Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences

Graduation Plan: All tracks

Submit your Graduation Plan to the Board of Examiners (Examencommissie-BK@tudelft.nl), Mentors and Delegate of the Board of Examiners one week before P2 at the latest.

The graduation plan consists of at least the following data/segments:

Personal information	
Name	Esther Arensman
Student number	4376986
Telephone number	-
Private e-mail address	-

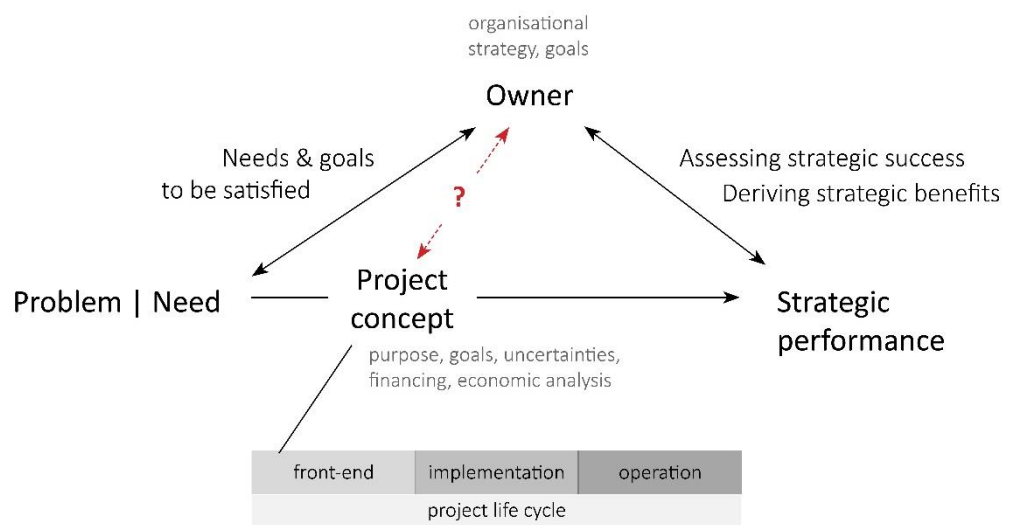| Studio		
Name / Theme	Design and Construction Management	
Main mentor	Prof. Dr. Paul Chan	Design and Construction Management
Second mentor	Dr. Ir. Monique Arkesteijn	Real Estate Management
Argumentation of choice of the studio	The conceptual phase of a project has always had my interest. During my Bachelor I very much enjoyed coming up with architectural concepts for the design problems I was faced with. During an internship I did in an Architectural office, I soon noticed that much has been decided upon already before an architect gets to join the process. I chose to follow the Management in the Built Environment master track to get to know more about the whole process of designing and constructing the Built Environment and the people who are involved in it. I wanted to get more into the beginning of the process, into the phase where a project only exist conceptually. This lead to the choice of my graduation topic, which is on the topic of generating project concept alternatives in the front-end phase.	

Graduation project		
Title of the graduation project	**The role of the owner in generating project concept alternatives in the front-end phase** *A case study research on the concept development phase of projects in the built environment*	
Goal		
Location:	The Netherlands	
The posed problem,	The front-end of a (construction) project consists of the preliminary stages where a project is formulated. A systematic literature review showed that little has been written about the owner in the front-end phase of construction projects. From what has been written, nobody goes into how conceptual solutions (project concepts) are generated, and the role of the owner in this.	

|	
	Defining the project concept is an essential part of the front-end phase, by intending to support the solution of a problem or the satisfaction of a need. A project concept contains the purpose, goals, key uncertainties, a financial plan and economic analysis for a project, and is the basis for strategic success. The owner has the need to be satisfied by the project and is important in assessing the strategic success in regards to the project outcomes. For a project to succeed in strategic terms, different concepts should be considered, but the absence of a concept definition phase is a deficiency in many projects. Because of its relation with the need which initiates a project, and its role in assessing the strategic success of a project, the goal of this research is to analyse the role of the owner in generating project concepts alternatives in practice. Links between the main concepts – research gab (elaborated) (own image).
research questions and	**Main research question** ***What is the role of the owner in generating different project concept alternatives in practice during the front-end phase, of projects in the built environment?*** **Research sub-questions** 1. How are alternative project concepts generated? 2. Who are involved in generating project concept alternatives? 3. Is, and if yes how is, the alignment between the organisational strategy and project concept incorporated in generating project concept alternatives?
design assignment in which these result.	Not applicable

