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Keeping up with the environment

A method for environmental scanning towards sustainability strategies for construction clients

Master's thesis in Design and Construction Project Management

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DEPARTMENT OF ARCHITECTURE AND CIVIL ENGINEERING

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ABSTRACT

Construction clients have significant influence over the construction industry and can help drive the development of sustainability in the industry. One way for organisations to orient themselves and develop long-term strategy aligned with external development is to perform environmental scanning. Environmental scanning is a tool for organisations to identify trends in their external environment. Building on actual practices, this study investigates how construction clients can benefit from using environmental scanning in their strategic decision making today. The thesis aims to propose a sustainability-focused environmental scanning method tailored to construction clients by looking at currently available methods, and what clients request. To investigate existing methods of environmental scanning and the role of the construction client, a thorough literature review was performed. An empirical investigation, drawing on nine interviews, and one workshop with a focus group, was carried out to understand the current practices of environmental scanning in client organisations and their needs from an environmental scanning method. All participants in the empirical study are clients in the Swedish construction industry. The findings show that several methods for environmental scanning exist, but they are not specifically aimed at or suitable for the construction sector. Furthermore, all construction clients participating in this study perform environmental scanning to some extent, but most do it with a lack of structure and miss crucial parts of the process. The clients had not reflected on how a method aimed at sustainability should be structured, but several could see the potential benefits of one. Lastly, an environmental scanning method is proposed, consisting of four steps: *Internal evaluation*, *Scanning for trends*, *Analysis*, *Decision making and follow-up*. The method is tailored to the needs and the project-oriented context of construction clients, to support their long-term strategic sustainability work. However, each client organisation has different goals and purposes for their implementation, thus the model acts as guidelines and is adaptable to different levels of the organisation.

Key words: environmental scanning, construction client, sustainability strategy, SWOT, PEST, scenario analysis, strategic scanning, sustainable business model, sustainable construction, client role in construction

Hålla jämna steg med omvärlden

En metod för omvärldsanalys mot hållbarhetsstrategier för byggherrar

Examensarbete inom masterprogrammet Organisering och ledning i bygg- och fastighetssektorn

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SAMMANFATTNING

Byggherrar har ett påtagligt inflytande över byggbranschen och kan hjälpa till att driva utvecklingen av hållbarhet inom branschen. Ett sätt för organisationer att anpassa sig och utveckla sin långsiktiga strategi i linje med extern utveckling är att genomföra omvärldsanalys. Omvärldsanalys är ett verktyg för organisationer att identifiera trender i deras externa omvärld. Baserat på byggherrars agerande, undersöker den här studien hur de använder omvärldsanalys i sitt strategiska beslutsfattande idag. Rapporten syftar till att föreslå en hållbarhetsinriktad metod för omvärldsanalys som är skräddarsydd för byggherrar genom att undersöka befintliga metoder, och vad byggherrarna efterfrågar. För att undersöka befintliga metoder för omvärldsanalys och byggherrens roll har en grundlig litteraturstudie genomförts. En empirisk studie, baserad på nio intervjuer, och en workshop med en referensgrupp, genomfördes för att förstå hur byggherreorganisationerna arbetar med omvärldsanalys idag och vilka deras behov från en metod är. Samtliga deltagare i den empiriska studien är byggherrar inom den svenska byggbranschen. Resultatet visar att flera metoder för omvärldsanalys existerar, men de är inte specifikt riktade mot eller anpassade för byggbranschen. Dessutom genomför alla byggherrar som deltog i studien omvärldsanalys i någon utsträckning, men de flesta gör det med bristande struktur och missar väsentliga delar av processen. Byggherrarna har inte reflekterat över hur en metod för omvärldsanalysen riktad mot hållbarhet borde vara uppbyggd, men flera av dem kan se potentiella fördelar med en metod. Slutligen föreslås en metod för omvärldsanalys, som består av fyra steg: *Intern utvärdering*, *Söka efter trender*, *Analys*, och *Beslutsfattande och uppföljning*. Metoden är skräddarsydd efter den projekt-orienterade kontexten som byggherrar verkar i, för att stödja dem i deras långsiktiga strategiska hållbarhetsarbete. Däremot har varje byggherreorganisation olika mål och syfte med sin omvärldsanalys, således fungerar metoden som en riktlinje och är anpassningsbar till olika nivåer i organisationen.

Nyckelord: omvärldsanalys, byggherrar, hållbarhetsstrategi, SWOT, PEST, scenarioanalys, strategisk skanning, hållbar affärsmodell, hållbart byggande, byggherrens roll

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Preface

This thesis has been carried out in the spring semester of 2022, as the final part of the master's programme *Design and construction project management* at Chalmers University of Technology. It has been done in collaboration with Friends of Gothenburg Innovation, whom we would like to thank for their support and the opportunity of accessing their knowledge and experience within the topic of environmental scanning, which has strongly contributed to the quality of the thesis.

We would like to express our gratitude to our supervisors during this project. Martine Buser has been our supervisor at Chalmers University of Technology and has guided us throughout the process and provided valuable feedback regarding the structure and content of the thesis. Also, Staffan Bolminger who has been our supervisor at Friends of Gothenburg Innovation and has supported us throughout the process with his knowledge and advice. Furthermore, we would like to thank the other employees at Friends of Gothenburg Innovation for their support and thought-provoking discussions about the topic.

Finally, we are thankful for all the participants in the study who shared their experiences, knowledge, and opinions with us during the interviews and the workshop. Without their participation, the study could not have been performed with the same credibility and quality. Also, our opponents Simon Kvarnsund and Victor Pantzar provided us with helpful feedback and reflections about our thesis, which contributed to improvements to the final thesis. Furthermore, both authors have contributed equally to the research and this thesis.

Göteborg May 2022

Erik Andreasson, Nikolina Bolvede

1 Introduction

This thesis is written in collaboration with Friends of Gothenburg Innovation (FOG Innovation). FOG Innovation is a consulting company working with innovation and development in the construction industry. Their core values are to develop sustainable cities and use collaboration and innovation as tools to achieve their own and their customer's objectives (FOG Innovation, n.d.).

1.1 Background

The construction industry has a large impact on the environment through its high consumption of materials and energy. In 2019, it contributed to 21 per cent of the total greenhouse gas emissions in Sweden (Boverket, 2021b). Moreover, it does not only affect the environment but also faces social and economic challenges. Meanwhile, the demands from policymakers and the public to build a sustainable society are increasing, putting pressure on the industry to lower its environmental impact (Xiaodong et al., 2010). This situation requires that the sector innovates and transforms the actual practices. To do so it needs to be able to identify and understand the possibilities that sustainability offers. One of the main stakeholders in the industry to initiate change is the client who has a possibility to promote sustainable development in construction, primarily by determining sustainable incentives and requirements in projects. Pitt et al. (2009) show in their study that client awareness and client demands are seen as the key drivers for sustainable construction.

The work toward a more sustainable construction industry is an ongoing process, and since sustainability is a complex issue it requires a long-term strategy (Dubois & Gadde, 2002a). More and more, organisations encounter an ever-changing environment which requires high attention to stay up to date (Albright, 2004). This is evident today in the construction industry where trends are having a direct impact on both regulations and the market. For example, the new climate declaration requires that the climate impact from the construction process of all new buildings in Sweden after the 1st of January 2022 need to be declared (Boverket, 2021a). Another example is the 2022 energy crisis in Europe, which is an effect of both long-term trends and current events, and has a significant impact on energy-intensive industries (Crispeels et al., 2022). These emerging trends create a demand for client organisations to be aware of happenings and developments in their environment.

One way for organisations to identify upcoming challenges such as climate declaration and energy shortages is by performing environmental scanning (Albright, 2004). Environmental scanning can help organisations to map opportunities, reduce uncertainties and even to anticipate threats in their environment, providing a base for managers' decisions and future actions (Lesca, 2011). A lot of research has been made on how organisations can use environmental scanning to gain knowledge about their environment for the future development of their work, where the most frequently mentioned methods are SWOT and PEST analysis. The topic of environmental scanning was first conceptualized in the late 1960s but has now seen an increasing relevance with the increasing overflow of information, and the need to orient and filter for relevant information. The connection between environmental scanning and sustainability is not a new concept. According to the book *Environmental Scanning and Sustainable Development* (Lesca, 2011), the combination of environmental scanning and sustainability has seen an increasing interdependence between the two topics. However, little research has been done about environmental scanning in the

construction industry, especially regarding its impact on sustainability work in client organisations.

FOG Innovation, through their daily interactions with their customers, is under the impression that the construction clients would benefit from performing more structured environmental scanning which they could use as a base for strategic decisions towards sustainability and thereby shape demands for the industry. Thus, the company has identified a need to investigate how clients work today and how a suitable method for environmental scanning towards sustainability can be designed. If there are no established practices for environmental scanning, or if the practices are inefficient, the rate of development in the industry risks falling behind other industries and thus not achieving the set environmental goals. This can also be applied to the individual organisation, which might fall behind competing organisations if environmental scanning is not performed. The high rate of changes to laws and regulations regarding sustainability also requires a functioning environmental scanning process to stay updated, and failure to do so could have legal consequences.

1.2 Aim

This thesis aims to compose a method for environmental scanning that construction clients can use in their strategic decision making linked to sustainability issues. The method will be developed by identifying the needs of client organisations, with the objective of finding emerging threats, and opportunities in their external environment.

Through investigating existing methods for environmental scanning, the aim is to propose a method which is especially suitable for the construction industry to see trends and signals which could impact their work with sustainability. More in detail, the research will map the current state of environmental scanning among construction clients and thereby propose a method which will hopefully enhance their sustainable strategic decision making.

1.3 Delimitation

The study will focus on the perspective of professional construction clients (both public and private organisations) within the Swedish context. The research further focuses on established clients and not on individuals building houses occasionally.

Furthermore, the proposed method will be intended for a strategic level in client organisations and not focus on specific construction projects. This limitation was chosen because sustainability issues require long-term goals and involvement in strategic decisions. All aspects of sustainability will further be discussed, including environmental, social, and economic.

The focus of applying the proposed method for environmental scanning is to deliver an analysis that the organisation can use in decision making, but not to provide a detailed description of the implementation. This, because the actions taken from the environmental scanning will vary depending on the results of the analysis and the resources and strategy of the specific organisation.

1.4 Research questions

The research will be framed around the following questions:

- What are the existing methods for environmental scanning?

- How do construction clients work today with environmental scanning linked to sustainability issues?

- What would construction clients request from such a method?

- What elements should the method contain for supporting the construction client efficiently in their strategic work towards sustainability?

1.5 Structure of Thesis

This thesis will be developed according to the following structure:

- Chapter 2: Methodology
  In this chapter, the method on which the study is based is presented and explained in detail, including both the theoretical study and empirical study. It also discusses the ethical considerations of the study and evaluates the research method.

- Chapter 3: Theoretical Framework
  The result from the theoretical study is presented in this chapter and divided into two subcategories: client and sustainability, and environmental scanning.

- Chapter 4: Empirical study
  This chapter introduces the result from both the interviews with construction clients and the workshop with the focus group. The second part of the chapter focuses on the result of the discussions during the workshop.

- Chapter 5: Discussion
  The discussion compares findings from the literature with the findings from the empirical study. The main findings will also be analysed from the perspective of how a method for environmental scanning should be developed to fit construction clients.

- Chapter 6: The proposed method for environmental scanning
  In this chapter, the proposed method for environmental scanning for construction clients is presented in detail. Each step is explained with support from the result of the theoretical- and empirical study.

- Chapter 7: Conclusion and suggestions
  In the last chapter, the main findings from the study are concluded and summarised, answering the research question. Further research is also suggested for questions which have not been answered throughout the study.

2 Methodology

To answer the research questions, a qualitative abductive study has been carried out from an interpretive perspective. According to Dubois and Gadde (2002b), the abductive approach is suitable when theoretical study and empirical investigation evolve simultaneously, which was useful when developing a method for environmental scanning. A qualitative study enables a deeper understanding of the phenomena and provides a connection between different factors affecting the problem. Silverman (2014) describes that the main advantage of a qualitative study is that it can provide an increased understanding of the connections between the different variables, which for this work was needed for the development of the environmental scanning method. This enabled us to find connections between the current tools used by clients and the already existing practices.

Therefore, this study includes a comprehensive literature review and an empirical study including interviews and a workshop with a focus group of construction clients.

This chapter will also discuss the ethical considerations of the study and evaluate the research method.

2.1 Theoretical Study

The theoretical part of the study consists of a systematic literature review which provided an understanding of the topic as well as unanswered questions. The review gave a broad base for the research and knowledge about different viewpoints regarding the topics. Since the literature consider already developed methods for environmental scanning it gave a base to the development of an appropriate method, together with results from the empirical study.

The literature searched included three topics: the client's role in the construction industry, sustainability in construction and environmental scanning. The search was divided into these topics since they are not frequently combined in previous research. A comprehensive search was carried out based on the three mentioned topics and search strings were created based on these, which is in line with the method for a literature review mentioned by Bryman and Bell (2007).

The search was primarily based on literature from databases such as Scopus, Chalmers Library and Google scholar. To find articles and books connected to the topics, the following search strings were used and combined in several ways: environmental scanning methods, construction client's role, sustainability in construction, construction and environmental scanning, scenario analysis, strategic scanning, horizon scanning, foresight, sustainable business model, SWOT analysis, PEST analysis, construction client development. In addition to this, several physical books borrowed at Chalmers Library have been reviewed to get a deeper understanding of environmental scanning as a process.

2.2 Empirical Study

The empirical study consisted of one-to-one interviews with construction clients and a workshop with a focus group.

2.2.1 Interviews

Interviews have been carried out with nine construction clients to get a perspective of the current state of environmental scanning in the industry. The interviewed organisations were selected based on a few different premisses: some were suggested

by FOG Innovation, some were selected because they are major construction clients nationally, and some were chosen because they had previously worked with environmental scanning. The selection also considered if the organisation is public or private, and if they build to maintain or build to sell, since the aim was to capture a wide representation of construction clients. The interviews provided a picture of how different client organisations work and enabled a discussion about the specific organisation. The results from the interviews were compiled to get an overall picture of the current state and challenges in the industry. Some of the interviewees participated both in the interview study and the focus group, and some were only part of the interview study. The reason for this was to keep the interview study broad and provide an overall picture of the industry, but at the same time keep the focus group in a manageable size for discussions. Both interviews and the workshop with the focus group were seen as necessary since the interviews enabled a deeper discussion about how specific organisations work, which would be hampered in the bigger group.

The interviews were semi-structured following a qualitative research approach which was suitable since the goal of the research was already clearly stated. According to Bryman and Bell (2007) this way of interviewing is suitable when several cases or organisation is to be reviewed since it enhances the analysis and ability to find connections between the cases.

Since there are many different types of client organisations, the interviewees in this study represent organisations that vary a lot, including public, private, infrastructure and buildings (see Table 1). The variety of participants enabled the proposed method to fit all categories of clients. In most of the organisations, an employee with insight into both sustainability and the organisation's strategic work was chosen, which often resulted in the sustainability manager or sustainability strategist. In two of the organisations, we got in contact with people working with strategy but not specifically linked to sustainability. For one of the organisations, the interview was carried out with a project manager, working more closely with the construction projects. This combination of positions contributed to the work thus it provided different viewpoints about environmental scanning from different positions in the organisations.

The size of the organisations which the participants in the empirical study represent is stated in Table 1. Both the revenue of the organisation in the year 2020 and the number of employees are included to allow for comparison. The revenue is divided into the following intervals which are:

- 1 000- 4 000 Mkr
- 4 000- 8 000 Mkr
- >8 000 Mkr

And the number of employees is divided into the following intervals:

- <250
- 250-750
- >750

One of the participants represents a municipality which has been excluded from the size division since it is challenging to state which part of the organisation their department influences. However, the municipality is one of the largest in western Sweden.

Table 1: An overview of the interviewed clients with alias and their categorization.

Alias	Private	Public	Position of Interviewee	Type of Client	Revenue 2020 [Mkr]	Number of employees
State-owned client 1		X	Business developer	Build and maintain	4 000-8 000	250-750
State-owned client 2		X	Strategist	Build and maintain	>8 000	>750
Commercial property owner 1	X		Sustainability Coordinator	Build and maintain	1 000 – 4 000	<250
Commercial property owner 2	X		Sustainability Manager	Build and maintain	4 000-8 000	250-750
Commercial property owner 3	X		Sustainability Manager	Build and maintain	4 000-8 000	250-750
Housing company	X		Sustainability Developer	Build and maintain	1 000-4 000	250-750
Regional public client		X	Sustainability Strategist	Build and maintain	1 000-4 000	250-750
Property developer	X		Project Manager	Build to sell	1 000-4 000	<250
Municipality		X	Sustainability Strategist	Build and maintain/ use	-	-

For this study, the interviewees are speaking on behalf of their organisation, even if one's opinion does not have to be the same as the whole organisation. In the following parts of the report, the names of the clients described in Table 1 are used both for the interviewees and the organisation they represent.

All the interviews were carried out digitally, to allow for interviewees with geographical dispersion. We used Swedish to facilitate the interviews and not to risk missing nuances in the language. The interviews were recorded and thereafter transcribed. The transcriptions were colour coded in 5 different themes which could be identified after the interviews. The objectives for the colour coding were to structure the result and not risk missing crucial information.

2.2.2 Focus Group

By gathering people knowledgeable about a specific topic in a focus group it is possible to create interactions and discussions that can facilitate the elaboration of ideas (Silverman, 2014). For this research, we have followed Bryman and Bell (2007) point of view by using the group for more unstructured discussions and not intended

to conduct group interviews. Bryman and Bell (2007) argue that a focus group can be used to help participants define a problem and together identify potential solutions. This is closely related to the purpose with the group in this study, where their experience and ideas helped us to assess the method draft for environmental scanning. It was also beneficial that the clients could create joint ideas that they as a group in the industry believes in, which enabled a broader use of the developed method. In addition to this, the focus group technique allows both the researcher and the participants to question viewpoints which is rarely done in one-to-one interviews (Bryman & Bell, 2007).

The focus group consisted of the interviewed representatives from the organisations: Regional public client, Property developer, and Municipality. These three were chosen after the interviews since they all had interesting viewpoints and occupy different positions in their respective organisations. The Regional public client was asked to participate since they could see the need for a more structured way of performing their environmental scanning. The Property developer was chosen because they could provide a project-oriented picture of how environmental scanning could be handled as a Project Manager and throughout the organisation. The Municipality could contribute with experience from earlier work with environmental scanning at the same time as they wanted to improve their method which made them interested in the outcome of our method. Unfortunately, the representative for The Municipality got sick and could not participate in the workshop. However, the representative received the presentation and questions afterwards. The reflections from the Municipality are therefore included in the result of the workshop. The aim was to include State-owned client 2 as well, since they have a well-structured method for environmental scanning in place and could therefore have contributed with valuable recommendations, but they unfortunately did not have time to participate. The workshop was held digitally since one of the participants was not able to travel to Gothenburg. It was recorded and notes were taken during the discussion.

The work with the focus group included one three-hour-long workshop. The workshop was divided into two parts, one focused on the results from the interviews, which the participants were a part of, and the other part focused on the draft of the proposed method. The results from the interviews were presented, and the group got the possibility to come up with additional thoughts and interpretations. Furthermore, three preprepared questions were discussed related to the result which enabled clarification to some reflections. As a second part of the workshop, an overview of the draft of the developed method for environmental scanning was presented. Thereafter, each step of the method was explained more in detail and the participants got to discuss each step for around twenty minutes with support from four preformulated questions. As a final step, the group elaborated on if they thought this was a method they could apply in their organisation, and if any tools were needed for them to do it. The participants were able to come up with suggestions for improvements and changes to make the method as suitable as possible for construction clients and gave insights into how the method could be applied in their organisations. Thereby the workshop gave the ability to specify the method based on demands from the industry.

2.3 Development of proposed method for Environmental Scanning

The development of the proposed method was based on both the theoretical- and empirical study. A draft of a proposed method for environmental scanning was created from the results of the interviews, where the client's current practices and

requirements from a proposed method were identified, together with the results from the theoretical framework. In the workshop, a draft of the proposed environmental scanning method was presented and further discussed and elaborated on. The result from the workshop provided inputs for improvements and changes that could be made before the final proposed method was created. This process is explained in Figure 1.

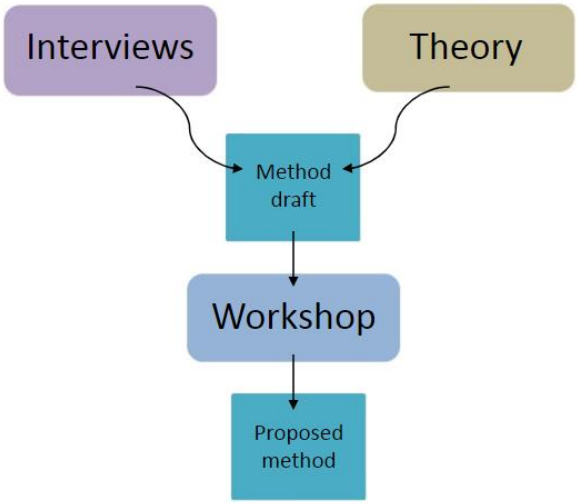

Figure 1: Illustration of the working process, including both the empirical and the theoretical study. (Illustration by the authors).

