Together by the Sea: A Value-Sensitive Design Approach to Social Ties on Campus Esbjerg Strand

Master's thesis in Techno-Anthropology

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Abstract

Esbjerg and Southwest Jutland are facing a challenge in keeping and attracting students to the region. Data points to a strong social environment and opportunities for student jobs as the key considerations when young people choose where to study. Campus Esbjerg Strand - a new university campus currently in the planning stages, is a key part of the effort by the region to provide that environment for students. By operationalizing the analytical concept of social ties in a value-sensitive design process, this thesis aims to explore how technologies on Campus Esbjerg Strand can support closer ties among students, as well as between students and local industry. Based on empirical data collected during participant observation and semi-structured interviews, a values hierarchy was constructed, resulting in the specification of norms and design requirements for technologies in common and shared areas of Campus Esbjerg Strand.

Keywords: Value-sensitive design, social ties, higher education, university campus, common areas, values hierarchy

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Introduction

The genesis of this master's thesis was my move to Esbjerg at the end of August of 2024.

Prior to moving here, I had only visited for a very brief moment and had not had a proper chance to get acquainted with the city. I knew very little about Esbjerg, and most of what I did know was based on what I had heard from friends, classmates, and former colleagues when I told them of my plans to move here. The picture painted to me was that of a remote, empty fishing town. What stood out to me immediately was that most people who told me about Esbjerg had never actually been to Esbjerg, which made me question their expertise on the matter. So, when I stepped off the train at Esbjerg station that day, I was determined to make my own conclusions.

Coincidentally, my new apartment was located right at the other end of the main pedestrian street, which starts near the train station. The first section of the street is full of stores, cafes, and restaurants - just like one would expect from a pedestrian street in the center of the largest city of the region. As I walk further away from the main square and closer to the more remote end of the pedestrian street where my apartment is located, the scenery starts to change, as the shops and cafes turn into "For rent" and "Moving out sale" signs. Having lived in multiple other Danish cities before, this seemed unusual to me. Maybe all those people who had never been here were right all along.

I did not have much time to ponder on it because, after a brief stop at the apartment, I was on my way to a job interview. This time, the walk took me through an industrial area by the sea. Seeing the ships, heavy machinery, warehouses, and office buildings throughout the area, it became clear that there is movement in the city, and that the movement is close to the water.

The job interview was with an organization that is helping create more movement in Esbjerg by attracting more young people to study and build their lives here, so, from my first day in Esbjerg, I was involved in tackling the challenges I witnessed on my first day in Esbjerg. I did not yet know at that time, however, that there is a landmark project on the horizon - a new university campus, right next to the water, which will serve as the physical representation of Esbjerg's ambition to become a growing city once again.

Background

Labor and education in Esbjerg and Southwest Jutland

The first impression of Esbjerg as a relatively empty and calm city compared to other cities in Denmark is supported by statistics. While the population of the other biggest cities in Denmark has grown over the last 15 years - Copenhagen by 26%, Aarhus by 24%, Aalborg by 19% and Odense by 12%, in Esbjerg it has stagnated, with the population growing by less than 1% (Danmarks Statistik, 2025). One of the areas affected by a stagnating population is the labor market. Both private companies and public entities in Esbjerg and Southwest Jutland experience a lack of labor across different professional areas, namely IT, teaching, and the healthcare sector (Epinion, 2023). The region has a higher-than-national-average percentage of positions that are filled by applicants who are not qualified for the role, leading to an increased work pressure, delays and loss of revenue (ibid.)

