a network (Stassopoulou, Petrou, & Kittler, 1998). Both graphical and predictive BBN's can therefore help in developing an advanced understanding of the decision-making process that is being modelled. Especially when limited information about a problem is known a graphical and predictive BBN is a good method to learn more about the problem.

As discussed above literature shows that a DAG is suitable for researching and mapping a decision-making process. Most studies that try to do this however structure a decision-making process in which the decision-making subject is only reviewed from one stakeholders perspective. In this study the decision is a compromise between the views of multiple actors (e.g. School, Municipality, Childcare organizations etc.). Mapping a decision-making process in which the perspective of multiple actors is kept in mind poses difficulties since the views of actors can be very different and opposing (Grover, 2016). Different studies however show that it is possible to map such a decision-making problems (Fenton & Neil, 2000; Haapasaari et al, 2012; Grover, 2016). Research that uses DAGs in such a way mainly try to map environmental decision-making problems or try to develop artificial intelligence systems.

When constructing a DAG that tries to map a problem from the view of different stakeholders it is important to consider which parties are stakeholders, as this is a crucial step in scoping and simplifying the problem (Fenton & Neil, 2000). A party that is involved in the decision-making process or affected by the decision should be excluded from the model if (Fenton & Neil, 2000):

- I. Their viewpoints/needs are not relevant; or
- II. Their viewpoints are fundamentally inconsistent with that of the decision maker or an accepted stakeholder (there is no point in attempting to solving a decision problem when there is no solution that could be accepted by all the stakeholders)

Furthermore, it is important to decide upon a methodology on how to construct the DAG. This methodology has to suit the objective of the use of the DAG. As discussed in the previous paragraph possible methodologies can be (Kuhnert, 2011):

- I. Construct DAG based on (historic) data
- II. Construct DAG based on expert opinions

When using DAGs based on historic data in decision-making process next to the criteria that the data you are using is up to date and of good quality, you have to keep in mind that the data consist of the decisions made in the past and thus these decisions must be correct. If the decision made in the past are bad decisions the model will not correct for these bad decision. Although such information about bad decision in the past can be very valuable to understand where the decisions came from, and can be used to learn from for future cases, such an information is less valuable if you are trying to develop a decision support tool.

In this study constructing a DAG based on historic data is not consider to be a good methodology. In this study the aim is to research the structure of the decision-making process, and lay grounds for the development a decision support tool. This means that the decision that have been made in the past have to be of a good quality. Since literature shows that lots of community schools are not satisfied with the way ownership and BM&O is arranged (Regioplan, 2014) and recent law and legislation changes (2015), cause that decisions made before 2015 are not up to date. Furthermore, because of the subjectivity of a decision-making process data that could be collected would be very uncertain. It is therefore expected that decision-making data is of an inferior quality. At last data about the decision-making process is not available. It is a possibility to collect this data, however large amounts of data are needed to construct a DAG based on data. The combination of the expected inferior quality of the data (bad decisions and subjectivity of the study), the way the DAG could be used in the future (decision support system) and the fact that data is not available the DAG will be constructed based on expert opinions.

In this case the methodology that combines fuzzy Delphi method and matrix questionnaires is considered to be the best. By using questionnaires a partially subjective decision-making process can be researched in a quantitative way. Furthermore, the opinion of a bigger group of people that are involved in the decision-making process can be reviewed. Also when only conducting qualitative research (expert interviews for example) it is possible that the results of the research are influenced by the opinions of the researcher (biased network). Since the subject of the study is already a partially subjective decision-making process this could harm the usefulness of the research.

#### 4.1.4 Graphical BBN – Adjacency Matrix

In this study the graphical structure of the BBN, also known as DAG, will be constructed by using a matrix questionnaire. Although this methodology is not widely used several studies show that constructing a DAG by using this type of methodology is possible (Nasir et al, 2003; Luu et. al, 2007). In studies that use, or propose, the matrix questionnaire different approaches have been used. In all studies first the variables that directly or indirectly influence the problem that is assessed in the DAG have been selected. This is often done by using FDM or structured interviews (Nadkarni & Shenoy, 2004). In some cases an extra step has been carried out. In these cases the structured interviews have also been used to determine a raw causal map based on causal phrases, causal connectors and effect phrases (Nadkarni & Shenoy, 2004). In the studies in which this extra step has been carried out the matrix questionnaire is used to transform the raw causal map to a DAG. In the cases in which this extra step is not carried out the DAG is only constructed based on the matrix questionnaire.

Rule	Accepted	Rejected
1 Average < 1,01	No	Go to Rule 2
2 Average < 1,5 and (W-S)>4	No	Go to Rule 3
3 Average < 1,5 and Skewness = Positive	No	Go to Rule 4
4 Average > 2,5	Yes	Go to Rule 5
5 Average > 1,95 and (S-W)>4	Yes	Go to Rule 6
6 Average > 1,95 and Skewness = Negative	Yes	Go to Rule 7
7 No 0 scores	Yes	Go to Rule 8
8 Scores incline towards 3	Yes	Go to Rule 9
9 Scores incline towards 0	No	-

Table 20. Logical rules analysis matrix questionnaire (Nasir, McCabe, & Jartono, 2003)

Regarding the matrix questionnaire in general two approaches are used. In some questionnaires all possible relationships have been presented to the respondents, in other studies relationships that were considered to be illogical where not shown to the respondents (Nadkarni & Shenoy, 2004; Nasir, McCabe, & Jartono, 2003). Furthermore, the relationship between the same variables do not have to be filled in by the respondents because it is not possible for a variables to influences itself. Not showing all relationships within the questionnaire has been done to reduce the number of relationships that had to be assessed by the respondents and thus shorten the questionnaire. Ensuring the questionnaire is not to long is important because this can cause experts to lose interest in filling in the questionnaire. In case of the matrix questionnaire this risk is even higher. Studies show that experts generally find it very difficult to provide opinions in quantified form and in case of the matrix questionnaire the relationships that have to be reviews are often complex (Nasir, McCabe, & Jartono, 2003; Megill, 1984; Edwards, 1955).

In studies that used the matrix questionnaire different measurement scales to assess the relationships have been used. In general a distinction can be made between scales that measure the strength of the relationship and scales that measure the direction of the relationship. Nasir et al (2003), for example, uses a 4 point scale that differentiated between the strength of the relationship (no relationship, weak relationship, strong relationship, very strong relationship). Luu et al. (2009) also uses a scale that differentiates between the strength of the relationship but uses 5 different measurement levels (no relationship, somewhat relationship, relationship, strong relationship, very strong relationship). The matrix questionnaire methodology proposed by Nadkarni & Shenoy (2004) differentiates between the direction of the relationship (negative, no and positive relationship). In studies in which the matrix questionnaire is used to determine the direction of the relationship often already a graphical structure of the asses problem has been made by determining the relationships based on interviews (causal phrases, causal connectors and effect phrases).

When assessing the results of the matrix questionnaires several different methodologies are being used. In some cases an FDM approach is used, in other cases the results are assessed based on logical tests. In studies in which they used a 4 or 5 point scale that differentiates between the strength of the relationship mostly logical rules are being used to test the results (Luu, Kim, van Tuan, & Ogunlana, 2009). These logical rules take into account the average score, the skewness, the number of weak scores (0 or 1) and the number of strong scores (2 or 3) (Nasir, McCabe, & Jartono, 2003). Based on the outcome of the test a variables is either accepted or rejected. In Table 20 an overview is given of the logical test.

Rules 1, 2, 3 and 9 are exclusion rules. Rule 4,5,6 and 7 are inclusion rules. When changing the scale used in the questionnaire the logical rules have to be assessed again.

## **4.2 Setup DAG experiment**

### **4.2.1 Overview setup questionnaire design, data collection and analysis**

To study the relationships between the different nodes a matrix questionnaire has been made. This has been done in multiple steps:

- I. Selection of variables based on FDM experiment (chapter 3)
- II. Construction of matrix questionnaires
- III. Collecting data
- IV. Analyzing data using logical rules

Step 2 until 4 will be discussed in the next sub paragraphs (Step 1 already has been discussed in chapter 3). In this study the predictive power behind the DAG will not be added to the model. Because data about the decision-making process is not available and it is expected that such data will be of bad quality, predictive power should be added by using expert opinions (for example, the methodology proposed by Nasir et al, 2003).

### **4.2.2 Matrix questionnaire - design**

To define the relationships between the different nodes a matrix questionnaire has been made. The setup of this questionnaire has been based on the methodology described in the previous paragraph. Within the questionnaire 12 variables (11 factors and 1 outcome) that studies the relationships between variables that influence the decision towards an ownership model are included, and 14 variables (13 factors and 1 outcome) that influence the decision towards a BM&O model are included. In this case none of the relationships have been shielded in the matrix questionnaire. Although the number of relationships that have to be assessed by respondents is high in this case it was thought to be best to show all the relationships since there was no solid basis for shielding certain relationships other than the researcher own opinion. Because of the large amount of variables influencing the decision towards an ownership model and BM&O model the questionnaire however has been split in two separate questionnaires to decrease the risk of people losing interest in filling in the questionnaire:

- I. Questionnaire 1: Matrix questionnaire ownership model decision-making process
- II. Questionnaire 2: Matrix questionnaire BM&O model decision-making process

Because there is not yet a raw causal map that maps the decision-making processes the choice has been made to ask respondents to assess the strength of the relationships in the matrix questionnaire. In accordance with the study of Luu et al (2009) a 5 point scale, to assess the strength of the relationship, has been used that differentiated between the following levels:

- I. no relationship (0)
- II. somewhat relationship (1)
- III. relationship (2)
- IV. strong relationship (3)
- V. very strong relationship (4)



In Appendix D and Appendix E the questionnaire that has been used to determine the relationships between the different variables can be reviewed.

#### 4.2.3 Matrix questionnaire - Collecting data

Possible respondents that have been contacted to fill in the questionnaire include schools, municipalities, real estate advisors and childcare organizations. Possible respondents have been selected based on an overview of community schools within the Netherlands and the network of consultancy firm HEVO and Knowledge center Ruimte-OK.

Based on the overview of community schools within the Netherlands a list of organizations that are involved in the development of community schools has been made. Organizations on this list have been contacted via telephone to ask whether they were willing to fill in one of the questionnaires. During the telephone conversation the question was asked in which process the organization was more involved: Choosing an ownership model or choosing an BM&O model. Based on this question one of the questionnaires (ownership or BM&O) was sent to the respondents. In some cases a secretary agreed on sending the questionnaire to the person within the organization that was most suited to fill in the questionnaire. In that case both questionnaire links have been included in the email and respondents have been asked to fill in the questionnaire of the process they were most involved in. By contacting the different organizations via telephone it was possible to find out which person within the organization knew most about these kind of decision-making problems and explain the subject of the study. By doing this the quality of the answers given in the questionnaire could be monitored.

In addition to contacting organizations via telephone also organizations that are connected to possible respondents have been asked to share the questionnaire with their network. For example, HEVO shared the questionnaire on LinkedIn (1000 + followers from different organizations who involved in public real estate) and Ruimte-OK shared the questionnaire on their twitter page and in their newsletter (10.000+ people from municipalities, schools and childcare organizations receive this newsletter). Because the organizations that shared the questionnaire are heavily involved in public real estate developments and research the quality of dataset could be protected. Furthermore, in both cases a short explanation of the type of respondents needed and the goal of the research was added to ensure that people that would not be involved in the process of choosing an ownership and BM&O model for community school would not fill in the questionnaire. At last routing questions that asked about the involvement in possible respondents the decision-making process were added to ensure only people that were involved filled in the questionnaire. If people were not involved they would directly go to the end page of the

questionnaire. Unfortunately, sharing the questionnaire via social media and newsletters did not give that many results. Although a lot of people clicked on the questionnaire link they did not fill in any of the questions. Therefore it could be concluded that the subject of this study is relevant to the field (initial click) but the respondents were not triggered enough to also fill in the questionnaire.

Questionnaire	Finished questionnaires	Partially finished questionnaires	Excluded (little variation in answers given)	Total number of respondents per question
Ownership model	36	11	2	39 – 41
BM&O model	40	26	2	43 – 51

Table 21. Frequency table respondents matrix questionnaires

In total more than 500 organizations have been contacted via telephone to fill in the questionnaire. 315 of these organizations agreed on filling in the questionnaire. When organizations started filling in the questionnaire some organizations did not fill in the complete questionnaire. To ensure that enough results could be collected the order of the questions shown to respondents was altered several times during the period people were asked to fill in the questionnaire. By doing this the total number of variables on which data was gathered increased. This however also meant that not very every question within the data set that was generated the same number of responses are available.

In Table 21 a frequency table that shows the number of respondents for both matrix questionnaires is shown. In total 47 people (partially) filled in the ownership questionnaire. 2 answer sets have been excluded because of too little differentiation in answers given by the respondents. Therefore the total number of respondents for every questions varies between 39 and 41. Concerning the BM&O questionnaire a total of 66 people (partially) filled in the. Also in this case two answer sets have been excluded from the dataset. The total number of respondents for every questions concerning the BM&O model therefore varies between 43 and 51.

Important to mention concerning both questionnaires is that although childcare organizations have been contacted to fill in the questionnaire most of them were not involved in the decision-making process. Their opinion therefore is less represented in the results of the matrix questionnaire.

The response rate on the questionnaire is very low. This could be caused by the intensity of the questionnaire (matrix) and the number of questions. Furthermore, a lot of the organizations that were contacted via telephone mentioned that a few weeks before someone from another university also contacted them to fill in a questionnaire about BM&O of community schools. The low response rate can therefore also be caused by survey fatigue.

#### 4.2.4 Matrix questionnaire - Data analysis

In this study the results of the questionnaire have been analyzed using nine logical rules similar to the rules discussed in the previous paragraph (Table 20). This methodology has been used by several different researchers and proved to be successful (Nasir, McCabe, & Jartono, 2003; Luu, Kim, van Tuan, & Ogunlana, 2009). This methodology used information about the average, skewness, number of strong scores and number of weak relationships to determine whether relationships are accepted or rejected.

The decision to use the nine logical rules instead of an FDM approach to analyze the results is taken because it was expected that an FDM approach would not be sensitive enough.

When using an FDM approach signs such as the skewness and the number of strong and weak relationships are not being considered. When also looking at the skewness, strong and weak scores within the data set it is expected that a better selection of relationships can be made.

### **4.3 Results Matrix questionnaire**

#### **4.3.1 Results matrix questionnaire – Ownership model**

A total of 132 relationships had to be reviewed by the respondents. The results have been analyzed by using the logical rules shown in Table 20. Based on this analysis a total of 49 relationships were accepted and 83 were rejected. In Table 22 an overview of the accepted relationships can be seen. The relationships have been ranked based on the average score. Furthermore, the table also shows the frequency of the different answers possibilities, the total number of people that answered the question about the specific relationship and the skewness of the dataset.

#### **4.3.2 Discussion results matrix questionnaire – Ownership model**

When looking at the selected relationships a total of 16 relationships that are accepted in one direction ( $A \rightarrow B$ ) are also selected in the other direction ( $B \rightarrow A$ ). What is striking to see is that in a lot of these cases the scores for  $A \rightarrow B$  and  $B \rightarrow A$  similar. For example, when looking to the scores for the relationships “Collaboration model  $\rightarrow$  Synergy” and “Synergy  $\rightarrow$  Collaboration model”, or “Financial CC  $\rightarrow$  Risk profile” and “Risk profile  $\rightarrow$  Financial CC”, almost the same number of people filled in the same scores, and the skewness and average are almost the same. Furthermore, people tended to rate the relationships on the middle of the scale (answer option: there is a relationship). There are almost no cases in which a large group of respondents gave a very high, or very low, rating regarding the strength of the relationship.

Based on the outcome of the matrix questionnaire a directed graph can be constructed. In a directed graph, opposed to a DAG, circular relationships are still included. Concerning the 16 circular relationships that have been accepted based in the matrix questionnaire therefore a decision has to be made which of the two relationships will be added to the model to transform the directed graph that can be created based on the matrix questionnaire to a DAG. Furthermore, based on the analysis of the matrix questionnaire a few relationships are accepted that are considered illogical or far-fetched. At last a few relationships that were thought to be of importance were not added to the model. Because based on the matrix questionnaire only a directed graph can be made, interviews will be held in the next phase of this research to validate the matrix questionnaire data, and transform the directed graph to a DAG.

To validate the results of the matrix questionnaire and transform the directed graph to a DAG, several interviews with experts in the field of public real estate management and community schools are carried out. Showing the results of the matrix questionnaire to the interviewees can be quite overwhelming because of the large amount of relationships (For a complete overview of the directed graph that can be constructed based on the outcome of

the matrix questionnaire see Appendix F). Therefore first a pre-selection has been made that will be discussed with the interviewees. In Appendix G the preselection and reasoning behind the preselection is shown.

In Appendix H the DAG that has been constructed after the preselection can be seen. This network will be shown to the interviewees during the validation interviews. Within this network the illogical and far-fetched relationships have been deleted. These relationships will be discussed during the interviews. Concerning the circular relationships one of the two relationships is shown within the network. At last the relationships that are labelled “maybe add” are not added to the model but will be discussed during the validation interviews.

Based on the preselection and a general examination of the network certain relationships of interest have been selected that have to be discussed during the validation interviews:

Not logical:

- Willingness to be owner → Organization types
- Synergy ↔ Organizational carrying capacity
- Organizational carrying capacity → Organization types
- Risk profile → Mandatory law

Far-Fetched:

- Organizational carrying capacity → Synergy
- Risk profile → Organization types

A→B, B→A (relationships of interest because no clear decision about the direction of the relationship could be made)

- Financial CC ↔ Size organizations
- Willingness to be owner ↔ Importance of I&S

Maybe add:

- Organization types → Importance of influence and say
- Size organizations → Importance of influence and say
- Number of organizations → Risk profile
- Number of organizations → Chosen ownership model

	A	B	Mean	0	1	2	3	4	total	skewness
1	Collaboration model	Synergy	2,67	4	6	20	7	2	39	-0,89
2	Organization types	Synergy	2,56	10	2	10	12	5	39	-0,60
3	Synergy	Collaboration model	2,41	6	5	22	5	1	39	-0,93
4	Financial CC	Risk profile	2,34	1	4	11	18	5	39	-0,80
5	Risk profile	Financial CC	2,32	4	4	28	15	1	41	-0,79
6	Willingness to be owner	Risk profile	2,32	6	12	10	9	2	39	-0,49
7	Financial CC	Choice own model	2,26	3	5	22	9	2	41	-0,90
8	Risk profile	Choice own model	2,26	7	4	11	13	6	41	-0,61
9	Importance of I&S	Choice own model	2,23	12	6	12	6	3	39	-0,66
10	Risk profile	Willingness to be owner	2,21	3	7	19	10	2	41	-0,40
11	Organizational CC	Choice own model	2,21	5	6	19	10	1	41	-0,64
12	number organizations	Synergy	2,21	6	8	19	4	2	39	-0,61
13	Collaboration model	Organization types	2,20	5	8	16	7	3	39	-0,67
14	Willingness to be owner	Organization types	2,20	7	15	13	6	0	41	-0,40
15	Financial CC	Importance of I&S	2,18	6	3	12	14	4	39	-0,52
16	Risk profile	Importance of I&S	2,18	2	7	18	10	2	39	-0,55
17	Collaboration model	Organizational CC	2,18	5	6	21	8	1	41	-0,37
18	Size organizations	Organizational CC	2,18	4	12	12	11	0	39	-0,72
19	Risk profile	Organization types	2,17	5	4	11	16	3	39	-0,36
20	Willingness to be owner	Financial CC	2,17	8	9	13	9	0	39	-0,40
21	Mandatory law	Choice own model	2,15	5	5	17	11	3	41	-0,37
22	Organizational CC	Willingness to be owner	2,15	6	6	16	9	2	39	-0,41
23	Willingness to be owner	Choice own model	2,15	9	11	11	8	0	39	-0,55
24	Organizational CC	Size organizations	2,13	6	5	16	12	0	39	-0,50
25	Organizational CC	Risk profile	2,12	5	5	21	10	0	41	-0,76
26	Organizational CC	Synergy	2,10	4	9	14	13	1	41	-0,53
27	Synergy	Organizational CC	2,08	8	7	11	12	1	39	-0,16
28	Chosen ownership model	Mandatory law	2,08	1	9	19	6	4	39	-0,18
29	Importance of I&S	Financial CC	2,07	8	10	14	3	4	39	-0,50
30	Organization types	Collaboration model	2,05	5	8	12	12	4	41	-0,61
31	Organizational CC	Importance of I&S	2,05	6	6	15	14	0	41	-0,51
32	Financial CC	Mandatory law	2,05	2	2	10	18	7	39	-0,19
33	Financial CC	Organization types	2,05	3	2	13	18	3	39	-0,34
34	Organization types	Risk profile	2,05	7	4	10	12	6	39	-0,30
35	Financial CC	Organizational CC	2,03	5	5	6	21	4	41	-0,25
36	Organizational CC	Collaboration model	2,03	6	5	13	12	3	39	-0,35
37	Importance of I&S	Organizational CC	2,03	7	8	17	6	1	39	-0,36
38	Importance of I&S	Willingness to be owner	2,03	8	11	15	4	1	39	-0,46
39	Organization types	Financial CC	2,02	6	9	10	13	3	41	-0,28
40	Synergy	Organization types	2,02	4	13	16	5	1	39	-0,23
41	Financial CC	Willingness to be owner	2,00	3	8	12	15	3	41	-0,40
42	Organizational CC	Organization types	2,00	4	9	15	10	1	39	-0,68
43	Willingness to be owner	Organizational CC	2,00	8	11	16	5	1	41	-0,31
44	Size organizations	Financial CC	1,98	4	5	16	13	1	39	-0,77
45	Financial CC	Size organizations	1,97	6	6	7	14	6	39	-0,70
46	Willingness to be owner	Importance of I&S	1,97	9	11	10	8	1	39	-0,26
47	Risk profile	Mandatory law	1,95	6	2	16	10	5	39	-0,34
48	Mandatory law	Financial CC	1,95	7	1	14	10	9	41	-0,17
49	Synergy	Risk profile	1,95	6	6	22	4	1	39	-0,45