2.4 Ethical Considerations

According to Bryman and Bell (2007) ethical principles in business research can be divided into four areas:

- Whether there is a harm to participants
- Whether there is a lack of informed consent
- Whether there is an invasion of privacy
- Whether deception is involved

In a qualitative study, performing interviews and collecting information from a focus group, there is a risk for the interviewee to get harmed by their employer if secret information is being spread. Bryman and Bell (2007) state that care therefore needs to be taken to ensure that participants of the study and their organisation are not identifiable. With this in mind, this report keeps the names of the participants and their organisations anonymous. The organisations have also been divided into subgroups which have been considered large enough for the participants to be out of risk of being identified. At the beginning of the interviews and the workshop the participants got informed that they can avoid answering questions that they do not want to share or feel uncomfortable sharing. This has been done to avoid that the interviewees felt pressured to reveal information.

Furthermore, the participants have been informed about the purpose of the study and their participation and approved that their information may be used. By doing this the authors tried to avoid any lack of informed consent. According to Bryman and Bell (2007), invasion of privacy is closely related to informed consent if the participant has been informed about the use of their contribution and their right to reject a question. Thereby they have resigned from the right to privacy in this specific area. The authors

have also been transparent with the aim and method of the study and thus avoided deception.

The authors of this report further consider that the result of the research does not affect any of the above categories or contribute to other ethical dilemmas. By using the result of this report, no ethical problems have been identified.

2.5 Evaluation of Research Method

The qualitative research method including interviews and a workshop with a focus group have both advantages and disadvantages. According to Bryman and Bell (2007), qualitative interviewing is more flexible which allows the interviewer to ask follow-up questions to understand the interviewee's point of view. However, semi-structured interviews also make it challenging to compare the different interviewees' answers since they might have gotten different conditions to answer their questions and the formulation of the follow-up questions could vary between the occasions.

In this study, the focus group has been a valuable source for the development and tailoring of the proposed method for environmental scanning to construction clients. The challenge with a focus group is however that there is a risk of group effects which can be seen when participants share a certain point of view and group members start thinking uncritically (Bryman & Bell, 2007). This tried to be avoided by frequently asking all the members about their opinion but should be considered when reviewing the result.

Since the method for environmental scanning has been adapted to construction clients based on both literature and the opinions of the clients participating in the empirical study, the result is dependent on the individuals in each organisation. Most of the participants are either sustainability managers or strategists which means that the results depend on their perspectives. One of the participants works as a project manager. The project perspective could have been strengthened by including people working in projects from other organisations as well. Since this study however aimed at proposing a method which should influence client organisations' sustainability strategy, this was not prioritized. In addition, the study could have allowed for a more nuanced comparison between different types of clients if a larger variety of clients who build to sell and build to maintain were included.

3 Theoretical Framework

In this chapter, the theoretical framework, which is based on a systematic literature review, is presented. First, theory about the client's role in construction is presented together with general knowledge about sustainability in construction and findings on how construction clients can influence sustainability through their role within the industry. Thereafter the concept of environmental scanning, its benefits and challenges, a selection of the most common methods of environmental scanning, and environmental scanning as a complete process are elaborated upon.

3.1 Client and sustainability

The construction industry's impact on society and the environment has led to the increasing focus on the topic of sustainability in construction over the last decades (Sfakianaki, 2015). In this section, the focus will be on the client's role in construction and how they can influence the development of sustainable construction.

3.1.1 The client's role

According to The Swedish planning and building act, PBL, the client is the entity that initiates a building, infrastructure, or demolition project. They are also responsible for making sure that rules and regulations are considered during the process so that technical requirements are met and projects are quality assured. Walker (2015) defines the construction client as "authority arising from legitimacy to make binding decisions relating to a construction project possessed by an organisation or an individual" (p.108). However, the role of the client's entity is more than the initiator of the project, they also act as the link between the users and the contractors (Adam, 2019). The role will differ depending on if they build, maintain, and develop the building themselves or if they build to sell. Walker (2015) further argues that the objectives of the client organisation will determine the level of involvement in a project. It depends on the level of knowledge about construction in the organisation, the structure of the organisation and the characteristics of the individuals in the organisation.

Ryd and Fristedt (2019) divide clients into three categories: clients who build and maintain, clients who build to sell and clients who build to use. The categories are described as:

Build and maintain: These clients build to manage their buildings by themselves and aim at long-term ownership. They are usually real estate companies or property developers, and since real estate is a part of their main business they can be defined as clients in the construction industry. They can be both housing companies owned by the municipality or private ones.

Build to sell: These clients are performing new construction or reconstruction with the purpose to sell, usually to a new housing cooperative. They can also develop entire residential areas where they sell a plot to a private owner and enters into an agreement to build. The last-mentioned clients are sometimes referred to as developers.

Build to use: These are organisations who need a building for their core business, and they build for their own needs and keep the ownership. In some cases, the organisation rent the building from a property owner even if they were the ones initiating the project. In this case, the organisation still acts as a client even if the property owner formally is the owner.

The client is the one ordering a construction project, Boyd and Chinyio (2006) therefore argue that the construction industry would not exist without clients. These ideas go back several years in time, Latham (1994) stated already in the *Latham Report* that the client has a responsibility to demand improvements and higher standards. The client is the one stating requirements for a project which the industry needs to meet, this also makes it possible for the client to be the implementer of new ideas (Latham, 1994). They are also responsible for the procurement process and to evaluate criteria for each project. However, over the years, when projects have become more complex, the organisation of clients has changed (Walker, 2015). Today clients are more complex entities and their environment is more turbulent. Through the years the demands on the clients have increased regarding control of the process, including rules and regulations, health and safety, and quality assurance. This requires an increased need to be more precise with the goals and characteristics of the building (Ryd & Fristedt, 2019).

3.1.2 Sustainability in construction

The construction industry is facing numerous challenges related to sustainability both today and in the upcoming years and decades. One mega trend affecting sustainability in construction is the continuous urbanization globally, with over 50 per cent of the world's inhabitants living in urban areas and the growth is projected to continue with the 60 per cent mark expected to be reached by 2030 (UN, 2022). The same trend is visual in Sweden, where 88 per cent of the inhabitants are living in urban areas, compared to 200 years ago when 90 per cent of the inhabitants lived in the countryside (SCB, 2022). Cities are currently accountable for 60 to 80 per cent of the global energy consumption and with the expected growth of urbanization, this figure can only be expected to grow (UN, 2022). With construction playing a significant role in shaping our cities, the industry faces transformation which will have an impact on society. There has been a lack of technological development in the construction industry compared to other sectors and productivity has stagnated, showing the potential for improvements (Almeida et al., 2016).

Environmental sustainability is the most widely researched and the most commonly addressed issue of sustainability in the industry (Medineckienė et al., 2010). The construction industry faces several issues related to environmental sustainability, some of which are waste creation, energy use, water use, re-use and recycling of materials, pollution, and biodiversity (Pitt et al., 2009). Collectively, these issues are contributors to climate change and therefore the construction industry must adapt to reduce its contribution to it and to provide a built environment which can withstand the effects of climate change (Almeida et al., 2016).

The industry also has a significant impact on social sustainability by affecting quality of life, cohesiveness of society, and promotion of healthy living for the people in and around buildings (Pitt et al., 2009).

The economy will also be affected by the transformation of the construction industry. Reducing construction costs and building infrastructure can narrow the gap between regions and boost economic growth (Almeida et al., 2016). A reduction of construction costs by 1 per cent would save approximately 100 billion USD per year globally (Almeida et al., 2016), allowing for investments in other areas which could boost economic activity.

The application of the three aspects of sustainability (environmental, social, and economic) into construction practices and businesses is what can be referred to as

sustainable construction (Tan et al., 2011). Sabini and Alderman (2021) and Geissdoerfer et al. (2018) identify numerous reasons for construction companies to integrate sustainable practices into their business operations: competitive advantages, moral obligations, organizational resilience, and long-term performance. However, it can be difficult for construction companies to integrate all three aspects of sustainability simultaneously into a project since the objectives can be counterproductive or conflictual at times. In those cases, trade-offs must take place to achieve actions in all aspects of sustainability (Sabini & Alderman, 2021).

One of the main issues with prioritising sustainability in construction is argued by several authors to be the negative impact on the cost of a project. There may be conflicting interests between different stakeholders in a project, with a different focus on life-cycle costs from client, contractor and tenants (Almeida et al., 2016). Ding (2008) further explains that the incentive for most construction projects is to make an economic profit, making it less attractive for clients to implement sustainable requirements and risking the profitability of the project. There exists a tension in the industry between long-term sustainability goals and the project-oriented short-term goals of the organisation, where the responsible project manager often is judged by their short-term project outcomes (Sabini & Alderman, 2021). A lack of knowledge regarding sustainability among stakeholders has also been identified as a reason for lacking consideration of long-term sustainability goals in projects. Sabini and Alderman (2021) suggest that there is a need for a revised mindset away from the strictly economic view of project management, to allow for sustainability practices to be prioritised. Therefore, an acceptance of the tension between economical goals and sustainability is required at project, organisational, and institutional level in order to find solutions.

Furthermore, Johansson and Gluch (2008) showed that the dominating focus on efficiency and cost in the construction industry limits the influence of environmental managers on organisational strategic decision making. However, in a more recent interview study, Gluch and Månsson (2021) found that after the Paris agreement and the UN Sustainable Development Goals the influence and legitimacy of environmental managers, now often named sustainability managers, in organisations have increased. There is also a belief among contractors that engaging in improved sustainability will lead to competitive disadvantage, due to increased costs and time-inefficiency (Tan et al., 2011). This perception was also observed in a survey among environmental managers in Swedish construction companies conducted by Johansson and Gluch (2008), where 57 per cent of construction companies said that the lack of competitive advantage was a barrier to environmental performance. Interviewees from the same study also said that environmental issues are not considered enough in strategic decisions and that environmental issues in general are not given enough consideration in day-to-day work.

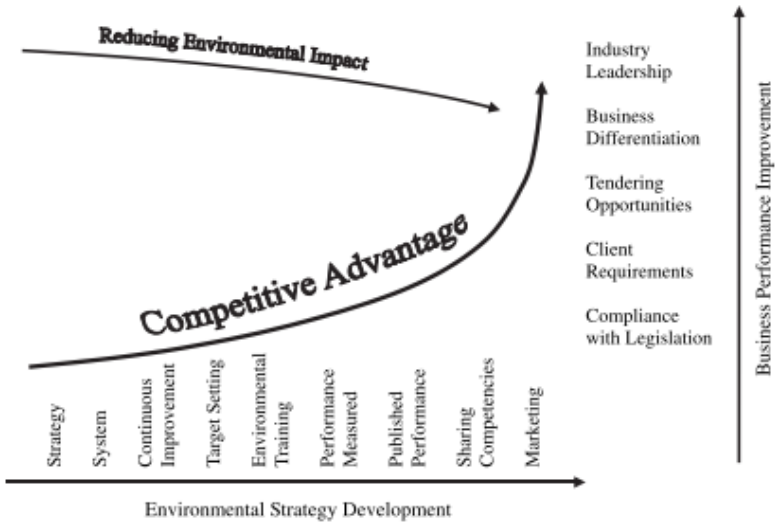

Figure 2: Describing the correlation between reducing the environmental impact and an organisation's competitive advantage. (Tan et al., 2011).

Although there is a perception that a focus on environmental issues is related to lower competitiveness, there are studies which have found that well-implemented sustainability practices can increase competitiveness as seen in Figure 2 (Tan et al., 2011). Also, Geissdoerfer et al. (2018) say that sustainable business model is a concept that is increasingly interpreted as a competitive advantage nowadays. Being more sustainable can also improve the public image and reputation of the organisation and thereby increase its competitiveness (Pitt et al., 2009).

3.1.3 Sustainable Business Model

As sustainability is increasingly seen as a competitive advantage, it is further integrated into the core business model of organisations. Sustainable business model is "a model where sustainability concepts shape the driving force of the organisation and its decision-making" (Stubbs & Cocklin, 2008, p. 103). The purpose of the concept is to create a more sustainable economic system and to give incentives for the business to invest in sustainable solutions (Geissdoerfer et al., 2018). The sustainable business model also enhances the strive towards sustainability goals and is further seen as a competitive advantage for businesses. Geissdoerfer et al. (2018) state that organisations applying this type of business model either tend to integrate more sustainable practices and goals, or work with value creation and delivery closely related to sustainability. Organisations willing to change towards a more sustainable profile need to include actors in their external environment, which requires a change in business model and a more network-oriented logic (Pieroni et al., 2019), which is illustrated in Figure 3, together with the other crucial aspects needed for a shift towards a sustainable business model. An organisation which does not consider sustainability in its business model is argued by the authors to soon be obsolete (Geissdoerfer et al., 2018).

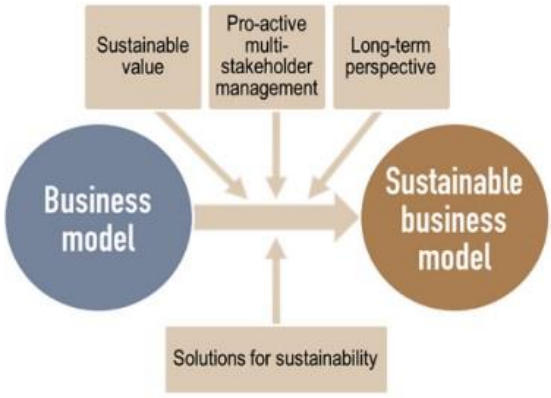

Figure 3: An illustration of the considered aspects in a sustainable business model. (Geissdoerfer et al., 2018).

According to Schaltegger et al. (2011), there are three helpful strategies in the work towards a sustainability-oriented business model: defensive, accommodative and proactive. The defensive strategy focuses on lowering the risk that new regulations will require a change in the business. Accommodative includes some changes in the business model towards more sustainable incentives, but without a greater impact on the product and revenue. The proactive strategy, however, is seen as the most effective since it requires an implementation of sustainable practices in the core business of the organisation and the complete business chain is defined by sustainable goals (Pieroni et al., 2019). Frankelius (2001) highlights further that a review of the business model is crucial as a first step in environmental scanning. The reason is that organisations with too narrow business ideas risk missing important events in the external environment.

Previous research reveals that the sustainable solutions that are created in construction projects are challenging to transfer to the business model of the organisation. The organisations do not put enough resources into transferring this, and it is therefore unusual to offer the previously innovated solutions to upcoming customers (Buser & Carlsson, 2020).

3.1.4 How the client can promote sustainability

With a sustainable business model, the need for sustainability innovation and development becomes integral to the development of the organisation and the industry. Since the construction industry includes multiple actors in a project-based environment it can be challenging for individual organisations to manage long-term development. However, clients have the possibility, through demands, to control which aspects that should be seen as beneficial for contractors and consultants to focus on (Kadefors & Femenías, 2014). If multiple clients cooperate on a higher level, it can be possible to influence the industry as a whole.

To promote innovation in the construction industry there need to exist long-term relationships that go beyond individual projects (Dubois & Gadde, 2002a). Without any future relationship between the involved actors after the current project, there are few incentives for organisations to learn from a project, since the next project may have different members and pose different questions (Dubois & Gadde, 2002a). Thus, currently, progress relies on individual learning rather than collective organisational learning, and the solution proposed by Dubois and Gadde (2002a) is to engage in cooperative action between organisations.

Collaboration between actors, even between client organisations, can reduce the cost of innovation while also increasing its impact according to Kadefors and Femenías (2014). The project-based nature of the construction industry requires collaborative innovation. However, this environment is complex and contains a high degree of interdependence and uncertainty between actors and processes (Dubois & Gadde, 2002a). One major contributor to the interdependence in construction is the division into specialized subcontractors and the need for collaboration between them. Engaging in collaborative development requires resources, and Kadefors and Femenías (2014) state that these resources preferably should be linked to strategic and long-term goals and policy.

Several authors claim that the client is the stakeholder which has the best possibility to strive for more sustainable projects. Pitt et al. (2009) investigated the development of sustainability in the construction industry by asking organisations to rank drivers and barriers to sustainable incentives. Their result shows that the client was seen as the most important actor in the implementation of sustainable construction practices. Both client awareness and client demands were found to be two out of three greatest drivers to sustainable construction (Pitt et al., 2009). However, lack of client awareness and lack of client demands were also identified as barriers of sustainable construction, which led to the proposal of educating clients regarding sustainability. Adam and Lindahl (2016) agree with the previously mentioned authors as they determine the client to be the actor leading the way for the industry, especially public client organisations. They see the potential in leading the industry in a more sustainable direction through both regulations and increased awareness.

3.2 Environmental Scanning

Observing and understanding the environment enables organisations to make strategic decisions which align decisions with the organisation's business model and externally emerging trends. The process of identifying, collecting, and analysing external information which may influence the organisational strategy and decision making can be defined as environmental scanning (Albright, 2004).

3.2.1 What is environmental scanning?

Environmental scanning was first conceptualized in 1967 by Aguilar in his book *Scanning the Business Environment* and there have been numerous studies investigating different aspects of environmental scanning since then (Jennings & Lumpkin, 1992). Environmental scanning is defined by Choo (1999) as "the acquisition and use of information about events, trends and relationships in an organization's external environment, the knowledge of which would assist management in planning the organization's future course of action" (p.21). The process can help organisations to be updated and alert to emerging trends and developments in their external environment. Thereby, organisations can utilize this information to support long-term strategic goals and decisions which will ensure the future competitiveness (Liao, 2018). The term environmental scanning is sometimes used interchangeably with other similar terms in the literature, with the most frequent ones being:

Strategic scanning is defined by Lesca (2011) as the acquisition and use of information from the external environment regarding events, trends and dynamics. This information provides knowledge which can guide management in their future actions and decisions, in order to take advantage of the explored opportunities and minimize threats of discovered uncertainties. Lesca (2011) credits the origin of

strategic scanning to Aguilar and the publication of *Scanning the Business Environment* (1967) which is the same reference as multiple authors (Albright, 2004; Jennings & Lumpkin, 1992; Liao, 2018) in the study used to define environmental scanning. The process that Lesca (2011) define as Strategic scanning can be observed in Figure 4.

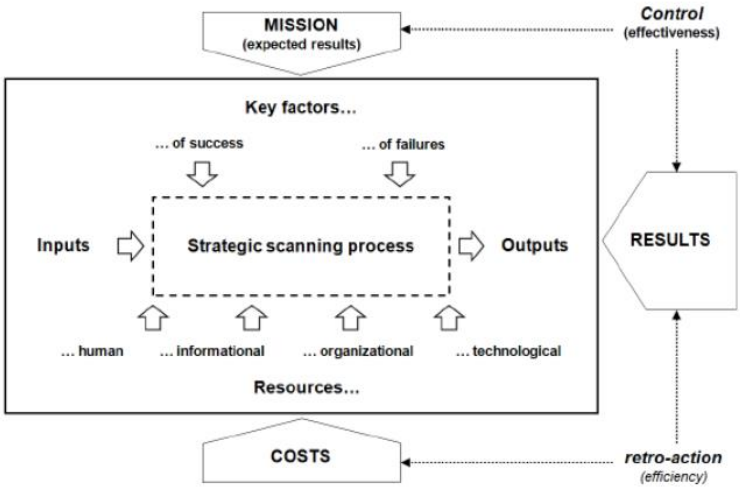

Figure 4: Illustration of the strategic scanning process. (Lesca, 2011).

Horizon scanning and *Foresight* are according to Cuhls (2020) frequently considered identical concepts which aim to predict future opportunities and threats, to assist organisations in identifying their upcoming challenges. However, Cuhls (2020) considers foresight as a broader and more comprehensive set of activities of which horizon scanning is only a part of the process. Furthermore, Vandenberg (2007) defines foresight as "a human capacity to look forward" (p.4). Horizon scanning encompasses the search and gathering of signals, which are typically information about new science and technologies, but does not include the analysis of said signals and their implications for the organisation (Cuhls, 2020). Therefore, foresight can be seen as identical to environmental scanning as it encompasses similar activities and goals, while horizon scanning should rather be considered as one of the activities included in the process of foresight and environmental scanning.

Strategic Radar is explained by Schoemaker et al. (2013) to include three steps: scenario planning, business analytics and dashboard technologies, which all intend to scan the environment for signals and trends. The organisation should use this radar for their strategic operation and plan to adapt to signals found when needed. The data for the analysis can come both inside the organisation and from the environment in which the organisation operates in (Schoemaker et al., 2013). Strategic Radar systems encompass searching for external signals that are continuously updated, strategic decisions based on the collected signals and continuing scanning for additional unexpected changes and trends.

Sustainable development-oriented scanning is the term used by Lesca (2011) when talking about strategic scanning with a focus on finding sustainable development trends. Thus, its process and goals are similar to environmental scanning except for its delimitation towards sustainability trends.

As explained, the process could be named differently depending on the steps the scanning includes, but the different terms are closely related to each other. The

expressions are intertwined, and the outcomes of the different steps have the same intention. Therefore, the term environmental scanning is used in this thesis.