Process
Method description

Research method

Type of study

In order to answer the main research question of this thesis, the research methodology is determined. The research will be descriptive of nature, producing knowledge about practice and can be classified as empirical research. The steps of an empirical research process can be seen in figure 5.1 (Barendse, Binnekamp, De Graaf, Van Gunsteren & Van Loon, 2012).
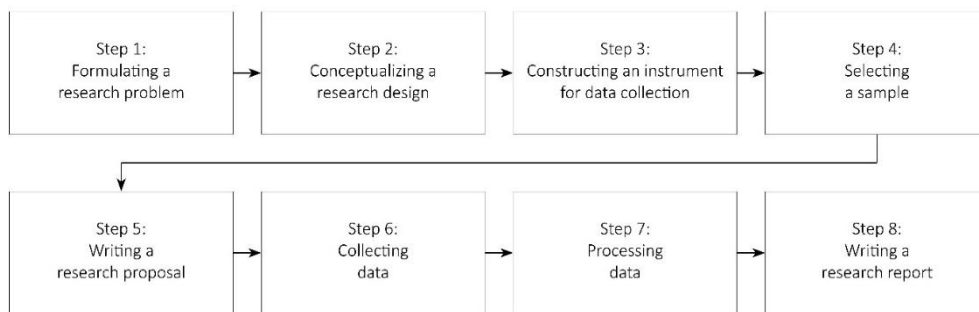
Steps of an empirical research process (Kumar, in Barendse, et al., 2012, pp. 4) edited.

The goal of the research is to describe the role of the owner in generating different project concept alternatives in practice.

The first part of this graduation thesis included the discussion of the concepts around the research problem and a systematic literature review was performed. This literature study part of the thesis resulted in the formulation of the research questions. This part can be recognized in the first steps of the empirical research process.

After the P2, the empirical part of the research starts. A qualitative research methodology will be adopted. In qualitative research, the focus is on 'the understanding of the social world through an examination of the interpretation of that world by its participants' (Bryman, 2012, pp. 380). By performing case studies, the aim is to find answers to the research sub-questions for each case. Cases will be searched based on the selection criteria which can be found in the next section. Qualitative data will be collected by performing semi-structured interviews and reviewing documents of the concept development phase.

In the final phase of the thesis, the data from the case studies will be processed. Conclusions will be drawn for each case study and the findings will be reported and compared with each other in order to answer the main research question. A general conclusion and discussion of the findings will be provided together with a reflection. This finishes off the last step of the empirical research process.

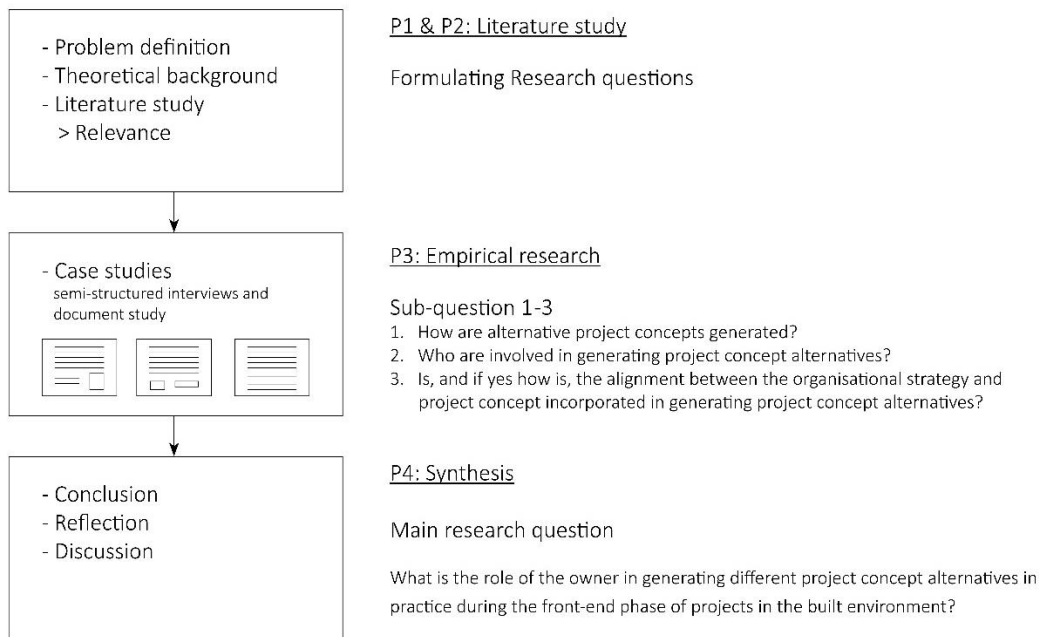The research design for this thesis is presented in figure 5.2.

Figure 5.2 | Research design (own image).

Methods and techniques to be used

Case study research
Multiple case studies will be performed to investigate the role of the owner in generating different project concept alternatives in practice. A case study is an empirical method that: 'investigates a contemporary phenomenon (the 'case') in depth and within its real-world context – especially when the boundaries between phenomenon and context may not be clearly evident' (Yin, 2018, pp. 15).