A key reason for the lack of qualified labor in Esbjerg is young people moving away from the region to study. More importantly, only a relatively small percentage of them return after finishing their studies, as evidenced by data that show that less than 20% of young people who have moved out of the region return within 3 years of receiving their master's degrees (Højbjerre Brauer Schultz, 2020). People leave to study and are not returning at a high enough rate to cover the labor needs of the region. One of the ways to combat this trend is to attract young people to move back to the city after they have finished their education. Another way is to provide more attractive opportunities and environment for education locally, giving young people who grew up in the region a reason to stay, as well as attracting young people from other regions in Denmark and from abroad to come study and live here. As the main city of the region, Esbjerg currently offers the most opportunities for higher education, with 6 different educational institutions - University of Southern Denmark (SDU), Aalborg University (AAU), Business Academy SouthWest (EASV), Fredericia Maskinmesterskole (FMS), University College Southern Denmark (UC SYD) and Syddansk Musikkonservatorium (SDMK).

When young people in Southwest Jutland decide where to study, the most important factors in their decision are a good study environment and opportunities for student jobs (Region Syddanmark, 2023). More specifically, opportunities to build social relations with other students is the second most important factor of the social environment young people want to be in when studying (Epinion, 2024). Moreover, the most important professional factor for students is clarity about how the skills they are learning in school are applied in the labor market (ibid.), which requires hands-on opportunities like student jobs, internships, and collaborations with future employers.

Taking action to provide students with a strong and welcoming social environment and good opportunities to apply their skills in the labor market is an important step towards countering the negative labor market and population trends in the region. The local government and industry are acutely aware of the issue, with one organization leading the effort.

Education Esbjerg

This master's thesis project was conducted in collaboration with Education Esbjerg. The following subsection is based on the information available on Education Esbjerg's website (Education Esbjerg, n.d.) and from my own personal experience from working in the organization, where I am employed as a student assistant.

Education Esbjerg (EE) is an organization with the mission to make Esbjerg an attractive city for students. The organization's vision is for more young people to choose to live and study in Esbjerg and its surrounding areas, and for more graduates to look for jobs in the region. EE focuses its efforts on three key areas - supporting the well-being of young people through community, creating a framework for a more direct connection between students and local companies, and offering a digital platform that enables and builds on the first two key areas.

EE organizes free events for students in their efforts to improve student well-being and strengthen the local student community. The variety of events ranges from sports (tickets to local handball, football and ice hockey games) to creative (painting, jam sessions), to more active (yoga, wakeboarding, bouldering, padel tennis), to completely unique experiences (spending a whole day at Lego or catching crabs in the Wadden Sea). The event team actively involves students in the process of planning new events. In addition to organizing events, EE collaborates directly with educational institutions on other initiatives to improve the well-being of young people in the region.

Along with the aforementioned social well-being events, EE organizes events oriented towards helping students navigate the beginning of their professional lives. These include workshops where students are taught how to create a CV and network professionally, as well as initiatives where students and representatives from local companies interact directly. For example, EE organizes a mentorship program, where representatives from local companies mentor local students. Companies that are members of EE and pay a membership fee get access to different initiatives and services that help them attract students. Students can sign up for these initiatives for free.

Most of the events and initiatives that the organisation offers can be signed up for on the organization's digital platform - E.1 Education. The students create a profile and gain access to the events. In addition, member companies can create a profile on the platform, where they can present the company and any open student jobs or collaboration opportunities. The digital branch of EE is currently undergoing significant development, with a new E.1 Education platform releasing in the summer of 2025. It will be possible to integrate and develop new features on the platform over time, providing the necessary digital support for the organization's mission.

The organization is also involved politically, particularly in advocating for more educational programs to be opened in the region. EE is governed by a board which consists of members from the local government, industry and public institutions, meaning that these are the interest groups whose interests the organization represents.

Campus Esbjerg Strand

Apart from the functions discussed in the previous subsection, Education Esbjerg is currently responsible for facilitating the planning, financing, and construction of Campus Esbjerg Strand (CES). In this subsection and later in the thesis, references to a strategic vision concept (Copenhagen Windows, 2024) will be made for details on the CES project. This document was ordered by EE and it is the most complete source on the project, containing the main objectives, interests, challenges, stakeholders, as well as the architectural, design, and technological vision of the project. CES is one part of a larger development project on Esbjerg Strand (E.1 Education, n.d.), which is planned to include apartments, commercial areas, leisure areas, offices and a university campus. The thesis will focus solely on the university campus part of the project.