As mentioned, environmental scanning is supposed to help organisations find trends in their external environment which can influence their strategic work. European Commision (n.d) say that trends "indicate a direction of change in values and needs which is driven by forces and manifests itself already in various ways within certain groups in society" (para.4). These trends can be divided into different levels, such as mega and macro. Megatrends are defined as "a long-term driving force that is observable now and will continue to have a global impact in years to come" (European Commision, n.d, para 1). While a macro trend is defined by Becker (2016) as "a large-scale, sustained shift in consumer interest or activities that can occur over several years or decades" (p.75) and are therefore more narrowed down than mega trends.

3.2.2 Why environmental scanning?

As seen from the definitions in the previous section, environmental scanning is argued to give the organisation the possibility to use identified trends and signals in their future decision making. It also allows the user to keep up with the rapid change in today's environment and reduce the risk of missing ongoing trends (Albright, 2004). Today's society is characterized by fast changes such as new actors, new techniques and changes in values, which means that organisations that stick to old habits risk falling behind (Sköld, 2013). Studies have also shown that the more uncertain, variable, and complex the environment gets the more important the performance of structured scanning is (Camponovo & Pigneur, 2004). Slaughter (1999) states that "Organizations that do not pay attention to a wide range of signals are unlikely to prosper because they will have missed vital information about markets, products, customers, competitors and the like" (p.441). Furthermore, Stoffels (1994) says that environmental scanning can help bridge the gap between the knowledge an organisation thinks it needs and what it actually needs to make good strategic decisions. There may be several reasons why this gap exists, such as a too narrow perception of the environment and limited resources to process and analyse information (Stoffels, 1994).

Most successful organisations are to some capacity performing environmental scanning and it is therefore considered relevant to be at the forefront of development (Camponovo & Pigneur, 2004). Albright (2004) further argues that the link between management and the external environment is what defines if an organisation is successful or not. Scanning the future can also help in determining opportunities and threats on the market (Vandenberg, 2007). Stoffels (1994) further argues that environmental scanning can reduce risk exposure by identifying threats and increase future cash inflows through the identification of opportunities, thus incentivising investments in environmental scanning.

Furthermore, Rohrbeck and Kum (2018) show strong evidence for the positive impact of environmental scanning on the performance of the organisation. Organisations which were prepared for the future had a 33 per cent higher profitability and 200 per cent higher market capitalization growth when compared with the average in the research. An organisation who were less prepared for the future had 37-44 per cent lower profitability than those that were in the forefront with environmental scanning (Rohrbeck & Kum, 2018).

Demirdöğen and Işık (2019) focused their study on how environmental scanning could help to assess innovation and technology transfer in the construction industry. They assumed that environmental scanning is the only way to map factors that affect an organisation's transfer of innovation and technology. The result showed that trends in the closest environment of the business had a direct impact and trends in the general environment had an indirect impact on innovation and technology transfer. It was therefore seen as necessary to scan both. While performing environmental scanning it is likely that the organisation broadens its view of the general environment and finds influences from other market segments. These findings make it possible to understand potential innovations that customers will request in the future (Liao, 2018). By carrying out the scanning process frequently the chance of finding reasons for innovation will increase.

Liao (2018) could in their study determine that organisations performing environmental scanning are likely to participate in activities and events which expand their network. This could further increase the degree to which they exchange ideas, communicate, and collaborate with others, which also stimulates development and innovation.

3.2.3 Sustainable development-oriented scanning

Taking environmental scanning one step further is to orient the activity towards the identification of sustainable development trends and their implications for the organisation. Lesca (2011) says that trends related to all three aspects of sustainable development are more complex and thus difficult to identify and analyse in the process of environmental scanning. An organisation looking to implement sustainable development-oriented scanning must identify which dimensions of the external environment can contribute to sustainable development, and what a sustainable development-oriented scanning process will contribute to, that a traditional environmental scanning process does not capture (Lesca, 2011). Fabbe‐Costes et al. (2011) highlight that the topic of sustainability is inherently related to the future, and thus environmental scanning should be a part of working towards sustainability.

Organisations taking a sustainability approach to scanning must widen their approach and look for new variables related to societal and ecological dimensions which are not traditionally part of an environmental scanning process (Lesca, 2011). According to Fabbe‐Costes et al. (2011), sustainable development-oriented scanning should focus on societal-level trends as these are the most uncertain and has the highest influence on sustainable development. However, since each organisation has different goals and ambitions related to sustainability the implementation must be adjusted to match the commitment of the organisation. For an organisation with lower ambitions, the minimum requirement will be to scan for legal and regulatory trends and changes, while an organisation with high sustainability ambitions may want to scan for developments from a wider array of sources (Lesca, 2011).

Legislative and regulatory changes related to sustainability have been frequent over the past decade, and Lesca (2011) suggests sustainable development-oriented scanning as a tool to identify upcoming regulations and implement appropriate strategic actions, either by preparing for restrictions or to grasp opportunities which may present themselves. Scanning allows organisations to be proactive and transform legal constraint into competitive advantages. Lesca (2011) further says that voluntarily taking a proactive approach towards developing a sustainable strategy which goes further than regulatory restriction can increase competitiveness. Three

reasons why an organisation may choose this approach are: external pressure from stakeholders, taking an ethical or moral standpoint, and to improve economic performance (Lesca, 2011).

3.2.4 Defining the environment

The environment is defined by Duncan (1972) as the totality of physical and social factors that are directly taken into consideration in the organisations' decision-making. The *internal environment* are the factors considered inside the boundaries of the organisation and the *external environment* are the factors considered outside the organisation's boundaries. This definition explains the environment in broad terms, but several authors has also given suggestions for how the external environment could be categorised for the purpose of environmental scanning.

Stoffels (1994) proposes a division of the environment into five "dimensions": the operational, financial, technological, competitive and stakeholder dimension. Each dimension represents an aspect for which environmental scanning and strategic decisions should be made. It is important to note that each dimension should not be separated from the others, since it may lead to over-simplification. The dimensions are used to highlight all parts of the environment, but some emerging topics may be observed across multiple dimensions.

For each dimension Stoffels (1994) presents several aspects which will influence the future of the dimension. Government is omnipresent in the dimensions of the external environment of the organisation, as it sets the rules within which all actors in all dimensions must position themselves. Thus, it is of great importance to scan the activities of the government. Stoffels (1994) further describes that government is often predictable as there are signals indicating upcoming events in most cases.

Albright (2004) describes the different environments in a similar way as the previously mentioned author but calls them industry, technology, economic, social and political. These dimensions can be closely related to how the PEST model divides the environment where Political, Economic, Social, and Technological dimensions are used to enable an analysis of how external factors will affect the organisation. The industrial and technological environments can be linked to what Stoffels (1994) describe as financial and economical dimensions. Furthermore, the competitive dimension together with the stakeholder dimension could be seen as the factors Albright (2004) include in the industrial environment The operational however, is more linked to the specific organisation than the industry.

Lesca (2011) divides the external environment into different vertical levels in which the organisation can scan for trends, which spans vertically from function at the bottom to societal at the top. The levels are function, organisation, chain, network, and societal where Lesca (2011) identifies the network and societal levels to be the most important when performing sustainable development-oriented scanning since trends at the higher levels are the most uncertain and impactful. The scanning targets at the societal level are regulations, strategies of institutions, environmental organisations, behaviour and beliefs of people, and geopolitics and material resource trends (Lesca, 2011). Fabbe‐Costes et al. (2011) take a similar approach to dividing the environment into levels but emphasizes the importance of taking a multi-level approach and considering topics which are interrelated between levels.

3.2.5 Organisational factors affecting environmental scanning

Since the implementation of an environmental scanning process may require changes in the current ways of working within an organization, there is a need to understand how change processes and innovations can be implemented effectively.

Change initiatives can be difficult to perform successfully, and in the fast-paced changing environment of today it is essential that transformations are given the best possible chances of success. For more dramatic changes, individuals who bridge disconnected groups in the organisation are more successful in driving change. For minor changes, individuals with cohesive networks are more effective. The study also showed how good relationships with ambivalent people proved beneficial in all cases, and good relationships with resisters could be both positive and negative depending on the circumstances (Battilana & Casciaro, 2013).

Lesca (2011) stresses the importance of making the environmental scanning process into a central competence. For the scanning to make a significant difference, the managers need to realise its value and allocate enough resources. The scanning process is often made by middle managers, which the author explains as beneficial since they have both inter- and intra-organisational knowledge. It is therefore especially important that the top management show consideration to the result of the scanning and reward the process. Lesca (2011) further suggests that top management should be careful with controlling and imposing rules into the smaller units in the organisation since a strictly top-down communication can hamper information flow and knowledge sharing, which can affect the environmental scanning.

Rohrbeck and Kum (2018) have investigated the correlation between strategic foresight and the performance of an organisation by studying organisations' strategic work for seven years. They divided the environment and organisation into two aspects that they saw as crucial: foresight maturity and foresight need. Foresight maturity refers to the level of environmental scanning the organisation are performing today, while foresight needs explain to which extent environmental scanning is needed in the specific industry the organisation acts within, and depends on the complexity and innovation rate of the industry (Rohrbeck & Kum, 2018). This correlation is illustrated in Figure 5, where Rostang (2021) have interpreted the message of the previously mentioned authors. Rohrbeck and Kum (2018) could see that those organisations belonging to the field "Managerial Hyperopia", which the authors explain as being too focused on managing happenings far in the future and thereby missing things closer in time, did not perform better even if they were more mature than needed in the environment which they operate in.

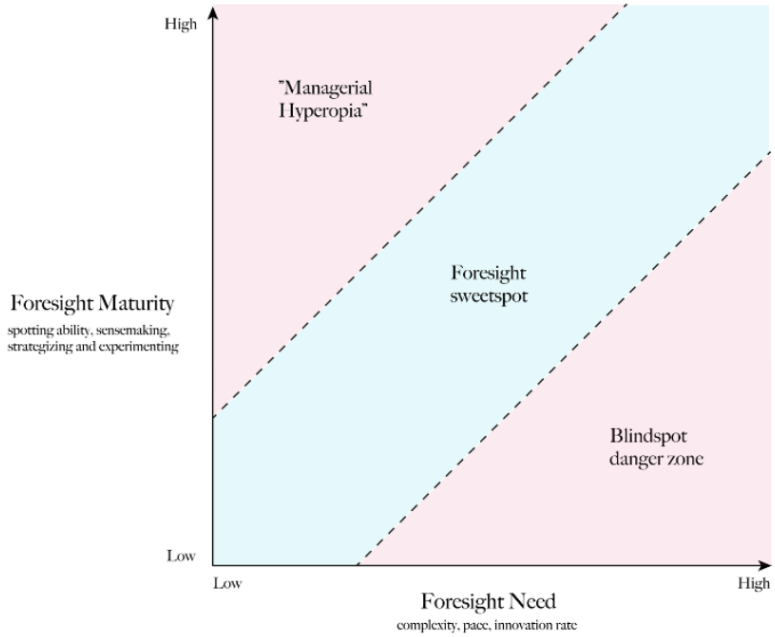

Figure 5: Illustration of the correlation between foresight maturity in an organisation and the need of foresight in a specific industry. (Rostang, 2021).

Innovation literature has discussed the diffusion of innovation for decades and the categories of adaptors have been reviewed from different perspectives. The first to conceptualize the different categories of adaptors was Everett Rogers in his book "Diffusions of Innovations". He divides the degree of adaptiveness to innovation into five different groups: innovators, early adopters, early majority, late majority and laggards (Rogers, 1981), as illustrated in Figure 6. The measure of adaptiveness can be linked to relative time at which the transformation is happening in a specific social system. It is measure by the rate of adoption in a social system and the system can be for example, a group, or an organisation (Rogers, 1981).

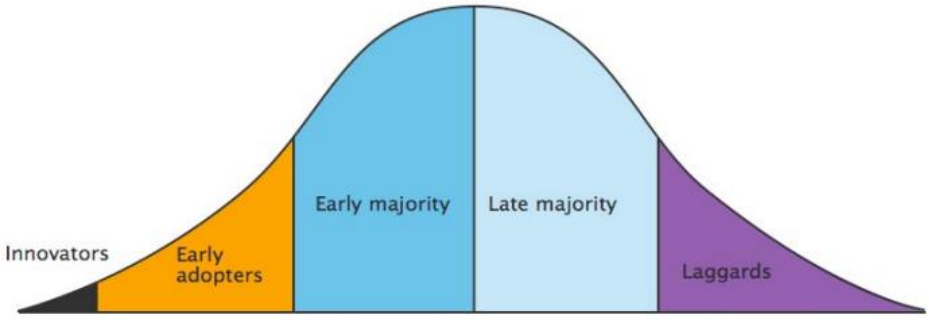

Figure 6: Illustration of the five different categories of adopters. (Robinson, 2009).

The organisation and their members reflect the level of innovation in the organisation. Since individuals' adoption is dependent on the social system they are being apart of, the organisation's innovation vision plays a crucial role in the adoption of the members (Kim, 2015).

Kadefors and Femenías (2014) have studied how construction clients can work with innovation. They stress the importance of a well-established innovation policy in the organisation. The policy should state why the organisation work with development and the long term-goal of the work. The goal should further be divided into sub-goals

for different time horizons in the organisation's strategic plan. According to Kadefors and Femenías (2014), a well-established policy can create a feeling of responsibility in the management team to use the development work and thus facilitate implementation, which is especially important in organisations where it is common that one individual do the innovation work.

3.2.6 Methods for environmental scanning

There exist numerous methods for performing environmental scanning, some more commonly used than others. In this section, some of the most frequently mentioned methods will be described more in detail. The methods described in this section are SWOT, PEST, Scenario analysis and Porter's Five Forces.

3.2.6.1 SWOT

SWOT analysis is a way to identify resources, both within and outside the organisation, as well as finding trends and patterns that may affect the business (Namugenyi et al., 2019). It is one of the most frequently mentioned methods in the literature for environmental scanning. SWOT is both known as an independent method and used together with other methods (Sköld, 2013). Some authors explain it as a complete method for the whole process of environmental scanning while Sköld (2013), for example, uses it solely as an tool for analysing the collected data. The framework is further known by its simplicity and its ability to identify key factors which might impact the business (Pickton & Wright, 1998). SWOT stands for Strengths, Weaknesses, Opportunities and Threats, where strengths and weaknesses are internal factors and opportunities and threats are external (Namugenyi et al., 2019). The outcome of the SWOT analysis is a list, or a 2x2 matrix, with all the environmental factors linked to each category listed (Pickton & Wright, 1998).

Both Sköld (2013), Namugenyi et al. (2019) and Pickton and Wright (1998) argue that the implementation is not seldom forgotten and that this is the negative aspect of the method. If organisations do not find an action plan, including solutions on how to change weaknesses and threats into something positive, the method is useless (Namugenyi et al., 2019).

Sammut-Bonnici and Galea (2014) suggest that SWOT should be used as a part of the PEST method and are even more useful together with Porter's five forces, which are other methods for environmental scanning. Sköld (2013) prefers to use it as a part of the analysis after applying other methods to sum up the work, and thereby easily identify actions that needs to be taken. Because of this, the opinion on how to apply SWOT differs between the authors.

There are also some authors who highlight some weaknesses of SWOT. Frankelius (2001) argues that the method does not provide a way to identify which factors that should be the basis for the assessment of the environment. He also questions the division of trends into threats and opportunities, since a trend can be either one depending on how the organisation acts upon it, and trends are not static and can shift from opportunity to threat, or vice versa, over time (Frankelius, 2001). Another weakness of SWOT can be its simplicity, which is often also cited as its strength, since it can lead to a too naïve and simplistic implementation with damaging strategic decisions as a consequence of insufficient analysis (Pickton & Wright, 1998).

3.2.6.2 PEST

PEST is a method, widely used to understand the external environment and strategic challenges of an organisation (Sammut-Bonnici & Galea, 2014). The letters in PEST stand for Political, Economic, Social, and Technological and the method aims at identifying the factors in the environment which can affect the organisation. The origin of the method has not been clearly identified, but someone who early mentioned similar methods was Jeremy McCarthy who launched the concept already in 1960 (Frankelius, 2001). Throughout the years, the model has been modified and there are now several versions of the method where the most frequently mentioned is PESTEL, including the additional factors: Environmental and Legal (Ho, 2014).

Sammut-Bonnici and Galea (2014) describe the factors in PEST as follows:

Political factors: Include all forms of governmental incentives such as taxation, legislation, trading policies, government policies and control of corruption.

Economic factors: Focus on the macroeconomic situation of the external environment and should consider local economy, economic trends, inflation, interest and exchange rate and taxation.

Social factors: Include work patterns, consumers trends and demand for services. Further examples can be lifestyles, role models and purchasing behaviour that influence the environment.

Technological factors: Intend to focus on technological breakthroughs that can either be a risk or benefit for the organisation and should reflect how the organisation responds to these innovations. Detailed examples can be new materials, new software's, effect on production and new distribution channels.

When using the method, only factors that are likely to influence the organisation or the industry should be taken into account (Sammut-Bonnici & Galea, 2014). However, Ho (2014) argues that these factors rarely have a direct impact on the organisation but rather affect the environment which the organisation acts in. The factors should further be analysed with regards to the organisation's resources, knowledge, and core business and enables the organisation to build scenarios specific to the organisation (Sammut-Bonnici & Galea, 2014), (Ho, 2014). As mentioned, several authors suggest that PEST could be used together with other analysis methods, such as SWOT. Sammut-Bonnici and Galea (2014) illustrate how PEST and SWOT can be used together for environmental scanning (see Figure 7).

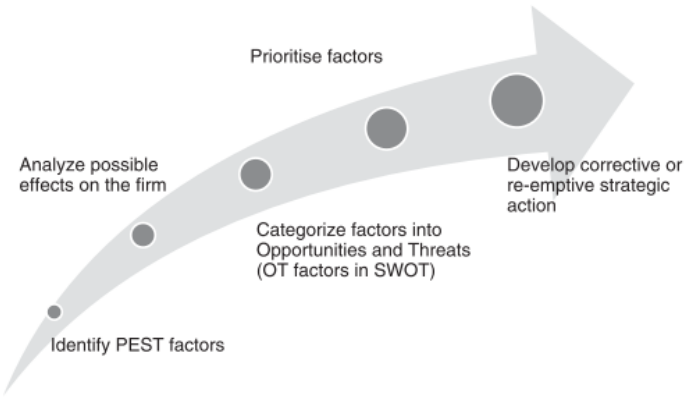

Figure 7: An illustration of how environmental scanning can be performed by using both PEST and SWOT. (Sammut-Bonnici & Galea, 2014).

The most frequently used way to summarize the analysis is to create a table including all the different factors affecting the external environment for each category (Ho, 2014). However, some authors have seen that this format does not show the correlation between the different categories of PEST and therefore suggests creating a systematic analysis diagram (see Figure 8). The diagram should not replace the table format but rather act as a complement, giving additional information.

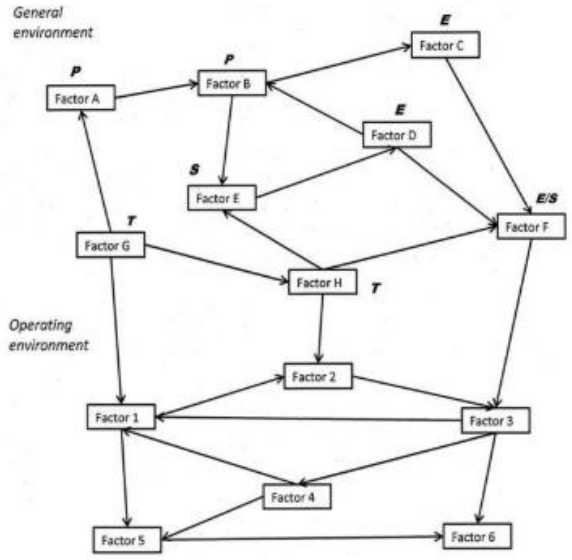

Figure 8: A general suggestion of a systematic PEST analysis diagram describing the correlation between the identified factors. (Ho, 2014).

Ho (2014) further highlights the importance of creating a common image of the environment in the group performing the analysis, to avoid confusion and misunderstanding. One disadvantage of PEST is that the categories lack precision in the way that it is hard to get an quick overview of the topics, such as a countries economy for example (Frankelius, 2001). The method provides a base but could be seen as vague since the step-by-step process is left for the user to decide.

3.2.6.3 Scenario analysis

Just like the other methods for environmental scanning, scenario analysis provide a possibility to create awareness of the future which can support strategic actions (Duinker & Greig, 2007). The idea of scenario analysis is to generate several pictures of what the future may look like to stimulate creativity and broaden the perspective. The scenarios should reflect a dynamic story rather than just an end state of a situation (Schoemaker et al., 2013).

Sköld (2013) describes that the analysis should be made around 3 questions:

- Possible future: what may happen?
- Probable future: what is most likely to happen?
- Preferable future: what would we prefer to happen?

By working with scenarios linked to the questions above, it is possible to shift focus from the most probable future and instead approach it from different angles. Duinker and Greig (2007) argue that this enables the user to find consequences and actions that is needed in different situations. It helps identifying uncertainties that are the most important for the organisation to focus on (Schoemaker et al., 2013). Duinker and

Greig (2007) further highlight that the importance of scenario analysis is not to make guesses about the future, but rather to challenge assumptions that might occur while working with environmental scanning and thereby broaden perspectives. According to Schoemaker et al. (2013) the analysis could also help in the implementation of strategy that considers diverse signals by reflecting viewpoints both inside and outside the organisation. To interpret weak signals of the future, most managers use happenings in the recent past, which are often misleading, especially after major events. Making scenarios can help to overcome this by supplanting the past as a main part of the process (Schoemaker et al., 2013).