Table 22. Accepted relationships based on matrix questionnaire Ownership

	A	B	Mean	0	1	2	3	4	total	skewness
1	Wanted I&S BM&O	Willingness resp. BM&O	2,68	2	2	17	18	11	50	-0,59
2	Knowledge about BM&O	Willingness resp. BM&O	2,66	1	4	15	21	9	50	-0,49
3	Organizational CC	Size organizations	2,65	1	3	17	22	8	51	-0,47
4	Wanted I&S BM&O	Choice BM&O model	2,62	0	2	22	19	7	50	0,26
5	Willingness resp. BM&O	Organizational CC	2,58	1	2	17	17	6	43	-0,37
6	Wanted I&S BM&O	Size organizations	2,57	1	6	16	19	9	51	-0,33
7	Organizational CC	Willingness resp. BM&O	2,56	3	3	16	19	9	50	-0,66
8	Wanted I&S BM&O	Organizational CC	2,56	0	2	22	12	7	43	0,47
9	Financial CC	Willingness resp. BM&O	2,54	2	4	14	25	5	50	-0,83
10	Knowledge about BM&O	Wanted I&S BM&O	2,54	0	6	17	21	6	50	-0,13
11	Willingness resp. BM&O	Wanted I&S BM&O	2,54	1	4	19	19	7	50	-0,29
12	Wanted I&S BM&O	Knowledge about BM&O	2,53	0	2	19	19	3	43	0,09
13	Organizational CC	Wanted I&S BM&O	2,52	1	4	18	22	5	50	-0,46
14	Wanted I&S BM&O	Collaboration model	2,51	1	1	22	13	6	43	-0,04
15	Financial CC	Organizational CC	2,50	1	4	13	24	2	44	-0,92
16	Financial CC	Choice BM&O model	2,50	3	3	19	16	9	50	-0,49
17	Willingness resp. BM&O	Size organizations	2,49	1	7	15	22	6	51	-0,41
18	Collaboration model	Synergy	2,48	3	5	16	17	9	50	-0,48
19	Willingness resp. BM&O	Financial CC	2,48	1	6	16	22	5	50	-0,45
20	Willingness resp. BM&O	Knowledge about BM&O	2,48	1	4	17	17	5	44	-0,33
21	Organizational CC	Choice BM&O model	2,46	1	5	18	22	4	50	-0,47
22	Wanted I&S BM&O	Financial CC	2,46	1	6	19	17	7	50	-0,18
23	Knowledge about BM&O	Organizational CC	2,44	1	2	20	17	3	43	-0,40
24	Organizational CC	Knowledge about BM&O	2,44	1	1	24	12	5	43	0,06
25	Financial CC	Wanted I&S BM&O	2,44	2	4	21	16	7	50	-0,31
26	Financial CC	Size organizations	2,43	3	7	18	14	11	53	-0,28
27	Size organizations	Organizational CC	2,42	2	4	17	14	6	43	-0,36
28	Knowledge about BM&O	Size organizations	2,41	1	6	22	15	7	51	-0,03
29	Collaboration model	Wanted I&S BM&O	2,40	2	4	22	16	6	50	-0,30
30	Knowledge about BM&O	Choice BM&O model	2,40	0	5	24	17	4	50	0,21
31	Willingness resp. BM&O	Collaboration model	2,39	1	4	21	13	5	44	-0,05
32	Financial CC	Organization types	2,37	3	7	16	20	6	52	-0,48
33	Synergy	Collaboration model	2,35	1	6	17	15	4	43	-0,20
34	Collaboration model	Choice BM&O model	2,34	3	3	21	20	3	50	-0,74
35	Size organizations	Financial CC	2,34	2	4	24	15	5	50	-0,25
36	Size organizations	Wanted I&S BM&O	2,34	1	6	21	19	3	50	-0,31
37	Economies of scale	Collaboration model	2,33	0	11	12	18	4	45	-0,07
38	Mandatory law	Financial flexibility model	2,32	4	3	21	17	5	50	-0,57
39	Synergy	Choice BM&O model	2,32	3	5	22	13	7	50	-0,24
40	Choice BM&O model	Mandatory law	2,31	3	4	23	14	4	48	-0,05
41	Organization types	Willingness resp. BM&O	2,30	3	8	17	15	7	50	-0,24
42	Willingness resp. BM&O	Choice BM&O model	2,30	2	6	23	13	6	50	-0,10
43	Financial flexibility model	Choice BM&O model	2,28	2	5	23	17	3	50	-0,41
44	Wanted I&S BM&O	Organization types	2,28	0	8	23	16	3	50	0,16
45	Organizational CC	Collaboration model	2,28	2	4	21	12	4	43	-0,23
46	Mandatory law	Collaboration model	2,27	3	10	14	6	11	44	0,03
47	Financial flexibility model	Wanted I&S BM&O	2,26	2	9	19	14	6	50	-0,08
48	Collaboration model	Number of organizations	2,26	3	8	16	19	4	50	-0,44
49	Knowledge about BM&O	Organization types	2,26	2	7	20	18	3	50	-0,39
50	Synergy	Organization types	2,26	1	7	25	12	5	50	0,15
51	Size organizations	Knowledge about BM&O	2,26	0	5	22	16	0	43	-0,32
52	Number of organizations	Collaboration model	2,26	1	8	18	11	5	43	0,09
53	Knowledge about BM&O	Collaboration model	2,25	0	5	24	14	1	44	0,08
54	Number of organizations	Economies of scale	2,20	0	10	23	14	3	50	0,26
55	Financial flexibility model	Collaboration model	2,18	0	11	20	9	5	45	0,50
56	Size organizations	Economies of scale	2,06	0	13	23	12	2	50	0,35

Table 23. Accepted relationships based on matrix questionnaire BM&O

Rule	Accepted	Rejected
1 Average < 1,01	No	Go to Rule 2
2 Average < 2 and (W-S)>4	No	Go to Rule 3
3 Average < 2 and Skewness = Positive	No	Go to Rule 4
4 Average > 3	Yes	Go to Rule 5
5 Average > 2,25 and (S-W)>4	Yes	Go to Rule 6
6 Average > 2,25 and Skewness = Negative	Yes	Go to Rule 7
7 No 0 scores	Yes	Go to Rule 8
8 Scores incline towards 3	Yes	Go to Rule 9
9 Scores incline towards 0	No	-

Table 24. Stricter logical ruleset

#### 4.3.3 Results matrix questionnaire – BM&O model

A total of 132 relationships had to be reviewed by the respondents concerning factors influencing the decision towards a BM&O model. After analyzing the results based on the same logical rules as used for the ownership model a total of 111 variables were accepted and 71 variables were rejected. Because the number of variables that were selected was very high the logical rules had to be made stricter. Unfortunately, no literature could be found on how to make the rules stricter since the methodology of using matrix questionnaires to construct a graphical BBN , or DAG, is not yet broadly used. Therefore the structure of the rules was kept the same and only the average value for the different rules was set to a higher level. In Table 24 the adjusted, stricter rules can be seen. After making the rules more strict a total of 56 variables were accepted and 126 were rejected. In Table 23 an overview of the accepted relationships can be seen. The relationships have been ranked based on the average score. Furthermore, the table also shows the frequency of the different answers possibilities, the total number of people that answered the question about the specific relationship and the skewness of the dataset.

#### 4.3.4 Discussion results matrix questionnaire – BM&O model

When looking at the selected relationships a total of 13 relationships that are accepted in one direction ( $A \rightarrow B$ ) are also selected in the other direction ( $B \rightarrow A$ ). Just as was the case with the circular relationship in the ownership matrix questionnaire in a lot of these cases the scores for  $A \rightarrow B$  and  $B \rightarrow A$  similar. For example, when looking to the scores for the relationships “Knowledge about BM&O  $\rightarrow$  Wanted I&S BM&O” almost the same number of people filled in the same scores, and the skewness and average are almost the same. Also people tended to rate the relationships on the middle of the scale (answer option: there is a relationship). There are almost no cases in which a large group of respondents gave a very high, or very low, rating regarding the strength of the relationship.

Based on the outcome of the matrix questionnaire a directed graph can be constructed. In a directed graph, opposed to a DAG, circular relationships are still included. Concerning the 13 circular relationships that have been accepted based in the matrix questionnaire therefore a decision has to be made which of the two relationships will be added to the model to transform the directed graph that can be created based on the matrix questionnaire to a DAG. Furthermore, based on the analysis of the matrix questionnaire a few relationships are accepted that are considered illogical or far-fetched. At last a few relationships that were

thought to be of importance were not added to the model. Because based on the matrix questionnaire only a directed graph can be made, interviews will be held in the next phase of this research to validate the matrix questionnaire data, and transform the directed graph to a DAG.

To validate the results of the matrix questionnaire, and transform the directed graph to a DAG, several interviews with experts in the field of public real estate management and community schools have been carried out. Also in this case showing the results of the matrix questionnaire to the interviewees can be quite overwhelming because of the large amount of relationships (For a complete overview of the directed graph that can be constructed based on the outcome of the matrix questionnaire see Appendix I). Therefore first a pre-selection has been made that will be discussed with the interviewees. In Appendix J the preselection and reasoning behind the preselection is shown.

In Appendix K the DAG that has been constructed after the preselection can be seen. This network will be shown to the interviewees during the validation interviews. Within this network the illogical and far-fetched relationships have been deleted. These relationships will be discussed during the interviews. Concerning the circular relationships one of the two relationships is shown within the network. At last the relationships that are labelled “maybe add” are not added to the model but will be discussed during the validation interviews. Based on the pre-selection the following relationships of interest will be discussed during the validation interviews:

#### Not logical

- Willingness to be responsible for BM&O → Collaboration model
- Financial carrying capacity → Organization types
- Wanted influence & say → Organization types
- Synergy → Organization types
- Financial flexibility → Collaboration model
- Economies of scale → collaboration model
- Willingness to be responsible for BM&O → Size organization
- Mandatory law → Collaboration model
- Knowledge about BM&O → Collaboration model
- Knowledge about BM&O → Organization types

#### Far-Fetched

- Organization CC → Collaboration model

A→B, B→A (relationships of interest because no clear decision about the direction of the relationship could be made)

- Willingness to be responsible for BM&O ↔ Wanted influence and say BM&O
- Wanted influence and say BM&O ↔ Collaboration model
- Financial CC ↔ Size organizations

#### Maybe add:

- Financial flexibility → Financial CC
- Number of organizations → ultimate choice BM&O model



- Economies of scale → Ultimate choice BM&O model
- Size organizations → Willingness to be responsible for BM&O

When looking to the illogical and far-fetched relationships that are accepted based on the outcome of the BM&O matrix questionnaire, a lot of relationships include the variable “Collaboration model” (5 out of 10). It is expected that for some respondents the difference between a BM&O and collaboration model was not entirely clear. The node “collaboration model” will therefore be a node of interest during the validation interviews. Furthermore, a lot of illogical relationships were selected in which a variable had an effect on the organization types within the initiative (4 out of 10). Therefore this variable will also be a node of interest during the validation interviews.

#### **4.4 Validation interviews**

##### **4.4.1 Setup expert interviews**

To validate the outcome of the matrix questionnaire and the FDM questionnaire validation interviews have been held with experts on BM&O and ownership for community schools. Because the interviewees had to be experts on the subject mainly advisors that advise the different actors within community school initiatives have been interviewed. These advisors have a broad overview of the subject because they often advise on multiple different community school projects. Additionally also a few school real estate managers, one municipal educational real estate manager and one real estate manager from a childcare organizations has been interviewed. These real estate managers from schools, municipalities and childcare organizations were selected based on their involvement in multiple community school projects. A total of 9 interviews have been held:

- I. Advisors: 4
- II. School: 3
- III. Municipality: 1
- IV. Childcare: 1

The interviews consisted of three parts:

- I. Discussion practical experience with BM&O and Ownership
- II. Discussion DAG Ownership
- III. Discussion DAG BM&O

During the first part of the interview the interviewees were asked to discuss their own experience regarding the choice for an ownership model and BM&O model. By doing this it was possible to validate the nodes within the network without influencing the interviewees. This was important because one of the major flaws of expert interviews to construct, or validate, a DAG is that the interviewer can influence the interviewee with their own opinions.

During the second part of the interview the DAG that maps the decision towards an ownership model is shown to the respondents. First the network is discussed by highlighting the relationships that directly link to the choice for an ownership model to make the network more readable. Next the indirect relationships are briefly discussed with the interviewee. To validate the decisions made during the preselection questions about the

relationships of interest (see paragraph 4.3.2) were asked. A question could, for example, be: “Based on the analysis of the matrix questionnaire the number of organizations only has influence on the synergy between the different organizations present within the initiative. Do you agree with this conclusion or do you think there should be another link?” When people said yes the follow-up question was which relationship they thought exists. If people said no a more direct question was asked (e.g. do you think it has influence on the risk profile? Do you think it has a direct effect on the ownership model?). Although this more direct question can influence the interviewee towards a certain answer the interviewees sometimes has a hard time reading the network because of the size of the network. Furthermore, for some interviewees it was hard to keep in mind all the different variables that were present in the network. At last people were asked whether they thought the ownership DAG was recognizable to them and whether it represented their experience with choosing an ownership model. During the third part of the interview the BM&O DAG has been discussed using same approach as used during phase two of the interviews.

In general the first part of the interviews was not very structured since the first part mainly consisted of the interviewees telling about their own experiences. Not every interviewee did this in the same manner. The second and third part of the interviews where more structured since the different predefined variables of interest were discussed more precisely.

#### 4.4.2 Discussion expert interviews – phase 1: Experiences

The validation interviews started by asking the interviewees about their own experience with choosing an ownership and BM&O model. By doing this the nodes within the network could be validated without influencing the answer of the respondents.

For both the process of choosing and ownership model and BM&O model the advisors that were interviewed nearly all mentioned the variables that directly influence the decision towards one of the models. Some also mentioned the nodes that indirectly influenced the decision towards an ownership and BM&O model when discussing their experiences. Some of the most common experiences discussed during the interviews that related to the variables present within the network where:

- I. Number of organizations (BM&O and ownership): Multiple advisors told that based on their experiences when more organizations are part of the initiative a more fixed and professional ownership model and BM&O models was chosen.
- II. Influence and say (ownership): Various advisor told that for the municipality the ownership situation is very depended from the degree of influence they want to keep on the community school (for example, influence on which participants are leasing the building). When the municipality wants to keep influence on the community school often the square meters not used by the school are therefore owned by the municipality
- III. Collaboration and synergy (ownership & BM&O): All advisors mentioned the collaboration and synergy between the different partners within the community school as an important variable for both the choice towards an ownership and BM&O model. The advisors told that they always try to connect the BM&O model and ownership model to the way the building is used. The usage of the buildings arises from the way the different users collaborate.

- IV. Willingness, risk and carrying capacity (ownership): When looking to the overview of the experiences of the advisors in most cases the building was owned by the municipality since the schools or other organizations did not want and could (because of organizational and financial CC) bear the risk of owning the entire building. In some (older) cases a housing corporation was owner of the building but because of the current law and legislation this is not possible anymore.

When discussing the experience of the interviewees from educational foundations concerning the choice for a BM&O and ownership model the main focus of the interviewees was on the collaboration model and synergy between the different users. The interviewees told that trust and synergy was very important when working closely together. The interviewees all told that synergy is a precondition, and a key factor, when developing a new community school. When asking the real estate managers from the school foundations about their experiences with choosing an ownership and BM&O models the following experiences were brought forward:

- I. Collaboration model & synergy (BM&O model): One of the interviewees told that the reason why they chose for a VvE was because they were not closely working together with the other partners within the community school. Therefore they only wanted to work together concerning BM&O on the elements of BM&O where it was really necessary (common areas, installations and outside maintenance). Other interviewees experienced the same relationship: When working more closely together they would also work more closely together concerning BM&O.
- II. Risk, organizational CC and financial CC (Ownership): For the school the ownership situation was very straight forward. Most of the real estate managers from schools told that they would only become owner of the square meters of the building that did not have an educational function when the risk was not too high and they had the financial and organizational capacity to do so. One of the interviews, for example, told that in all their community schools they are owner of the entire building. When they develop a new community school they however only add limited square meters for other functions. By doing this they reduce the vacancy and BM&O risk.
- III. Willingness and influence & say (ownership and BM&O): One of the real estate managers told that they chose for BM&O by the school (primary user) because the municipality (owner of the square meters without educational purpose) was not willing to do this since this was not their core business. The other partner within the project leased their building parts and therefore only wanted to pay service charges for BM&O. These other users did not necessarily care about how this was arranged (Influence and say). In this case the other partners paid a service charge to the school and rent to the municipality. In return for this service charge the school carried out the BM&O. In this case the choice for the BM&O model was heavily influenced by the willingness of the different partners to be responsible for BM&O but also the wanted influence and say the different partners wanted.
- IV. Number of organizations (BM&O): A general remark made by all the real estate managers was that when there are more partners the BM&O situation becomes increasingly difficult to arrange and a more strict BM&O model has to be chosen. This shows that the number of organizations is indeed important for the chosen BM&O model

During the interview with the municipal educational real estate manager/policy maker the variables that came forward when discussing experiences were different from the other interviews. For the municipality variables such as the financial CC and risk profile were less important since they already get budget to build the educational part of the community school and are obliged to do so. Based on the political view of the municipality then the decision was made whether the other square meters should also be owned and maintained by the municipality. This political vision was mainly influenced by whether the municipality wants to keep control in its own hands or sees itself as a policy maker (core business). The real estate manager from the municipality that was interviewed told that in the past the municipality he worked for wanted to keep control over the community schools and therefore the municipality was owner of the entire building and responsible for BM&O. Right now however within the municipality the view on the tasks of the municipality changes (going back to the core business of writing policies instead of being a real estate property manager) and therefore the ownership for new community schools, and the BM&O for new and existing community schools is currently being reconsidered. In case of the municipality that was interviewed therefore mainly the willingness and wanted influence and say was very important and other factors were less influential in the decision-making process.

When interviewing the real estate manager from the childcare organization again it came forward that they were not involved in the decision-making process towards an ownership model. The real estate manager told that in the beginning they were also not really involved in choosing a BM&O model, but in time their involvement in this decision-making process grew. For the childcare organizations the collaboration model was the most important factor in choosing a BM&O model. In case of in depth collaboration (ICC) it was more likely to do things together with the other parties since in that case often a (somewhat) combined organization within the community school is created to arrange the in depth pedagogical collaboration. Furthermore, this also created economies of scale which was also a factor that could influence the decision (e.g. why would you hire two cleaning companies when you can also do this together?).

During the two questionnaire phases it was already clear that childcare organizations are almost always leasing their part of the building and therefore are almost never (solely) responsible for BM&O or own (parts of) the building. During the interview was asked why this was the case and if the interviewee knew situations in which the childcare organization owned their part of, or the entire building. By asking this question it was possible to obtain insight in the considerations of the childcare organizations and therefore also whether the variables present in the DAGs influenced their decision. Although the possibility to be owner of (parts) of the building was considered by the interviewed childcare organization in the end the risk of owning real estate is high for these types of organizations since they are very dependent from government funding mechanisms. Furthermore, the culture of childcare organizations in general is still very lease oriented. In general therefore the organizations do not want to be owner. Furthermore, in many cases the municipality and school have a very strong position within the initiative in comparison to the often smaller (in square meters within the community school) childcare organizations. Because the childcare organizations are often leasing their part of the building they do not feel the responsibility to be (solely) responsible for BM&O and don't necessarily want the influence and say.

#### 4.4.3 Discussion expert interviews – phase 1: Results

Based on part one of the interviews it was possible to validate the variables (nodes) present in the ownership and BM&O DAG. In the previous paragraph an impression of the experiences of the interviewees discussed during the interviews is given. Based on this type of discussions during the interviews Table 25 and Table 26 have been made. In Table 25 and Table 26 the number of interviewees that mentioned a variable that is present within the network is shown. In Table 25 (ownership model) the results from the childcare organizations have been left out since the childcare organizations that was interviewed was not involved in this decision-making process.

Based on phase 1 of the validation interviews it can be concluded that the nodes present in the DAG are indeed important to the decision-making process. Although not all interviewees mentioned all the variables this is understandable. Every interviewee got the change to do their own story. Not everyone did this in the same manner and thus not always every factor was mentioned. Furthermore, not for every actor the same variables are important. For example, when looking to the results of the FDM questionnaire the variable risk profile (ownership DAG) is less important for the municipality than for the other actors. When examining Table 25 it can be seen that indeed the municipality did not mention this variable. Although the number of observations during the validation interviews and the individual actor groups for the FDM results are very low, the same trends can be observed. During the first phase of the discussion also a few variables that were not present in the networks have been mentioned by people. In general these variables were part of the larger selection of variables presented to people in the FDM questionnaire and were rejected because they were not important enough or because they are not known at the time the DAG could be used in the future to choose an ownership or BM&O model. Examples include:

Ownership variables:

- I. Tax benefits
- II. Co-use regulations (Mede gebruiksregeling)
- III. Public versus private ratio
- IV. Client (Bouwheerschap)
- V. Complete decentralization
- VI. Ratio building users

BM&O variables:

- I. Ratio building users (m<sup>2</sup>)
- II. Municipal policy
- III. Amount of building sharing

Choice ownership model					
	Advisor	School	Municipality	Childcare	Total
Financial CC	4/4	2/3	-	-	6/8
Risk Profile	3/4	2/3	-	-	5/8
Mandatory law	3/4	2/3	-	-	5/8
Organization types	3/4	2/3	-	-	5/8
Organizational CC	4/4	3/3	1/1	-	8/8
Collaboration model	4/4	3/3	-	-	7/8
Size organizations	3/4	1/3	-	-	4/8
Number organizations	3/4	2/3	1/1	-	6/8
Synergy	4/4	3/3	-	-	7/8
Will. to be owner	4/4	3/3	1/1	-	8/8
Importance of influence and say	4/4	3/3	1/1	-	8/8

Table 25. Frequencies variables mentioned during validation interviews – ownership

Choice BM&O model					
	Advisor	School	Municipality	Childcare	Total
Financial CC	2/4	2/3	-	1/1	4/9
Economies of scale	3/4	2/3	1/1	1/1	7/9
Financial flexibility model	2/4	2/3	-	-	4/9
Mandatory law	2/4	2/3	-	-	4/9
Collaboration model	4/4	3/3	1/1	1/1	9/9
Knowledge about BM&O	3/4	2/3	1/1	1/1	7/9
Organizational CC	3/4	2/3	1/1	1/1	7/9
Size organizations	3/4	2/3	-	-	5/9
Number organizations	3/4	1/3	1/1	-	6/9
Organization types	2/4	1/3	-	-	3/9
Synergy	4/4	3/3	1/1	1/1	9/9
Wanted influence and say BM&O	4/4	3/3	1/1	1/1	9/9
Will. to be resp. for BM&O	4/4	3/3	1/1	1/1	9/9

Table 26. frequencies variables mentioned during validation interviews – BM&O

	A	B	Label	Proposed action	Number of people agreed	Action
1	Will. to be owner	→ Organization types	Not logical	Direction	1	Ask delete
	Will. to be owner	→ Organization types		Delete	7	Delete
2	Synergy	↔ Organizational CC	Not logical	Delete	8	Delete
3	Organizational CC	→ Organization types	Not logical	Delete	7	Delete
4	Risk profile	→ Mandatory law	Not logical	Delete	6	Delete
5	Organizational CC	→ Synergy	Far-fetched	Delete	6	Delete
6	Risk profile	→ Organization types	Far-fetched	Delete	7	Delete
7	Financial CC	↔ Size organizations	A→B, B→A	Direction	5	B → A
8	Will. to be owner	↔ Importance of I&S	A→B, B→A	Direction	6	B → A
10	Organization types	→ Importance of I&S	Maybe add	Add	5	Add
11	Size organizations	→ Importance of I&S	Maybe add	Add	3	-
12	Number of organizations	→ Risk profile	Maybe add	Add	2	-
13	Number of organizations	→ Chosen ownership model	Maybe add	Add	6	Add

Table 27. Validation interviews – validation relationships ownership DAG

#### 4.4.4 Discussion expert interviews – phase 2

In paragraph 4.3.2 the preselection for the ownership DAG shown to the interviewees during the validation interviews has been discussed. Based on this preselection relationships of interest have been selected. During phase 2 of the validation interviews these relationships of interest have been discussed with the interviewees. In Table 27 the results of this discussion can be seen. A change within the model is accepted if 5 out of 8 (majority) of the interviewees agreed on deleting, adding or changing the relationship.

Based on the validation interviews six relationships have been deleted from the ownership DAG and two relationships have been added. Most interviewees agreed on deleting the illogical and far-fetched relationships. Most of them could understand where the idea of adding the relationships with the label “Maybe add” came from but did not entirely agree in all cases. For example, some of the advisors agreed that in the past the size of the organizations indeed influenced the importance of influence and say. In more recent community school projects however they encountered that the size of the organizations was not that important anymore but the organizations mainly looked at the financial and organizational carrying capacity. Therefore most interviewees did not think that adding this relationship to the network would ensure that the network would become a better reflection of the decision-making process towards an ownership model in practice. Concerning two circular relationships the direction of the relationship has been discussed. Based on this discussion the direction of the relationships have been set to:

- Size organization → Financial CC: Most interviewees agreed on the fact that an organization will first grow and only then the financial carrying capacity can increase.
- Importance of influence and say → Willingness to be owner: Interviewees thought that the importance of influence and say is a measure of how willing organizations are to become owner of the building. Therefore the relationship is accepted in this direction.

In general the interviewees thought that the ownership DAG was very recognizable. Certain crucial relationships such as “Risk profile → Willingness to be owner → Choice ownership model” were present within the network. The model related to the experience they encountered in practice.

#### *4.4.5 Discussion expert interviews – Phase 3*

In paragraph 4.3.2 the preselection for the BM&O DAG shown to the interviewees during the validation interviews has been discussed. Based on this preselection relationships and nodes of interest have been selected. During phase 3 of the validation interviews these relationships and nodes of interest have been discussed in detail with the interviewees. In Table 28 the results of this discussion can be seen. A change within the model is accepted if 5 out of 9 (majority) of the interviewees agreed on deleting, adding or changing the relationship. Based on the validation interviews eight relationships have been deleted from the model, for four relationship the direction has been changed and two relationships have been added to the model.

Important relationships that were labelled “maybe add” that were also missing in the eyes of most of the interviewees were “number of organizations → Choice BM&O model” and “Economies of scale → Choice BM&O model”. Especially the relationship between the number of organizations and the choice for an ownership model was emphasized by a lot of the different interviewees. These relationships therefore will be added to the model. The relationship “Size organizations → Willingness to be responsible for BM&O” will not be added because most interviewees argued that in the past this relationship was present but in more recent projects organizations looked more at the financial and organizational carrying capacity (just as was the case with the ownership model).