Case selection criteria
The goal is to study three cases, in relation to time constraints and availability of cases. It is recognized that the value of the found data will increase with more case studies. Multiple case studies will be performed in order to compare the findings. Since each of the cases will be in other contexts, the outcomes might differ. To select the cases, the following case selection criteria have been defined:

1. In the cases, a minimum of 2, alternative project concepts should have been generated (apart from 'the zero-alternative' - proceeding without major changes or new investment). (This criterion is based on the requirements of the Norwegian QA scheme);
2. Large building project (not infrastructure) since that is at the heart of this faculty and my interest;
3. The motive for the need/problem in the cases I will be studying should have to do with accommodating an organisation;
4. A) Projects which are at least in the definitive design phase, or past this phase to be able to reflect on the front-end phase;

B) If the project is finished, it should have been recently finished. In relation to the available information and memory of the people involved. To be able to state how alternatives are generated in practice it becomes more relevant if the project was recently performed, otherwise the results could already have been outdated – do not describe the present situation;

5. Dutch projects, to be able to conduct interviews in person.

To acquire different case studies, the goal is to find a graduation internship. In the search for a graduation company, there will be a focus on large consultancy firms, since the availability of larger, complex projects, which increases the probability that alternative project concepts were generated in the first place is higher.

The aspect of whether a case should be from the public or private sector is not included in the case selection criteria. Besides the aspect of money which maybe plays a larger role in private sector cases, project from both sectors will suffice. But, it is important to note that the few studies that were done on the identification and evaluation of project concept alternatives have all been done on major public projects (mostly in Norway, in relation to the Quality Assurance Scheme – as part of the Concept Research program).

Ideally, cases will be found which are in line with the selection criteria. I am aware of the risks involved that I might not be able to find cases that correspond with the criteria or it is impossible to acquire certain data or talk to specific persons. I am dependent on what is available in practice. I will try to find it cases with these criteria first. If unsuccessful, the criteria will be adapted.

Data collection

Multiple cases will be studied by reviewing documentation/reports from the conceptual stage of each project and by performing semi-structured interviews with multiple members of the owner organisation who took part in the process of designing project concept alternatives. Interviews and document study will be performed between February and April 2020.

The cases will be selected in consultation with the internship company and the graduation mentor, and the best way to approach the project owner(s) will be discussed. To find out what the role of the owner is/was in the generating of alternatives, the people to interview should (have) perform(ed) the role of the owner or closely related to this role. The first task is to find about what the tasks of the 'owner' were/are in the selected cases studies, and whether this corresponds to the role description that is used as the definition of the 'owner' for this thesis. This should lead to the identification of the people to interview – assuming they know about the concept definition process.

The semi-structured interviews will be held in person or via Skype, depending on the situation and preferences of the interviewee. If agreed upon by the interviewee, recordings will be made in order to produce transcripts for data analysis. For each case, multiple interviews will be performed with members from the owner organisation to be able to sketch a complete picture of the concept development phase.

In preparation of the interviews, documentation about the project and information about the owner organisations will be read. The interviews will start by asking broad questions as to find out how the project started and in what context. Hereafter, questions will be asked such as: Can you tell me about the process of concept generation? Which concepts were generated? What was done to generate alternatives? What were the needs and objectives for the project? Who were involved? These questions are asked to be able to sketch a 'picture' of each of the cases.

'If, and if yes, how the strategy of the organisation was incorporated in the process of generating alternatives' will be asked in the second part of the interview. From the answers on the first part, whether or not the strategy is mentioned, will already indicate the answer to this sub question, but to specifically answer this more detailed questions will be asked.

Data analysis

To analyse the data gathered, the transcripts will be put into Atlas.ti. This is a computer software program in which the data can be coded. Coding is used to review transcripts by giving labels (names) to parts of text that seem to be of 'potential theoretical significance and/or that appear to be particularly salient within the social worlds of those being studied (Bryman, 2012, pp. 568).

As Bryman (2010) explains: In coding, the data is considered as possible indicators of concepts, which are constantly compared. 'Constant comparison enjoins the researcher constantly to compare phenomena being coded under a certain category so that a theoretical elaboration of that category can begin to emerge' (Bryman, 2012, pp. 568).

Coding is one of the main processes in grounded theory, which is an iterative approach concerned with developing theory out of data. Data is collected and analysed at the same time. It is advised to start coding as soon as possible, to sharpen the understanding of the data (Bryman, 2012). Coding the data does not mean analysing the data. It is a way to reduce the vast amount of data that is gathered and helps thinking about the meaning of the data (Huberman & Miles, in Bryman, 2012).