Working with scenarios can be challenging and requires a lot of resources. Sköld (2013) therefore suggests limiting the use of scenario analysis to trends that might have a major strategic impact on the organisation. In addition, using scenarios as a base for organisational strategy is complex since there will be several outcomes to plan for, compared to forecast where usually one outcome is considered (Sköld, 2013). However, planning for multiple outcomes of the future is also what makes the organisation prepared for reality and the advantage of the method.

3.2.6.4 Porter's Five Forces

In the article *How competitive forces shapes strategy* (Porter, 1979), the author proposes the concept of five forces which affect a competitive market, and that an organisation's awareness of these forces can affect its vulnerability to them. The magnitude of the forces is demonstrated through the competitiveness of an industry, where an industry with more intense forces is more competitive. Potential causes for higher competitiveness are customers, new entrants, suppliers, and substitute products or services, all of which should be considered in the organisation's strategy. However, it is necessary to understand the root causes of the competitive forces in an industry to identify potential areas of change, trends, opportunities and threats (Porter, 1979).

The five forces according to Porter (1979) are:

The threat of new entrants highlights the effect of new competitors entering the markets.

The bargaining power of customers can affect the profitability of an industry through their purchasing decisions and demands.

The bargaining power of suppliers' act as a force on an industry through its prices and the quality of its products.

The threat of substitute products or services can limit the profitability of an industry by offering alternatives to customers, thereby creating a pricing ceiling or a raised quality level.

The jockeying among current contestants refers to the measures taken by competing organisations to gain market shares through competing on price, product, or marketing.

Understanding how these forces work on their industry is integral to an organisation's strategy, as it can be manipulated through strategic decisions by targeting certain customers or suppliers with lower bargaining power (Porter, 1979). Knowledge of how the forces act can also enable management to anticipate changes and upcoming opportunities and threats. A central part of analysing Porter's five forces is the definition of the industry boundaries to define which competitors are active in it by offering substitute products or services (Frankelius, 2001). There are also dimensions

of the environment which are relevant to the organisation that are not directly part of its industry, such as governmental regulations, economy, society, and technology. Therefore, there exists criticism of the model for not considering enough dimensions to classify it as enough to accomplish an all-inclusive environmental scan (Frankelius, 2001; Sköld, 2013).

3.2.7 Environmental scanning as a process

Several authors (Frankelius, 2001; Pieroni et al., 2020; Ridenius, 2019; Sköld, 2013; Stoffels, 1994) have created methods for environmental scanning by composing a process of steps which utilizes the previously presented methods (SWOT, PEST, Scenario Analysis, Porter's Five forces) for parts of the process, but they are not seen as complete tools for environmental scanning by themselves. These processes are not all the same, but they share similarities in their interpretation of environmental scanning. A broad overview of the process is given in Figure 9 as composed by Stoffels (1994).

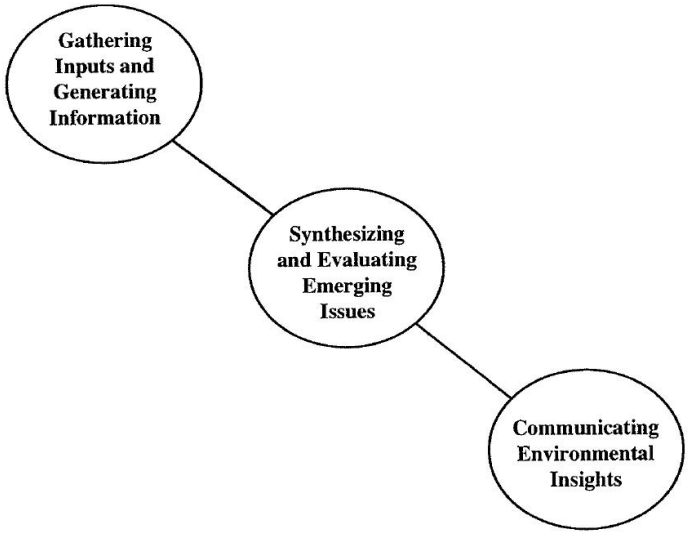

Figure 9, Global view of Scanning Process. (Stoffels, 1994).

Sköld (2013) highlights the importance for organisations to engage in a structured environmental analysis, and that it is not sufficient to perform spontaneous environmental scanning except for the smallest organisations. When only performing spontaneously there is a risk of receiving limited benefits from the scanning, and having a too narrow scope of the environment (Sköld, 2013). Employees engaging in spontaneous scanning often focus too much on how things are done presently, and not enough on how it may change in the future. The processing of gathered information is also informal and may not reach the right actors in the organisation, who has impact on the decision-making process. However, organisations which do spontaneous scanning can have a foundation which can be built upon to create a structured process. Current practices should not be disregarded, instead the interest for the environment should be encouraged and existing knowledge should be used for the development of a new structure (Sköld, 2013).

3.2.7.1 Reviewing position and setting goals

In the early stages of an environmental scanning process, it is suggested for an organisation to review its current practices, needs, and expected outcomes through the lens of the business model (Frankelius, 2001; Pieroni et al., 2020; Sköld, 2013). This

can increase knowledge and understanding of how the organisation could be affected by changes in the environment. It also helps to identify areas which might be most influential to the business model. Both Pieroni et al. (2020) and Frankelius (2001) proposes a workshop format to gather views on the business model and within which areas of competence the organisation can find valuable opportunities. Pieroni et al. (2020) suggest doing a SWOT analysis of the strengths and weaknesses of the current business model during the workshop. For the review of current business model and for future scanning activities to be optimized, it is necessary to grasp the width of the industry the organisation is active in. If the organisation has a too narrow interpretation of their industry, there is a risk of missing opportunities or threats from other industries, or unobserved areas of its own industry (Frankelius, 2001). Frankelius (2001) emphasizes the importance of creative thinking in the early steps in the process, to use creativity as a way of finding new perspectives on the organisation and its environment as well as promoting innovative ideas.

Another step which the different authors agree on is to set goals and targets for the environmental scanning process, to formulate what the expected outcomes of the scanning activities are (Frankelius, 2001; Sköld, 2013; Stoffels, 1994). An example can be to identify a knowledge gap in the organisation which must be filled (Stoffels, 1994). One prerequisite to setting goals is to understand the needs of the organisation, thus the previous step of reviewing current practices goes hand in hand with setting relevant goals. One way to map the relation between current practices and the goals are to list them in a table according to relevant dimensions, where the current status is listed next to the goal (Sköld, 2013). The dimensions for which to set goals proposed by Sköld (2013) focuses on the organisational outcomes of the scanning process, such as the extent of the scanning activities, the process for scanning, the organisation, the culture and the tools and products. By setting these goals, the process of environmental scanning is the focus of the goals instead of the scanning result. Frankelius (2001) suggests that a detailed mapping of topics identified by a brainstorm session should be done before searching for information to avoid scanning unnecessary sources. The author describes how the topics should be ranked with regard to impact on the organisation and level of knowledge in the organisation. The method enables the organisation to focus the rest of the process to topics which is of high importance for the organisation and where they lack knowledge.

3.2.7.2 Information gathering

After the initial, the topics that should be observed need to be identify and the organisation should decide how the information should be collected. Frankelius (2001) proposes a method of classifying topics according to their impact and the current knowledge of the topic within the organisation. Sköld (2013) also suggests focusing on topics with the highest potential impact on the organisation, and that the point of setting focus topics is to avoid an overflow of information. Nowadays an overflow of information is just as much of a problem as lack of information, as the internet gives nearly unlimited access to news, scientific reports, and different networks. Sköld (2013) says that previously environmental scanning consultants could use access to information as a selling argument to organisations who were looking to scan the environment, but now the focus should be on filtering only the information which is relevant. However, it is important to find a balance between focus topics and still allowing for finding information which has not been identified as important, since such information could prove to be useful (Sköld, 2013). Also, it is difficult to know beforehand which information will be required or necessary to make

observations of upcoming trends, thus the availability of information will shape the perception of the situation (Stoffels, 1994). Ridenius (2019) highlights the importance of filtering sources to make sure the material is reliable, relevant, up to date, and to be aware of the potential bias of the author.

The scanning for information should be performed by everyone in the organisation who have something to contribute with, and the idea is that all gathered information will be compiled and analysed in the next step (Stoffels, 1994). The guideline for the scanning activity should be the prioritized topics identified, and the topics can help define which individuals or groups who should focus on specific topics. The topics are divided among scanners depending on their previous knowledge and the availability of information through networks and connections (Sköld, 2013). The sources of information can vary depending on the topic and the resources available to the scanner. Sköld (2013) highlights the importance of continuously reviewing which sources of information that are relevant. It is also important to be aware of the difference between environmental monitoring and environmental scanning, where environmental monitoring is a more shallow observation of information while environmental scanning encompasses a deeper analysis and understanding of the information (Sköld, 2013). Environmental monitoring is used as a more passive and spontaneous intake of information while environmental scanning should be done with purpose.

Stoffels (1994) divides environmental scanning into different levels depending on the objective of the organisation. Observation is labelled as the lowest level of scanning, where the objective is to identify and learn what is true in the environment at a specific time. On the opposite end of the scale, prediction and synthesis is labelled as the highest level as organisations try to absorb signals of future events and forge them into a strategic model for the future (Stoffels, 1994).

The most common sources of information are people, events, and documents according to Stoffels (1994), with the majority of information coming from people. Stoffels (1994) also divides sources of environmental information into internal and external sources, with an even division between them for people sources and a predominance for external sources for events and documents as can be seen in Figure 10. The most valuable sources of information will be the ones who can provide early signals of trends with accuracy and credibility, since the primary focus of environmental scanning is providing a foundation for long-term strategy (Stoffels, 1994). Daily news sources are at the other end of the scale which primarily report current events and trends that are already happening, therefore their primary use is to confirm or dismiss the accuracy of earlier strategic decisions (Stoffels, 1994). To find documented sources Sköld (2013) suggests using some sort of IT tool to gather and filter publications according to key words or sources defined by the scanner.

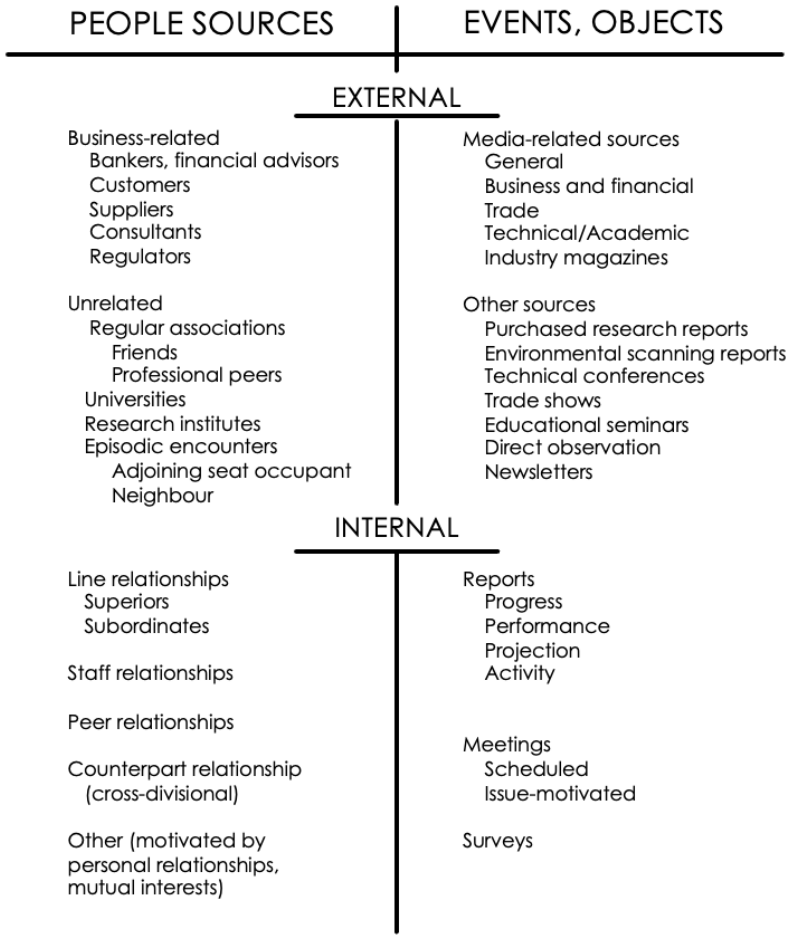

Figure 10: Sources of Environmental Information (Illustration by authors, inspired by Stoffels (1994))

3.2.7.3 Information analysis and prioritization

This step is about sorting, analysing and prioritizing the information that has been collected, which all the authors describe as crucial in some way. Sköld (2013) emphasizes that analysing the gathered information is an important part of the process since it enables to find connections between different trends, and in a structured way visualise the impact on the organisation. The analysis also helps in identifying different viewpoints of the factors affecting the environment thus different methods for analysing the findings could be beneficial in different situation (Sköld, 2013; Stoffels, 1994). Ridenius (2019) further explains that this step is what differs a good and bad environmental scanning process since the priority of information is crucial for the forthcoming actions.

For analysing the material, Sköld (2013) mainly focuses on the tools that have been introduced more in detail in section 3.2.6 such as SWOT, scenario analysis, Porter's five forces and adds Business model canvas and Trend cards as additional tools. The author emphasizes that these models both analyse and prioritize trends and signals. Ridenius (2019) also mentions SWOT as a method suitable for analysing the material, but adds that the following questions also works as a quicker and easier analysis:

- What happens?
- Why does it happen?
- Who is affected/ does it affect us?

- What are the consequences?

Stoffels (1994) presents both quantitative and qualitative tools for measuring and analysing trends in the environment, which can help in the forecasting of upcoming events. The methods can be divided into mapping techniques, modelling techniques and subjective techniques Stoffels (1994).

Mapping techniques can help sort the information and provide an overview of the environment by reducing and illustrating connections between identified factors. For this Stoffels (1994) proposes flow charts or tree diagrams as example of visual tools.

Modelling techniques are the most quantitative tools and can be either explanatory or predictive. These are more mathematical models which are used to find connections and predict the future.

Subjective techniques are argued to be beneficial for more complex environments where the uncertainty is high. It is the less quantitative method and is easily applied in groups with various skills. Stoffels (1994) proposes brainstorming, scenario development and role playing as examples of useful subjective techniques.

Pieroni et al. (2020) focuses on developing a business model for circular economy and agrees with the other authors that SWOT can be a suitable tool for the analysis. If time is limited it is also possible to do the SWOT analysis individually before the findings are collected in a workshop. As a last step in the analysis Pieroni et al. (2020) describe the importance of prioritizing the most critical threats for future actions.

Sköld (2013) describe that the prioritization can be done by rating the factors with high, medium, or low impact/effort. These factors can also be divided into direct impact, indirect impact, expectations, and resources needed. Each finding is thereafter rated linked to the different factors to identify the trend that needs to be handled first.

3.2.7.4 Communicating and integrating

The forementioned steps in the process of environmental scanning should all hopefully lead to interesting actions (Frankelius, 2001). Sköld (2013) describes that the process of environmental scanning extends beyond the analysis and should lead to change, new strategies, actions, or at least new approaches. This step is sometimes limited to a presentation which Sköld (2013) highlights as insufficient since the process needs to include some kind of action or reaction. An organisation has the ability to influence events in their environment and Frankelius (2001) emphasize that by the information that has been collected throughout the process the organisation can decide if they want to adapt, integrate, or be inspired by happenings in their environment.

The result of the environmental scanning should according to Sköld (2013) be delivered to the management team as early as possible. The author further describes that the senior management team can preferably be involved already in the analysis workshops since people are more receptive for information which they have been involved in creating. Thereafter it is possible to integrate the scanning into other processes and projects in the organisation. Stoffels (1994) also suggests a more active approach from senior management by engaging in dialogues about the scanning results as a way of setting organizational strategy from the observed topics. The number of topics presented to senior management should also be restricted, according to Stoffels (1994) “11 is too many, six may be all right” (p. 99).

For the scanning process to be successful, Frankelius (2001) highlights the importance of continuity and long-term approach to avoid a static perception of the environment. After reviewing the results of the scanning process and taking appropriate action, the organisation should identify which trends that should still be monitored onwards. In the follow-up of the scanning process the organisation may also identify a lack of information regarding some topics and therefore realise that it needs to tweak its information gathering in some way to fill the blank spots (Ridenius, 2019).

When the scanning process is completed and the findings have been prioritized for implementation, a new process takes over. The steps ahead are more about how to implement change, which the authors in the reviewed literature do not include in the process of environmental scanning.

3.2.7.5 Overview of steps in the process

In the previous sections, environmental scanning has been described as a complete process from the perspective of several authors. The authors include different steps in different parts of the process, but all do somehow use four general steps. Therefore, Table 2 summarise the findings from the different authors by dividing the process into *Reviewing position and setting goals*, *Information gathering*, *Information analysis and Prioritization* and *Communicating and integrating*.

Table 2: Summary of environmental scanning steps according to the literature. Each colour represents the authors' categorization of the literature used.

Step	Sköld (2013)	Frankelius (2001)	Stoffels (1994)	Pieroni et. al (2020)	Ridenius (2019)
Reviewing position and setting goals	Goal	Reconsideration of perspective	Set scanning and information strategy	Understand where you are	Keywords and monitoring area
	Current situation	Creative discharge	Gather cues and clues about the future	Analyse change drivers	Gathering of information
	Lay the foundation	Analysis 1: Meaning	Abstract, distil and report information		Sorting and selection
Information gathering	Focus	Analysis 2: Knowledge	Classify and correlate etc.	Define where to go	Analysis
	Collection	Fusion	Assess and rank		Presentation
Information analysis and prioritization	Analysis	Information gathering	Relate environmental vision to near-term task environment	Consolidate a vision	Decisions and actions
Communicating and integrating	Integration	New business map	Relate environmental vision to strategic position		Evaluation
	Day-to-day operations	Action			
	Follow-up and development				

4 Empirical study

In this chapter the empirical results from the nine interviews will be presented as well as the result from the workshop with the focus group. In the end of the chapter, the main findings from the empirical study are summarized.

4.1 Interview results

The following sections describe the results from the interview study. The results have been divided into five common themes which are: construction client's influence on sustainability, strategic decision making, sustainable business model, applied method for environmental scanning, and requirements for a method for environmental scanning. The interviewees and their organisations will be referred to as their alias according to Table 1.

4.1.1 Construction client's influence on sustainability

The interviewed clients all agree that they have a great responsibility to drive the development of sustainability in the industry. All of them mention their ability to set requirements as an important part in this. All the commercial property owners and the housing company explain that nothing will happen unless they set sustainable goals as requirement when procuring a project, since the contractor is obliged to build according to the contract. Commercial property owner 3 and state-owned client 2 describe that they have developed specific sustainability goals that is a part of the requirements in their procurement process. Commercial property owner 1 describe challenging sustainability requirements as positive for the contractor, "*I think it feels like a security for the contractors, who also want to do good, if the client has a clear control and goa*l". However, commercial property owner 2 and the regional public client highlight the importance of knowing what the contractor can deliver to push the development of the industry but still have reasonable demands. Two of the public clients explain that their role is also to spread knowledge about the topic by investing in research and being a role model for other organisations.

Besides requirements, the interviewees mention several other tools they can use to drive sustainable development. A recurring response is that environmental certification of buildings has been a successful tool for driving innovation, development, and sustainability performance. Additionally, commercial property owner 2 and state-owned client 1 describe that they try to influence the politicians by writing articles and raise the issue externally. State-owned client 1 together with the regional public client further explain that sharing knowledge in external networks is a way for them to both learn and share experience regarding sustainability. Commercial property owner 2 and the property developer both stress that requirements from their customers is one incentive for them to work with sustainability issues since they more frequently ask for sustainable solutions. The regional public client says that dialogues with contractors can ensure that the contractors are prepared for new requirement and ideas that soon will come.

Even if the interviewees all agree that there exist tools which can help them in the development, they also identify some barriers which hamper their work with sustainability. Only one interviewee, commercial property owner 3, says that there are no specific challenges. Both public (state-owned client 2 and the regional public client) and private (commercial property owner 2) clients mention the economic aspect as a barrier for sustainable development. The public ones especially mention that the initiatives need to be economically defensible since the cost will in the end

affect the rent for public organisations, such as healthcare and schools. At the same time, state-owned client 1, say that they need to invest in sustainable materials already now even if it costs more, to enhance the development of these techniques. The property developer further explain that they need to take risks and invest in more sustainable incentives for the industry to develop. Furthermore, both commercial property owner 2 and state-owned client 2 highlights that it takes time to change the industry. The change process is a challenge since the industry has been linear for decades and now must change towards a more circular way of thinking, which usually takes time, time that does not exist. Commercial property owner 1 claims that nowadays more and more needs to be done during the building process which can be overwhelming. The interviewee explains that there is usually a shortage of time, and you promise a lot to the customer regarding price, time, and quality, which is hard to ensure if you set for example recycling as a requirement in the procurement. The property developer and the municipality also say that it is challenging to be first to try something new.

4.1.2 Strategic decision-making

Although there is a difference in size and roles of the client organisations, most of them say that strategic decisions are made by the management team, except for two of the public organisations which are governed by political decisions. Most of the interviewees who are working with sustainability within their organisation describe that their knowledge, observations of trends or developments are part of the basis for the strategic decisions that are made by top management.