Concerning the relationship “economies of scale → Collaboration model” most interviewees agreed that the relationship should be in the other direction. In case interviewees did not think the direction of the variable should be changed the question was asked whether the relationship should be deleted. Because most interviewees agreed that the relationship should be in the other direction the direction is changed. The reason for collaborating is not necessarily economies of scale.

Concerning the illogical relationships “Financial CC → Organization types”, “Wanted I&S → Organization types” and “Synergy → Organization types” first the question was asked whether people would change the direction of the relationship. For these three relationships the relationships in the opposite direction were considered to be more logical during the pre-selection, but they were not selected. If people did not agree on changing the direction of the relationship the question was asked whether the relationship should be deleted. In all three cases the majority of the interviewees agreed with changing the direction of the relationships.

Concerning the three circular relationships for which the direction could not be determined during the preselection the direction has been determined during the validation interviews. Based on this discussion the direction of the relationships have been set to:

- Wanted influence and say → Willingness to be responsible for BM&O: The wanted influence and say is a measure of how willing organizations are to be responsible for BM&O. Therefore the relationship is accepted in this direction.
- Size organizations → Financial carrying capacity: Most interviewees agreed on the fact that an organization will first grow and only then the financial carrying capacity can increase.

Concerning the third circular relationship (Wanted influence and say → collaboration model) the majority of the interviewees did not think this relationship should be present within the network. The variable wanted influence and say concerns the wanted influence and say on BM&O and not on the substantive collaboration which is arranged in the collaboration model. These two variables should therefore not be linked to each other and the circular relationship therefore is deleted.

Next to the relationships discussed in Table 28 there were two nodes of interest that had to be discussed during the validation interviews:

- I. Collaboration model
- II. Organization types

Concerning the collaboration model it was expected that not all respondents (matrix questionnaire) understood the difference between the collaboration model and the BM&O model. By deleting some of the relationships from and to the collaboration model node (see Table 28) most interviewees thought that influence of the node “Collaboration model” was accurate in comparison to the decision-making process towards a BM&O model in practice.



	A	B	Label	Proposed action	Number of people agreed	Action
1	Will. To be resp. for BM&O	→ Collaboration model	Not logical	Delete	7	Delete
2	Financial CC	→ Organization types	Not logical	Direction	6	B → A
	Financial CC	→ Organization types		Delete	3	-
3	Wanted I&S	→ Organization types	Not logical	Direction	8	B → A
	Wanted I&S	→ Organization types		Delete	1	-
5	Synergy	→ Organization types	Not logical	Direction	8	B → A
	Synergy	→ Organization types		Delete	1	-
6	Financial flexibility	→ Collaboration model	Not logical	Delete	6	Delete
7	Economies of scale	→ Collaboration model	Not logical	Direction	6	B → A
	Economies of scale	→ Collaboration model		Delete	2	-
8	Will. To be resp. for BM&O	→ Size organization	Not logical	Delete	7	Delete
9	Mandatory law	→ Collaboration model	Not logical	Delete	8	Delete
10	Knowledge about BM&O	→ Collaboration model	Not logical	Delete	8	Delete
11	Wanted I&S	↔ Collaboration model	A → B, B → A	Direction	-	Delete
12	Will. To be resp. for BM&O	↔ Wanted I&S	A → B, B → A	Direction	7	B → A
13	Financial CC	↔ Size organizations	A → B, B → A	Direction	5	B → A
14	Organizational CC	→ Collaboration model	Far-fetched	Delete	7	Delete
15	Knowledge about BM&O	→ Organization types	Far-fetched	Delete	8	Delete
16	Financial flexibility	→ Financial CC	Maybe add	Add	4	-
17	Number of organizations	→ Choice BM&O model	Maybe add	Add	8	Add
18	Economies of scale	→ Choice BM&O model	Maybe add	Add	5	Add
19	Size Organizations	→ Will. to be resp. for BM&O	Maybe add	Add	3	-

Table 28. Validation interviews – validation relationships BM&O DAG

The second node of interest “Organization types” was initially influenced by a lot of different factors. These relationships however were not logical and therefore this node was a node of interest during the validation interviews. After changing the direction of the relationships within the network most interviewees agreed that the influence of “organization types” on the decision towards a BM&O model for community schools was accurately displayed within the network.

In general the interviewees thought that the BM&O DAG was recognizable. Certain crucial relationships were present within the network such as “Mandatory law → Financial Flexibility model → Choice BM&O model” and “Organization types → wanted influence and say → choice BM&O model”. After changing some relationships within the network the model related to the experience they encountered in practice.

## 4.5 Directed acyclic graph - Ownership

### 4.5.1 Discussion DAG ownership – key nodes

Based on the matrix questionnaire and the validation interviews the ownership DAG has been constructed. This graphical structure represents the decision-making process towards an ownership model for community schools in the Netherlands. In the DAG a total of 12 nodes and 29 relationships between the nodes are included. Based on the outcome of the matrix questionnaire and the validation interviews however the graphical structure contains one cycle (choice ownership model → mandatory law → Financial CC → Willingness to be owner → Choice ownership model) and therefore is not a DAG but a directed graph. Since a DAG relates to time in a linear matter cycles within the graph are not desirable and makes solving the problem NP-hard. Converting a directed graph to a DAG is possible by deleting a minimal amount of relationships, a minimal amount of nodes or by contracting each strongly connected component into a single super vertex. In this case the cycle can be easily broken by removing the relationship “choice ownership model → mandatory law”. In Figure 23 the

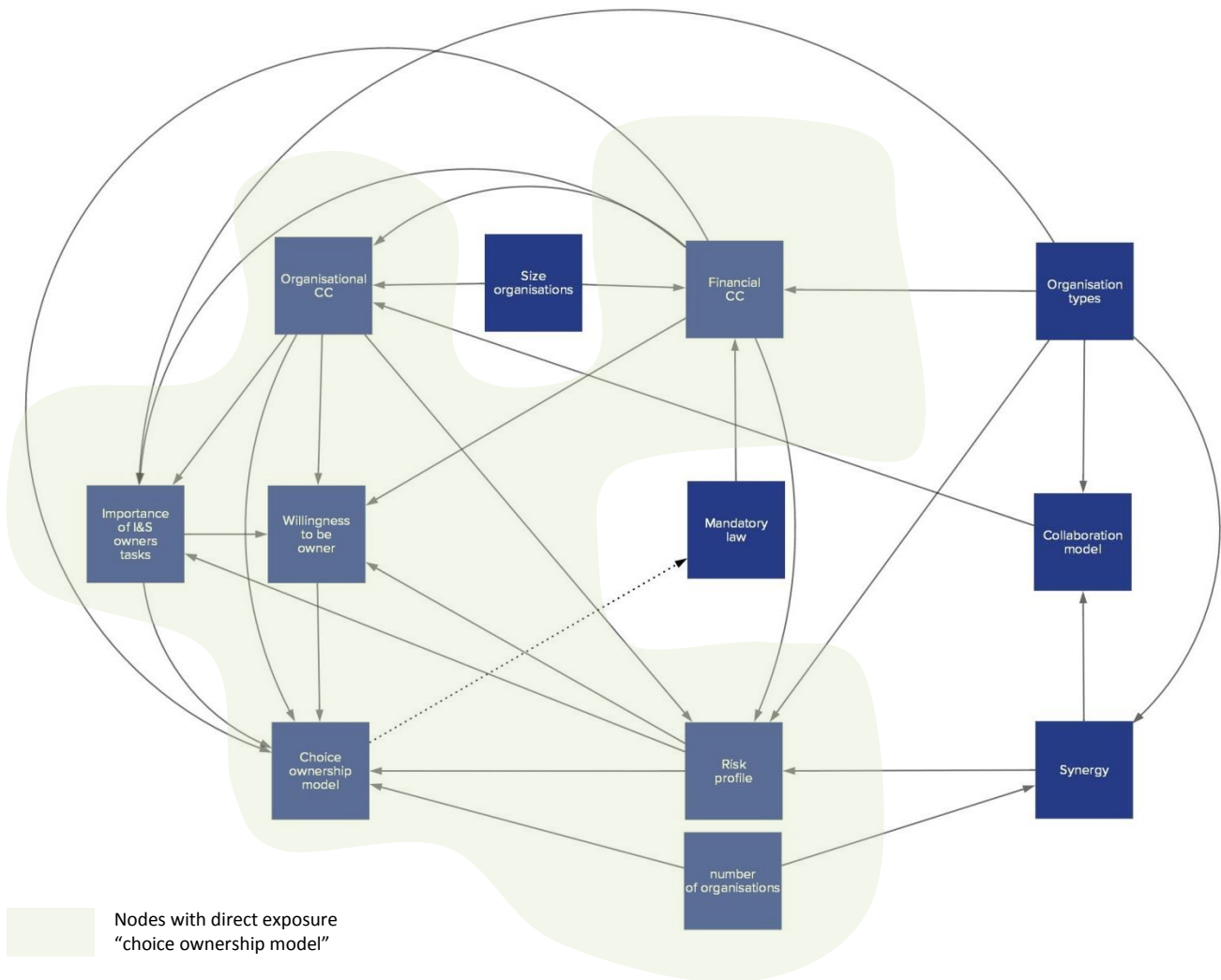


Figure 23. Final ownership DAG

DAG that represents the decision-making process towards an ownership model for community schools in the Netherlands is shown. In this figure the removed cyclic relationship has been shown with a dotted line.

Some nodes have a more prominent effect on the choice for an ownership model than others. In literature numerous discussions about how to determine the most prominent influencers within a network can be found. In some cases the use of graph theory is proposed to determine all possible paths from a node in the network towards the root nodes within the network. By doing this the connectivity of the nodes within the network with regards to the root node can be determined. Other ways of determining the effect of nodes within the network are to look at the indegree, outdegree, and total degree for every node within the network and look at the exposure nodes and intermediate nodes in relation to the root nodes within the network.

In Table 29 for every node the indegree, outdegree and degree are shown (analysis of number of neighbors for every node). Based on this analysis it can be concluded that there are three leaf nodes present within the network that only influence other nodes and are not influenced by any of the other nodes within the network:

- I. Organization types
- II. Size organizations
- III. Number of organizations

	Degree per node			Influence on "Choice ownership model"		
	Outdegree	Indegree	Degree	Direct Exposure & exposure via intermediate	Direct Exposure	Exposure via Intermediate
Synergy	2	2	4			x
Financial CC	5	3	8	x		
Willingness to be owner	1	4	5		x	
Organization types	5	-	5			x
Importance of I&S owners' tasks	2	4	6	X		
Risk profile	3	4	7	x		
Size organizations	2	-	2			x
Mandatory law	1	-	2			x
Collaboration model	1	2	3			x
number of organizations	2	-	2	x		
Organizational CC	4	3	7	x		
Choice ownership model	-	6	6	-	-	-
Total	28	28	56	5	1	6

Table 29. Analysis relationships and nodes – Ownership DAG

Furthermore, there is one root node that shows the outcome of the model: choice ownership model. Therefore the network meets the requirement of a DAG.

Based on the outdegree for every node within the network the key influencers within the network can be determined. Within this network there are three key influencers:

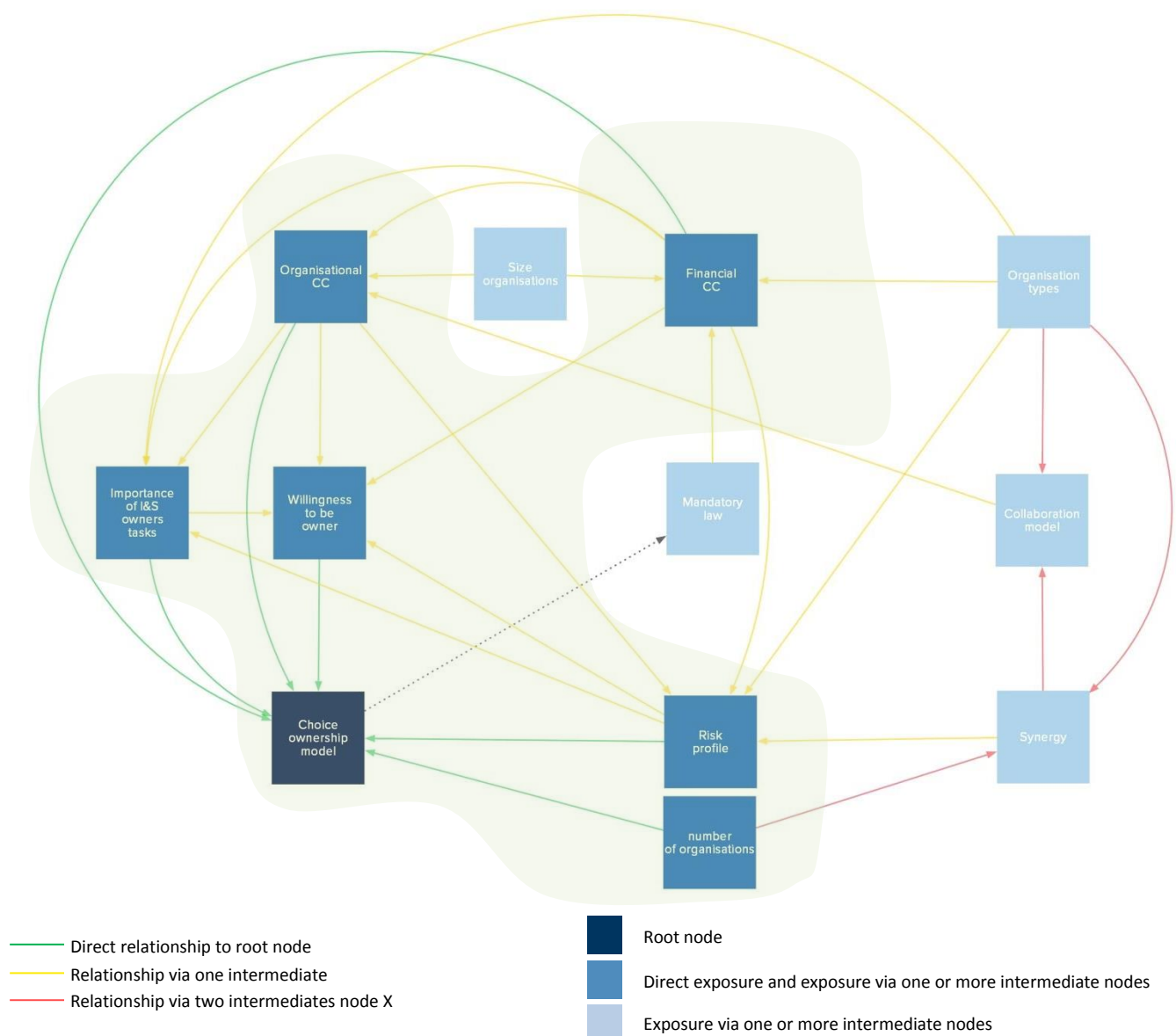
- I. Financial carrying capacity
- II. Organization types
- III. Organizational carrying capacity

Although based on the outdegree of the nodes these three variables are key influencers, within the network the outdegree does not necessarily tell whether a node is best connected to the rest of the network and the root node. As can be seen in Table 29 the node "organization types" is not directly connected (direct exposure) to the node "Choice ownership model", but affects the root node via an intermediate node.

To look further into the connectivity of the different nodes within the network and their influence on the node "choice ownership model" the outdegree connection for every node have been labelled according to the minimum number intermediates within the network (shortest path) they have to cross to reach the node "choice ownership model". To determine the nodes that have the highest influence on the root node a weighted score has been given to every node within the network based on the number relations that directly expose the variable to the root node and the number of relationships that influence the root node via one or two intermediates. In Table 30 and Figure 24 an overview of this analysis can be seen. Based on this analysis it can be conclude that five nodes have a very strong effect on the root node (weighted score  $\geq 15$ ):

- I. Financial carrying capacity
- II. Organization types
- III. Importance of influence and say owners' tasks
- IV. Risk profile
- V. Organizational carrying capacity

	Direct relationship	Relationship via one intermediate	Relationship via two intermediates	Weighted impact score
Weight	10	5	1	
Synergy	-	1	1	6
Financial CC	1	4	-	30
Willingness to be owner	1	-	-	10
Organization types	-	3	2	17
Importance of I&S owners' tasks	1	1	-	15
Risk profile	1	2	-	20
Size organizations	-	2	-	10
Mandatory law	-	1	-	5
Collaboration model	-	1	-	5
number of organizations	1	-	1	11
Organizational CC	1	3	-	25



#### 4.5.2 Discussion DAG ownership – textual explanation

To further validate the ownership DAG, in this paragraph some of the paths within the network will be discussed textually:

- I. (1) Size organizations → (2) Organizational CC → (3) Willingness to be owner → (4) Choice ownership model

Organizations that are very big (1) often are more likely to have a higher organizational carrying capacity (2). Because of this higher organizational carrying capacity (2) the organizations will most likely also be more willing to be the owner of community school (3) since they have the organizational resources to deal with the tasks that are part of being owner of such a building. (Partially) Based on the willingness to be owner (3) of the community school building an ownership model (4) can be chosen. If only one actor within the initiative is willing to be the owner (3) the chances are high this actor will in the end also become the owner of the building (4) (dependent from other factors such as the financial CC, wanted influence and say etc.). If more than one actor within the initiative is willing to be the owner (3) it is more likely that a combined ownership structure (VvE) is considered by the actors within the initiative (4).

- II. (1) Organization types → (2) Importance influence and say owners' tasks → (3) willingness to be owner → (4) Choice ownership model

Certain organization (1) naturally want more, or less influence and say (2). For example, the childcare organizations wants less influence and say on the owners' tasks of the BM&O because they almost always lease. The school however often wants more influence because based on the WPO they have to be responsible for the owners part of the BM&O of their building parts. The amount of influence and say (2) is a measure of how willing organizations are to become owner of the building (3). If an organizations want a lot of influence and say it is more likely that they are also willing to become owner. Based on the willingness of the different actors to become owner an ownership model can be selected (4).

- III. (1) Number of organizations → (2) Synergy → (3) Risk profile → (4) Willingness to be owner → (5) Choice ownership model

When a lot of organizations are part (1) of the initiative for a community school it is less likely that between all the different organizations a higher synergy is present (2). When the synergy (2) between the different organizations is lower the added value of being part of a community school is less high and therefore the risk (3) of people leaving the initiative/building are higher. Therefore the risk profile (3) (vacancy risk) will most likely be higher which will have a negative effect on the willingness of the different organizations to become owner (4). The higher the risk the less willing people will be to become owner. When less people are willing to be owner the chance of certain ownership model (5) to be chosen are lower (for example, combined ownership).

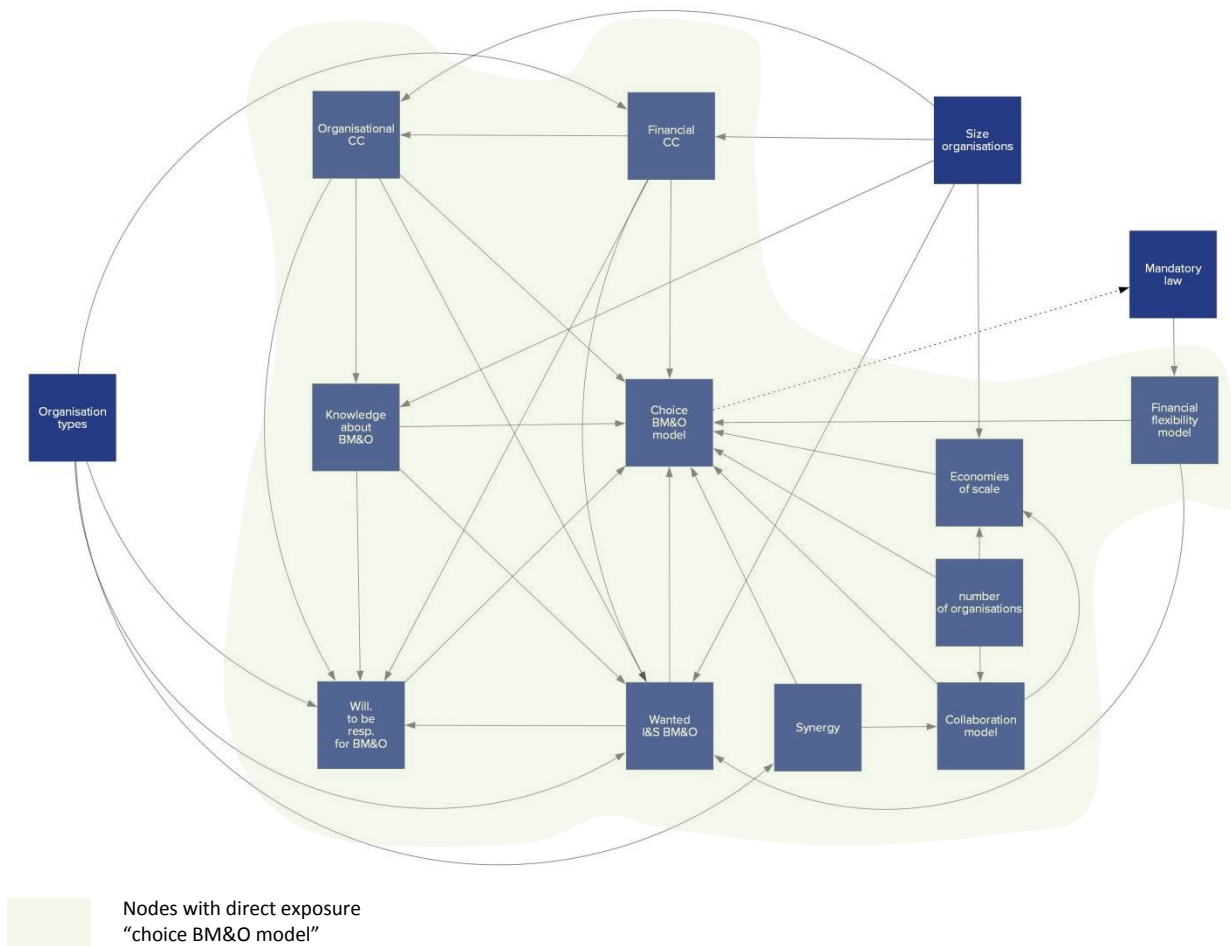


Figure 25. Final BM&O DAG

## 4.6 Directed acyclic graph - BM&O

### 4.6.1 Discussion DAG BM&O

Based on the matrix questionnaire and the validation interviews the BM&O Dag has been constructed. This graphical structure represents the decision-making process towards a BM&O model for community schools in the Netherlands. In the DAG a total of 14 nodes and 35 relationships between the nodes are included. Based on the outcome of the matrix questionnaire and the validation interviews however the graphical structure contains one cycle (choice BM&O model → mandatory law → Financial flexibility model → choice BM&O model) and therefore is not a DAG but a directed graph. Since a DAG relates to time in a linear matter cycles within the graph are not desirable and makes solving the problem NP-hard. Converting a directed graph to a DAG is possible by deleting a minimal amount of relationships, a minimal amount of nodes or by contracting each strongly connected component into a single super vertex. In this case the cycle can be easily broken by removing the relationship "Choice BM&O model → Mandatory law". In Figure 25 the DAG that represents the decision-making process towards an BM&O model for community schools in the Netherlands is shown. In this figure the removed cyclic relationship has been shown with a dotted line.

	Degree per node			Influence on "Choice BM&O model"		
	outdegree	Indegree	Degree	Direct Exposure & exposure via intermediate	Direct Exposure	Exposure via Intermediate
number of organizations	3	-	3	X		
Synergy	2	1	3	X		
Wanted I&S BM&O	2	6	8	X		
Will. to be resp. for BM&O	1	5	6		X	
Organization types	4	-	4			X
Size organizations	5	-	5			X
Collaboration model	2	2	4	X		
Economies of scale	1	3	4	X		
Financial flexibility model	2	1	3	X		
Organizational CC	4	2	6	X		
Financial CC	4	2	6	X		
Mandatory law	1	-	2			X
Knowledge about BM&O	3	2	5	X		
Choice BM&O model	-	10	11	-	-	-
Total	34	34	68	9	1	3

Table 31. Analysis relationships and nodes – BM&O DAG

Some nodes have a more prominent effect on the choice for an BM&O model than others. Also in this case an analysis of the indegree, out degree, degree, exposure and intermediates has been carried out. In Table 31 for every node the indegree, outdegree and degree are shown (analysis of number of neighbors for every node). Based on this analysis it can be concluded that there are three leaf nodes present within the network that only influence other nodes and are not influences by any of the other nodes within the network:

- I. Number of organizations
- II. Organization types
- III. Size organization

Furthermore, there is one root node that shows the outcome of the model: choice BM&O model. Therefore the network meets the requirement of a DAG.