Literature and general practical preference

The full literature list can be found on page 29 and 30 in the P2 report, the main literature sources are presented here:

Haddadi, A., Johansen, A., & Bjørberg, S. (2017). Best Value Approach (BVA): Enhancing Value Creation in Construction Projects. *Business Systems Research Journal*, *8*(2), 84–100. https://doi.org/10.1515/bsrj-2017-0018

Hjelmbrekke, Hallgrim, Klakegg, O. J., & Lohne, J. (2017). Governing value creation in construction project: a new model. *International Journal of Managing Projects in Business*, *10*(1), 60–83. https://doi.org/10.1108/ijmpb-12-2015-0116

Hjelmbrekke, H., Lædre, O., & Lohne, J. (2014). The need for a project governance body. *International Journal of Managing Projects in Business*, *7*(4), 661–677. https://doi.org/10.1108/ijmpb-03-2013-0012

Samset, K. (2010). *Early Project Appraisal: Making the Initial Choices*. Basingstoke: Palgrave Macmillan.

Samset, K., Andersen, B., & Austeng, K. (2014). To which extent do projects explore the opportunity space? *International Journal of Managing Projects in Business, 7*(3), 473–492. https://doi.org/10.1108/ijmpb-08-2013-0038

Samset, K., & Volden, G. H. (2016). Front-end definition of projects: Ten paradoxes and some reflections regarding project management and project governance. *International Journal of Project Management, 34*(2), 297–313. https://doi.org/10.1016/j.ijproman.2015.01.014

Williams, T., & Samset, K. (2010). Issues in Front-End Decision Making on Projects. *Project Management Journal, 41*(2), 38–49. https://doi.org/10.1002/pmj.20160

Williams, T., Vo, H., Samset, K., & Edkins, A. (2019). The front-end of projects: a systematic literature review and structuring. *Production Planning and Control, 30*(14), 1137–1167. https://doi.org/10.1080/09537287.2019.1594429

Besides, in the research method section of this graduation plan I reference to:

Barendse, P., Binnekamp, R., De Graaf, R. P., Van Gunsteren, L. A., & Van Loon, P. P. J. (2012). *Operations research methods for managerial multi-actor design and decision analysis.* Amsterdam: IOS Press.

Bryman, A. (2012). *Social Research Methods* (4th ed.). Oxford, United Kingdom: Oxford University Press.

Yin, R. K. (2018). *Case Study Research and Applications: Design and Methods* (6th ed.). Los Angeles: SAGE.

Reflection

1. What is the relation between your graduation (project) topic, the studio topic (if applicable), your master track (A,U,BT,LA,MBE), and your master programme (MSc AUBS)?

One of the main courses in the MBE master is on Design and Construction Management. In this course, the focus is on getting to know the different phases a project consists of, the actors involved in the design and construction process, risks, uncertainties, procurement strategies, etc.. The complexity and multiplicity of aspects to take into account becomes very clear. The front-end is the first phase of a project, where the basis for the project is laid. In the definition of a project concept, the people involved have to take into account many factors and plan for the future with little information available and high uncertainties. This requires analytical skills, creativity and design capabilities which lay at the heart of the faculty of Architecture and the Built Environment and the master program.

2. What is the relevance of your graduation work in the larger social, professional and scientific framework.

Scientific and societal relevance

Scientific relevance

In the front-end, freedom to choose is at its optimum and the costs related to making major changes are minimal. The fundamental choices are made, with the greatest consequences. Uncertainty is at its highest and little information is available. Paradoxically, most resources are usually spent in the implementation phase, where the potential to reduce uncertainties by adding information, is much lower (Samset, 2010; Samset & Volden, 2016). In the curriculum and textbooks for students in the field of Project Management, the focus lies mostly on the management of projects during the implementation phase, while in the front-end the major choices are made.

The problem of 'how to systematically arrive at better project concepts up front is largely neglected' (Samset, 2010, pp. 8).

Not many studies have researched how alternative concepts are defined and considered in practice and which ones are chosen (Samset, 2010). To the best of my knowledge, no research has been carried out specifically on the role of the owner in generating project concepts alternatives before.

Societal relevance

'The choice of concept is considered the single most important decision that will determine viability and utility of a project, and hence the extent to which public funds are being used effectively' (Samset, Berg, & Klakegg, 2006, pp. 6). When projects are unable to produce the anticipated effect, in public projects, public resources are wasted (Samset et al., 2006). Which is a serious problem associated with the strategic performance of projects.

In a time where urbanisation and sustainability are themes which highly influence the built environment, it becomes ever more important to realise projects which not only successfully perform the intended outcomes but also are aligned with the goals and objectives of an organisation to achieve strategic success. If projects don't align with an organisations' needs, this means resources, time and money are not optimally used. Research into improving the decisions made in the front-end phase, which influence the rest of the project and the implementation and operation phase, is therefore valuable.