When asked about the time horizon of the strategic decisions and goals the answers differed a bit. Some of the clients has a span of looking at the upcoming five years while some are looking as far ahead as twelve years or further. State-owned client 1 says they work with three different horizons:

- Yearly planning for the upcoming projects.
- Three-year strategy which sets the direction of current practices.
- Long-term strategy which sets the vision of their position and role in the industry for the upcoming ten to twelve years.

State-owned client 2 also works with long-term strategy with a twelve-year horizon, which they review and revise every four years since elections affect the political guidelines they have incorporated into their strategy. The housing company takes an even further approach and say that they look 50 to 60 years into the future when they set their strategic goals, but that their business plan has a four-year span. To follow up sustainability goals, the municipality uses a system of colour coding their progress, where different parts of the organisation assigns either red, yellow, or green to each goal to grade their progress.

The client organisations have different procedures in place for how information reaches the management team, in more or less structured ways. Commercial property owner 1 emphasizes that the small size of their organisation makes it possible to just tell the CEO whenever they meet in the office if you have any news or send an email. They have a more structured way of sending the information, which is sustainability manager, to property development manager to management team, but that is rarely applied. However, commercial property owner 2 explains that they have a clear process of how information collected out in the organisation reaches the management. The sustainability manager in the organisation is a part of the management team and

have several presentations for the board each year, which the interviewee says is a reason to why their sustainable initiative is rarely ignored.

4.1.3 Sustainable business model

The interviewed clients work in various ways with sustainability in their strategy and business models, and it therefore varies to which degree sustainability influence their daily work. Since the interviewees work in various positions in the organisations, their knowledge about the strategic work towards sustainability differs. However, the majority of the interviewees work as sustainability managers or strategists. The interviews also revealed that the organisations have different ways of choosing development areas.

Commercial property owner 3, who does not have a specific department for sustainability but instead integrate it throughout the organisation, explains that the developments they invest in should affect the organisation's income, cost, or value of the property for it to be relevant. The interviewee further argues that they consider the sustainable aspect since it often affects either income, cost, or the value of the property. The regional public client says that the politicians decide which areas they should focus on for development and expresses that it is hard to develop an area which is not clearly stated in the political goals. One year ago, they got a goal to lower the environmental impact of construction and recycling of construction products with 50 per cent, which has been easier to work with since it is prioritized by the politicians. The municipality, who is also tied to the political goals, has used the UN sustainable development goals as a framework and divided it into specific sustainability goals for their organisation. They have thereafter worked together with the politicians to match their different objectives. Furthermore, their ambition is to be in the forefront with sustainable incentives and inspire others, which they have ability to do in their own projects according to the interviewee.

Most of the clients has sustainability as one of their focus areas in their business model and their strategic work towards sustainability usually extends to 2030. Commercial property owner 2 describes that they have three focus areas in their strategy, of which sustainability is one. For them, it is a way to survive as an organisation since it affects interest rates, loans, and insurances. Commercial property owner 3 says that since their ambition is to run the business in a sustainable way their sustainability goals are equally prioritized as their economic goals. They can also see that it pays off to run the business in a sustainable way since it reduces costs, increase revenues, and increase the value of the property. Furthermore, state-owned client 1 has sustainability as one of their two focus areas in their strategy, but even if it should be prioritized, it can sometimes be challenging in practise. Both the property developer and commercial property owner 1 also have sustainability as one of their focus areas in their strategy. The property developer describes an example of how their strategic decisions can affect their daily business. In one of their current projects the conditions around the building made it impossible to use any other material for beams and columns than steel, which forced them to lower the environmental impact as much as they could on the other components in the project to reach their sustainability goal. The interviewee emphasizes that if they should follow their strategic goals in the future, they should not engage in projects like this.

The category of the client organisation can also influence whether it is easy to see the benefits of sustainable incentives or not. The housing company emphasize that it is easier for them to see the profitability of long-term strategic decisions since they

maintain the building and do not build to sell, which is in line with the previously mentioned by commercial property owner 2 and commercial property owner 3.

4.1.4 Applied method for environmental scanning

The clients generally have a similar perception of the meaning of the term *environmental scanning*, although their interpretation varies in depth and detail. All interviewees agree on the general interpretation that the term involves the act of scanning the environment, which the organisation acts within, for trends and development which can have an impact on the organisation. Most of the clients' responses to their perception of environmental scanning focused on scanning of the immediate environment, or context, of the organisation and its industry. "*To me it is very important what is happening around and what affects us and be able to motivate why we do this or that" says the housing company and elaborates "environmental scanning and stakeholder analysis becomes a part of the job*".

State-owned client 2 is the only client organisation which uses a definition for what a trend is. A trend, according to them, is a change in the external environment of the organisation, which has a direction. The change is observable in the present, it is not speculative or something "*that will happen*". Additionally, a trend has a minimum expected duration and a scope.

4.1.4.1 Client environmental scanning structure

All the interviewees say that their organisation perform environmental scanning in some capacity, there is however a disparity in how established their process for environmental scanning is. State-owned client 1, state-owned client 2, and the municipality have environmental scanning as a defined task in their role in the organisation, and those clients also have established certain processes where environmental scanning played a continuous part in the strategic work of the organisation. For the other client organisations, environmental scanning is a part of their strategic work to some degree but not with the same continuity, defined purpose, or assigned resources.

State-owned client 1 works in a department with focus on strategic development and environmental scanning is a part of their scope of work. They have continuous tasks related to the process including both scanning for trends and developments as well as analysing the collected trends and writing reports with set intervals for both internal and external use. State-owned client 1 also has a clear division of labour within the environmental scanning process, where different people are responsible for scanning different dimensions of the environment, and they have certain people from different roles assigned to participating in workshops for analysis. State-owned client 2 and commercial property owner 1 similarly work in a department with focus on strategic development with an established responsibility for engaging in environmental scanning as a part of their role, although it is not their primary work task. The municipality highlight that their purpose with the scanning is not only to find technical solutions but also to prepare the organisation for how it should work with certain trends.

Most of the other client organisations perform some parts of the scanning process similarly to state-owned client 1, state-owned client 2, and the municipality, but they do not do it with the same structured purpose, method or continuity. The housing company explains that they do have a *"future group"* with focus on the year 2030 with regards to technology and sustainability, but also says that they lack a specific

method and instead "*participate in such contexts and read many reports*". Similarly, commercial property owner 1 has a recurring activity which is an annual SWOT analysis, but they also say that they do not have a specific process which creates the basis of the SWOT analysis. The recurring theme for most clients was the lack of an established process for performing environmental scanning, and as such most of the work is relying on ad hoc engagement from individuals in the organisation, except for the aforementioned: state-owned client 1, state-owned client 2, and the municipality.

A common denominator for state-owned client 1, state-owned client 2, and the municipality, is that the environmental scanning is performed with an intended use and repeated at certain intervals. The intended use for those clients is as a support in strategic decision making, in the case of state-owned client 1 and state-owned client 2 the management team is the primary recipient of the environmental scanning result. The environmental scanning process is done in relation to certain recurring decision processes in all three of these organisations, such as yearly reviews of the business model and sustainability goals. However, state-owned client 1 also says that they would like to be more continuous in their environmental scanning. For most of the organisations with a less structured process, the scanning is performed either regularly but less frequently, or without any regularity at all. The housing company uses the environmental scanning in their review of the business plan every four years.

The clients who somehow perform environmental scanning use it as a tool to review the organisation's business model and its strategy in relation to trends and events in the external environment. Commercial property owner 3 says that the environmental scanning result is used in their annual sustainability report. State-owned client 1 and the housing company say that it is used in annual revisions of the business plan. Some of the organisations also use environmental scanning for setting or reworking their sustainability goals.

Only state-owned client 2 describe that they have a definition for the environment, which they have divided into dimensions. They further highlight the importance of knowing your own organisation as well as the context you are working in. State-owned client 2 divides their environment into economic, political, institutional, social, technological, ecological, legal, and media dimensions, a model they call EPISTEL+ Media. The other clients do not have such a definition of their environment, and for most of the interviewed clients the environmental scanning focus on a less extensive environment with more focus closer to the organisation.

4.1.4.2 Scanning the environment

There are some differences in what type of information the clients are looking for, if they have any specified goals with their scanning. Several of the clients describe that stakeholder analysis and market analysis are parts of their environmental scanning, while a few of them focus more on a wider interpretation of the environment. There is also a difference in how the clients scan the environment. The clients with a more structured process in place continuously gather inputs from a wide array of sources and the clients with a less structured process rely more on what is picked up by employees in their line of work. Commercial property owner 2 responded "*we don't have anything structured, we don't have an expressed method*" to the question of how they gather trends and developments within sustainability. Commercial property owner 3 responded "*I wish we had something special, it's classic footwork. It's about hanging on Twitter and following the right persons*" to the same question.

State-owned client 2 divides scanning into a broader search where they look for mega and macro trends which can affect their business in the upcoming 10 to 15 years, and secondly into focus areas where they are targeting certain topics. State-owned client 1 uses input from two directions, first from mega and macro trends which will affect the organisation, and then also from their tenants' perspective. Commercial property owner 2, commercial property owner 3, and the housing company also focus on listening to stakeholders connected to the business. Yearly, commercial property owner 2 perform more in-depth interviews with employees to gather information. State-owned client 1 and the housing company use internal surveys as a way of reviewing the organisation and gathering input on how their employees perceive trends in the environment.

All the clients consider networks as one of their primary sources of information when scanning the environment. State-owned client 1 mentions that some managers in the organisation are part of networks related to their field of work, and that their sustainability manager is part of several networks. Commercial property owner 1 and the regional public client also refers to networks as a primary source of information, and the regional public client also adds that "*it's up to individuals to stay updated*" and commercial property owner 1 says "*it's much about contacts and networks in the industry*". Three of the clients also name seminars and conferences as important events to take part in to gather information about their environment. State-owned client 1 and state-owned client 2 also have some collaboration with researchers and universities as parts of their network and sources of information.

Other sources of information are written sources such as newsletters, mega and macro trend reports, industry media, and scientific reports. Most of the clients do not have any systematic way of gathering input from these written sources, with the exception being state-owned client 2 who uses a software which automatically scans for publications according to specified input and key words. Instead, the other clients rely on information reaching them (through subscriptions) or using the same sources of publications as they have previously used. Some of the sources for mega and macro trends mentioned were the European Commission Competence Centre on Foresight, Copenhagen Institute for Future Studies, and Sveriges Kommuner och Regioner.

Also, when it comes to responsibility for reading the gathered references only state-owned client 2 has a systematic process for reviewing the information. They have an editorial team with divided responsibilities for different topics, which reviews the gathered information related to their assigned topic, and thereby perform a first step of screening from their scanning software, before proceeding for further analysis. However, most of the clients rely on individuals or departments staying up to date with development in their field.

4.1.4.3 Analysis and delivery of trends

Most of the clients do not have any method or process in place to analyse the collected trends and information in order to assess the implications they could have on the organisation, either as potential threats or opportunities. In these organisations the analysis relies mainly on personal reflection or internal discussions that arise from the observed trends, but not as a planned analysis activity. When it comes to sharing knowledge internally, commercial property owner 2 says that there is room for improvement, although they have meetings several times per week. "*We don't have any clear system for how we process it*", commercial property owner 2 elaborates when asked how they process the trends and signals that they pick up. Commercial

property owner 1 also says that they lack a documented process and that weekly and monthly meetings are used to share observations of trends or signals with potential significance to the organisation. However, in relation to their sustainability plan commercial property owner 1 says that they do have guidelines for how to review if the current plan is right in relation to the organisational environment, which was used in a workshop format.

State-owned client 1 and state-owned client 2 also use workshops with the intention of analysing scanning results and prioritizing which observations must be acted upon. Both use some kind of method to evaluate observations and to prioritize trends which are most significant to the organisation. State-owned client 2 describes that they sometimes use consultants as workshop leaders to help them develop their method for scanning and analysis.

State-owned client 1 works with a prioritization matrix to evaluate trends according to their probability of occurrence and their impact on the organisation. The evaluation is most often done during workshops where ten to fifteen topics are filtered down to between three and five prioritized trends. The trends which are evaluated as having a high impact on the organisation are prioritized, with the action depending on their estimated probability of occurrence. High probability and high impact trends should be part of the strategic work ahead, and for low probability high impact trends there should be readiness for action if the trend should show signs of occurrence. State-owned client 1 also says that they sometimes evaluate the low probability trends by implementing scenario analysis as a part of the preparation process and readiness for action. However, state-owned client 1 further says "*it sounds good in theory, but it doesn't really work that way in practice*" and exemplifies with the Covid-19 pandemic not being part of any scenarios in advance.

Scenario analysis is used by some of the other clients, mostly as a part of their sustainability work through performing climate scenarios to evaluate how their business and properties will be affected according to different scenarios of climate change and actions taken by the organisation.

Most of the clients deliver the scanned trends to upper management, often the board of directors, as a basis for strategic decision making. There is variance in how formal the delivery of trends to upper management is, ranging from formal delivery of reports to the less formal passing of information to managers through conversation. State-owned client 1 and state-owned client 2 are clear that the board of directors is the intended recipient of the environmental scanning results, and for both of them the results are compiled in reports. Clients with more informal ways of reaching management do not express any concerns that the information would not reach decision makers, and many of them have direct contacts with members of the board of directors in their daily work. State-owned client 2, commercial property owner 1, and commercial property owner 2 also say that co-workers in the organisation is an intended recipient for the scanned trends, although it can be difficult to monitor how it is implemented throughout the organisation or what effects it has. Commercial property owner 2 says "*the difficult part is to get it out to our 500 colleagues who are the ones who performs the work and should implement the new technique or whatever it is*".

4.1.5 Requirements for a new method for environmental scanning

None of the interviewees express that they have thought of the need for a specific method for environmental scanning towards sustainable strategies before. However,

when asked if it could be helpful, some stated aspects of their current practices which could be improved through a new environmental scanning method towards sustainability. State-owned client 2, who is working regularly with environmental scanning, says that a specific method for sustainability might increase the quality of the search for trends regarding the topic. The interviewee stresses that a specific method could enable a better search through more specific search strings linked to sustainability. In addition, it could allow for more early warnings which they sometimes miss in their more general method. The housing company believes that a method could accelerate the development and contribute to an evenly distributed knowledge in the organisation, that does not have to rely on individuals' ability to scan the environment. Furthermore, the property developer describes the need of a method on project level since they sometimes have very specific requirements they need to solve in the different projects. In that case they need answers right away to see if they should invest in innovation, best practices or an already proven solution.

Commercial property owner 1 stresses the importance of a method that is easily integrated in their everyday work. Several of the interviewees are on the same track, the method must be relevant for their specific organisation and up to date. Commercial property owner 2 emphasizes that information which is unnecessary for them to process needs to be removed before it reaches them, otherwise the process risk being too extensive. The regional public client describes the need of a more detailed described method, including the necessary steps and especially the time required. The interviewee further explains that shared responsibility often causes confusion, and it therefore needs to be clear where in the organisation environmental scanning should be performed.

The interviewees do not completely agree about where in the organisation the environmental scanning process should be performed. State-owned client 2, commercial property owner 1 and commercial property owner 3 all believe that the scanning process should be performed further down in the organisation closer to projects and property managers to gather more perspectives. State-owned client 2 and commercial property owner 1 mention that people higher up in the organisation, such as the management team, will catch trends and signals on a more general level, while commercial property owner 3 argues that it must be done on a management level if the organisations strategic decisions are affected. State-owned client 2 adds that if the method should aim at a specific area of knowledge, the scanning need to be performed by someone with this knowledge. However, commercial property owner 2 argues that the environmental scanning should be performed by their team as sustainability managers. The housing company and the regional public client emphasize that the management team should be responsible for the process since they are the ones making strategic decisions, from there it would be possible to break it down to different parts of the organisation. They further explain that decisions are not taken into consideration if it is initiated by anyone else than management.

The clients also describe different needs for which time horizon that is interesting for them to scan, which seem to be closely related to the time horizon of their projects and strategic goals. The property developer often works with projects that are supposed to be finished 10 years from now and would therefore prefer to find trends and signals that could be current at that time and further. Most of the other interviewees mention that they would like to scan for trends which extends as far into the future as their strategic sustainability work, which is usually 2030.

4.2 Workshop results

The workshop was divided into two steps, firstly, the results from the interview study were presented and the participants got to reflect about the outcome. Secondly, a method draft for environmental scanning was presented followed by discussions and reflections around the different steps of the process. This section will therefore be divided into two parts, presenting the results from the different parts of the workshop. The ones participating in the workshop were the property developer, the municipality and the regional public client.

4.2.1 Reflections around the interview study

The general reflections about the result of the interview study are that it matches the focus group's perception of the industry. One of the participants, who has a background from both public and private client organisations, agrees with the result and highlights that it is often dependent on individuals performing environmental scanning regardless of the level in the organisation. However, the focus group believes that environmental scanning must be done at different levels in the organisation since the aim of the scanning will differ between strategic level and project level. During projects, the scanning is focused on finding solutions which can help fulfilling the strategic goals.

The regional public client can see that a structured way of analysing the scanning results would be beneficial for the organisation since they sometimes underestimate the possibilities linked to sustainability. The development in some areas is much further ahead than the organisation believes, and analysing trends could be a way to show possibilities that already exist. The group further discussed that one reason for the lack of analysis could be that people working with environmental issues, such as a sustainability manager or sustainability strategist, often does this because they are passionate about the topic. They therefore find it obvious to scan for trends linked to the issue but lack an understanding of the advantages for the organisation. The municipality adds that they lack an occasion where they can analyse the information together. This is however something they try to create every year linked to their annual sustainability report.

From the interviews it could be seen that the interviewees had various opinions regarding the economic aspect of sustainability development. The participants in the focus group explain this by the differences between being a client who builds to sell or builds to maintain, but also the differences between being a private or public client. The regional public client highlights the challenges of being a public client who wants to be in the forefront but at the same time are not allowed to raise the rent for public organisations, such as schools or hospitals using their properties. For commercial businesses however, they have identified an increased demand for sustainable buildings which can explain why some clients sees it as beneficial to invest in development of sustainability. The property developer argues that it is still more expensive to build sustainably and that companies engaged in commercial business often have money to drive the development, which will consequently lower the cost for public organisations as well. Nevertheless, the negative aspect is that this forces tenants which cannot afford the development to move to less popular areas, which will affect social sustainability. The property developer further explains that private organisations often have the ability to take higher risks as well and it is often a part of their strategy to gain market shares, something that the public clients are unable to do.

4.2.2 Reflections around the method for environmental scanning

For the second step of the workshop, four steps which the authors have identified as crucial for environmental scanning were presented. These steps were discussed and elaborated on more in detail by the focus group and they described how these steps could be applied in their specific organisations. The results from the discussion are presented below.

4.2.2.1 Early in the process

When an organisation has decided that they want to perform more structured environmental scanning, a group of people deciding objectives and aim with the scanning need to be selected. For this step, the focus group highlights three categories of employees they see as crucial in his group, being:

- Someone who has influence in the business plan
- Someone knowledgeable about sustainability
- Someone closer to the projects, such as a project manager

The reason to include someone with influence in the business plan is to enable allocation of resources but also if changes need to be done in control documents. They also highlight the need of spreading the knowledge about sustainability from the sustainability group to other parts of the organisation. The participants also argue to keep it small, they recommend maximum five people, which will facilitate decision making. Furthermore, the group suggest using workshop or a meeting as format for this and stress that it is hard work that needs to be done. However, they believe that approximately four hours is enough to determine overall aim and goal with the environmental scanning. Thereafter different departments in the organisation might need to establish a work plan for how the scanning affects their work.

4.2.2.2 Collect trends

The focus group agrees that the person in charge of scanning depends on which area you are looking for information, but they believe that it is beneficial to include both individuals who are knowledgeable about the specific topic, and someone who is closer to the projects. The mix of people will give a more realistic view of trends and an eventual change will be easier to implement if people on different levels in the organisation has been involved in the process. The group believes that it might be beneficial if naysayers participate in the collection of material, since it will increase the chance of them identifying a problem and consequently be more susceptible to change. The ones working with sustainability feel like their ideas are sometimes not prioritized just because it is coming from them as "*sustainability nerds*". It is therefore argued that inclusion of people from different levels in the organisation can counteract this by spreading the knowledge and collection of trends.

How to collect information is a challenging question for the group. They mostly suggest the same sources that was discussed in the interviews, such as networks, industry magazines, ongoing innovation projects, but they also emphasize that it would be beneficial to scan outside Sweden and try to broaden one's perspective. Furthermore, the participants describe the difficulty of searching for scientific research since it is time consuming and not always related to practice. However, they find it important to somehow document the findings during the scanning to be able to spread the knowledge in the organisation and to know what decisions are being based on. One suggests using already established systems in the organisation for this and

highlights that the notes might look different depending on target group. The municipality describes that they use the collected information as a base for the analysis.

4.2.2.3 Analyse trends

Analysing the collected trends was from the interviews found to be a step that clients normally miss, therefore this topic was discussed more in detail with the focus group. The group came up with the idea that the people involved in this step should be the same as the ones performing the first step, described in 4.2.2.1. It might be good to include some additional members to avoid giving one's opinion to much space. Additional people could be someone who has performed the scanning or someone who has observed an interesting trend.