Based on the outdegree for every node within the network the key influencers within the network can be determined. Within this network there are four key influencers:

- I. Organization types
- II. Size organizations
- III. Organizational carrying capacity
- IV. Financial carrying capacity

Although based on the outdegree of the nodes these four variables are key influencers, within the network the outdegree does not necessarily tell whether a node is best connected to the rest of the network and the root node. As can be seen in Table 31 the node "organization types" is not directly connected (direct exposure) to the node "Choice BM&O model", but affects the root node via an intermediate node.

	Direct relationship	Relationship via one intermediate	Weighted impact score
Weight	10	5	
number of organizations	1	2	20
Synergy	1	1	15
Wanted I&S BM&O	1	1	15
Will. to be resp. for BM&O	1	-	10
Organization types	-	4	20
Size organizations	-	5	25
Collaboration model	1	1	15
Economies of scale	1	-	10
Financial flexibility model	1	1	15
Organizational CC	1	3	25
Financial CC	1	3	25
Mandatory law	-	1	5
Knowledge about BM&O	1	2	20

Table 32. Analysis relationships – BM&O DAG

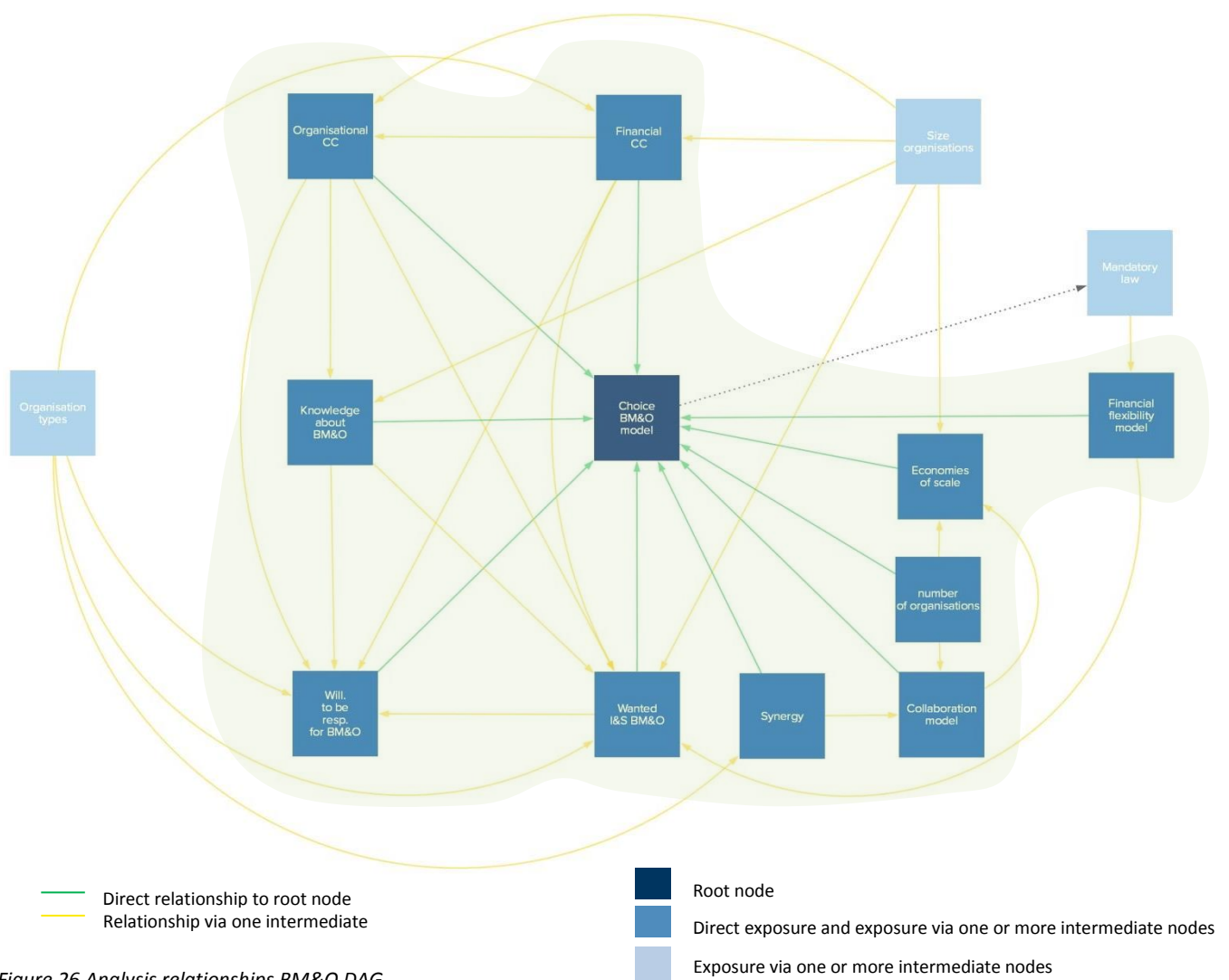


Figure 26. Analysis relationships BM&O DAG



To look further into the connectivity of the different nodes within the network and their influence on the node “choice BM&O model” the outdegree connection for every node have been labelled according to the minimum number intermediates within the network (shortest path) they have to cross to reach the node “choice BM&O model”. To determine the nodes that have the highest influence on the root node a weighted score has been given to every node within the network based on the number of relations with that directly expose the variable to the root node and the number of relationships that influence the root node via one intermediate. In this case there are no relationships that affect the root node via two intermediates thus this option is not included in the analysis. In Table 32 and Figure 24 an overview of this analysis can be seen. Based on this analysis it can be conclude that in case of the decision-making process towards a BM&O model in the Dutch community school sector a lot of variables have a prominent effect on the decision-making process. A lot of variables get a height weighted score and have both an indirect and a direct effect on the root node “Choice BM&O model”. Furthermore, most the variables that do not have a direct effect on the root node have multiple relationships towards the root node via intermediate nodes.

#### 4.6.2 Discussion DAG BM&O – textual explanation

To further validate the BM&O DAG, in this paragraph some of the paths within the network will be discussed textually:

- I. (1) Mandatory law → (2) Financial flexibility model → (3) Choice BM&O model

Mandatory lay (1) influences whether organizations are obliged to save money for BM&O and therefore influences the financial flexibility (2) the BM&O model can provide to the organizations. If money has to be saved this money can't be used for other purposes than BM&O. A less financially flexible model is expected to be less likely chosen (3) by the different organizations present within the community school initiative because less financial flexibility is often not advantageous for the primary school (which is often one of the biggest users of the building).

- II. (1) Organization types → (2) Wanted influence and say BM&O → (3) Choice BM&O model

Certain organizations (1) in general want more influence and say (2) than others on the BM&O. An example that was clearly existing during this study is that childcare organizations (1) don't want the influence and say on BM&O (2) but often they want the role of tenant within the initiative. If an organization does not want influence and say on BM&O a BM&O model in which this organizations is (partially) responsible for BM&O is less likely to occur.

- III. (1) Organization types → (2) Synergy → (3) Collaboration model → (4) Choice BM&O model

Between certain organizations (1) it is more likely that there is synergy (2). For example, it is more likely that there is synergy between a school and a childcare organizations than between a school and a general practitioner. More synergy (2) between organizations makes it more likely that a collaboration model (3) in which the goal is to create more in depth collaboration between the organizations is chosen. When organizations work more closely

together (3) it is more likely that they will also work together concerning BM&O. Therefore the type of collaboration influences the type of BM&O model (4) that most likely will be chosen.

#### 4.7 Differences and similarities between the ownership and BM&O DAG

##### 4.7.1 Variables

After the construction of the ownership DAG and the BM&O DAG that represent the decision-making processes, differences can be observed in the variables that are part of the models. On a first glance when looking to both networks the BM&O DAG includes more variables than the ownership DAG (Table 34). The difference is caused by the fact that in case of the BM&O DAG one financial and one organisational factor more is included in the DAG.

	Ownership DAG	BM&O DAG
Total number of relationships	28	34
Direct relationships to root node	6	10
Relationships to root node via one intermediates	18	24
Relationships to root node via two intermediates	4	-
Nodes within direct exposure	6	10
Nodes with indirect exposure	5	3

Table 33. Comparison structure ownership and BM&O DAG

	Financial	Legal	Organizational	Psychological	Total
Ownership	2	1	5	3	11
BM&O	3	1	6	3	13

Table 34. Comparison variable types included in ownership and BM&O DAG

Both DAGs	Only ownership DAG	Only BM&O DAG
<ul style="list-style-type: none"> <li>Financial carrying capacity</li> <li>Mandatory law</li> <li>Organization types</li> <li>Organizational carrying capacity</li> <li>Collaboration model</li> <li>Size independent organizations</li> <li>Number of organizations</li> <li>Synergy</li> </ul>	<ul style="list-style-type: none"> <li>Risk profile</li> <li>Willingness to be owner</li> <li>Importance of influence and say on tasks owner</li> </ul>	<ul style="list-style-type: none"> <li>Economies of scale</li> <li>Financial flexibility BM&amp;O model</li> <li>Knowledge about BM&amp;O</li> <li>Importance influence and say BM&amp;O</li> <li>Willingness to be responsible for BM&amp;O</li> </ul>

Table 35. Reoccurring nodes within both DAGs

Although on a first glance the main differences between the models are the amount of nodes within the DAGs, there are also differences and comparisons between the models in terms of variable types. In general there are a lot of variables that are included in the ownership DAG and in the BM&O DAG, but in some cases a variable is only included in one of the models (Table 35). In total 8 variables are included in both DAGs and the variables willingness to be owner and willingness to be responsible for BM&O, and the variables importance of influence and say BM&O and importance of influence and say on tasks owner, have a similar character. The variables within the two DAGs therefore mainly differentiate based on variables that are very specific to one of the decision-making processes such as knowledge about BM&O or risk profile. The fact that the two DAGs share a lot of similar variables could indicate that the two decision-making processes are indeed connected to each other (as was also indicated in literature).

#### 4.7.2 Structure

When looking to the structure of the ownership and BM&O DAGs that represent the decision-making processes, the first difference that can be observed is that the BM&O DAG includes more relationships (34 versus 28 relationships). Furthermore, the nodes within the BM&O DAG are better connected to the root node than in the ownership DAG. In case of the ownership DAG 6 variables have a direct relationship with the root node Choice ownership model, in case of the BM&O DAG 10 variables have a direct effect on the root node Choice BM&O model. Next to the higher amount of direct relationships between nodes within the BM&O DAG and the root node, there are also no relationships within the BM&O DAG that connect a node via two intermediate nodes to the root node.

Based on the difference in structure between the two DAGs it is expected that the decision towards a BM&O model is more complicated than the decision towards an ownership model since more variables have a direct effect on the outcome of the decision-making process, and the nodes within the BM&O DAG are better connected to the root node.

#### 4.7.3 Relationships reoccurring nodes

Because of the similarities in variables within the two DAGs it is interesting to see whether in both models the same relationships between the same nodes have been selected. Therefore in Table 36 for the 8 similar variables and 2 variables with a similar nature, the relationships have been studied. Based on the analysis shown in Table 36 it can be seen that in general relationships that are present within the ownership DAG are also present within the BM&O DAG. There are however a few situations in which this is not the case.

From the total of 9 relationships that are only present in either one of the DAGs, 4 relationships are either from or to the node collaboration model, and 2 relationships are either from or to the node synergy. During the validation interviews it came forward that most interviewees thought that the collaboration model and synergy was less important for the choice for an ownership model than for the choice for a BM&O model. This could partially explain the lack of relationships in the ownership DAG opposed to the BM&O DAG. The fact that there is no relationship between organization types and collaboration model in the BM&O DAG however cannot be explained by this phenomena. The variable organization types was a node of interest in the BM&O DAG during the validation interviews. Based on

	Fin. CC	Man. law	Org. types	Org. CC	Coll. model	Size org.	Numb. org.	Syn.	I&S	Willing-ness	Choice model
Fin. CC				x/x					x/x	x/x	x/x
Man. law	x/-										
Org. types	x/x				x/-			x/x	x/x	-/x	
Org. CC									x/x	x/x	x/x
Coll. model				x/-							-/x
Size org.	x/x			x/x					-/x		
Numb. org.					-/x			-/x			x/x
Syn.					x/x						-/x
I&S										x/x	x/x
Willing-ness											x/x

x/x	: Both models		Both DAGs
-/x	: Only BM&O model		One DAG
x/-	: Only ownership model		

Table 36. Comparison relationships nodes that are present within both DAGs

the discussion of the node during the validation interviews however no interviewee mentioned a relationship between these two variables. When asking about it the majority of the interviewees said that the effect from organization types was mediated through the variable synergy. Unfortunately, during the validation interviews no extra attention has been given to the relationship between organization types and synergy in the ownership BM&O and therefore an explanation to why in the ownership DAG the relationship is included cannot be given.

In the ownership DAG the relationship mandatory law → Financial cc is included within the model. In the BM&O DAG however this relationship is not included. This can be explained because in case of the BM&O DAG an extra variable “Financial Flexibility model” (that is specific to the BM&O decision-making process) mediates the effect from mandatory law.

Concerning the relationships organization types → willingness and size organizations → influence and say, both are only included in the BM&O DAG. During the validation interviews this difference has been discussed and was explained by most interviewees based on the different nature of being owner and being responsible for BM&O.

## **4.8 Conclusion Directed acyclic graphs**

Based on the questionnaire and interviews the ownership and BM&O DAGs that represent the decision-making process towards an ownership and BM&O model have been made.

### **4.8.1 Matrix questionnaire**

Based on the matrix questionnaire a first directed graph could be created. Within this directed graph circular relationships, and some illogical relationships have been included. In a DAG with three variables (X, M and Y) an arrow ( $X \rightarrow Y$ ) means that there is a causal effect of X on Y that is not mediated through the variable M. Often when building DAGs, people tend to forget this aspect and think only about whether any kind of causal effect exists, without paying attention to how it is mediated (Textor, 2015). This may result in DAGs with too many arrows as could be the case with the directed graphs that are created based on the matrix questionnaire. Therefore validation of the directed graphs to transform them into a DAGs has to be carried out.

When looking further into the matrix questionnaire data in both cases it was striking to see that most people gave fairly neutral “in the middle” answers. When looking to the frequencies of answer option for every question in general no large groups of respondents gave extreme high or extreme low scores. Furthermore, in case of circular relationships often the scores for  $A \rightarrow B$  and  $B \rightarrow A$  were fairly similar.

### **4.8.2 Validation interviews**

After analyzing the initial results of the matrix questionnaire it was clear that validation was necessary. By conduction a pre-selection to convert the directed graph to a DAG, and conducting validation interviews, the number of (circular) relationships has been drastically lowered. Based on the matrix questionnaire 49 ownership relationships, and 56 BM&O relationships, have been selected. After the validation interviews 28 ownership relationships and 34 BM&O relationships are included in the networks.

During the validation interviews was asked whether both networks represented the decision-making process towards ownership and BM&O model accurately. The interviewees agreed that, after slightly altering the network, the networks represented the decision-making process in practice fairly accurate. Because of the complexity of the decision-making process towards an ownership and BM&O model in the Dutch community school sector, it is almost impossible to perfectly represent the decision-making process. As one interviewee said :” When looking to the variables within the network it is possible to draw relationships between every node, the network however includes the most important relationships”.

Based on the validation interviews that have been conducted, it can also be concluded that in recent years a lot has changed concerning the view of the different actors on the community school concept. As most interviewees told in the past community schools were often seen as a business complex in which different organizations are housed but they don’t really work together. Nowadays however, the collaboration between the different partners within a community school is a key condition for new community schools. Most interviewees told that when there is no collaboration and synergy between the partners the initiative is doomed to fail.

#### 4.8.3 Directed acyclic graph

Based on the validation interviews, and analysis of DAGs, it can be concluded that concerning the decision-making process towards an ownership model there are five variables that, based on the structure of the network, have a prominent effect on the decision for an ownership model: “Financial carrying capacity”, “Organization types”, “Importance of influence and say owners’ tasks”, “Risk profile” and “Organizational carrying capacity”. When looking to the analysis of the BM&O DAG all variables have a more or less similar effect on the decision.

Unfortunately, it was not possible to connect the two DAGs to each other since based on the analysis the first questionnaire (FDM) it was not possible to unambiguously determine which decision had to be made first (ownership or BM&O)

#### 4.8.4 Differences and similarities between the ownership and BM&O DAG

The ownership and the BM&O DAG are somewhat similar to each other in terms of nodes present within the networks. 8 Variables are present within both networks and there are 2 variables in each network that are of a similar nature. The differences nodes within the models are mainly caused by variables that are very specific to either one of the decision-making processes.

Based on the structure difference between the ownership and BM&O DAGs it can be concluded that the decision towards a BM&O model in the Dutch community school sector is more complex. This observation is based on the fact that in case of the BM&O DAG more nodes have a direct relationship to the root node choice BM&O model, and in general more variables are well connected to the root node than is the case in the ownership DAG.

When looking to the relationships between variables that are present within both DAGs in general the same relationships are included within the model. When looking to the reason why in some cases relationships are only included in one of the DAGs this is either caused by a difference in nature of being responsible for BM&O and being owner or because of a different importance of the collaboration and synergy between building users on the ultimate choice.



## **5. Conclusion**

In the final chapter of this graduation thesis the most important findings of the research are explained concisely. In the first section a short conclusion of the research results will be given and a critical evaluation of the study will be carried out. In the next section the societal and scientific relevance of the study will be discussed. In the last section recommendation for future research will be discussed.



## 5.1 Conclusion

### 5.1.1 *Discussion of the research and findings*

The main aim of this study was to close the gap between knowledge in practice about the decision-making process towards a BM&O and ownership model in the Dutch community school sector and literature. The initial research question central to this study was:

- *How is the decision-making process towards an ownership and BM&O model in the Dutch community school sector structured?*

To study the structure of the decision-making process towards an ownership and BM&O model in the Dutch community school sector, a DAG that represent this decision-making process towards an ownership and BM&O model has been made. The network consists of nodes that represent variables that influence the decision towards one of the models, and relationships between the different variables. To construct the DAGs the study focused on selecting variables that influence the decision towards one of these models and the relationships between these different variables.

The variables that that influence the decision-making process towards one of the models have been selected by using FDM. Based on a brainstorm session and the literature review a first overview of variables has been created. Next a questionnaire has been used to collect information about the importance of the different variables on the decision towards an ownership model and BM&O model. This survey questionnaire has been sent to different actors within the Dutch community school sector. Based on the analysis of the FDM questionnaire it can be concluded that psychological and organizational factors have a big impact on the decision-making process. When considering the ranking of the single derived numbers, these two however categories do not have the highest scores, but most variables within these two categories have been selected. Furthermore, the results of the FDM questionnaire showed that a lot of variables get a somewhat similar importance score. This observation demonstrates that the decision-making process towards an ownership model and BM&O model in the Dutch community school sector is quite complex and requires difficult consideration between a lot of (almost similarly important) variables. In Table 37 and Table 38 the most important variables that influence the decision towards and ownership model and BM&O model can be seen. These variables have been selected based on the FDM results and a re-evaluation.

After selecting the variables influencing the decision towards a BM&O and ownership model in the Dutch community school sector, the relationships between the different variables have been reviewed. This has been done by using an adjacency matrix questionnaire that have been sent to different actors within the Dutch community school sector. Based on the adjacency matrix questionnaire the initial structure of the graphical model has been constructed. Based on the matrix questionnaire however, only a directed graph and not a DAG could be developed. Therefore validation interviews with experts on the subject of ownership and BM&O of Dutch community schools have been used to transform the directed graph to a DAG. Furthermore, the interviews have been used to validate whether the DAG represents the decision-making process towards a BM&O and ownership model correctly.

Selected attributes influencing the decision towards an ownership model			
Financial Attributes		Legal Attributes	
<ul style="list-style-type: none"> <li>Financial carrying capacity</li> <li>Risk Profile</li> </ul>		<ul style="list-style-type: none"> <li>Mandatory law</li> </ul>	
Organizational Attributes		Psychological Attributes	
<ul style="list-style-type: none"> <li>Organization types</li> <li>Organizational carrying capacity</li> <li>Collaboration model</li> <li>Size independent organizations</li> <li>Number of organizations</li> </ul>		<ul style="list-style-type: none"> <li>Content Synergy</li> <li>Willingness to be owner</li> <li>Importance of influence and say owners'tasks</li> </ul>	

Table 37. Attributes influencing the decision towards an ownership model

Selected attributes influencing the decision towards a BM&O model			
Financial Attributes		Legal Attributes	
<ul style="list-style-type: none"> <li>Financial Carrying Capacity</li> <li>Economies of scale</li> <li>Financial flexibility BM&amp;O model</li> </ul>		<ul style="list-style-type: none"> <li>Mandatory law</li> </ul>	
Organizational Attributes		Psychological Attributes	
<ul style="list-style-type: none"> <li>Collaboration model</li> <li>Knowledge about building management</li> <li>Organizational carrying capacity</li> <li>Size independent organizations</li> <li>Number of organizations</li> <li>Organization types</li> </ul>		<ul style="list-style-type: none"> <li>Content Synergy</li> <li>Wanted influence and say BM&amp;O</li> <li>Willingness to be responsible for the building management</li> </ul>	

Table 38. Selected attributes influencing BM&O

Based on the adjacency matrix questionnaire and validation interviews the final DAGs, that graphically represent the decision-making process, have been constructed. The DAGs that can be seen in Figure 27 and Figure 28.

After analyzing the two DAGs a difference in the structure of the ownership DAG and the BM&O DAG has been observed. In case of the ownership DAG five single variables have a strong effect on the decision towards an ownership model. These variables are very well connected within the network.

- I. Financial carrying capacity
- II. Organization types
- III. Importance of influence and say owners' tasks
- IV. Risk profile
- V. Organizational carrying capacity

In case of the BM&O DAG the variables within the network all have a (somewhat) similar effect on the root node of the DAG (the choice for a BM&O model) and more variables are well connected to this node.