The participants also highlight the importance of reviewing the trends with the organisational goals in mind, especially sustainability goals. The impacts and effects on the goals should be considered when evaluating the information and prioritization of trends should be done thereafter. How it affects the economy of the organisation is also seen as crucial. One of the participants mentions that they use different tools for analysing and sorting trends such as, SWOT or impact analysis. Furthermore, the regional public client thinks it might be unnecessary that collect trends and analyse trends are two different steps and sees them as nearly the same. The participant suggests presenting them as one step and thereby shortening the description of the method.

4.2.2.4 The end of the process

As a last step in the process the group discussed how the result should be compiled and how the process of environmental scanning should be evaluated. They believe that everyone that has been a part of the scanning process should participate in the compilation of the result. One of the participants highlights that business developers and the ones planning the annual budget should be involved which will facilitate prioritization or changes in the business plan. When discussing how it should be compiled, they recommend using systems that are already in place, if possible. One of them mentions that they usually create one-page presentations when they have investigated something, and do also include recommended actions in the presentation, something that would be possible for this purpose as well. Furthermore, they use project reports where they usually refer to other investigations if there is something one would like to read more about. However, they all agree that the result of the environmental scanning should be a short summary, including proposed actions and references to a longer version if needed.

When evaluating the scanning process, the group finds it necessary to review if the process provided the requested outputs, but also to reflect about the people involved, number of resources and knowledge gained from the process. These are aspects that should be consider in the work towards an improved process for further scanning and to be able to see if actions taken from the environmental scanning helps the organisation to approach their strategic and sustainability goals. The municipality explains that they evaluate their work processes every two years, and this could be an occasion for evaluating the environmental scanning process as well. The focus group further highlights that it is challenging to quantify the financial outcome, but it might be possible to see how the process contributes to reaching their goals.

4.2.2.5 Reflections around implementing the method

After discussing the proposed method draft more in detail, the participants of the focus group were asked if they believe in implementing the method into their organisations and what they would need to use it. The participants all find it possible to apply this kind of method and express a need of a short and clear description of the method and the different steps. They would also prefer questions for each step which the organisation needs to answer before moving forward. The property developer also highlights it as beneficial that the method seems to be applicable in different levels of the organisation and the possibility to perform it in varying degrees. Furthermore, they express a need of a description of the purpose with environmental scanning which can be used to convince the management team to use this method.

4.3 Main findings

From the nine interviews and the workshop with the focus group it is possible to identify some aspects which are mentioned several times and some that are specifically interesting for the development of a proposed method. This section therefore states the main findings from the empirical material including both interviews and workshop. The main findings are:

- Most of the clients' environmental scanning process relies on individuals.
- The scanning process is often performed without a clear goal and purpose.
- All the clients scan for trends, although most of the clients miss analysing the collected information.
- Few of the clients have a more structured process for environmental scanning in place.
- The process needs to involve more people and should not only be the sustainability enthusiast's responsibility.
- The scanning needs to be performed in various levels of the organisation since client organisations often are project based.
- The affordability of sustainable incentives differs between public and private companies as well as if you build to maintain or build to sell.

5 Discussion

This chapter will analyse the result of the literature study as well as the empirical study. It will further elaborate on similarities and differences from the literature and the empirical study and act as a base for the proposed method in chapter 6.

5.1 Sustainability and construction clients

Pitt et al. (2009) emphasize that construction clients have a great responsibility and opportunity to drive sustainable development in the industry, which the interviewees in this study agree with. Both the literature and the interviewees highlight requirements as their main tool to influence, but the clients themselves add tools such as environmental certification, knowledge sharing in external networks and influencing politicians by writing articles in the media. Worth noting is that this is what the clients mention as tools that exist but does not necessarily mean that all are applied. Their possibility to influence however makes it crucial for the industry that clients are aware of changes in their environment. It is further possible to identify a willingness by clients to be part of the development of sustainability with some mentioning that they invest in, for example, new materials to contribute to innovation. However, the clients' opinions regarding the economic aspects of sustainability vary.

Both Tan et al. (2011) and Geissdoerfer et al. (2018) discuss the correlation between environmental strategy and competitive advantage without stating any clear conclusion. According to Johansson and Gluch (2008), however, a majority of construction companies in their study identifies lack of competitive advantage as a barrier for environmental performance. Geissdoerfer et al. (2018) emphasize that this is about to change since a sustainable business model is argued to be increasingly beneficial nowadays. This study indicates that Geissdoerfer et al. (2018) are correct since the empirical study shows that organisations having a long-term view, by being a client who build and maintain, can see sustainability as economically beneficial. Two of the commercial property owners explain this as both more beneficial in the maintenance stage of a building's life cycle, and because they get more favourable interest rates, loans, and insurances, which increases the value of the property. Both these clients also have sustainability as a main part of their strategy, and it could therefore be argued that a sustainable business model affects the competitive advantage.

The empirical study shows that the three client organisations with a structured environmental scanning process are public organisation. Both state-owned client 1 and the municipality express that they want to be in the forefront of sustainability development, and that environmental scanning is one way to achieve it. On the other hand, the regional public client says that they want to be at the forefront, but cost constraints make it difficult. Furthermore, the focus group concluded that private organisations are the ones who should drive the development, since they can take more risks. From these answers it is possible to observe an inconclusiveness among the construction clients regarding if private or public companies are driving the development of sustainability in the industry. Thus, it might also be difficult for a client organisation performing environmental scanning to know which organisations they should observe if they want to follow innovators or early adopters. Also, the empirical results indicates that it is up to each organization to find their own ambition and they should not only rely on other segments of the industry to drive development. If there is hesitation about who initiates sustainability development, actors may become passive and wait for other clients to make a first move.

5.2 Client's organisational strategy

As shown in the literature, one way of improving and reducing cost of innovation in the construction industry is to use collaborative ways of working and to engage in long-term relationships with other actors, which extends beyond the individual project (Dubois & Gadde, 2002a; Kadefors & Femenías, 2014). Among the interviewees, collaboration was not highlighted as a tool for developing sustainability, even if they mention dialogues with contractors as a way of ensuring that they are prepared for upcoming requirements in the procurement process. Two clients also said that they invest and engage in research, which can be seen as a form of collaboration that can promote innovation. The difference between the literature and empirical study may be because the interviewees primarily focus on driving sustainability in individual projects, as illustrated by the focus on procurement, while Kadefors and Femenías (2014) show that long-term relationships and collaboration needs to extend beyond individual projects.

The fast-paced change in the environment can put greater demands on the clients to keep up with legal and societal sustainability demands, and with the fragmentation of the construction industry, with multiple actors involved in projects, the demand for collaborative efforts to influence the industry may prove necessary. As Pieroni et al. (2019) showed, it is necessary for organizations which strive to work with sustainability to engage with other actors in their environment. Although collaboration between actors can reduce the cost of innovation according to Kadefors and Femenías (2014), resources must be available and should preferably have a connection to an organization's long-term goals and strategic planning.

A part of promoting development through long-term goals and strategic planning can be for the client to have an innovation policy which clearly states why the organization works with innovation and what the purpose of it is (Kadefors & Femenías, 2014). The innovation policy can be a part of the strategic plan of the client, which can help bring a sense of responsibility for management to allow for innovative work. However, as some of the clients said in the interviews there are barriers which slow down the pace of change in the industry and that the change from a linear construction process into a more circular mindset will take time. Therefore, there is a need for organisations to plan long-term for the future to prepare for upcoming changes and for their implementation.

Most of the interviewed clients work with long-term sustainability goals, with most targeting 2030 based on the UN Sustainable Development Goals. However, many of the client organisations set their business goals with a shorter time-horizon, commonly around four years. For clients to fully adopt a sustainable business model, their business goals should be shaped by their sustainability goals, and therefore it could also be argued that their business strategy should have a similar time-horizon as their sustainability goals. The two state-owned client organisations, who were among those with a structured environmental scanning process, also worked with more long-term strategic goals where both organisations set 12-year strategic plans. In the case of State-owned client 1, the 12-year strategic plan was then used to set the 3-year business goals which should support the 12-year vision, illustrated in Figure 11. The literature also supports that sustainability focused environmental scanning can, and should, be an integral part of long-term strategic planning for sustainability since it is primarily focused on trends and future development (Fabbe‐Costes et al., 2011).

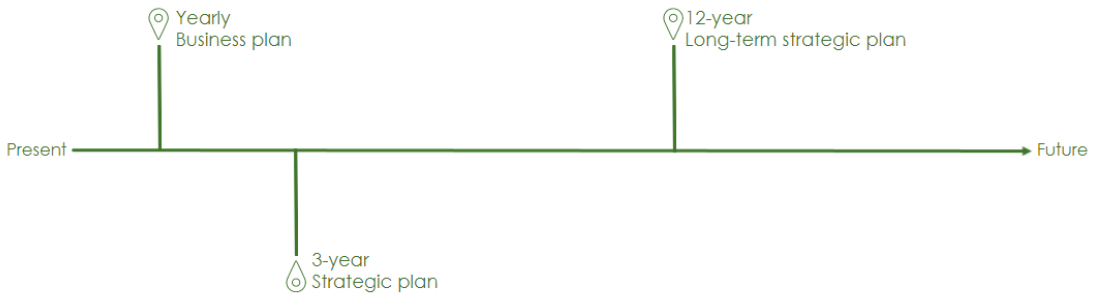

Figure 11: An illustration of the strategic time horizon according to State owned client 1. (Illustration by the authors).

How far into the future the strategic planning goes can also influence the level of trends that should be scanned for in the environmental scanning process. For the long-term plan it is more appropriate to scan for trends which are not changing as frequently as events in the organisation's closest environment. For the yearly planning, topics which are more directly affecting the organisation's business plan should be reviewed. This is presented in Figure 12 where the strategic time horizon is based on how state-owned client 1 works. Fabbe‐Costes et al. (2011) stresses that since the uncertainty in the far future is higher, mega trends, which are usually not changing as much as macro trends, will be more suitable to use for the long-term plan, especially linked to sustainability.

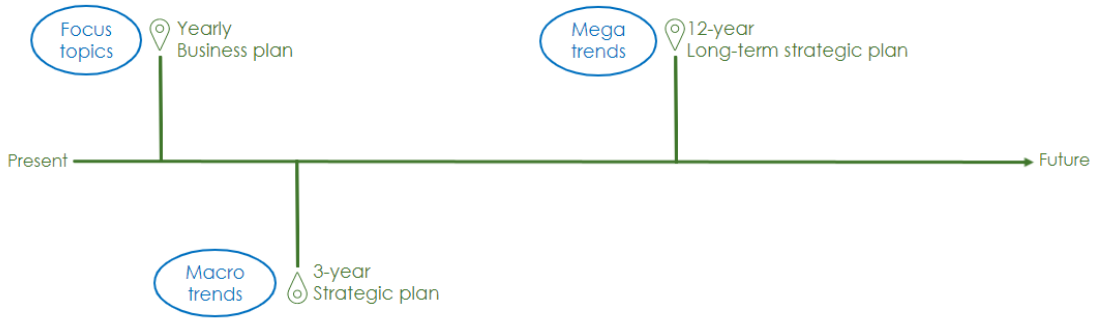

Figure 12: The strategic time horizon linked to the level of environmental scanning. (Illustration by the authors).

The empirical study showed that strategic decisions were primarily taken by the management team, and both the literature and the interviewees agree that they therefore are main recipients of the environmental scanning results. There were however some differences in how information reaches the managers in the different client organisations, with some clients having more formal information channels, while some were less formal. The differences in the client organisations can most likely be due to the different sizes of the organisations, but also because some of the interviewees were members of the management team or had direct connections to the management team through their department manager. Having an established way for sharing information to reach decision makers is essential to have an impact on strategic decision making. However, the formality of the chain of information to management can vary depending on the organisational culture, as long as there is a way for the necessary information to reach decision makers.

5.3 Conditions for environmental scanning in the organisation

From the empirical study, it is possible to identify how construction clients work with environmental scanning linked to their sustainable strategy and how the client organisations differ in terms of performing a more structured scanning or not. Most of the clients, however, argue that they are performing environmental scanning, even if a lack of established processes can be identified. Frankelius (2001) emphasizes that knowledge about environmental scanning is a competence which grows over time. However, all the clients stress that their organisation always has performed environmental scanning, without an established process in place. The reason for this is not concluded from the study but might be either because they do not find it necessary or because they are not aware of the advantages that a more structured environmental scanning process can bring. Anyhow, for clients to succeed with the implementation of such a process, they need to find out why and how it can help their specific organisation as described section 3.2.2.

During the interviews and workshop, several clients mentioned that the scanning is dependent on individuals being interested and aware of sustainability, but there is normally no established process for collecting information. Battilana and Casciaro (2013) further argues that individuals who have major influence in informal networks are beneficial to use as drivers for transformation. The problem with being dependent on individuals is that if they leave, the organisation will lose both knowledge that might not have been spread in the organisation, and their process of driving change. In this way, clients who have a more structured way of performing environmental scanning, involving several levels of the organisation, has an advantage and expose themselves to lower risk.

An aspect which is closely related to being dependent on individuals is that most of the interviewed client organisations perform the environmental scanning without a clear aim and purpose. The individuals performing the monitoring does this without a stated purpose and describe it more as a way of managing their working role. In some organisations it might be enough to collect trends in a more spontaneous manner, but it is still crucial to have a goal with the process. The literature shows that the purpose of setting goals is to understand the needs of the organisation and set the boundaries for the scanning process such as, number of resources, expected outcome etc. The client organisations having a more established process for environmental scanning also have a clear aim where they, for example, link the result of the scanning to their revision of strategy every four year.

As previously discussed, several aspects influence the level of structure of the scanning process in the organisation, where size of the clients is identified as one additional aspect. Commercial property owner 1, which is one of the organisations with the least number of employees in this study (see Table 1), explains that it is easy for them to reach top management since they meet in the hallway several times a week. However, the largest organisation in this study is one of the organisations which has a well-structured process for environmental scanning in place. This might be because the need of a structured process is clearer in a larger organisation. Even so, a clear process for environmental scanning is preferable to not risk missing any crucial steps, but for smaller organisations a more agile approach to the process might work.

5.4 Process of environmental scanning

Section 5.2 discusses that collaborative ways of working can improve innovation and reducing costs. Since environmental scanning sometime is argued to be resource intensive it would be beneficial to use collaboration in already established networks. The empirical study shows that most of the clients already uses networks to gather information and an idea could therefore be to perform more general environmental scanning together in these networks, especially for mega and macro trends in construction that are not specifically linked to one organisation. This could provide a base for organisations in the industry seeking to be aware of the future, at the same time as individual organisations can save resources. However, it is important to note that mega and macro trends still need to be analysed from the perspective of each organisation and a process should be in place for this.

Although the focus of environmental scanning is to discover trends in the external environment of the organisation, both the empirical- and literature study shows that it is important to utilize both internal and external sources of information to scan for trends. Multiple of the interviewees use internal surveys or interviews as a mean of collecting observations of trends in the surroundings of the organisation, and this also acts as a way of involving a multitude of roles in the environmental scanning process. Stoffels (1994) also shows the importance of using both internal and external sources of information, giving examples of both personal, network and written sources.

An additional conclusion from the interview study is that a majority of the interviewed clients are to some extent performing environmental monitoring but lack an established way of analysing the collected information. This is also one of the aspects which distinguishes those who have a more structured process for environmental scanning from those who does not. The interviewed clients also describe a focus on monitoring happenings in their close environment when asked how they interpret the concept environmental scanning. This differs from the definition presented by Choo (1999) (section 3.2.1) where the author emphasizes that the collected trends should be used as a guide for the management team's decision making. The analysis is according to Sköld (2013) and Ridenius (2019) a crucial step which will determine the outcome of the process and facilitate the prioritization of trends for future actions. When clients skip the analysis, they risk missing the benefits with performing environmental scanning and the organisation is left with individuals having more knowledge about the environment without influencing the strategy of the organisation.

The literature suggests several tools for analysing collected information, where SWOT, PEST, Scenario analysis and Porter's five forces are described more in detail in this report (see section 3.2.6). It is however hard to recommend one of the methods since all of them have advantages and disadvantages for different situations. Porter's five forces may seem to be a bit outdated but the benefit with this tool is that it provides an understanding of the market and the forces acting in the market, which is still relevant today. However, the tool has a competitive focus which might conflict with the collaborative way of working which is more common nowadays and something that should be encourage. SWOT is the tool which is most frequently used by the clients today. The clients describe it as an easily applied tool which provides an overview of how trends affect the organisation. This is also how the tool is described by Sköld (2013), Pickton and Wright (1998), but they further highlight the importance of using the result as a base for decision making and not feel satisfied after sorting the

trends. PEST is helpful for sorting trends in different environments and could be used in several steps of the process, both for ensuring collection of information in several dimensions, but also for sorting and analysing already collected trends. However, PEST is not enough as a tool for the complete process of environmental scanning and needs to be combined with prioritization of trends. Scenario analysis was mentioned by the clients as a tool used to predict how their real estate would be affected by climate change. Few of them used it for strategic planning which is more emphasized by the literature.

However, the most crucial aspect when choosing a method for analysis is that it provides an overview of the trends and facilitates the prioritization. Sköld (2013) further highlights the advantages of using already established methods which the organisation is familiar with and incorporating them in the environmental scanning process. Despite the methods for analysis described above, this study identifies a need for construction clients to get support of a complete process for environmental scanning. This is based on the fact that clients currently seem to miss important steps, such as, defining aim and purpose with the scanning and analysing trends, and therefore needs a method which can guide them throughout the complete process.

The clients did in general find it hard to reflect upon what they required from a structured method for environmental scanning, which may be due to that they do not have a clear process today. It was challenging for them to imagine how it may look like. This became clear at the workshop where a method draft was presented which facilitated the discussion and enabled the client's contribution of inputs.

None of the clients had thought of a need for a specific method towards sustainability prior to the interview, but some of them say that they would find it useful when asked about it. One of the clients, which had a more structured process in place, could see that a method aimed at sustainable issues could broaden their knowledge and allow tailored search strings for the specific topic. It is difficult to find clear evidence that there is a need for a specific method with a sustainability focus since none of the clients use environmental scanning for this specific purpose. However, some literature, such as Lesca (2011) and Fabbe‐Costes et al. (2011), have identified that there are certain attributes that should be considered when scanning for sustainability trends. Thus, these authors see a demand for, what Lesca (2011) calls, sustainable development-oriented scanning.

6 The proposed method for environmental scanning

From the literature and empirical study, this study identifies the need for environmental scanning to be approached and implemented as a process which is incorporated with other internal work processes in the organisation. The process should not be seen as a stand-alone one-time project. Both the literature and the empirical study has shown that it is preferable to use existing processes, when possible, to make the implementation (or expansion) of environmental scanning easier to get started with. The empirical study also shows that most of the interviewed clients engage in environmental scanning without clear goals, analysis, or follow-up, and could therefore be seen as unstructured approaches to environmental scanning which does not encompass a complete process. However, a few of the clients approach environmental scanning with a structured process in place, which is also in line with what the literature describes as necessary. Also, the most common already existing methods for environmental scanning (SWOT, PEST, Scenario analysis) are seen as insufficient to be used on their own, as discussed in section 5.3. Therefore, this proposed environmental scanning method will be presented as a process divided into four steps:

- *Internal evaluation*
- *Scanning for trends*
- *Analysis*
- *Decision making and follow-up*

An overview of the complete method can be seen in Figure 13, which can act as a visual aid for construction clients to get an understanding of the environmental scanning process as a whole. Each step has defined inputs, outputs, and guidelines for how it should be implemented. Since each step requires different competences, the following description will also suggest who to include in the different parts of the process. The perspective of sustainability should be considered throughout the process.

Figure 13: Overview of the complete method. (Illustration by the authors).

As discussed in chapter 5, the process of environmental scanning will differ depending on several factors of the organisation such as size, type of client, strategy, and sustainability goals. Also, the project-based context of the construction sector faces some additional challenges, such as information-sharing both vertically and between projects. Since the literature about environmental scanning used in this study is not focusing on the construction sector, the empirical study has been crucial to tailor the method to the needs of construction clients. Additionally, since the goals and purpose of environmental scanning differs between client organisations, the proposed method for will act as guidelines for the organisation using it. It will further provide the organisation with questions and aspects which needs to be dealt with for each step.

6.1 Internal evaluation

The first identified step of environmental scanning is for the organisation to perform an internal evaluation which will guide the organisation to tailor the environmental scanning process according to the business model and sustainability goals of the organisation. The literature highlights the importance of reviewing current scanning practices and to analyse what the goals and purpose of the environmental scanning process should be. This step was identified as insufficient in most of the client organisations, as their scanning efforts were often done without a specified goal in mind. This step of the process should also help the organisation to decide the extent of

the scanning process and the resources available for it. An overview of the internal evaluation is illustrated in Figure 14.

According to the focus group, a half-day workshop should be enough to synthesize the needed output, which is in line with the literature which also proposes a workshop. The format of the internal evaluation can differ depending on the internal experience with workshops in the organisation. The literature suggested brainstorming and SWOT as two options, it is however important to remember that the focus of this session is to evaluate the business model and sustainability goals. For the internal evaluation the first half of SWOT would primarily be used, focusing on internal strength and weaknesses of the business model and sustainability goals.