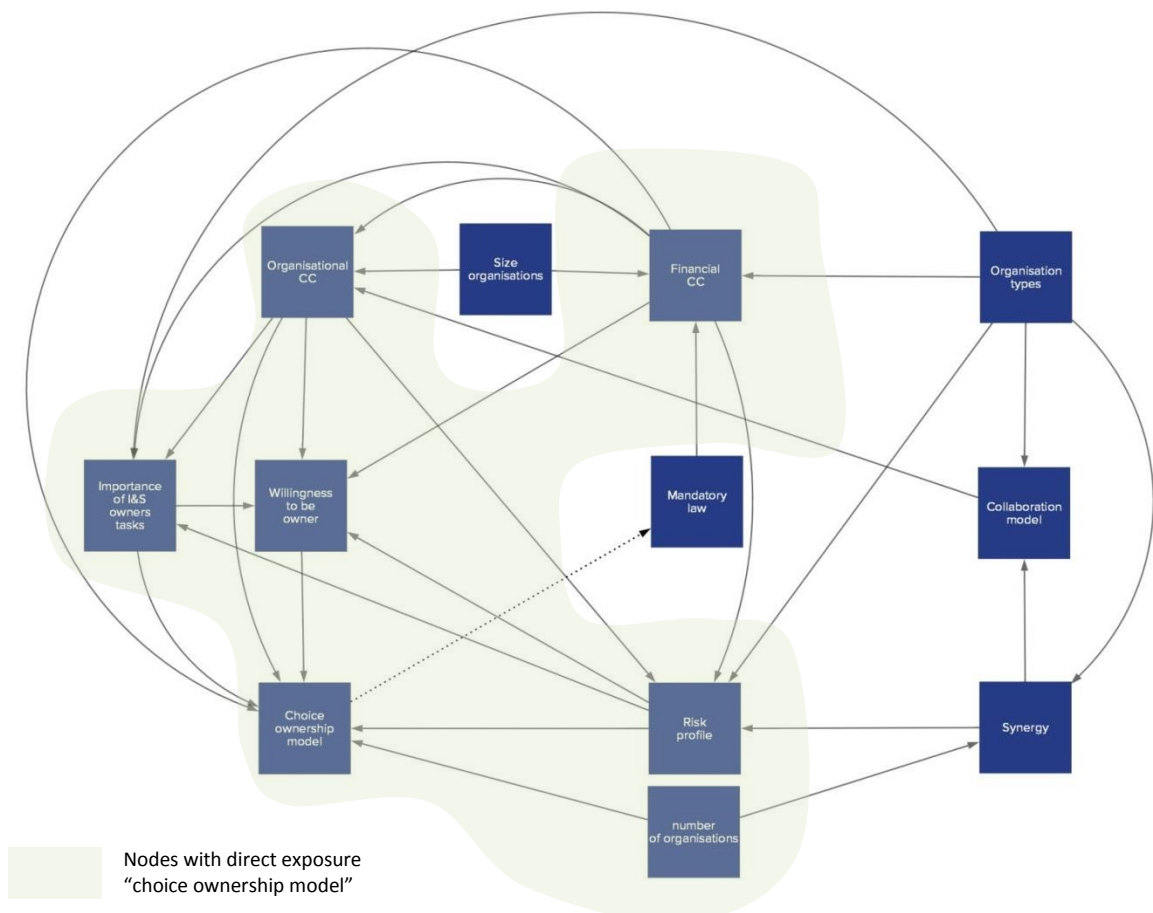


Figure 27. Ownership DAG

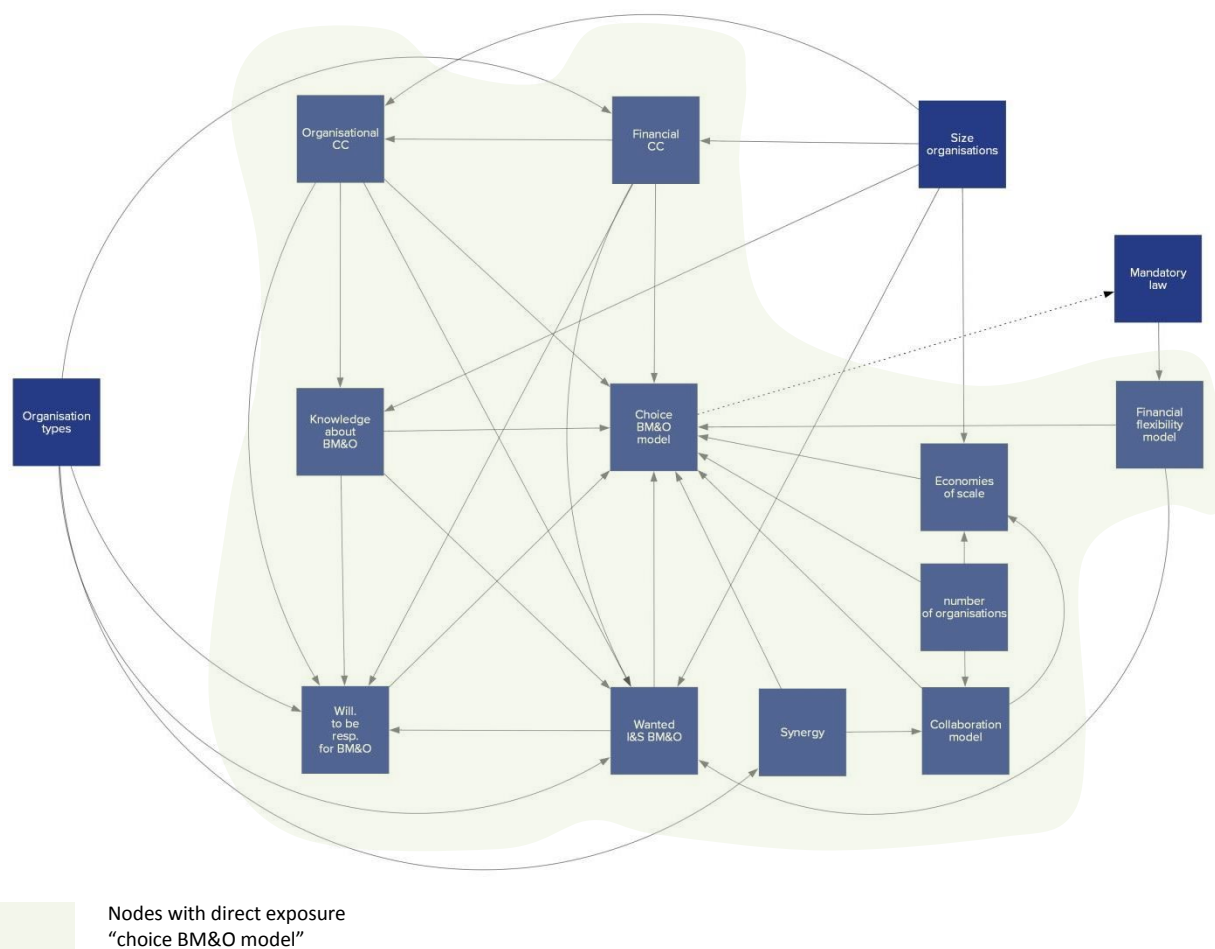


Figure 28. BM&O DAG

### 5.1.2 Evaluation study

The aim of the study was to close the gap between information known in practice and literature about the decision-making process towards a BM&O and ownership model in the Dutch community school sector. Studying the subject by developing a DAG has laid grounds for the development of a tool that can help predict the decision-making process towards a BM&O and ownership model in future new community schools. Next to closing the gap between information known in practice and literature the study therefore also succeeded in exploring the possibility, and laying out the foundation, of a predictive BBN that can be used in the future.

Although the study has successfully reached its goals, some parts of the study could be improved. For example, in case of the FDM questionnaire only limited results for the different actor groups could be gathered and therefore the results for all the different actor groups have been analyzed together instead of separately. Questionable is whether this has a negative effect on the structure of the DAG that has been constructed in this study since the variance within the entire data set (combined actor groups) was still quite low. When the actor groups could be split however it would have been possible to make separate DAGs for every actor groups. By doing this extra information about the differences between the actor groups could have been gathered.

Another example of possible areas of improvement within the study can be the limited number of municipalities and childcare organizations that have been interviewed during the validation interviews. Concerning the childcare organizations this is expected to not be such a big problem since the study showed that childcare organizations are almost never involved in the decision-making process towards an ownership and BM&O model. Municipalities are however almost always involved in this process and interviewing only 1 municipality could therefore be a flaw in the study. However, again it is expected that this will not be such a big problem because the advisors that have been interviewed are involved and concerned with the objective of all the different actors within a community school initiative and therefore also looked at the network through the eyes of the municipality when validating the DAGs.

Although the study has successfully closed the gap between information known in practice and literature, and has succeeded in laying out the foundations for a predictive BBN, the outcomes of the study are mainly exploratory. Unfortunately, it is not yet been possible to make the BBN predictive since it requires an extensive data collection from all stakeholders involved in the decision-making. Moreover, the nature of the research problem is semi-structured due to existence of the qualitative criteria that are difficult to quantify for using in BBN. This study has however brought us one step closer to achieving the development of a predictive BBN, and when such a predictive BBN is developed in the future it is expected that very interesting information can emerge from this and the predictive model can be very useful in practice.

## **5.2 Relevance**

### **5.2.1 Scientific relevance**

In scientific literature studies on public real estate are underrepresented. A lot of studies focus on residential or corporate real estate but only a minimal amount of studies consider PRE. Furthermore, PRE is very dependent from local governance which makes that studies from other countries do not necessarily provide insight in the Dutch PRE sector. Despite the fact that there is less literature about PRE the PRE sector is one of the biggest real estate sectors within the Netherlands. Researching the subject of PRE therefore is very important.

This study is aimed on studying a small sector within the entire PRE-sector: Community schools. By considering this subject knowledge about an under documented subject has been documented and added to the scientific library. Furthermore, this study has laid grounds to further study the subject in a more quantitative way which can provide valuable information in the future to build a decision support tool for such organizational problems. Also, to our knowledge, this is the first time a network approach is used for structuring these types of problems.

### **5.2.2 Social relevance**

Although when considering the entire PRE-sector the community school sector is small, it is expected that in coming years a lot of new community school initiatives will be founded. In community school initiatives that have been founded in the past one of the main problems during the user phase of the building are connected to ownership and BM&O (Oberon, 2016). These problems often interfere with the initially good initiatives for multifunctional use of buildings, and in the worst cases these problems threaten the survival of community schools that have been built.

Because of the expected number of community schools that will still be built in the coming years it is necessary to study the subject of ownership and BM&O. By doing the cause of the problems concerning ownership and BM&O during the user phase of community schools can be determined and hopefully be solved. Not only new community schools can benefit from this, but also existing community schools that struggle with BM&O and ownership.

In this study the aim was to study BM&O and ownership discussions in the first phase, the initial initiative (before actual requirements concerning the building have been determined), of the development of a new community school. By researching the beginning of the process a first start can be made by researching the problems and searching for a solution to the reoccurring problems concerning BM&O and ownership. Furthermore, it is expected that when organizations start considering ownership and BM&O construction before an actual program of requirements, design and construction has been completed, a lot of problems can be prevented because in that case it is possible to better match the building design to the use of the building.

### **5.3 Recommendation**

#### **5.3.1 Community school sector**

Ownership, and particularly BM&O, is a subject that creates a lot of problems within the Dutch community school sector. The general idea of experts on the subject is that considering the ownership and BM&O structure early in the process (before the program of requirements has been made) can prevent a lot of problems. By doing this the design can be matched to the use of the building and the feasibility of collaboration between the different partners (concerning BM&O) can be determined in an early stage. Talking about the subject makes the different parties within the process aware of what they are up against and thus also makes them aware that doing things together, or separate, might not be what they want (although they initially thought otherwise). When such a change of heart takes place late in the process the impact on the project (in terms of feasibility, time and money) can be very big. When the design has been made on the assumption of collaborative BM&O, it is very hard to change the design to accommodate split BM&O (Think, for example, about changes for combined to separate gas, water and electricity meters and the impact of such a change on the installations within the building). Being aware of the impact of the moment on which decision are made, and shaping the process from initiative to construction of the building accordingly can prevent a lot of problems. It is therefore recommended to examine the subject of ownership and BM&O early in the process of developing a new community school (before building requirements and designs are completed).

#### **5.3.2 Future research**

This study can mainly be seen as an exploratory study towards the decision-making process for an ownership and BM&O model in the Dutch community school sector. Future research is needed to gain more insight in the subject of this study, and to fulfil the full potential of this study.

#### ***Decision support tool***

To fulfil the potential of the DAG that has been constructed in this study, the DAG could be made predictive. To reach this goal, first of all the different levels of the variables within the network have to be determined. In some cases, the literature already clearly defines the levels (choice model or collaboration model), but in other cases a questionnaire should be used to determine the different levels. For example, in case of financial carrying capacity the different levels can be Low, medium and high. A questionnaire than must be used to transform these qualitative levels to a more quantified form. When the different levels have been determined conditional probability tables could be added to the DAG to make the DAG predictive. The conditional probability tables define the marginal probability of a single variable with respect to others. The marginal probability values can be determined by using historic data. In this case, it is advised to do this based on expert opinions (mythology proposed by Nasir et al, 2003) rather than historic data because data about the variables within the network is not available and represent the decision in the past, and because of the qualitative characteristics of a decision-making process. By developing a predictive BBN interesting information about the decision-making process can be gathered and a decision support tool can be developed.

Although developing a predictive BBN would fulfil the potential of this study, it would also be very interesting to use the conclusions from this study to only develop a decision support tool (such as a MCA). Although less information about the decision-making process can be gathered by doing this, the tool will most likely be more convenient in practice since it is less of a black box.

#### *Differences between actor groups*

In this study the DAGs that have been created have been made based on variables that were selected based on the FDM results from all results instead of the different actor groups. Based on the validation interviews however some differences between the different actor groups could be observed. By making separate DAGs and in the future, maybe BBNs, for every actor group, these differences can be studied. Such a study could help in identifying the problem areas in the decision-making process towards an ownership and BM&O model in the Dutch community school sector.

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## Appendix A

### Detailed explanation FDM variables – Ownership model

Variable	Explanation
Financial carrying capacity	→ Is an organization capable of carrying the financial consequences of being owner.
Complete decentralization	→ Have the tasks of the municipality (duty of care for educational real estate) been transferred towards the school.
Financial flexibility ownership model	→ Does the model allow for financial flexibility regarding the use of funding.
Height of the investment	→ How high is the investment/how much does it cost to become owner of the building
Duration possible lease contracts	→ How long do possible tenants want to lease for.
Risk Profile	→ How high is the BM&O risk and vacancy risk associated with the initiative.
BM&O cost owners part	→ How high are the annual cost of BM&O, users part.
Mandatory law	→ Is there mandatory law that influences the organizations when choosing for an ownership model.
Possible Tax benefits	→ When choosing for certain ownership structures there is the possibility of tax benefits. This could have a positive effect on the probability of one of the models to be chosen.
Influence of shared-use regulations (Dutch: Medegebruiksregeling)	→ In case of ownership by the school the shared-use regulation weakens the position of other building users. This can have a negative effect on the probability choosing the ownership model in which the school is owner.
Collaboration model	→ How do the different organizations collaborate concerning their core business (face to face, hand in hand etc.).
Size independent organizations	→ How big are the organizations that are part of the initiative.
Organization types	→ Which organizations are part of the initiative (e.g. school, library, childcare organization etc.).
Organizational carrying capacity	→ Is the organizations capable of carrying the workload that is the result of being owner of the building.
Complexity of the model	→ Is the model straightforward or very complex in terms of agreements that have to be made between the organizations.

Presence of a facility management department	→	Does one of the organizations within the initiative have a facility management department that is already familiar with ownership tasks.
Amount of building sharing	→	How the ratio of square meters that are used by multiple organizations (shared use/total building)
Apartments above school	→	Are there apartments above the school building (When this is the case it is almost certain that the building will be divided into apartment rights)
Size of the building	→	How big is the building (expected to influence the workload accompanying being owner of the building)
Number of organizations	→	How many organizations are part of the initiative
Client (Bouwheerschap)	→	Who will be the client during the construction of the building
Chosen building management model	→	Which BM&O model has been chosen
Municipal policy ownership	→	What is the municipalities view on ownership of community schools
Public versus private ratio	→	Ratio of square meters for public use versus private use (social versus corporate use)
Locational flexibility	→	How important is locational flexibility for the different participants within the project. (locational flexibility relates to whether organizations want to have the possibility of moving elsewhere after a certain period of time)
Frequently used ownership models within the organizations	→	Which ownership models have been previously used by the organizations
Personal Synergy	→	Do the people from the actors that are involved in developing the community school have personal synergy, and thus get along.
Content Synergy	→	Is there synergy between the organizations based on their primary business process.
Willingness to be owner	→	Are there organizations that are willing to be owner
Willingness to collaborate	→	Are the organizations willing to collaborate with each other.
Previous experiences with ownership models	→	Do the organizations have negative or positive experiences with one of the ownership models in the past.
Wanted influence and say on lease composition	→	How important is it for the organizations to have influence and say regarding which organizations will be part of the community school.



Wanted influence and say on owners part of BM&O	→	How important is it for the organizations to have influence and say regarding the tasks associated with the owners part of BM&O
Importance of being owner	→	How important is it for the organizations to be building owner



## Appendix B

### Detailed explanation FDM variables – BM&O model

Variable	Explanation
Financial Carrying Capacity	→ Is an organization capable of carrying the financial consequences of being responsible for BM&O
Complete decentralization	→ Have the tasks of the municipality (duty of care for educational real estate) been transferred towards the school.
Economies of scale	→ Do the different organizations within the initiative think economies of scale is important
Financial flexibility BM&O model	→ Does the model allow for financial flexibility regarding the use of funding.
BM&O cost users part	→ How high are the annual cost of BM&O, owners part.
Mandatory law	→ Is there mandatory law that influences the organizations when choosing for a certain BM&O model.
Collaboration model	→ How do the different organizations collaborate concerning their core business (face to face, hand in hand etc.).
Number of organizations	→ How many organizations are part of the initiative
Organization types	→ Which organizations are part of the initiative (e.g. school, library, childcare organization etc.).
Size independent organizations	→ How big are the organizations that are part of the initiative.
Complexity BM&O model	→ Is the model straightforward or very complex in terms of agreements that have to be made between the organizations.
Presence of facility management department	→ Does one of the organizations within the initiative have a facility management department that is already familiar with BM&O tasks.
Amount of building sharing	→ How the ratio of square meters that are used by multiple organizations (shared use/total building)
Apartments above building	→ Are there apartments above the school building (When this is the case it is almost certain that the building will be divided into apartment rights and thus a VvE will be established)
Building size	→ How big is the building (expected to influence the workload accompanying being responsible for BM&O of the building)

Frequently used BM&O models within the organizations	→	Which BM&O models have been previously used by the organizations
Municipal policy towards building management	→	What is the municipalities view on being responsible for BM&O for community schools
Knowledge about building management	→	How much knowledge do the organizations have on BM&O? Do they have experience etc.
Chosen ownership model	→	Which ownership model has been chosen
Organizational carrying capacity	→	Are the organizations capable of carrying the workload that accompanies being responsible for BM&O.
Public versus private ratio	→	Ratio of square meters for public use versus private use (social versus corporate use)
Personal Synergy	→	Do the people from the actors that are involved in developing the community school have personal synergy, and thus get along.
Content Synergy	→	Is there synergy between the organizations based on their primary business process.
Willingness to collaborate	→	Are the organizations willing to collaborate with each other.
Previous experiences with BM&O models	→	Do the organizations have negative or positive experiences with one of the BM&O models in the past.
Wanted influence and say BM&O	→	How important is it for the organizations to have influence and say regarding BM&O
Importance of being responsible for building management	→	How important is it for the organizations to have be responsible for BM&O
Willingness to be responsible for the building management	→	Are the organizations willing to be responsible for BM&O

## Appendix C

### Fuzzy Delphi method questionnaire

#### Introductie vragenlijst:

Alvast heel erg bedankt dat u de tijd en moeite neemt om de vragenlijst in te vullen! De bedoeling van de vragenlijst is om inzichtelijk te maken welke factoren invloed hebben op de selectie van een eigendomsmodel en een beheer- en exploitatiemodel voor Multifunctionele accommodaties (MFA), Brede Scholen en Integrale kindcentra (IKC). Op basis van een brainstormsessie met verschillende experts op dit gebied, en literatuuronderzoek, is er een lijst met factoren opgesteld. Om te bepalen welke van deze factoren relevant en belangrijk zijn wordt er aan u gevraagd om de belangrijkheid van de verschillende factoren aan te geven.

De Vragenlijst bestaat, afhankelijk van uw betrokkenheid bij het kiezen van eigendoms-, beheer- en exploitatiemodel, uit maximaal drie onderdelen:

1. Algemene vragen (+/- 2 minuten)
2. Vragen over eigendomsmodellen (+/- 4 minuten)
3. Vragen over beheer- en exploitatiemodellen (+/- 4 minuten)

Als u bijvoorbeeld alleen betrokken bent geweest bij het kiezen van een eigendomsmodel zal alleen onderdeel 1 en onderdeel 2 aan u getoond worden.

**LET OP!** Onderdeel 2 (eigendomsmodellen) & Onderdeel 3 (beheer- en exploitatiemodellen) lijken erg veel op elkaar! Het gaat echter om twee verschillende onderdelen die bedoeld zijn om het verschil in keuze factoren voor een eigendomsmodel versus een beheer- en exploitatiemodel inzichtelijk te maken.

Start

#### Onderdeel 1: Algemene vragen

Via welke organisatie bent u betrokken bij MFA's, Brede Scholen of IKC's? (Vul de naam van uw organisatie in)

Bij welke keuze betreffende verschillende eigendoms-, beheer- en exploitatiemodellen voor de MFA, Brede School of IKC was/is uw organisatie betrokken?

**Eigendom:** Wie is de juridische eigenaar van het gebouw? Is dit de gemeente, een van de gebouwgebruikers, een derde, iedereen samen in een VVE (Vereniging van Eigenaren) etc.

**Beheer & Exploitatie:** Hoe is de verantwoordelijkheid betreffende technisch onderhoud, facilitair management en organisatorisch management van het gebouw geregeld, en hoe worden de kosten voortkomend uit deze activiteiten verrekend?

- ☐ Mijn organisatie is alleen betrokken bij de keuze voor een eigendomsmodel
- ☐ Mijn organisatie is alleen betrokken bij de keuze voor een beheer- en exploitatiemodel
- ☐ Mijn organisatie is betrokken bij beide keuzes: de keuzes voor een eigendomsmodel en voor een beheer- en exploitatiemodel
- ☐ Mijn organisatie is niet betrokken bij de keuze voor een eigendomsmodel en voor een beheer- en exploitatiemodel

Vorige vraag

Volgende vraag

### Onderdeel 1: Algemene vragen

Op welke manier bent/was u betrokken bij het kiezen van een eigendoms, beheer en/of exploitatiemodel voor een MFA Brede Scholen of/ien IKC's?

- ☒ Als adviseur/expert
- ☐ Vanuit het schoolbestuur of de scholenstichting
- ☐ Vanuit de gemeente
- ☐ Vanuit de kinderopvangorganisatie (Peuterspeelzaal, BSO, TSO, NSO, vve, Kinderdagverblijf etc.)
- ☐ Overig

Welk verband denkt u dat er bestaat tussen het eigendomsmodel en het beheer- en exploitatiemodel? Moet eerst het beheer- en exploitatiemodel gekozen worden, of moet eerst het eigendomsmodel gekozen worden? Kies het beste antwoord:

- ☐ Eerst het eigendomsmodel, daarna het beheer- en exploitatiemodel
- ☐ Eerst het beheer- en exploitatiemodel, daarna het eigendomsmodel
- ☐ Dit maakt niet uit
- ☐ Weet ik niet

Vorige vraag

Volgende vraag

### Onderdeel 2: Eigendomsmodellen

Het tweede gedeelte van de vragenlijst zal gaan over de factoren die invloed hebben op het kiezen van een eigendomsmodel. De factoren zijn opgesplitst in:

- Financiële factoren
- Juridische factoren
- Organisatorische factoren
- Psychologische factoren

In het onderzoek worden de volgende eigendomsmodellen beschouwd:

- Eigendom in handen van een van de (hoofd)gebruikers
- Eigendom in handen van de gemeente
- Eigendom in handen van een derde (investeerder)
- Gesplitst eigendom (gebouw kadastraal opgesplitst)
- VVE (Vereniging van eigenaren waarbij het gebouw opgesplitst is in appartementsrechten)

Vorige vraag

Volgende vraag

Onderdeel 2: Eigendomsmodellen

Hoe belangrijk zijn de volgende Financiële factoren bij het kiezen van een eigendomsmodel voor een MFA, Brede school of IKC?

	Heel onbelangrijk - 4	- 3	Onbelangrijk - 2	- 1	Neutraal 0	1	Belangrijk 2	3	Heel Belangrijk 4
Financiële draagkracht van de organisatie	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Is er sprake van volledige doordecentralisatie	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
De gewenste financiële flexibiliteit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hoogte van de investering	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(Verwachte) Looptijd van eventuele huurcontracten	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Het risicoprofiel van de MFA, Brede School of IKC	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
De hoogte van het eigenaarsdeel van de exploitatiekosten <small>(eigenaarsdeel: groot (buiten)onderhoud, huurdersadministratie, verzekeringen en belastingen voor de rekening van de eigenaar)</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Vorige vraag

Volgende vraag

Onderdeel 2: Eigendomsmodellen

Hoe belangrijk zijn de volgende Juridische factoren bij het kiezen van een eigendomsmodel voor een MFA, Brede school of IKC?

	Heel onbelangrijk - 4	- 3	Onbelangrijk - 2	- 1	Neutraal 0	1	Belangrijk 2	3	Heel Belangrijk 4
De mogelijkheid tot een erfpachtconstructie met de gemeente	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Invloed van de medegebruiksregeling verordening voorzieningen huisvesting op de positie van andere gebruikers in het gebouw	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mogelijk BTW voordeel door bepaalde eigenaar constructie	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Juridische verplichtingen die voortvloeien uit het kiezen voor een bepaalde eigendomsconstructie <small>(in geval van splitsing in appartementsrechten zijn er juridisch zaken waarmee men rekening moet houden zoals de verplichte oprichting van een VVE en ondernemingsfonds, ledenvergaderingen etc. in geval van een stichting mag deze geen winst uitkeren, geen winstoogmerk hebben etc.)</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Vorige vraag

Volgende vraag

## Onderdeel 2: Eigendomsmodellen

Hoe belangrijk zijn de volgende Organisatorische factoren bij het kiezen van een eigendomsmodel voor een MFA, Brede school of IKC?

	Heel onbelangrijk		Onbelangrijk		Neutraal		Belangrijk		Heel Belangrijk
	- 4	- 3	- 2	- 1	0	1	2	3	4
Mate van inhoudelijke samenwerking tussen de organisaties (samenwerkingsmodel)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Is er sprake van het oprichten van een (nieuwe) gezamenlijke organisatie bestaande uit de participanten in de MFA, Brede School of IKC?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Aantal organisaties die onderdeel uitmaken van de MFA, Brede school of IKC	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Soort organisaties die onderdeel uitmaken van de MFA, Brede school of IKC	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Grootte van de afzonderlijke primaire organisaties binnen de MFA, Brede school of IKC (school, kinderopvang etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Organisatorische draagkracht van de organisatie (Heeft de organisatie de organisatorische capaciteiten om eigenaar te zijn van het gebouw?)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
De ingewikkeldheid van het eigendomsmodel	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Aanwezigheid van een organisatie met een facilitaire management afdeling (t.b.v. administratieve taken gebouw(eigenaar))	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wordt de MFA, Brede school of IKC opgericht in een bestaand gebouw, in een verbouwd gebouw of in een nieuw gebouw	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gebouwvorm: Mate van gedeelde ruimte/installaties	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gebouwvorm: Appartementen boven school	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gebouwvorm: Grootte van het gebouw	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(Veel) voorkomende eigendomsmodellen binnen de organisatie	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bereidheid om zich voor langere tijd te vestigen op één plek (locatie flexibiliteit)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wie is de aangewezen bouwheer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Het gekozen beheermodel	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gemeentelijk beleid betreffende eigendom van (multifunctionele) schoolgebouwen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gemeentelijk beleid betreffende verdeling onderhoudstaken in geval van eigendom in handen van de gemeente (afstaan normvergoeding (school) vs. kostendekkende doorberekening vs. onderhoud blijft verantwoordelijkheid van gebruikers)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Het publieke karakter van de MFA, Brede School of/en IKC	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Vorige vraag

Volgende vraag



## Onderdeel 2: Eigendomsmodellen

Hoe belangrijk zijn de volgende Psychologische factoren bij het kiezen van een eigendomsmodel voor een MFA, Brede school of IKC?

	Heel onbelangrijk		Onbelangrijk		Neutraal	Belangrijk		Heel Belangrijk	
	- 4	- 3	- 2	- 1	0	1	2	3	4
Synergie tussen de individuele gebouwgebruikers (persoonlijk)	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Synergie tussen de organisaties (inhoudelijk vlak)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bereidheid om gebouweigenaar te zijn	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bereidheid om met elkaar samen te werken	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ervaringen uit het verleden met één van de eigendomsmodellen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gewenste mate van invloed en zeggenschap op gebouwsamenstelling (huurders samenstelling gebouw)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gewenste invloed en zeggenschap op het eigenaarsdeel van beheer en exploitatie (eigenaar beheer: groot (buiten)onderhoud, huursadministratie, verzekeringen en belastingen voor rekening van de eigenaar)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Waarde die gehecht wordt door de organisatie aan het in bezit hebben van het gebouw (belang) <u>LET OP!</u> De vraag gaat over het belang van de factor "waardere die gehecht wordt aan het eigendomschap" op de keuze voor een bepaald eigendomsmodel, niet waarde van de factor zelf!	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Vorige vraag

Volgende vraag

## Onderdeel 3: Beheer- en exploitatiemodellen

Het derde gedeelte van de vragenlijst zal gaan over de factoren die invloed hebben op het kiezen van een beheer- en exploitatiemodel. De factoren zijn opgesplitst in:

- Financiële factoren
- Juridische factoren
- Organisatorische factoren
- Psychologische factoren

In het onderzoek worden de volgende beheer- en exploitatiemodellen beschouwd:

- Beheer door één (hoofd)gebruiker
- Beheer en exploitatie door een beheer stichting
- Beheer en exploitatie door een derde (uitbesteden)
- Beheer en exploitatie als onderdeel van een integraal contract
- VVE beheer (Vereniging van Eigenaren)

Vorige vraag

Volgende vraag

### Onderdeel 3: Beheer- en exploitatiemodellen

LET OP Als u onderdeel 2 (eigendomsmodellen) al heeft ingevuld. Onderdeel 2 & Onderdeel 3 lijken erg veel op elkaar! Het gaat echter om twee verschillende onderdelen van de vragenlijst die bedoeld zijn om het verschil in keuze factoren voor een eigendomsmodel versus een beheer- en exploitatiemodel inzichtelijk te maken.

Hoe belangrijk zijn de volgende Financiële factoren bij het kiezen van een beheer- en exploitatiemodel voor een MFA, Brede school of IKC?

	Heel onbelangrijk - 4	- 3	Onbelangrijk - 2	- 1	Neutraal 0	1	Belangrijk 2	3	Heel Belangrijk 4
Is er sprake van volledige doordecentralisatie	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eventueel schaalvoordeel door het kiezen voor een bepaald beheer- en exploitatiemodel	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gewenste financiële flexibiliteit (wel of geen verplichte uitgave aan onderhoud)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Financiële draagkracht van de afzonderlijke organisaties (b.v. eventueel voorschieten van bepaalde kosten als men verantwoordelijk is voor beheer en exploitatie)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
De hoogte van het gebruikersdeel van de exploitatiekosten (Gebruikersdeel: Organisatie beheer (administratie, inventaris beheer, ICT beheer etc.), binnenonderhoud, energiekosten, verzekeringen en belastingen voor rekening van de gebruiker)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Vorige vraag

Volgende vraag

### Onderdeel 3: Beheer- en exploitatiemodellen

LET OP Als u onderdeel 2 (eigendomsmodellen) al heeft ingevuld. Onderdeel 2 & Onderdeel 3 lijken erg veel op elkaar! Het gaat echter om twee verschillende onderdelen van de vragenlijst die bedoeld zijn om het verschil in keuze factoren voor een eigendomsmodel versus een beheer- en exploitatiemodel inzichtelijk te maken.

Hoe belangrijk zijn de volgende Juridische factoren bij het kiezen van een beheer- en exploitatiemodel voor een MFA, Brede school of IKC?

	Heel onbelangrijk - 4	- 3	Onbelangrijk - 2	- 1	Neutraal 0	1	Belangrijk 2	3	Heel Belangrijk 4
Juridische verplichtingen die voortvloeien uit het kiezen voor een bepaald beheer- & exploitatiemodel model (In geval van een VVE zijn er juridisch zaken waarmee men rekening moet houden zoals splitsing van het gebouw in appartementsrechten, verplichte fondsvorming, verplichte ledenvergaderingen etc. In geval van een stichting mag deze geen winst uitkeren, geen winsttoegankelijk hebben etc.)	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Vorige vraag

Volgende vraag

### Onderdeel 3: Beheer- en exploitatiemodellen

LET OP Als u onderdeel 2 (eigendomsmodellen) al heeft ingevuld. Onderdeel 2 & Onderdeel 3 lijken erg veel op elkaar! Het gaat echter om twee verschillende onderdelen van de vragenlijst die bedoeld zijn om het verschil in keuze factoren voor een eigendomsmodel versus een beheer- en exploitatiemodel inzichtelijk te maken.

Hoe belangrijk zijn de volgende Organisatorische factoren bij het kiezen van een beheer- en exploitatiemodel voor een MFA, Brede school of IKC?

	Heel onbelangrijk - 4	- 3	Onbelangrijk - 2	- 1	Neutraal 0	1	Belangrijk 2	3	Heel Belangrijk 4
Mate van samenwerking tussen de organisaties <small>(samenwerkingsvorm)</small>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Is er sprake van het oprichten van een (nieuwe) gezamenlijke organisatie bestaande uit de participanten in de MFA, Brede School of IKC?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Aantal organisaties die onderdeel zijn van de MFA, Brede school of IKC	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Soort organisaties die onderdeel zijn van de MFA, Brede school of IKC	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Grootte van de afzonderlijke primaire organisaties binnen de MFA, Brede school of IKC <small>(school, kinderopvang etc.)</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
De ingewikkeldheid van het beheer- en exploitatiemodel	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Aanwezigheid van een organisatie met een facilitair management afdeling <small>(t.b.v. uitvoeren taken horende bij beheer en exploitatie)</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wordt de MFA, Brede school of IKC opgericht in een bestaand gebouw, in een verbouwd gebouw of in een nieuw gebouw	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gebouwworm: Mate van gedeelde ruimte/installaties	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gebouwworm: Appartementen boven school	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Grootte van het gebouw	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(Veel) voorkomende beheer- en exploitatiemodellen binnen de organisatie	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gemeentelijk beleid betreffende verdeling onderhoudstaken in geval van eigendom in handen van de gemeente <small>(afstaan normvergoeding binnenonderhoud school vs. kostendekkende doorberekening vs. binnenonderhoud blijft verantwoordelijkheid van gebruikers)</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kennis over beheer en exploitatie binnen de organisatie	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Het gekozen eigendomsmodel	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Organisatorische draagkracht van de organisaties <small>(Heeft de organisatie de organisatorische capaciteiten om verantwoordelijk te zijn voor beheer &amp; exploitatie?)</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Het publieke karakter van de MFA, Brede School of/en IKC	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Vorige vraag

Volgende vraag

### Onderdeel 3: Beheer- en exploitatiemodellen

LET OP Als u onderdeel 2 (eigendomsmodellen) al heeft ingevuld. Onderdeel 2 & Onderdeel 3 lijken erg veel op elkaar! Het gaat echter om twee verschillende onderdelen van de vragenlijst die bedoeld zijn om het verschil in keuze factoren voor een eigendomsmodel versus een beheer- en exploitatiemodel inzichtelijk te maken.

Hoe belangrijk zijn de volgende Psychologische factoren bij het kiezen van een beheer- en exploitatiemodel voor een MFA, Brede school of IKC?

	Heel onbelangrijk - 4	- 3	Onbelangrijk - 2	- 1	Neutraal 0	1	Belangrijk 2	3	Heel Belangrijk 4
Synergie tussen de individuele gebouwgebruikers (persoonlijk vlak)	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Synergie tussen afzonderlijke organisaties (inhoudelijk vlak)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bereidheid om met elkaar samen te werken	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bereidheid van de organisatie om verantwoordelijk te zijn voor beheer en exploitatie	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ervaring uit het verleden met één van de beheer- en exploitatiemodellen binnen de afzonderlijke organisaties	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gewenste mate van invloed en zeggenschap betreffende gebruikers beheer en exploitatie	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Waarde die gehecht wordt door de organisatie aan het verantwoordelijk zijn voor beheer en exploitatie	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Vorige vraag

Volgende vraag

Bent u bereid om ook deel te nemen aan de volgende fase van dit onderzoek? In deze fase zullen er specifieke vragen gesteld worden over het keuzeprocess binnen uw organisatie betreffende het eigendom, beheer en exploitatie van um MFA, Brede School of IKC.\*

- ☐ Ja  
☐ Nee

\* De volgende fase van het onderzoek zal waarschijnlijk halverwege januari starten.

Dit is de laatste pagina van deze vragenlijst. Ik wil u hartelijk bedanken voor het invullen van de vragenlijst! Om uw antwoorden te verzenden dient u op [verzenden te klikken](#).

Als u nog vragen heeft betreffende het onderzoek kunt u contact met mij opnemen via: [e.s.p.h.penders@student.tue.nl](mailto:e.s.p.h.penders@student.tue.nl)  
De resultaten van het onderzoek zullen gepubliceerd worden op: [www.repository.tue.nl](http://www.repository.tue.nl)

Vorige vraag

Verzenden

## Appendix D

### Matrix questionnaire – Ownership

#### Introductie

Alvast heel erg bedankt dat u de tijd en moeite neemt om de vragenlijst in te vullen! De bedoeling van de vragenlijst is om inzichtelijk te maken hoe factoren die invloed hebben op de keuze voor een eigendomsmodel voor Multifunctionele accommodaties (MFA), Brede Scholen en Integratie kindcentra (IKC), gerelateerd zijn aan elkaar. Op basis van een eerdere vragenlijst zijn verschillende factoren die van invloed zijn op het keuze proces voor een beheer- en exploitatiemodel gedefinieerd. De Vragenlijst bestaat uit twee onderdelen:

1. Algemene vragen
2. Vragen over de variabelen die invloed hebben op de keuze voor een eigendomsmodel

Het invullen van de vragenlijst duurt ongeveer **15 minuten**.

Vorige

Volgende

#### Onderdeel 1: Algemene vragen

Via welke organisatie bent u betrokken bij MFA's, Brede Scholen of IKC's? (Vul de naam van uw organisatie in)

Bij welke keuze betreffende verschillende eigendoms-, beheer- en exploitatiemodellen voor de MFA, Brede School of IKC was/is uw organisatie betrokken?

Eigendom: Wie is de juridische eigenaar van het gebouw? Is dit de gemeente, een van de gebouwgebruikers, een derde, iedereen samen in een VVE (Vereniging van Eigenaren) etc.

Beheer & Exploitatie: Hoe is de verantwoordelijkheid betreffende technisch onderhoud, facilitair management en organisatorisch management van het gebouw geregeld, en hoe worden de kosten voortkomend uit deze activiteiten verrekend?

- ☐ Mijn organisatie is alleen betrokken bij de keuze voor een eigendomsmodel
- ☐ Mijn organisatie is alleen betrokken bij de keuze voor een beheer- en exploitatiemodel
- ☐ Mijn organisatie is betrokken bij beide keuzes: de keuzes voor een eigendomsmodel en voor een beheer- en exploitatiemodel
- ☐ Mijn organisatie is niet betrokken bij de keuze voor een eigendomsmodel en voor een beheer- en exploitatiemodel

Op welke manier bent/was u betrokken bij het kiezen van een eigendoms, beheer en/of exploitatiemodel voor een MFA Brede Scholen of/en IKC's?

- ☐ Als adviseur/expert
- ☐ Vanuit het schoolbestuur of de scholenstichting
- ☐ Vanuit de gemeente
- ☐ Vanuit de kinderopvangorganisatie (Peuterspeelzaal, BSO, TSO, NSO, vve, Kinderdagverblijf etc.)
- ☐ Overig

Vorige

Volgende

## Onderdeel 2: Eigendomsmodellen

Het tweede gedeelte van de vragenlijst zal gaan over de factoren die invloed hebben op het kiezen van een **eigendomsmodel**. De factoren die aan u getoond worden binnen deze categorieën zijn vastgesteld op basis van een vorige vragenlijst. Alleen de factoren die als meest belangrijk uit deze vragenlijst kwamen zijn opgenomen in deze vragenlijst.

De bedoeling van deze vragen is het vaststellen van de relatie tussen verschillende variabelen en of deze relatie ook van belang is voor de verschillende actoren groepen binnen een MFA, brede school of IKC. Belangrijk is dan ook dat u de vragen vanuit het perspectief van uw organisatie, bijvoorbeeld de school, invult! Als u de vragenlijst als adviseur invult, vul de vragen dan in vanuit het perspectief zoals u dit in het begin van de vragenlijst heeft aangegeven. Onderstaande voorbeeldvraag geeft u een beeld van de vragen die aan u getoond worden in deze vragenlijst.

**De volgende vraag is een voorbeeld vraag, u hoeft hier dus niets in te vullen:**

Wat is de relatie tussen de volgende variabelen in het besluitvormingsproces voor een **eigendomsmodel** voor een MFA, Brede school of IKC? \*

\* Geef alleen aan of er sprake is van een directe relatie tussen de variabelen in de kolom (variabel 1) en de rij (variabel 2)!



<b>variabel 2 →</b> <b>variabel 1 ↓</b>	Financiële draagkracht van uw organisatie	Risico Profiel	Beheer en exploitatiekosten, <u>eigenaarsdeel</u>	Verplichte wet en regelgeving rechtsvormen
Financiële draagkracht	X	<i>nauwelijks een relatie (-1)</i>	<i>Heel sterke relatie (+2)</i>	<i>Sterk relatie (+1)</i>
Risico profiel	<i>Geen relatie (-2)</i>	X	<i>Geen relatie (-2)</i>	<i>Nauwelijks een relatie (-1)</i>
Beheer en exploitatiekosten eigenaarsdeel	<i>Er is een relatie (0)</i>	<i>Er is een relatie (0)</i>	X	<i>Geen relatie (-2)</i>
Verplichte wet en regelgeving voor rechtsvormen	<i>Geen relatie (-2)</i>	<i>Heel sterke relatie (+2)</i>	<i>Sterke relatie (+1)</i>	X

Vorige

Volgende

Wat is de relatie tussen de volgende variabelen in het besluitvormingsproces voor een eigendomsmodel voor een MFA, Brede school of IKC?

Antwoord mogelijkheden: Er is geen sprake van een relatie tussen de variabelen 0 Er is nauwelijks sprake van een relatie tussen de variabelen 1 Er is sprake van een relatie tussen de variabelen 2 Er is sprake van een sterke relatie tussen de variabelen 3 Er is sprake van een heel sterke relatie tussen de variabelen 4

Als u meer uitleg wilt over een variabel kunt u met u muis over de onderstreepte tekst bewegen om een veld met informatie over het variabel te openen.

Tabel 1/3	Financiële draagkracht van de organisaties binnen de samenwerking	Risico profiel van de MFA, Brede school of IKC	Wet en regelgeving bepaalde rechtsvormen (VvE, Stichting)	Type organisaties
Financiële draagkracht van de organisaties binnen de samenwerking	X			
Risico profiel van de MFA, Brede school of IKC		X		
Wet en regelgeving bepaalde rechtsvormen (VvE, Stichting)			X	
Type organisaties				X
Organisatorische draagkracht van de organisaties				
Samenwerkingsmodel				
Grootte van de afzonderlijke organisaties				
Aantal organisaties binnen de samenwerking				
Synergie tussen de organisaties die onderdeel zijn van de samenwerking				
Bereidheid om gebouweigenaar te zijn				
Gewenste invloed en zeggenschap op de taken van de gebouweigenaar				
Uiteindelijke keuze voor een beheer/ en exploitatiemodel				
Tabel 1/3	Financiële draagkracht van de organisaties binnen de samenwerking	Risico profiel van de MFA, Brede school of IKC	Wet en regelgeving bepaalde rechtsvormen (VvE, Stichting)	Type organisaties

Vorige

Volgende

Wat is de relatie tussen de volgende variabelen in het besluitvormingsproces voor een eigendomsmodel voor een MFA, Brede school of IKC?

**Antwoord mogelijkheden:** Er is geen sprake van een relatie tussen de variabelen 0 Er is nauwelijks sprake van een relatie tussen de variabelen 1 Er is sprake van een relatie tussen de variabelen 2 Er is sprake van een sterke relatie tussen de variabelen 3 Er is sprake van een heel sterke relatie tussen de variabelen 4

Als u meer uitleg wilt over een variabele kunt u met u muis over de onderstreepte tekst bewegen om een veld met informatie over het variabele te openen.

Tabel 2/3	Organisatorische draagkracht van de organisaties	Samenwerkingsmodel	Grootte van de afzonderlijke organisaties	Aantal organisaties binnen de samenwerking
Financiële draagkracht van de organisaties binnen de samenwerking	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Risico profiel van de MFA, Brede school of IKC	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Wet en regelgeving bepaalde rechtsvormen (VvE, Stichting)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type organisaties	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Organisatorische draagkracht van de organisaties	X	<input type="text"/>	<input type="text"/>	<input type="text"/>
Samenwerkingsmodel	<input type="text"/>	X	<input type="text"/>	<input type="text"/>
Grootte van de afzonderlijke organisaties	<input type="text"/>	<input type="text"/>	X	<input type="text"/>
Aantal organisaties binnen de samenwerking	<input type="text"/>	<input type="text"/>	<input type="text"/>	X
Synergie tussen de organisaties die onderdeel zijn van de samenwerking	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Bereidheid om gebouweigenaar te zijn	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Gewenste invloed en zeggenschap op de taken van de gebouweigenaar	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Uiteindelijke keuze voor een beheer/ en exploitatiemodel	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Tabel 2/3	Organisatorische draagkracht van de organisaties	Samenwerkingsmodel	Grootte van de afzonderlijke organisaties	Aantal organisaties binnen de samenwerking

Vorige

Volgende



Wat is de relatie tussen de volgende variabelen in het besluitvormingsproces voor een eigendomsmodel voor een MFA, Brede school of IKC?

Antwoord mogelijkheden: Er is geen sprake van een relatie tussen de variabelen 0 Er is nauwelijks sprake van een relatie tussen de variabelen 1 Er is sprake van een relatie tussen de variabelen 2 Er is sprake van een sterke relatie tussen de variabelen 3 Er is sprake van een heel sterke relatie tussen de variabelen 4

Als u meer uitleg wilt over een variabele kunt u met u muis over de onderstreepte tekst bewegen om een veld met informatie over het variabele te openen.

Tabel 3/3	Synergie tussen de organisaties die onderdeel zijn van de samenwerking	Bereidheid om gebouweigenaar te zijn	Gewenste invloed en zeggenschap op de taken van de gebouweigenaar	Uiteindelijke keuze voor een eigendomsmodel
Financiële draagkracht van de organisaties binnen de samenwerking	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Risico profiel van de MFA, Brede school of IKC	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Wet en regelgeving bepaalde rechtsvormen (VvE, Stichting)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type organisaties	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Organisatorische draagkracht van de organisaties	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Samenwerkingsmodel	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Grootte van de afzonderlijke organisaties	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Aantal organisaties binnen de samenwerking	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Synergie tussen de organisaties die onderdeel zijn van de samenwerking	X	<input type="text"/>	<input type="text"/>	<input type="text"/>
Bereidheid om gebouweigenaar te zijn	<input type="text"/>	X	<input type="text"/>	<input type="text"/>
Gewenste invloed en zeggenschap op de taken van de gebouweigenaar	<input type="text"/>	<input type="text"/>	X	<input type="text"/>
Uiteindelijke keuze voor een beheer/ en exploitatiemodel	<input type="text"/>	<input type="text"/>	<input type="text"/>	X
Tabel 3/3	Synergie tussen de organisaties die onderdeel zijn van de samenwerking	Bereidheid om gebouweigenaar te zijn	Gewenste invloed en zeggenschap op de taken van de gebouweigenaar	Uiteindelijke keuze voor een eigendomsmodel

Vorige

Volgende

Dit is de laatste pagina van deze vragenlijst. Ik wil u hartelijk bedanken voor het invullen van de vragenlijst! Om uw antwoorden te verzenden dient u op [verzenden te klikken](#).

Als u nog vragen heeft betreffende het onderzoek kunt u contact met mij opnemen via: [e.s.p.h.penders@student.tue.nl](mailto:e.s.p.h.penders@student.tue.nl)  
De resultaten van het onderzoek zullen gepubliceerd worden op: [www.repository.tue.nl](http://www.repository.tue.nl)

Vorige

Verzenden



## Appendix E

### Matrix questionnaire – BM&O

#### Introductie

Alvast heel erg bedankt dat u de tijd en moeite neemt om de vragenlijst in te vullen! Op basis van een eerdere vragenlijst zijn verschillende factoren die van invloed zijn op het keuze proces voor een beheer- en exploitatiemodel gedefinieerd. De bedoeling van deze vragenlijst is om inzichtelijk te maken hoe deze factoren gerelateerd zijn aan elkaar. Door het onderzoeken van de relaties tussen de variabelen is het mogelijk om inzicht te krijgen in het beslissingsproces van verschillende actoren binnen Brede school, MFA of IKC initiatieven. De Vragenlijst bestaat uit twee onderdelen:

1. Algemene vragen
2. Vragen over de variabelen die invloed hebben op de keuze voor een beheer- en exploitatiemodel

Het invullen van de vragenlijst duurt ongeveer **20 minuten**.

Vorige

Volgende

#### Onderdeel 1: Algemene vragen

Via welke organisatie bent u betrokken bij MFA's, Brede Scholen of IKC's? (Vul de naam van uw organisatie in)

Bij welke keuze betreffende verschillende eigendoms-, beheer- en exploitatiemodellen voor de MFA, Brede School of IKC was/is uw organisatie betrokken?

**Eigendom:** Wie is de juridische eigenaar van het gebouw? Is dit de gemeente, een van de gebouwgebruikers, een derde, iedereen samen in een VVE (Vereniging van Eigenaren) etc.

**Beheer & Exploitatie:** Hoe is de verantwoordelijkheid betreffende technisch onderhoud, facilitair management en organisatorisch management van het gebouw geregeld, en hoe worden de kosten voortkomend uit deze activiteiten verrekend?

- ☐ Mijn organisatie is alleen betrokken bij de keuze voor een eigendomsmodel
- ☐ Mijn organisatie is alleen betrokken bij de keuze voor een beheer- en exploitatiemodel
- ☐ Mijn organisatie is betrokken bij beide keuzes: de keuzes voor een eigendomsmodel en voor een beheer- en exploitatiemodel
- ☐ Mijn organisatie is niet betrokken bij de keuze voor een eigendomsmodel en voor een beheer- en exploitatiemodel

Op welke manier bent/was u betrokken bij het kiezen van een eigendoms, beheer en/of exploitatiemodel voor een MFA Brede Scholen of/en IKC's?