The focus group also highlighted that the number of people involved in this step should be around five, to allow for different perspectives while keeping the group small enough to make the workshop efficient. Three categories of people are important to involve: someone from management with insight into strategic decision making, someone with sustainability competence, and someone closer to the project and core business. This will give different perspectives on the process which might prove necessary to set a realistic goals and scope for the scanning.

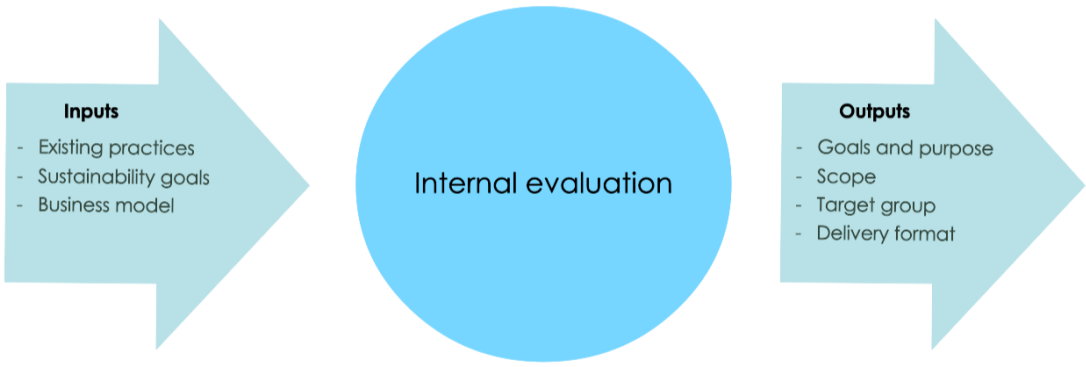

Figure 14: An overview of the first step. (Illustration by the authors).

Inputs

For the organisation to implement the internal evaluation they need to have specific inputs which will be the foundation for decisions taken in this step of the environmental scanning method. The proposed inputs are:

- Existing practices
- Business model
- Sustainability goals

The first input into the internal evaluation is to review the current processes that already are being performed by the organisation, to take advantage of knowledge and processes which are already in place. This could for example be scanning activities, which can be expanded or tweaked to fit within this proposed method. But there can also be other processes which currently are not directly tied to environmental scanning that can be used for the process, such as yearly business plan reviews or monthly department meeting.

Literature shows that environmental scanning should be performed through the lens of the current business model, and for it to take on a sustainability dimension the sustainability goals also needs to be taken into consideration for decisions made. Both the interviewees and the literature saw environmental scanning as a way for the

organisation to stay up to date with external developments, and therefore the business model and sustainability goals act as a framework to evaluate the topics that are relevant for the organisation.

Outputs

The purpose of the internal evaluation is to set the goals and scope of the environmental scanning process by defining and documenting four outputs.

- Goals and purpose
- Scope
- Target group
- Delivery format

The inputs can help determine the ambition of the organisation when it comes to both sustainability and innovation, which also helps guide the goals of the environmental scanning towards topics and trends which will prove to be useful for the organisation. Schaltegger et al. (2011) provide three different levels of ambition for a sustainable business model, which the client organisation may use as a guide for its goals and purpose.

- *Defensive:* Being agile to changing legislation and regulations to lower risk.

- *Accommodative:* Making some changes to the business model towards sustainability, without making major changes to the product, process, or services.

- *Proactive:* Implementing sustainable practices as a core in the business model and defining the business chain according to the sustainability goals.

Similarly, the construction clients can take inspiration from the categories of adaptors presented in section 3.2.5 to identify which level of innovation they aim to scan for. Below are some examples of what information the categories of adaptors can scan for to achieve their ambition of innovativeness:

- *Innovators:* Scanning for weak signals and sustainability trends that has not reached the construction industry, looking at what might happen in the future.

- *Early adopters:* Scanning for emerging sustainability trends which are likely to have an impact on the industry in the upcoming years and are already being implemented by innovative competitors.

- *Early majority:* Looking at trends that some competitors are already acting upon and which are being more commonly talked about in the industry.

- *Late majority:* Scanning for trends that are starting to have a widespread effect and implementation within the construction industry.

- *Laggards:* Looking mainly at what others already have done, and what will be forced upon the organisation through legislation and regulation in the near future.

With these consideration in mind, the client should decide what the goals and purpose of the environmental scanning process should be, as well as how it should be used and

by whom. By documenting the goals and purpose of the scanning process it will also be easier for the organisation to afterwards evaluate the outcomes of the environmental scanning process. To guide the client in this process, four questions are proposed which will help the client deliver the necessary outputs of the internal evaluation.

1. What are the goals and purpose of the environmental scanning process?

This question should help the client to identify why they are doing environmental scanning and what they want to use it for. As seen from the empirical study environmental scanning can be used as a basis for setting the business plan or to increase knowledge, or any other specific use that the organisation finds fitting to support them in achieving their overall business and sustainability goals. It is important to set a targeted use for the process to allow an evaluation of the process to be done afterwards.

2. How much resources will be available for the entire process?

For the goals and purpose to not be unrealistic, the organisation needs to allocate sufficient resources to the scanning process. As shown by both the literature and the empirical study, it is preferable to involve a wide range of members in the organisation. However, it might be necessary to allocate specific tasks or timeframes for members to engage in the scanning process for it to be done and not down prioritized by other work tasks.

3. Who should it be delivered to?

Having an intended recipient of the environmental scanning result can help shape the goals and purpose and the following question about type of delivery. Both the literature and empirical study agreed that most environmental scanning that will be used for strategic decision making is delivered to the management team. However, as this method can be scaled to fit different purposes in an organisation, for example to be used in a project, the recipient of the scanning analysis can change. Thus, this question is tightly connected to the intended use of the environmental scanning process.

4. How should it be delivered?

Finally, the format of the delivery can shift depending on the intended use and recipient of the scanning result. Several interviewees mentioned that scanning results intended for strategic decisions by upper management should be delivered in a short and compact format which will not be overwhelming for the already busy managers. A short slide presentation or report was commonly suggested when asked how the scanning result should be delivered. However, sometimes the scanning result will have a different type of recipient, for example internal newsletters or external publications, which will change the format of the delivery.

6.2 Scanning for trends

When the goals and purpose of the environmental scanning process has been outlined, the organisation should identify scanning topics and start scanning the environment for trends, as explained in Figure 15. As identified, there is a need for the information gathering to be purposeful and with the intention of fulfilling the objectives set out in the previous step.

The empirical study shows that it is common that scanning is performed by enthusiastic individuals in the organisation, while the literature proposed that scanning can be performed by anyone within the organisation. It is preferable to involve a wide variety of roles and individuals in the scanning step of process, both to avoid dependence on enthusiastic individuals and since competences and access to networks are spread among different parts of the organisation. However, it might be necessary to assign responsibility for some scanning topics to certain individuals who are naysayers or resistors to change, as a way of looking at the environment with another perspective than that of the enthusiast.

The scanning activity itself consists of reading and taking part of information from identified sources and evaluating its relevance according to the objectives for the environmental scanning process, for example of sources see Figure 10. There are also software programs which can be used to collect and filter information, but they have not been reviewed as a part of this study. As shown by the literature, it is important to scan for trends actively and continuously and not relying on information to reach the scanner by itself.

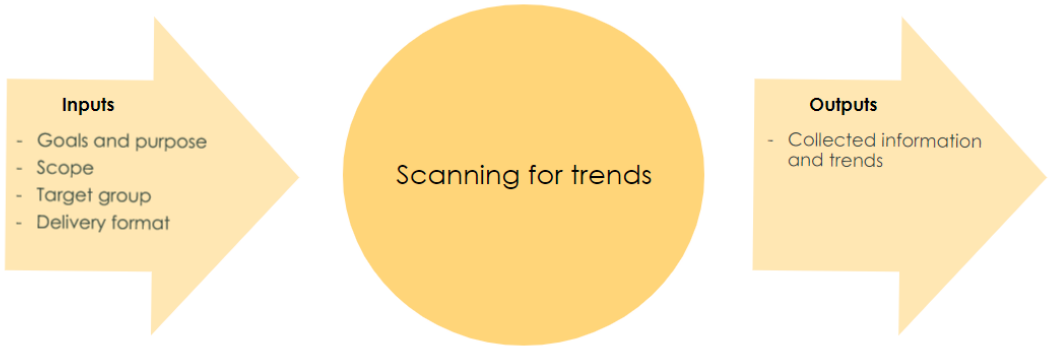

Figure 15: An overview of the second step. (Illustration by the authors).

Inputs

The outputs of the previous step, internal evaluation, are the inputs to this step and will help guide the identification of scanning topics and sources. The inputs for this step are:

- Goals and purpose
- Scope
- Target group
- Delivery format

The most inputs which are in focus in this step are the goals and the scope of the scanning process. The goals will help identify which information is relevant for the objective that the scanning process is trying to achieve. For example, the objective might be to investigate which macro-trends in the construction industry will have the most impact on the sustainability goals of the organisation in the upcoming five years, then the scanning for trends will focus on mega trend reports and related information to those identified trends. The scope fills a similar role since it sets the boundaries both regarding resources and time of the scanning activities. The target group and delivery format are not as important during this stage of the process but will fulfil a purpose in the upcoming steps.

Outputs

The purpose of scanning for trends is to identify sustainability trends in the external environment of the organisation, and to document them for further use in the later steps in the process. The expected output of this step is:

- Collected information and trends

The collected trends should be documented to allow for easier use in the upcoming analysis, but also to make the observer put the trend into words and synthesize it in a way that is short and understandable for decision makers. One way to document trends is to write trend cards, where trends are shortly summarized and prepared to be used for analysis.

The most important aspect of this step is to identify the topics which should be scanned, and to be aware of the environment and the sources which can be used to scan for information regarding the specified topic. Therefore, there are three questions which are intended to guide the clients in their scanning.

1. What are our focus topics?

With the goals and purpose of the scanning effort as guideline, the organisation needs to identify which topics that are relevant. One aspect which can influence the focus topics is the level of information, whether its trends at societal (mega) level, industry (macro) level, or organisational level. When the purpose of the scanning process is to provide a basis for reviewing the long-term strategy, there is a need to look at societal (mega) trends, while if the purpose is to use it for shorter-term business plan the focus should be on trends closer to the organisation. When it comes to scanning for sustainability trends the literature proposed to mainly look at higher levels such as societal and industry trends (Lesca, 2011). The level of topics also depends on the scope and resources of the environmental scanning process as trends at higher levels might take more resources to analyse in the context of the organisation. As discussed in section 5.3, it could be beneficial to perform mega- and macro trend analysis in collaboration with other organisations in the industry.

2. Which sources should be used?

To find trends within the specified focus topics, the scanner needs to use a variety of sources. Which sources should be used depends on the sources available to the organisation, thus it is important for the organisation to be aware of the different existing categories of sources. The interviewed clients without a structured environmental scanning process, focus mainly on networks and people sources, both internal and external, while the clients with a structured process were more frequently using a variety of sources. Continuously evaluating the sources of information is an important step of the process to make sure that the quality of the collected information meets the demand. Reviewing the sources of information is also a way to avoid information overflow, which is an issue that can slow down the process.

For most organisation, a balance between internal and external sources will be needed, and as the empirical study showed, most organisations are already using internal sources in some way. This allows for participation of a wide variety of roles in the organisation and can be done through internal surveys or interviews to gather information. For organisations who currently rely mainly on internal sources it might be necessary to evaluate which external sources that are available to them and how reliable they are.

Another concern when looking for information is to define the environment of the organisation, to evaluate what dimensions of the environment that are relevant to look for information in. The environment can be divided into different dimensions, see section 3.2.4.

3. Is the trend relevant for our organisation?

Although the primary analysis of trends is done in the following step, the scanners need to filter through the information they are consuming to identify if the trends are relevant to the organisation. A trend can be deemed relevant if it is judged to have an impact on the business model or the sustainability goals of the organisation. This first evaluation can be easier for scanners who are knowledgeable of the specific topic, as they might be able to put the observed trend in the context of the company. However, the literature highlights the difficulty and importance of finding a balance between finding relevant trends while still not ignoring weak signals which might have an impact that is not easily detected.

6.3 Analysis

The empirical study identified that most clients today do not analyse the trends and information they have collected. Therefore, this step will highlight the importance of performing an analysis and provide guidelines for clients to do so. The literature stresses that the analysis gives an opportunity to see connections between different trends and link this to how it affects the organisation. This step will also act as a basis for actions taken from the result of the process since the analysis leads to prioritization of trends. An overview of this step is illustrated in Figure 16.

Regardless of what method for analysis chosen, this step should be performed in a group where different perspectives are considered. Most of the analysis methods discussed in the literature recommend a workshop format. The focus group suggested to do the workshop with the same group as when performing the internal evaluation, since competences such as: insight into strategic decision making, sustainability knowledge, and knowledge about the projects and core business are all needed to analyse the trends in a nuanced way. Both literature and the interviewed clients believe that people able to make strategic decisions for the organisation should participate in the analysis since they will get a better understanding of the trends and suggested actions. It is also beneficial to include some additional participants to get some more perspectives, for example the scanners.

Worth noting is that if the organisation lacks resources to do a complex analysis, make it simple and fast rather than skipping it. Trends that have been collected but not analysed will not influence the company’s strategic sustainability work.

Figure 16: An overview of the third step. (Illustration by the authors).

Inputs

For the organisation to carry out the analysis, the output from the previous step, scanning for trends, is needed. The output of the previous step will be the inputs for the analysis.

- Collected information and trends

To do the analysis, all the collected trends that has been evaluated as relevant to the organisation are needed.

Outputs

The purpose of the analysis is to map the different trends and reflect about the trend's impact on the organisation. Furthermore, the trends need to be prioritized for further actions. This step will mainly provide two outputs that needs to be documented.

- Mapping of the collected information
- Prioritization of trends

As discussed in section 5.3 there exist a lot of different tools for analysing and sorting collected trends and information, where the most frequently mentioned in the literature are described more in detail in section 3.2.6. The organisation needs to choose one method for analysis which fits the organisation and their goal and purpose with the environmental scanning. The literature further emphasizes that if there are methods which the organisation is already familiar with, these could be mobilised to save the time and energy to learn new approaches. Stoffels (1994) divides the tools into the categories mapping-, modelling-, and subjective techniques, see section 3.2.7.3. Mapping techniques and subjective techniques will be most useful for analysing trends linked to strategic sustainability work in the construction industry. The mapping techniques can help the organisation to get an overview of the trends and the influence on the organisation. The subjective techniques are according to Stoffels (1994) useful in complex environments, which both sustainability and construction industry are argued to be.

The trends further need to be prioritized for the organisation to know which trends they should focus on and act upon. The literature describes different ways to do this with tools such as tables and diagrams, where some are described in section 3.2.7.3. The organisation can choose how to do this but there are four parameters which are frequently considered in the literature and by the clients who have a more structured process for environmental scanning in place.

1. How does it affect our organisation?

One of the most crucial aspects to consider is how the trend will affect the organisation. A major trend that is affecting the society might be identified, but the organisation needs to evaluate if it will affect their business. Therefore, this question is always relevant for the organisation to consider, both if it will affect the organisation and how so.

2. What is the probability that it will occur?

It is also necessary to reflect upon the probability of the trend to occur. Some outcomes of a trend might be happening in the future, which then is something the group can only make assumptions about. The events that are more probable might need to be incorporated into upcoming business plans, while other trends are worth noting and prepare the organisation for, for example by having an action plan in case it happens.

As mentioned by Rohrbeck and Kum (2018) the organisation needs to find the foresight hotspot, and avoid being too focused on managing happenings far in the future and thereby miss things closer in time. To find the foresight hotspot the specific industry which the organisation is active in needs to be considered. The foresight hotspot is related to the level of environmental scanning the organisation is performing, and the level of scanning that is needed in the construction industry, which is argued to be complex but not having a high innovation rate.

3. How much knowledge do we have about this topic?

The amount of knowledge the organisation has about the trend can also be an aspect which determine if it should be prioritized or not. It might require less resources to investigate a trend which the organisation has a lot of knowledge about and therefore worth focusing on, or the organisation evaluates their knowledge as enough regarding the trend and therefore unnecessarily to act upon.

4. How much resources are needed for us to act?

As touched upon in the previous question, the resources needed can decide if it is possible to act upon a trend or not. The resources that the organisation currently has available will affect how the trends are prioritized.

After performing this step, the organisation should have mapped the trends with the aim of the environmental scanning in mind. They should also have a prioritization which act as a base for decision making in the fourth and last step of the process.

6.4 Decision making and follow-up

This step is the one which will lead to the actions that needs to be taken from the environmental scanning, something the literature highlight as often forgotten. In this step, people who can make strategic decisions need to be included. As described, they should preferably be involved earlier but are at least needed for this step. Additional people should be the ones that have been a part of the process somehow, either as scanners or participants of the analysis. An overview of this step is illustrated in Figure 17.

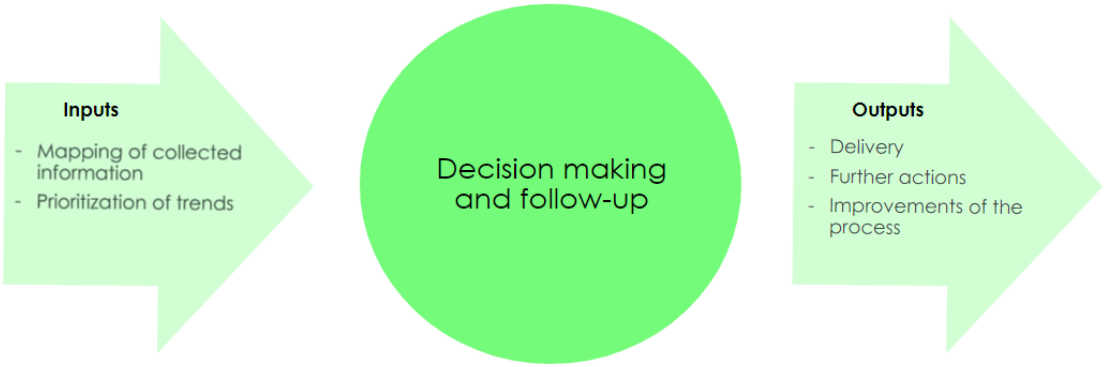

Figure 17: An overview of the fourth step. (Illustration by the authors).

Inputs

The outputs in the previous step are the inputs for decision making and follow-up. These inputs will be the base for the decisions taken in this step and the mapping will work as explanation for decision makers.

- Mapping of collected information
- Prioritization of trends

These inputs will be compiled into what will be the delivery of the process, which will enable decisions for further actions.

Outputs

The purpose of this step is to collect a result of the environmental scanning as well as decide what to do next. As highlighted in the literature, it is not enough to present the result of the process, it should lead to actions. Furthermore, the environmental scanning process should be evaluated, and improvements or changes should be discussed. The outputs of this step are:

- Delivery
- Further actions
- Improvements of the process

How the result of the scanning is compiled depends on decisions taken in the internal evaluation (**Fel! Hittar inte referenskälla.**). The organisation should gather the information according to the agreement. However, the interviewees and the focus group mentioned that it is beneficial to include the background to the decisions. Therefore, the explanation for the prioritization of trends could be included in the conclusion which will further provide the management team with knowledge about the effect on the organisation. The outline of the result will also depend on the targeted group, since the most crucial part is that the message is clear for the group which it is intended for.

The previous step, analysis, will provide the organisation with a prioritization of trends which should be considered and further acted upon. In most cases, it will include some kind of changes that need to be implemented for the organisation to be prepared for the future. The implementation process will consequently transform into theory of change management, which is not directly a part of the environmental scanning process.

As a last part, the environmental scanning process needs to be evaluated and the organisation need to review how the process worked. The following four questions should be considered to evaluate the process.

1. Did we reach our goals?

This is a quite simple question which the organisation needs to evaluate. If they did not reach their goal with the process, they should identify why. If the goals are reached there will most likely be things they have learned which can be brought to future processes.

2. Which trends do we need to scan continuously?

Although this is the last step of the method, it is not the end of the environmental scanning process. Both literature and the focus group highlight that this is a continuous process which will continue with the rest of the business. The trends which have been evaluated as prioritized need to be scanned continuously to find changes or new happenings which might affect the organisation. It is challenging to find changes in trends if the topic is scanned for a shorter time, therefore this is a process that will proceed.

3. Do we need to make any changes in the method?

The last part of the process is to evaluate the environmental scanning process. Gradually, knowledge about environmental scanning will be developed among the participants and the process need to be tailored to fit each specific organisation. The participants will gradually see which formats that work well and which that need to be developed further. Some of the clients who work with environmental scanning today highlighted that the process of changing and improving the method is continuous to fit the goals of the organisation.

As described above, the decision making and follow-up are the last part of the process but not the end of the environmental scanning. The organisation further needs to ask themselves:

4. Where do we continue?

This method is illustrated in a circular process, but the internal evaluation might not be required every time. How frequently the internal evaluation needs to be performed depends on how changeable the organisation is. This was also discussed during the workshop where the participants argued that the first step might be performed every second year, or more frequently if some major changes or events affect the organisation. However, the authors recommend to at least have a shorter discussion about the evaluation to see if changes have been made or not. It is thereafter possible to move forward without risk missing aspects that are affecting the goal and purpose of the process.