- ☐ Als adviseur/expert
- ☐ Vanuit het schoolbestuur of de scholenstichting
- ☐ Vanuit de gemeente
- ☐ Vanuit de kinderopvangorganisatie (Peuterspeelzaal, BSO, TSO, NSO, vve, Kinderdagverblijf etc.)
- ☐ Overig

Vorige

Volgende

## Onderdeel 2: Beheer- en exploitatiemodel

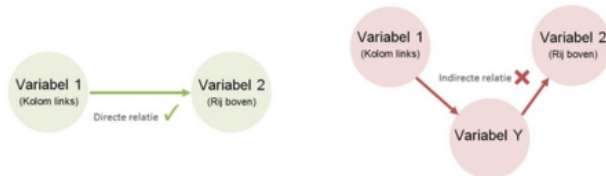
Het tweede gedeelte van de vragenlijst zal gaan over de factoren die invloed hebben op het kiezen van een **beheer- en exploitatiemodel**. De factoren die aan u getoond worden binnen deze categorieën zijn vastgesteld op basis van een vorige vragenlijst. Alleen de factoren die als meest belangrijk uit deze vragenlijst kwamen zijn opgenomen in deze vragenlijst.

De bedoeling van deze vragen is het vaststellen van de relatie tussen verschillende variabelen en of deze relatie ook van belang is voor de verschillende actoren groepen binnen een MFA, brede school of IKC. Belangrijk is dan ook dat u de vragen vanuit het perspectief van uw organisatie, bijvoorbeeld de school, invult. Als u de vragenlijst als adviseur invult, vul de vragen dan in vanuit het perspectief zoals u dit in het begin van deze vragenlijst heeft aangegeven. Onderstaande voorbeeldvraag geeft u een beeld van de vragen die aan u getoond worden in deze vragenlijst.

**De volgende vraag is een voorbeeld vraag, u hoeft hier dus niets in te vullen:**

Wat is de relatie tussen de volgende variabelen in het besluitvormingsproces voor een **beheer- en exploitatiemodel** voor een MFA, Brede school of IKC?

\* Geef alleen aan of er sprake is van een directe relatie tussen de variabelen in de kolom (variabel 1) en de rij (variabel 2)!



<b>variabel 2 → variabel 1 ↓</b>	Financiële draagkracht van uw organisatie	Eventueel schaalvoordeel door samenwerken op gebied van beheer en exploitatie	Financiële flexibiliteit die het beheer- en exploitatiemodel biedt	Hoogte beheer- en exploitatiekosten, gebruikersdeel
Financiële draagkracht	X	nauwelijks een relatie (-1)	Heel sterke relatie (+2)	Sterke relatie (+1)
Eventueel schaalvoordeel door samenwerken op gebied van beheer en exploitatie	Geen relatie (-2)	X	Geen relatie (-2)	Nauwelijks een relatie (-1)
Financiële flexibiliteit die het beheer- en exploitatiemodel biedt	Er is een relatie (0)	Er is een relatie (0)	X	Geen relatie (-2)
Hoogte beheer- en exploitatiekosten, gebruikersdeel	Geen relatie (-2)	Heel sterke relatie (+2)	Sterke relatie (+1)	X

Vorige

Volgende

Wat is de relatie tussen de volgende variabelen in het besluitvormingsproces voor een beheer- en exploitatiemodel voor een MFA, Brede school of IKC?

Antwoord mogelijkheden: Er is geen sprake van een relatie tussen de variabelen 0 Er is nauwelijks sprake van een relatie tussen de variabelen 1 Er is sprake van een relatie tussen de variabelen 2 Er is sprake van een sterke relatie tussen de variabelen 3 Er is sprake van een heel sterke relatie tussen de variabelen 4

Als u meer uitleg wilt over een variabel kunt u met u muis over de onderstreepte tekst bewegen om een veld met informatie over het variabel te openen.

Tabel 1/4	Bereidheid om verantwoordelijk te zijn voor beheer en exploitatie	Gewenste invloed en zeggenschap op beheer en exploitatie taken	Uiteindelijke keuze voor een beheer- en exploitatiemodel
Financiële draagkracht van de organisaties	<input type="text"/>	<input type="text"/>	<input type="text"/>
Schaalvoordeel door samenwerken op gebied van beheer en exploitatie	<input type="text"/>	<input type="text"/>	<input type="text"/>
Financiële flexibiliteit die het beheer- en exploitatiemodel biedt	<input type="text"/>	<input type="text"/>	<input type="text"/>
Wet en regelgeving bepaalde beheer rechtsvormen (VvE, Stichting)	<input type="text"/>	<input type="text"/>	<input type="text"/>
Samenwerkingsmodel	<input type="text"/>	<input type="text"/>	<input type="text"/>
Kennis over beheer en exploitatie binnen de organisaties	<input type="text"/>	<input type="text"/>	<input type="text"/>
Organisatorische draagkracht van de organisaties	<input type="text"/>	<input type="text"/>	<input type="text"/>
Grootte van de afzonderlijke organisaties	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type organisaties	<input type="text"/>	<input type="text"/>	<input type="text"/>
Aantal organisaties die onderdeel zijn van de samenwerking	<input type="text"/>	<input type="text"/>	<input type="text"/>
Synergie tussen de organisaties die onderdeel zijn van de samenwerking	<input type="text"/>	<input type="text"/>	<input type="text"/>
Bereidheid om verantwoordelijk te zijn voor beheer en exploitatie	X	<input type="text"/>	<input type="text"/>
Gewenste invloed en zeggenschap op beheer en exploitatie taken	<input type="text"/>	X	<input type="text"/>
Uiteindelijke keuze voor een beheer/ en exploitatiemodel	<input type="text"/>	<input type="text"/>	X
Tabel 1/4	Bereidheid om verantwoordelijk te zijn voor beheer en exploitatie	Gewenste invloed en zeggenschap op beheer en exploitatie taken	Uiteindelijke keuze voor een beheer- en exploitatiemodel

Vorige

Volgende

Wat is de relatie tussen de volgende variabelen in het besluitvormingsproces voor een beheer- en exploitatiemodel voor een MFA, Brede school of IKC?

**Antwoord mogelijkheden:** Er is geen sprake van een relatie tussen de variabelen 0 Er is nauwelijks sprake van een relatie tussen de variabelen 1 Er is sprake van een relatie tussen de variabelen 2 Er is sprake van een sterke relatie tussen de variabelen 3 Er is sprake van een heel sterke relatie tussen de variabelen 4

Als u meer uitleg wilt over een variabele kunt u met u muis over de onderstreepte tekst bewegen om een veld met informatie over het variabele te openen.

Tabel 2/4	Grootte van de afzonderlijke organisaties	Type organisaties	Aantal organisaties die onderdeel zijn van de samenwerking	Synergie tussen de organisaties die onderdeel zijn van de samenwerking
Financiële draagkracht van de organisaties	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Schaalvoordeel door samenwerken op gebied van beheer en exploitatie	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Financiële flexibiliteit die het beheer- en exploitatiemodel biedt	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Wet en regelgeving bepaalde beheer rechtsvormen (VvE, Stichting)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Samenwerkingsmodel	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Kennis over beheer en exploitatie binnen de organisaties	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Organisatorische draagkracht van de organisaties	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Grootte van de afzonderlijke organisaties	X	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type organisaties	<input type="text"/>	X	<input type="text"/>	<input type="text"/>
Aantal organisaties die onderdeel zijn van de samenwerking	<input type="text"/>	<input type="text"/>	X	<input type="text"/>
Synergie tussen de organisaties die onderdeel zijn van de samenwerking	<input type="text"/>	<input type="text"/>	<input type="text"/>	X
Bereidheid om verantwoordelijk te zijn voor beheer en exploitatie	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Gewenste invloed en zeggenschap op beheer en exploitatie taken	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Uiteindelijke keuze voor een beheer/ en exploitatiemodel	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Tabel 2/4	Grootte van de afzonderlijke organisaties	Type organisaties	Aantal organisaties die onderdeel zijn van de samenwerking	Synergie tussen de organisaties die onderdeel zijn van de samenwerking

Vorige

Volgende

Wat is de relatie tussen de volgende variabelen in het besluitvormingsproces voor een beheer- en exploitatiemodel voor een MFA, Brede school of IKC?

**Antwoord mogelijkheden:** Er is geen sprake van een relatie tussen de variabelen -2 Er is nauwelijks sprake van een relatie tussen de variabelen -1 Er is sprake van een relatie tussen de variabelen 0 Er is sprake van een sterke relatie tussen de variabelen +1 Er is sprake van een heel sterke relatie tussen de variabelen +2

Als u meer uitleg wilt over een variabele kunt u met u muis over de onderstreepte tekst bewegen om een veld met informatie over het variabele te openen.

Tabel 3/4	Samenwerkingsmodel	Kennis over beheer en exploitatie binnen de organisaties	Organisatorische draagkracht van de organisaties
Financiële draagkracht van de organisaties	<input type="text"/>	<input type="text"/>	<input type="text"/>
Schaalvoordeel door samenwerken op gebied van beheer en exploitatie	<input type="text"/>	<input type="text"/>	<input type="text"/>
Financiële flexibiliteit die het beheer- en exploitatiemodel biedt	<input type="text"/>	<input type="text"/>	<input type="text"/>
Wet en regelgeving bepaalde beheer rechtsvormen (VvE, Stichting)	<input type="text"/>	<input type="text"/>	<input type="text"/>
Samenwerkingsmodel	X	<input type="text"/>	<input type="text"/>
Kennis over beheer en exploitatie binnen de organisaties	<input type="text"/>	X	<input type="text"/>
Organisatorische draagkracht van de organisaties	<input type="text"/>	<input type="text"/>	X
Grootte van de afzonderlijke organisaties	<input type="text"/>	<input type="text"/>	<input type="text"/>
Type organisaties	<input type="text"/>	<input type="text"/>	<input type="text"/>
Aantal organisaties die onderdeel zijn van de samenwerking	<input type="text"/>	<input type="text"/>	<input type="text"/>
Synergie tussen de organisaties die onderdeel zijn van de samenwerking	<input type="text"/>	<input type="text"/>	<input type="text"/>
Bereidheid om verantwoordelijk te zijn voor beheer en exploitatie	<input type="text"/>	<input type="text"/>	<input type="text"/>
Gewenste invloed en zeggenschap op beheer en exploitatie taken	<input type="text"/>	<input type="text"/>	<input type="text"/>
Uiteindelijke keuze voor een beheer/ en exploitatiemodel	<input type="text"/>	<input type="text"/>	<input type="text"/>
Tabel 3/4	Samenwerkingsmodel	Kennis over beheer en exploitatie binnen de organisaties	Organisatorische draagkracht van de organisaties

Vorige

Volgende

Wat is de relatie tussen de volgende variabelen in het besluitvormingsproces voor een beheer- en exploitatiemodel voor een MFA, Brede school of IKC?

Antwoord mogelijkheden: Er is geen sprake van een relatie tussen de variabelen 0 Er is nauwelijks sprake van een relatie tussen de variabelen 1 Er is sprake van een relatie tussen de variabelen 2 Er is sprake van een sterke relatie tussen de variabelen 3 Er is sprake van een heel sterke relatie tussen de variabelen 4

Als u meer uitleg wilt over een variabel kunt u met u muis over de onderstreepte tekst bewegen om een veld met informatie over het variabel te openen.

Tabel 4/4	Financiële draagkracht van de organisaties	Schaalvoordeel door samenwerken op gebied van beheer en exploitatie	Financiële flexibiliteit die het beheer- en exploitatiemodel biedt	Wet en regelgeving bepaalde beheer rechtsvormen (VvE, Stichting)
Financiële draagkracht van de organisaties	X			
Schaalvoordeel door samenwerken op gebied van beheer en exploitatie		X		
Financiële flexibiliteit die het beheer- en exploitatiemodel biedt			X	
Wet en regelgeving bepaalde beheer rechtsvormen (VvE, Stichting)				X
Samenwerkingsmodel				
Kennis over beheer en exploitatie binnen de organisaties				
Organisatorische draagkracht van de organisaties				
Grootte van de afzonderlijke organisaties				
Type organisaties				
Aantal organisaties die onderdeel zijn van de samenwerking				
Synergie tussen de organisaties die onderdeel zijn van de samenwerking				
Bereidheid om verantwoordelijk te zijn voor beheer en exploitatie				
Gewenste invloed en zeggenschap op beheer en exploitatie taken				
Uiteindelijke keuze voor een beheer/ en exploitatiemodel				
Tabel 4/4	Financiële draagkracht van de organisaties	Schaalvoordeel door samenwerken op gebied van beheer en exploitatie	Financiële flexibiliteit die het beheer- en exploitatiemodel biedt	Wet en regelgeving bepaalde beheer rechtsvormen (VvE, Stichting)

Vorige

Volgende



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Als u nog vragen heeft betreffende het onderzoek kunt u contact met mij opnemen via: [e.s.p.h.penders@student.tue.nl](mailto:e.s.p.h.penders@student.tue.nl)  
De resultaten van het onderzoek zullen gepubliceerd worden op: [www.repository.tue.nl](http://www.repository.tue.nl)

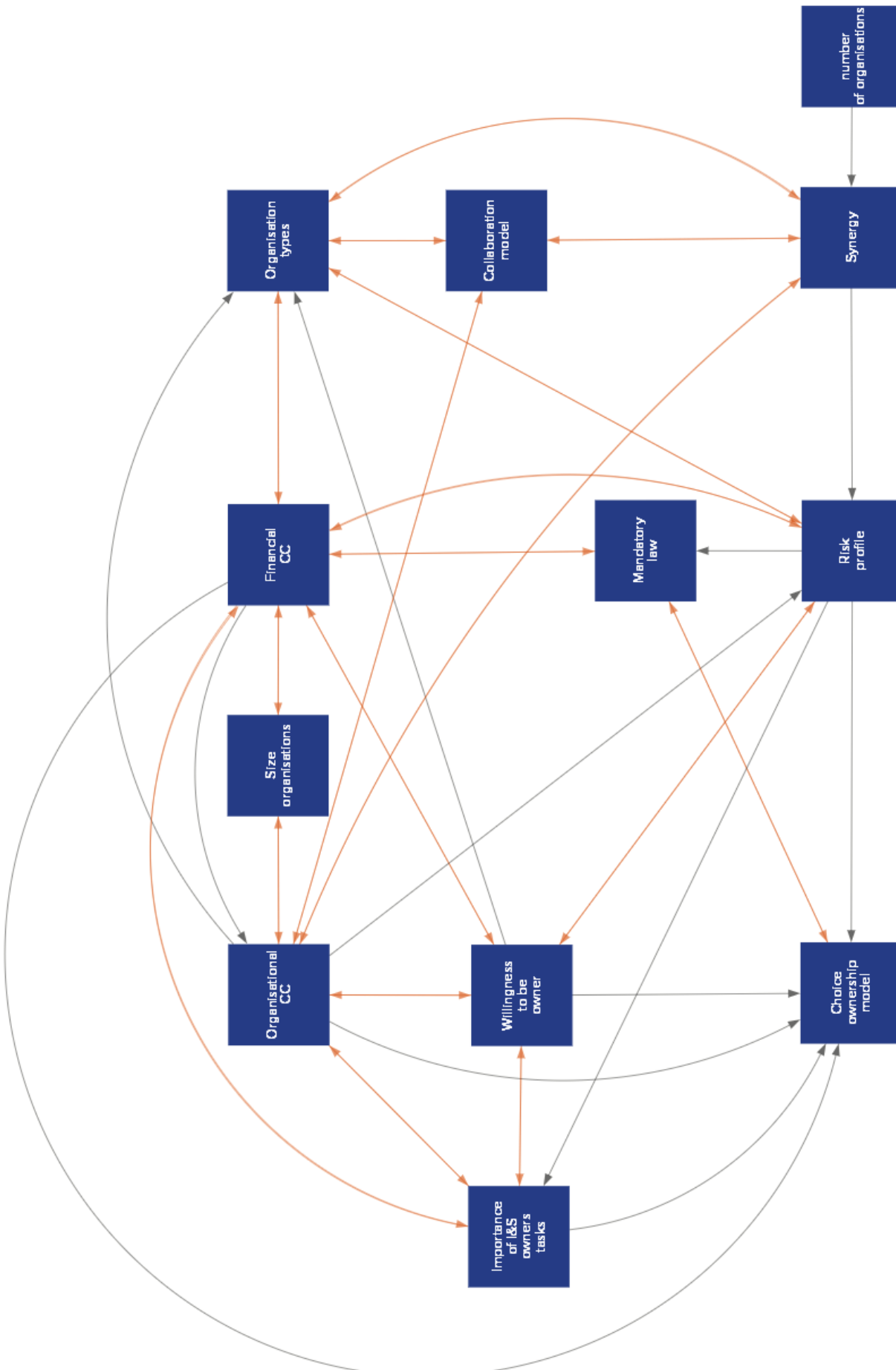
Vorige

Verzenden



## Appendix F

Initial Directed graph based matrix questionnaire – ownership model





## Appendix G

### Preselection DAG ownership model

From	To	Label	Action	Reasoning
Collaboration model	Synergy	$A \rightarrow B$ , $B \rightarrow A$	Delete	Relationship in other direction also accepted and more logical. Synergy for example is a condition to create a more in depth collaboration.
Organization types	Synergy		-	
Synergy	Collaboration model		-	
Financial CC	Risk profile		-	
Risk profile	Financial CC	$A \rightarrow B$ , $B \rightarrow A$	Delete	Although risk profile can influence the Financial carrying capacity of an organizations negatively over time this relationship is consider to be less present at the time an ownership model has to be chosen. The relationship in the other direction (Financial CC $\rightarrow$ Risk profile ) is considered to be of more importance for choosing an ownership model because when choosing an ownership model the financial carrying capacity of the individual organizations influences the risk profile immediately.
Willingness to be owner	Risk profile	$A \rightarrow B$ , $B \rightarrow A$	Delete	Although when more organizations want to be owner the initiative could become less risky because organizations are very committed to the initiative, in this case the relationship in the other direction is considered to be more important. Although this relationship gets a higher average score that the relationship in the other direction the difference is minimal and the answers of the relationship in the other direction are more consistent.
Financial CC	Choice own model		-	
Risk profile	Choice own model		-	
Importance of I&S	Choice own model		-	
Risk profile	Willingness to be owner		-	
Organizational CC	Choice own model		-	
# of organizations	Synergy		-	
Collaboration model	Organization types	$A \rightarrow B$ , $B \rightarrow A$	Delete	Although a certain collaboration model (for example a more in depth collaboration) can attract certain organizations the order in time the variables will influence each other will most likely be (t <sub>1</sub> ) organization types $\rightarrow$ (t <sub>2</sub> ) collaboration model $\rightarrow$ (t <sub>3</sub> ) organization types. Therefore this relationship will not be selected but the relationship organization types $\rightarrow$ collaboration model will be selected.
Willingness to be owner	Organization types	Not logical	Delete & discuss	This relation is not logical and has to be discussed during the validation interviews. It is expected that the relationship in the other direction is more logical and might be added to the model. For certain organizations it is more likely to become owner (school, municipality) than other organizations (childcare organizations ).
Financial CC	Importance of I&S		-	
Risk profile	Importance of I&S		-	
Collaboration model	Organizational CC		-	
Size organizations	Organizational CC		-	
Risk profile	Organization types	Far-fetched	Delete & discuss	It is possible that a higher risk profile causes certain organizations not to become involved in the initiative, but this relationship is considered to be far-fetched. Therefore this relations will be deleted from the model and this decision will be discussed during the interviews
Willingness to be owner	Financial CC	$A \rightarrow B$ , $B \rightarrow A$	Delete	The relationship in the other direction is logical. For this direction on logical explanation could be given. Therefore the relationship in the other direction will be included in the model
Mandatory law	Choice own model	$A \rightarrow B$ , $B \rightarrow A$	Delete	The relationship in the other direction is logical. For this direction on logical explanation could be given. Therefore the relationship in the other direction will be included in the model
Organizational CC	Willingness to be owner		-	
Willingness to be owner	Choice own model		-	
Organizational CC	Size organizations	$A \rightarrow B$ , $B \rightarrow A$	Delete	When the size of the organizations grows the organizational carrying capacity also grows. The relationship in the other direction therefore is more logical and will be included in the model

From	To	Label	Action	Reasoning
Organizational CC	Risk profile		-	
Organizational CC	Synergy	Far-fetched	Delete & discuss	Although it is possible that organizations with a similar organizational CC have more in common and therefore have more synergy, this relationship is a bit far-fetched. Furthermore community school initiatives in practice do not necessarily show signs of this relationship (very small and big childcare start looking into common grounds with schools). This relationship therefore will be deleted and discussed during the interviews
Synergy	Organizational CC	Not logical	Delete & discuss	The relationship above is the same relationship but the other way around ( organizational CC → Synergy, Synergy → Organizational CC). The relationship above was deleted from the first network draft because it was far-fetched, and this relationship just is not logical and cannot be explained in a logical manner. This relationship therefore will be deleted and discussed during the interviews
Chosen ownership model	Mandatory law		-	
Importance of I&S	Financial CC	A → B, B → A	Delete	Both relationships are selected. In this case the relationship in the other direction is considered to be more logical and relevant to the topic of this study.
Organization types	Collaboration model		-	
Organizational CC	Importance of I&S		-	
Financial CC	Mandatory law	A → B, B → A	Delete	Relation in the other direction is also accepted and is more logical. When certain laws en legislations apply this has a negative effect on the financial CC of the organizations (mandatory savings for maintenance or no distribution of profits).
Financial CC	Organization types	A → B, B → A	Delete	Relationships is more logical and also accepted. This relationship can't be logically explained and therefore the relationship in the other direction is kept
Organization types	Risk profile		-	
Financial CC	Organizational CC		-	
Organizational CC	Collaboration model	A → B, B → A	Delete	The relationship in the other direction is also selected and more logical. The answers of respondents showed that the relationship collaboration model → organizational CC is stronger. The relationship in the other direction is therefore kept and this relationship is deleted.
Importance of I&S	Organizational CC	A → B, B → A	Delete	The relationship in the other direction can be logically explained, in this direction this is not the case. Therefore the relationship in the other direction is kept and this relationship is deleted
Importance of I&S	Willingness to be owner		-	
Organization types	Financial CC		-	
Synergy	Organization types	A → B, B → A	Delete	The relationship in the other direction can be logically explained, in this direction this is not the case. Furthermore the relationship in the other direction is way stronger based on the respondents answers. Therefore the relationship in the other direction is kept and this relationship is deleted
Financial CC	Willingness to be owner		-	
Organizational CC	Organization types	Not logical	Delete & discuss	This relationship in the other direction would be more logical, but that relationship is not accepted because the mean is a little bit lower (2,0 versus 1,9). This relationship cannot be explained logically and will therefore initially be deleted from the model and discussed during the interviews.
Willingness to be owner	Organizational CC	A → B, B → A	Delete	The relationship in the other direction can be logically explained, in this direction this is not the case. Furthermore the relationship in the other direction is way stronger based on the respondents answers. Therefore the relationship in the other direction is kept and this relationship is deleted
Size organizations	Financial CC		-	
Financial CC	Size organizations	A → B, B → A	Delete & discuss	Both relationships are accepted but is hard to determine which relationship should be kept since the question is does a bigger organizations create more value or is it only possible to create more value if you have a bigger organizations ? Because the other relationship ( size → financial CC) has a slightly higher score that relationship will initially be kept and this relationship will be deleted. Because the difference is very small and both relationships can be explained logically this relationship has to be discussed during the interviews.