6.5 Overview of the method

Each step of the proposed method for environmental scanning towards sustainability has been described in detail in previous sections and is summarized in Table 3. The method is composed based on findings from both literature and the empirical study. Although it has already been mentioned, it is worth to emphasize that the environmental scanning process should not end once the construction client has finalised the decision making and follow-up step. As presented in Figure 13 ,the process should be seen as continuous with built-in improvement efforts to

increasingly fine-tune the process to the needs of the organisation. Since both the environment and the client organisations constantly evolve, every new cycle of environmental scanning should adapt to the new circumstances, just as the organisation tries to adapt to the environment through its use of environmental scanning. This gradual improvement of the environmental scanning process will come both from the evaluation of the process and from the organisational learning of how to perform it.

Table 3: Summary of proposed method for environmental scanning

	What?	**Why?**	**Who?**	**How?**
Internal evaluation	Set aim and purpose and allocate resources	To set tangible objectives which can be evaluated	Manager, sustainability expert, project person	Workshop, approximately 4 hours
Scanning the environment	Identify focus topics and scan the environment	To find sustainability trends which can impact the organisation	Widespread in the organisation, both enthusiasts and naysayers	Continuously over time
Analysis	Analyse collected trends and their effect on the organisation	To map and prioritize the collected trends	A group of people, preferably the same as in internal evaluation	Workshop format or meeting
Decision making and follow-up	Compile delivery, take actions on the results, and evaluate the process	To inform decision makers about the result, make strategic decisions, and evaluate the environmental scanning process	The group performing the scanning and decision makers	Presentation, workshop, or meeting

7 Conclusion and Suggestions

This chapter summarises the main findings from this study and answer the research questions. The aim of the study has been to identify how environmental scanning is currently performed by construction clients and to propose a method for environmental scanning which is adapted to their conditions. The method has been tailored to their needs by combining existing literature about environmental scanning with the insights from construction clients in the empirical study. In addition, further research that is needed within the topic is suggested to cover unanswered questions from the study.

7.1 Environmental scanning today in client organisations

This study shows that there exists a lot of methods for environmental scanning. It does however vary to which degree these methods describe the process of environmental scanning, since some can be interpreted as tools for a specific step of the process and some as complete processes which an organisation can implement. This study further concludes that some of the most frequently mentioned tools for specific steps of the process are SWOT, PEST and Scenario analysis. In addition to these tools, it exists a lot of literature explaining environmental scanning as a whole process, applying the tools in some of the steps. However, this study does not identify any specific method targeting the construction industry or client organisations. The ones performing environmental scanning in the industry today apply general methods for environmental scanning, which are not tailored for construction clients.

Since not much research has been done to determine how construction clients work with environmental scanning today, this perspective of the study mostly relies on the empirical investigations made throughout this work. From the interviews it is possible to understand that only a few client organisations have an established process in place for environmental scanning, and none of these are specifically aimed towards identifying sustainability trends. Further, the clients who have a structured process for scanning include the perspective of sustainability among the other aspects of the environment. All the interviewed clients are however performing environmental monitoring in a more or less structured manner, but most of them do not analyse the collected trends.

Some of the clients who does not express that they actively work with environmental scanning does however have some processes in place for how they collect findings from employees to include in their strategic work. From the empirical study it is further concluded that clients who do not have an established process for scanning are collecting information without a clear goal and purpose, which is closely related to the organisations becoming dependent on enthusiastic individuals performing the scanning.

The empirical study showed that construction clients find it difficult to reflect on their needs from a method for environmental scanning and to specify how it should be designed. Although most of the clients already engage in some form of environmental scanning, they have not reflected about the usefulness of a method directed towards scanning for sustainability trends prior to the interviews. However, some clients state that it could help them focus their scanning efforts and to spread knowledge about sustainability within the organisation.

For the method to be implemented by the clients they request that it should be easily integrated in the existing processes of the organisation. They further request a

possibility to apply the method at different levels in the organisation, from strategic level to project level. To facilitate integration into the organisation the clients see it as beneficial if the method is presented in a short and easily understandable format, with a clear description of the benefits of environmental scanning which could help motivate management of its usefulness.

7.2 Proposed method for construction clients

The proposed method, presented in detail in chapter 6, focuses on a process-oriented approach to environmental scanning which should help construction clients to identify sustainability trends in their external environment. The method aims to provide steps which should guide construction clients towards performing environmental scanning in a more structured way to help them accomplish results which will support their organisational strategic decision making. To incorporate the sustainability focus in the process the client organisations will have to keep their sustainability goals actively integrated in the different steps.

Since the needs of construction clients differ between each organisation, the method will guide the client by defining inputs and outputs for each of the four steps, accompanied by questions which will help the organisation define the output of each step. Therefore, the method will be tailored by the needs and resources of each individual client organisation. The four steps of the proposed method are:

- *Internal evaluation*
- *Scanning for trends*
- *Analysis*
- *Decision making and follow-up*

The method is intended to be incorporated into the existing processes of the organisation and should not be seen a stand-alone process. Therefore, the aim for construction clients should be to incorporate environmental scanning into their core business as a continuous process that evolves over time and supports the sustainable development both in the individual organisation and the construction industry through the client's influence.

7.3 Further research

Since this study has focused on evaluating the current status of environmental scanning in the industry and finding a suitable scanning method for construction clients, there are still some investigations which can be made in the area.

During the study it has been challenging to find evidence of a need for a specific method for environmental scanning which focuses on sustainability. Some authors argue that there are attributes that need to be specifically considered when scanning for sustainability trends. This can however be investigated further to ensure relevance of the proposed method.

There is also a need to quantify the overall advantages with environmental scanning. If it would be possible to clearly show construction clients how an established method will influence their organisation, it would facilitate the argumentation for the use of it. Somehow, they need to understand and believe in the advantages for it to be worth investing in.

Lastly, the proposed method of this study needs to be implemented and evaluated to see if it can bring any value for clients. It could be further investigated how the

method can be applied at different levels of the organisation since clients often work in a project-based environment. This was out of the scope of this study but is needed to show that the method is worth applying.

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8 Appendices

Appendix A: Interview questions

Introduktionsfrågor

- Är det OK att vi spelar in?
- Berätta lite om dig själv och din bakgrund
- Vad är din roll på företaget?
    - Hur länge har du varit på företaget?

Ämnesfrågor

- Vad är omvärldsanalys för dig?
- Gör ni någon skillnad på omvärldsanalys och omvärldsbevakning och i så fall hur?
- Hur bestämmer ni vilka utvecklingsområden ni ska satsa på i organisationen?
    - Hur prioriterar ni dessa?
- Vad styr ert utvecklingsarbete inom hållbarhet på?
- Hur påverkar hållbarhet er affärsmodell eller strategiska mål?
    - Hur syns de strategiska målen i ert dagliga arbete?
- Hur identifierar ni områden där ni spanar efter information?
- Hur fångar ni upp trender och utveckling inom hållbarhet?
- Vilka typer av källor hämtar ni information ifrån?
    - Forskning, statistik, föregångare i branschen, litteratur, personliga nätverk, erfarenheter
- Använder ni någon specifik metod för att genomföra framtidsspaning/ spaning på omvärlden?
    - Tex SWOT, PEST eller icke namngiven metod
- Vad gör ni med de trender/signaler ni fångar upp?
    - Har ni en strukturerad process för att göra det och hur ser den i så fall ut?
    - Delar ni upp informationssökningen i olika dimensioner?
- Vilka personer är involverade i att fånga upp dessa signaler?
- Hur når ni ledningen och beslutsfattande utifrån era trendspaningar?
    - Har ni ett organiserat sätt att föra det vidare till beslutsfattande?
- Om ni skulle ta del av en metod för omvärldsanalys för utveckling av strategiskt arbete inom hållbarhet: Hur skulle du vilja att den var utformad?
    - Hur skulle ni vilja få den presenterad?
    - Vilka resurser får den kräva?
        - Är detta något du tror ni skulle göra internt eller vilja outsourca?
    - På vilken nivå i organisationen tror du den skulle komma till användning?
    - Hur långt in i framtiden tror ni är nödvändigt och intressant för er organisation att spana?
- Har ni upptäckt några trender eller förändringar för sent?
    - Exempel: Lagstiftning
    - Vad hade krävts för att upptäcka det i tid?

- Hur långt fram i tiden sträcker sig ert strategiska arbete?
- Arbetar ni någon gång med att bygga scenarion, och i så fall hur?
- Vilken roll anser du ni byggherrar har för att driva på hållbarhetsarbetet i branschen?
    - Hur kan ni göra det?
    - Vilka verktyg har ni som byggherrar för att göra det?
    - Vilka utmaningar eller barriärer finns för att ni ska kunna driva hållbarhetsarbetet?

Om ni arbetar med det:

- Varför började ni med det?
- Vad är syftet idag?
- Ser du att er metod skulle kunna utvecklas på något sätt?
- Vad har ni fått ut av att arbeta med omvärldsanalys?
- Om er metod är bred och inte riktad mot hållbarhet, hur ser du då att en mer specifik metod skulle kunna vara utformad? Skulle det kunna vara till nytta?
- Hur sammanställs resultatet från er omvärldsanalys?
    - Vilka får ta del av det?
- Med vilket intervall sker omvärldsanalysen?
    - Sker det kontinuerligt?
- Hur mycket resurser kräver er metod?
- Hur påverkar omvärldsanalysen era strategiska beslut?

Om ni inte arbetar med det:

- Varför gör ni i nuläget ingen strukturerad omvärldsanalys?
    - Resurser, ingen vinning, tid
- Vad behövs för att ni skulle börja arbeta strukturerat med omvärldsanalys?
- Hur tror du att en mer strukturerad omvärldsanalys hade kunnat påverka ert hållbara strategiarbete?

Appendix B: Workshop presentation

WORKSHOP 27/4

Metodutveckling av omvärldsanalys

AGENDA

13.00 Dagens upplägg
13.05 Presentationsrunda
13.10 Resultat och slutsatser från intervjuer
13.25 Reflektion och feedback på intervjuer
13.55 Presentation av utkast metod
- Bensträckare

14.10 Workshop kring metoden
- 2 steg
- PAUS
- 2 steg

15.45 Sammanfattning

INTERVJUER RESULTAT

9 st Byggherrar
4 st offentliga och 5 st privata
Hållbarhetschef, hållbarhetsstrateg strateg, projektledare
Bygg och förvaltning, Bygger för att sälja

RESULTAT – BYGGHERRENS INFLYTANDE PÅ HÅLLBARHET

Byggherrar har ett stort ansvar och stora möjligheter att påverka utvecklingen av hållbarhet i byggbranschen

Kravställning är det främsta verktyget för att driva på förändring

Viktigt att ha kunskap och en dialog om vad entreprenören kan leverera, för att kravställningen ska gå att uppfylla

Samarbeten med universitet och finansiering av utveckling – kunskapsspridning i branschen

Den främsta barriären är kostnadsfrågan – en offentlig byggherre nämnde att hållbarhetsinitiativ måste vara ekonomiskt försvarbara

Hållbarhet är ett fokusområde för byggherrarna – några nämner att hållbarhet lönar sig i längden

RESULTAT - STRATEGIARBETE

Det hållbara strategiarbetet sträcker sig vanligtvis till 2030, vissa delar upp strategiarbetet i olika intervall: 1 år, 3 år och 10-12 år. Någon av de som förvaltar har längre perspektiv, 5060 år

De strategiska besluten tas av ledningsgrupp, de offentliga organisationernas strategiarbete förhåller sig mer direkt av politiken

Hållbarhetsarbetet ligger till grund för strategiarbetet i flera organisationer

Väldigt olika beslutsprocesser och hur information når ledningen. I mindre organisationer räcker det med ett mail eller muntlig kommunikation, i andra krävs det mer etablerade processer

RESULTAT - OMVÄRLDSANALYS

En majoritet använder något typ av verktyg så som SWOT, PEST eller Scenarioanalys

3 st har en uttalad process

De allra flesta bevakar omvärlden men få analyserar informationen

Få har ett tydligt syfte, mål och målgrupp

För de som har en mer etablerad process är analysen ofta kopplat till det strategiska arbetet

Den vanligaste källan till information som nämndes var nätverk, vissa pratade även om tidigare genomförda omvärldsanalyser, seminarium och konferenser

I många organisationer är bevakningen individberoende och bygger på att individer själva "tar ansvar" eller intresserar sig

RESULTAT – TANKAR KRING NY METOD

Ingen hade reflekterat över behovet för omvärldsanalys riktat mot det hållbara strategiarbetet

Vissa såg fördelarna med en metod så som mer strukturerad informationsinsamling och mer jämn fördelning av kunskap i organisationen

Metoden behöver vara lätt att integrera i det dagliga arbetet, onödig information ska sållas bort och innehålla detaljerad beskrivning av nödvändiga steg och tidsåtgång

Det är lite olika var i organisationen man tror att omvärldsanalysen behöver ske, allt från ledningsgrupp, till spritt ute i organisationen

REFLEKTION RESULTAT INTERVJUER

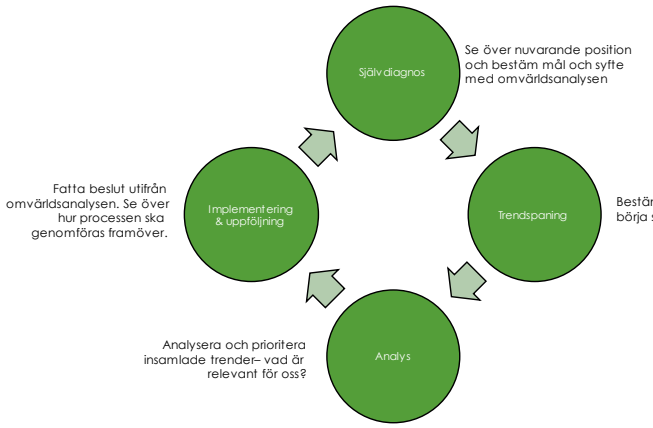
Generella reflektioner kring resultatet

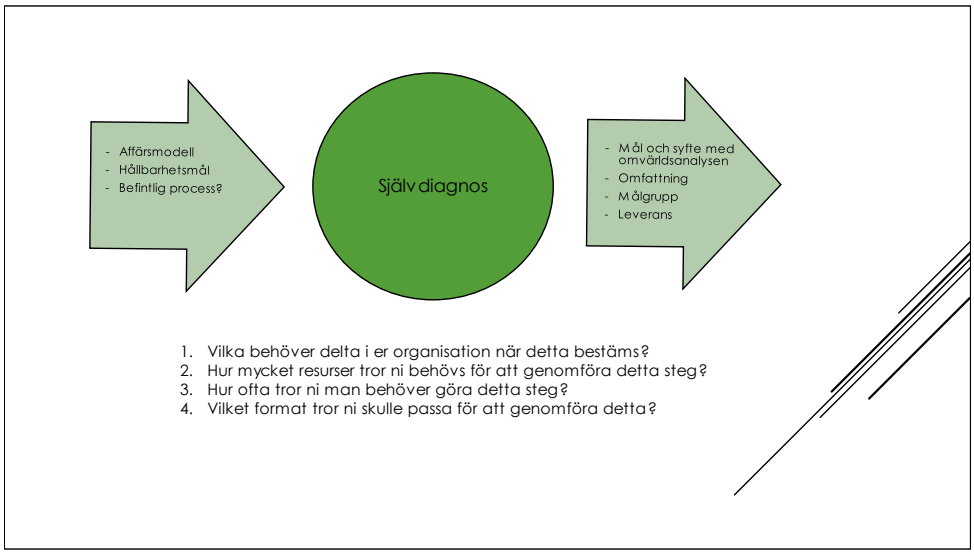
Hur kommer det sig att få strukturerat analyserar omvärlden när alla bevakar?

Varför tror ni vissa säger att kostnad är en barriär för att driva på utvecklingen av hållbarhetsarbetet medan några ser en ekonomisk vinning i det?

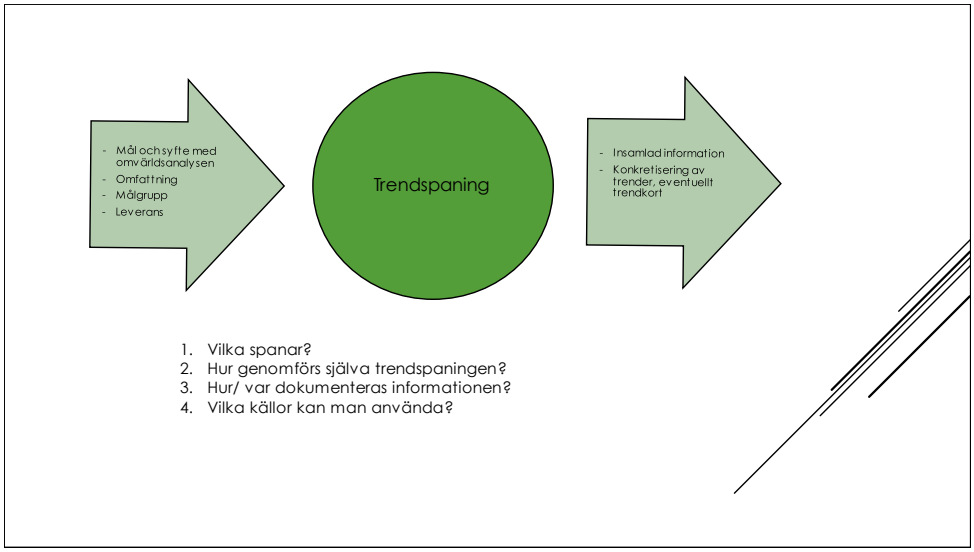
På vilket sätt påverkar byggherrekategorierna det strategiska hållbarhetsarbetet?

VÅR METOD – EN ÖVERBLICK

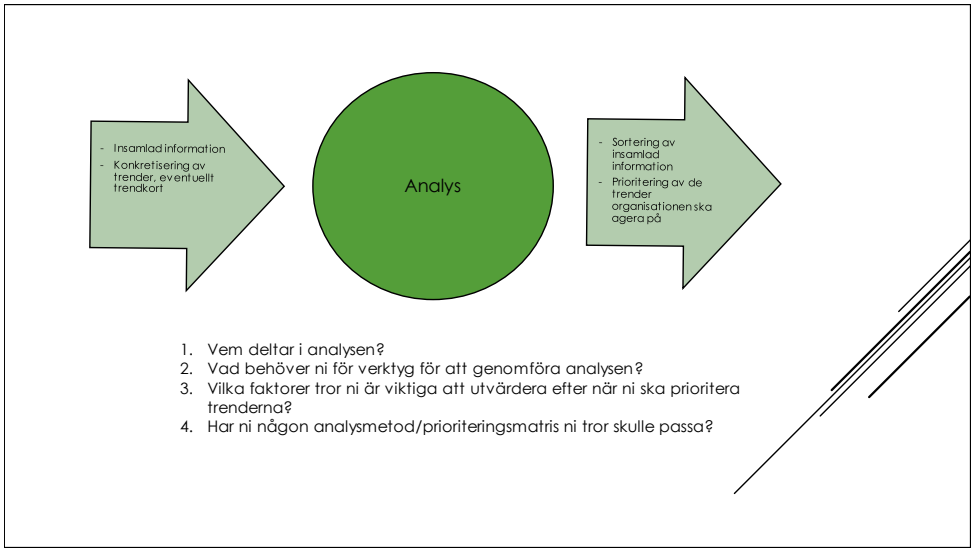




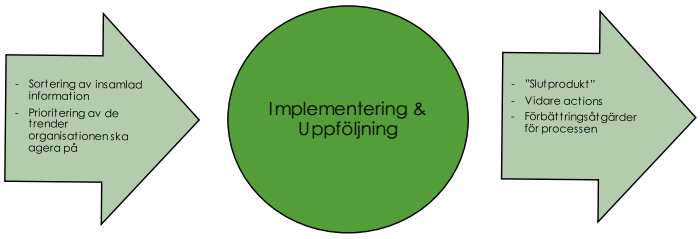
1. Vilka behöver delta i er organisation när detta bestäms?
2. Hur mycket resurser tror ni behövs för att genomföra detta steg?
3. Hur ofta tror ni man behöver göra detta steg?
4. Vilket format tror ni skulle passa för att genomföra detta?



1. Vilka spanar?
2. Hur genomförs själva trendspaningen?
3. Hur/ var dokumenteras informationen?
4. Vilka källor kan man använda?



1. Vem deltar i analysen?
2. Vad behöver ni för verktyg för att genomföra analysen?
3. Vilka faktorer tror ni är viktiga att utvärdera efter när ni ska prioritera trenderna?
4. Har ni någon analysmetod/prioriteringsmatris ni tror skulle passa?



1. Vem sammanställer omvärldsanalysen till mottagare?
2. Hur sammanställs det?
3. Vilka deltar i beslutsprocessen?
4. Hur granskar man processen för utvärdering?

REFLEKTION KRING METOD

Skulle ni kunna tänka er att använda denna typ av metod?
- Varför/ varför inte?

Vad skulle ni behöva för att använda metoden?

Saknar ni något eller ska något tas bort?

DEPARTMENT OF ARCHITECTURE AND CIVIL ENGINEERING
CHALMERS UNIVERSITY OF TECHNOLOGY
Gothenburg, Sweden 2022

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