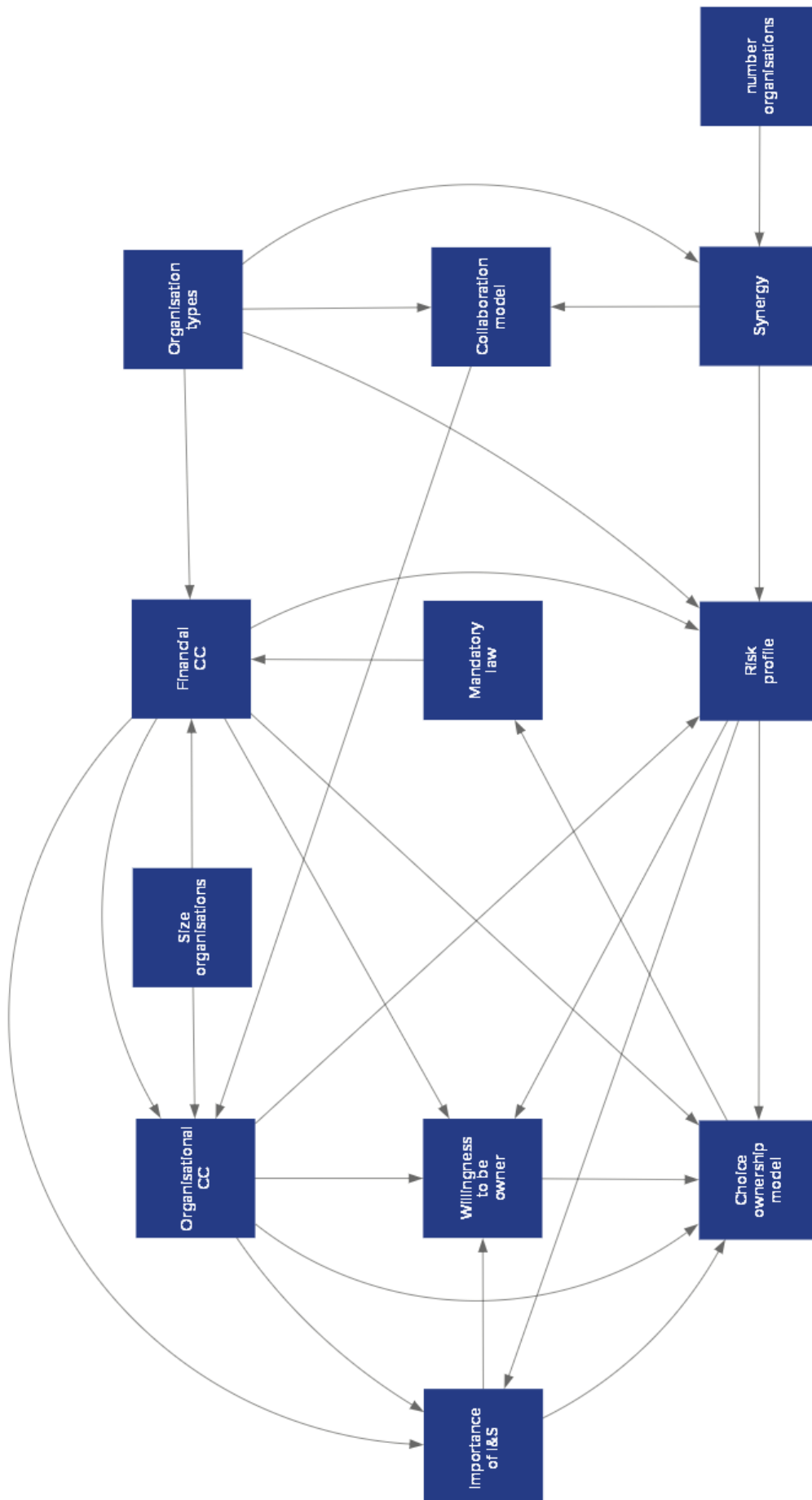
From	To	Label	Action	Reasoning
Willingness to be owner	Importance of I&S	A → B, B → A	Delete & discuss	Both relationships are accepted and both could be logical. The question is which of the relationships should be included. Because this relationship has a lower score initially this one will be deleted, but that decision will be discussed during the interviews.
Risk profile	Mandatory law	Not logical	Delete & discuss	This relationship can't be explained logically. Literature and practice does not give any reason to think this relationship exists. Therefore this relationship will initially be deleted and be discussed during the interviews.
Mandatory law	Financial CC		-	
Synergy	Risk profile		-	
Organization types	Importance of I&S	Maybe add	Discuss	It was expected that certain organizations would naturally want more influence and say.
Size organization	Importance of I&S	Maybe add	Discuss	It was expected that bigger organizations within the initiative would want more influence and say. It is however also possible that this is no direct relationship but an indirect relationship via financial and organizational carrying capacity.
# of organizations	Risk profile	Maybe add	Discuss	A basic idea of risk management is to spread risks. If only two organizations would be renting the building the vacancy risk for example is very high (if one organizations decide to terminate the lease half of the building will be empty). This situation could however be perceived differently in community schools because often the biggest user is the school and they will not /cannot terminate the lease that quickly.
# of organizations	Chosen ownership model	Maybe add	Discuss	It was expected this relationship would be important enough to be included in the model. The more organizations the less chance that one of the users of the building will also be the owner of the entire building. When there are a lot of different users it was expected that for example the VvE model of municipal ownership would be a good option instead of ownership by the users.





## Appendix H

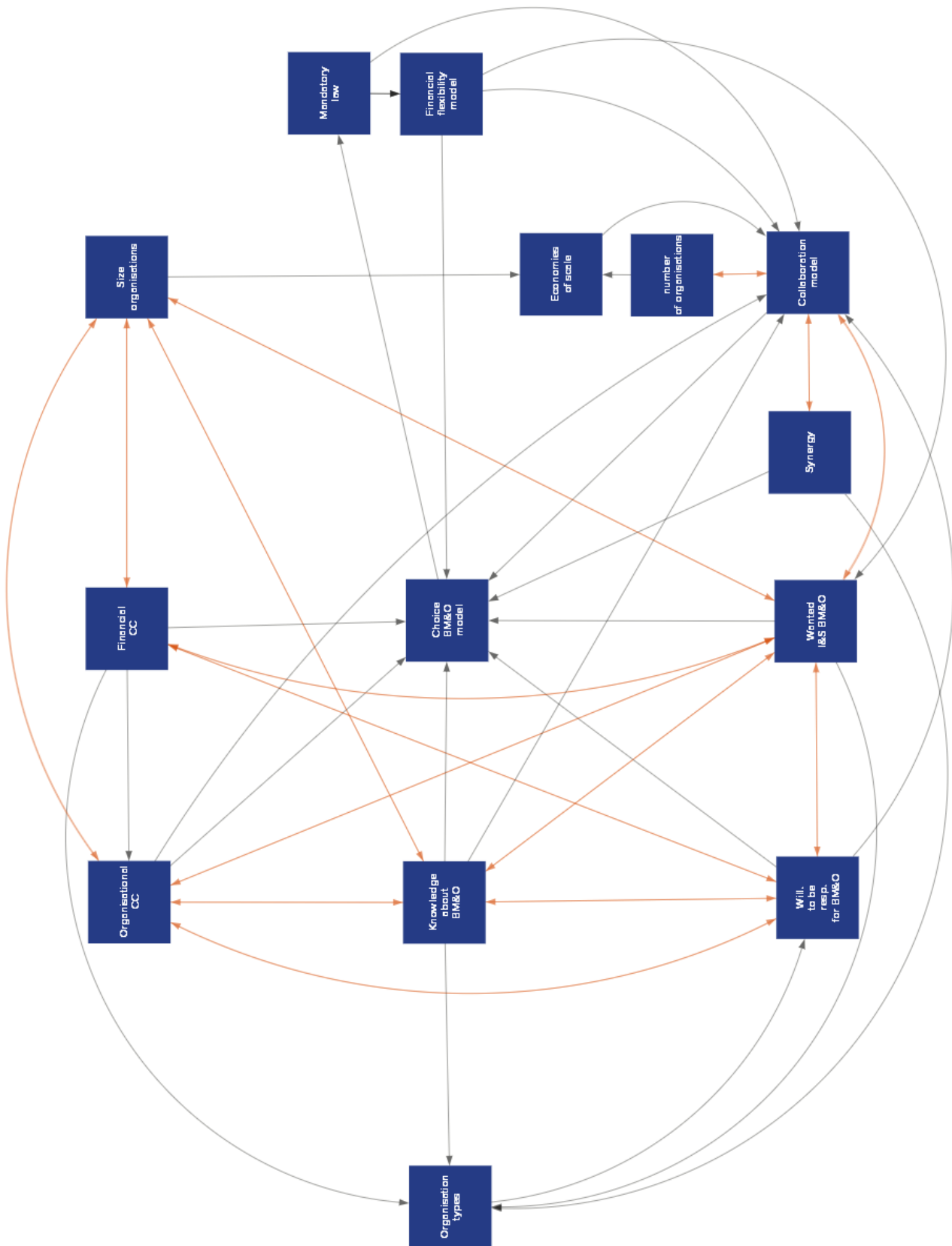
DAG after pre-selection – ownership model





## Appendix I

Initial directed graph based on matrix questionnaire – BM&O model





## Appendix J

### Preselection DAG BM&O model

From	To	Label	Action	Reasoning
Wanted I&S BM&O	Willingness resp. BM&O		-	
Knowledge about BM&O	Willingness resp. BM&O		-	
Organizational CC	Size organizations	A → B, B → A	Delete	The relationship in the other direction is more logical. The organizational carrying capacity is influenced by the number of people and types of functions within an organization, and thus de size of the organization
Wanted I&S BM&O	Choice BM&O model		-	
Willingness resp. BM&O	Organizational CC	A → B, B → A	Delete	The relationship in the other direction is logical. For the other direction a logical explanation could be given. Therefore the relationship in the other direction will be included in the model
Wanted I&S BM&O	Size organizations	A → B, B → A	Delete	The relationship in the other direction is logical. For the other direction a logical explanation could be given. Therefore the relationship in the other direction will be included in the model
Organizational CC	Willingness resp. BM&O		-	
Wanted I&S BM&O	Organizational CC	A → B, B → A	Delete	The relationship in the other direction is logical. For the other direction a logical explanation could be given. Therefore the relationship in the other direction will be included in the model
Financial CC	Willingness resp. BM&O		-	
Knowledge about BM&O	Wanted I&S BM&O		-	
Willingness resp. BM&O	Wanted I&S BM&O	A → B, B → A	Delete & discuss	The question is whether the willingness influences the I&S or the other way around. It is expected that the relationship in the other direction is the initial direction (t1) and this direction is the secondary direction (t2)
Wanted I&S BM&O	Knowledge about BM&O	Not logical	Delete	This relationship can't be explained logically and will therefore be deleted.
Organizational CC	Wanted I&S BM&O		-	
Wanted I&S BM&O	Collaboration model	A → B, B → A	Discuss	It is possible that when there are a lot of organizations that want a lot of influence and say it is harder to work together since none of the organizations want to give up their autonomy. The relationship in the other direction is also selected. During the validation interviews will be discussed which of the two relationships is more logical.
Financial CC	Organizational CC		-	
Financial CC	Choice BM&O model		-	
Willingness resp. BM&O	Size organizations	Not logical	Delete	This relationship can't be explained logically and will therefore be deleted.
Collaboration model	Synergy	A → B, B → A	Delete	Both relationships are accepted. When looking to community school project in general the amount of synergy determines the collaboration model and thus the relationship in the other direction is more logical. This relationship will therefore be deleted from the model.
Willingness resp. BM&O	Financial CC	A → B, B → A	Delete	The relationship in the other direction is logical. For the other direction a logical explanation could be given. Therefore the relationship in the other direction will be included in the model
Willingness resp. BM&O	Knowledge about BM&O	A → B, B → A	Delete	The relationship in the other direction is logical. For the other direction a logical explanation could be given. Therefore the relationship in the other direction will be included in the model
Organizational CC	Choice BM&O model		-	
Wanted I&S BM&O	Financial CC	A → B, B → A	Delete	The relationship in the other direction is logical. For the other direction a logical explanation could be given. Therefore the relationship in the other direction will be included in the model
Knowledge about BM&O	Organizational CC	A → B, B → A	Delete	The relationship in the other direction is logical. For the other direction a logical explanation could be given. Therefore the relationship in the other direction will be included in the model
Organizational CC	Knowledge about BM&O		-	
Financial CC	Wanted I&S BM&O		-	

From	To	Label	Action	Reasoning
Financial CC	Size organizations	A → B, B → A	Delete & discuss	The direction of this relationship can go either way. The question is whether the size influences the financial cc or that the size of an organizations only grows when the financial CC is higher. This relationship has to be discussed during the validation interviews.
Size organizations	Organizational CC		-	
Knowledge about BM&O	Size organizations	A → B, B → A	Delete	The relationship in the other direction is logical. For the other direction a logical explanation could be given. Therefore the relationship in the other direction will be included in the model
Collaboration model	Wanted I&S BM&O	A → B, B → A	Delete & discuss	It is possible that when a certain collaboration model is chosen organizations want more influence and say either because they give up some of their autonomy or because the partners do not have a enough trust towards each other. The relationship in the other direction is also selected. Which of the two is more logical will be discussed during the validation interviews.
Knowledge about BM&O	Choice BM&O model		-	
Willingness resp. BM&O	Collaboration model	Not logical	Delete & discuss	The willingness to be responsible for BM&O does not have anything to do with the collaboration model. It is expected that for some of the participants it was hard to understand the difference between the collaboration model and the BM&O model. Therefore this relationship is expected to be deleted. To validate this the relationship will be discussed during the validation interviews.
Financial CC	Organization types	Not logical	Delete & discuss	This relationship is not logical. The relationship in the other direction would be more logical (certain organization types can have a higher financial CC than other types of organizations ) but thus relationship is not selected. The relationship financial cc → organizations types therefore will be deleted and this decision will be discussed during the validation interviews.
Synergy	Collaboration model		-	
Collaboration model	Choice BM&O model		-	
Size organizations	Financial CC		-	
Size organizations	Wanted I&S BM&O		-	
Economies of scale	Collaboration model	Not logical	Delete & Discuss	The direction of this relationship is questionable. The question is whether the possibility for economies of scale influences that organizations work together more in depth or that the sequentially goes the other way around. This will be discussed during the validation interviews.
Mandatory law	Financial flexibility model		-	
Synergy	Choice BM&O model		-	
Choice BM&O model	Mandatory law		-	
Organization types	Willingness resp. BM&O		-	
Willingness resp. BM&O	Choice BM&O model		-	
Financial flexibility model	Choice BM&O model		-	
Wanted I&S BM&O	Organization types	Not logical	Delete & discuss	The relationship in the other direction is not selected but is way more logical than this relationship. It was expected that certain organizations based on their culture would want more influence and say. This relationship (I&S → Types) will therefore be deleted and during the validation interviews will be discussed whether the relationship in the other direction should be added to the model.
Organizational CC	Collaboration model	Far-fetched	Delete & discuss	It could be expected that organizations with a similar organizational CC would be more willing to work in depth with each other. This is however far-fetched and will therefore be discussed during the interviews.
Mandatory law	Collaboration model	Not logical	Delete	Also in this case it is expected that some of the respondents did not understand the difference between the collaboration model and the BM&O model. Mandatory law (mandatory savings and no distribution of profits) can't have influence on the collaboration model. This relationship will therefore be deleted.
Financial flexibility model	Wanted I&S BM&O		-	

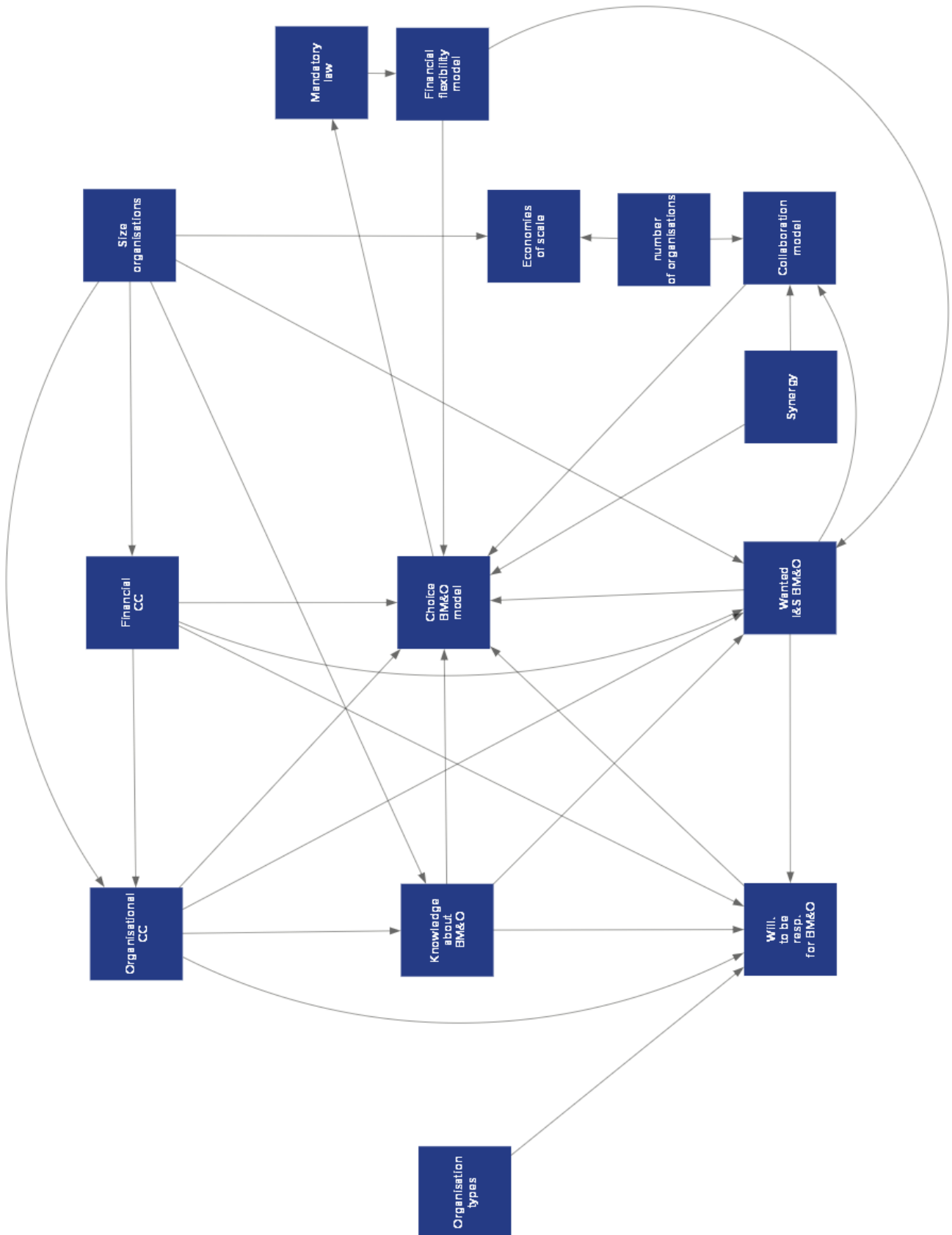
From	To	Label	Action	Reasoning
Collaboration model	# of organizations	A → B, B → A	Delete	The relationship in the other direction is logical. For the other direction a logical explanation could be given. Therefore the relationship in the other direction will be included in the model
Knowledge about BM&O	Organization types	Not logical	Delete & discuss	The relationship cannot be explained logically and will therefore initially be deleted. This decision will be discussed during the validation interviews.
Synergy	Organization types	Not logical	Delete & discuss	This relationship is expected to be the other way around. Although synergy can attract certain organizations it is expected that currently the order of events is the other way around (first organizations decide on entering the initiative and then synergy is created). Trends within the community sector however show that the direction of this relationship is slowly turning around (first organizations start working together in a service network to create synergy and then the decision is made to enter into an initiative to build a community school). At the moment however it is expected that the relationship types → synergy is more accurate. This decision will be discussed during the validation interviews.
Size organizations	Knowledge about BM&O		-	
# organizations	Collaboration model		-	
Knowledge about BM&O	Collaboration model	Not logical	Delete & discuss	Again it is expected that for some of the respondents the difference between the collaboration model and BM&O model was not clear. This direction would be a little bit logical if the choice for a BM&O model would be influence but this is not the case. Therefore the relationship is deleted.
# of organizations	Economies of scale		-	
Financial flexibility model	Collaboration model	Not logical	Delete & discuss	Again it is expected that for some of the respondents the difference between the collaboration model and BM&O model was not clear. This direction would be a little bit logical if the choice for a BM&O model would be influence but this is not the case. Therefore the relationship is deleted.
Size organizations	Economies of scale		-	
Financial flexibility model	Financial CC	Maybe add	Discuss	When you are less financial flexible this could have a negative effect on your financial carrying capacity. whether this relationship exists and is important enough to add will be discussed during the validation interviews
# organizations	Choice BM&O model	Maybe add	Discuss	It was expected that when there are more organizations within an initiative certain BM&O models would be less suited (for example BM&O by one of the primary users). His relationship will be discussed during the validation interviews
Economies of scale	Choice BM&O model	Maybe add	Discuss	It was expected that the possibility for economies of scale would have a direct effect on the decision for a BM&O model (work together or not).
Size organizations	Willingness resp. BM&O	Maybe add	Discuss	It was expected that bigger organizations were more willing to be responsible for BM&O than small organizations. This relationship will be discussed during the validation interviews.





## Appendix K

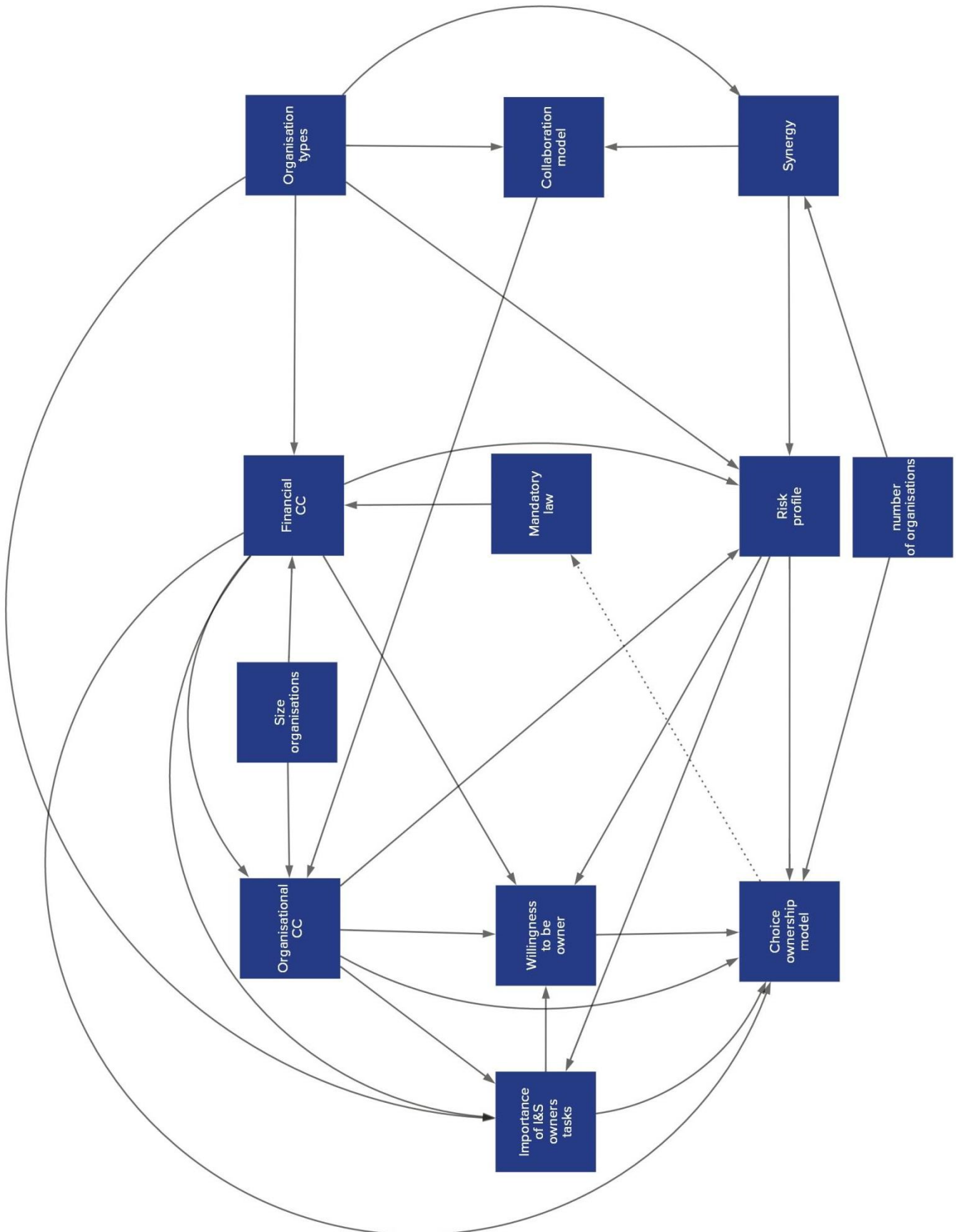
DAG after pre-selection – BM&O





## Appendix L

DAG after validation interviews – Final ownership DAG





## Appendix M

### DAG after validation interviews – Final BM&O DAG