CES will house three of Esbjerg's higher education institutions - SDU, EASV, and FMS. SDU Esbjerg offers study programs like law, public health, medicine, business administration, and resource management. Both bachelor's and master's programs are offered, with the bachelor's programs being in Danish and most master's programs in English. EASV also offers a wide variety of programs, ranging from business, marketing, and finance to design, web development, and computer science, to more technical educations, like production technologists, building designers, and offshore technicians. Most programs are offered in Danish, but there are some programs available in English as well, like multimedia design and computer science. FMS offers a machine technology (maskinmester) education, which is available only in Danish. Going forward, the terms "educational institutions" and "students" will refer to these three educational institutions and students that are enrolled there.

CES will house all three institutions in one building. This not only enables, but also necessitates that the institutions have areas that are common for all three, areas that are shared between the three, and areas that "belong" to each of the three. Common areas are areas that are accessible to students, faculty, technical staff, visitors, and other members of the campus simultaneously. Although subject to change before the campus is built, current plans include common areas like an entrance area, a canteen, a cafe, staircases, some of the hallways, a library, a reading hall, small kitchens, a fitness center, and some of the open seating areas. Shared areas are areas and facilities that can be used by these same groups, but require some coordination, meaning that the areas might be used by one group for some period of time, after which another group can use them, i.e., they are not available to everyone on campus simultaneously. The plans include shared areas like workshops, tech labs, hybrid work areas, some of the group rooms, and some of the classrooms. The degree to which the institutions will share the area of the campus has not been fully decided yet, but the consensus during the most recent workshops has been that 40-50% of the campus will consist of common and shared areas.

With their involvement in the project, EE aims to incorporate their mission in CES and help make the campus into a place that attracts young people to study in Esbjerg. Findings from the research done for the vision concept echo the statistics presented earlier. Some of the most significant struggles students in Esbjerg face are loneliness and stress due to uncertainty about finding a job after their studies. Students particularly emphasize their need for a larger

professional network with students from other schools and professional areas. The findings also show that local companies want a more direct contact with students, as most of their current interactions are arranged through educational institutions. Companies realize that they need to be more proactive to address their recruiting challenges, but also expect students to take more initiative in reaching out to them. Even with sound arguments and interest for a more direct interaction from both sides, the frames for how much local industry will be involved at CES are still unclear. However, the vision concept emphasizes the need to design the common and shared areas of the campus in a way that supports collaboration with groups outside of the educational institutions.

Currently, an architect bureau - NORD Architects, is preparing a proposal with more concretely defined floor plans, areas, and square meterage, based on the needs of all three educational institutions. This proposal will be used during the next stage of the CES project - fundraising. Due to uncertainty about how long the next stages will take, along with the complexity of receiving the necessary approvals for a project of this scale, it is unclear when the construction of CES will begin or when it is expected to be finished.

Partially due to the early stage and unclear time horizon of the project, there is not a very clear plan for technological design for common and shared areas of CES. Students express the need for a stable Wi-Fi connection and more power outlets on campus. Beyond that, there is an emphasis on using emerging, state-of-the-art technologies, like augmented and virtual reality, but the purpose of these technologies is not clear. Taking into consideration that there are no concrete plans for the technological design of common and shared areas of the campus yet, there is an opportunity for a proactive, anthropology-driven design project (Børsen, 2013), with the aim to design technological artifacts across these areas that will support the needs of the people in the socio-technical environment of Campus Esbjerg Strand.

Problem formulation

So far, I have presented challenges related to the labor market in Esbjerg and Southwest Jutland; the importance of a strong social environment and career opportunities as a way to attract students to Esbjerg; the importance of creating closer ties among students and between students and local industry; Campus Esbjerg Strand as a place that can help accomplish these objectives, and the unclear state of the technological design of common and shared areas of CES. With all that in mind, I commit to answering the following problem statement in this thesis:

How can technologies in common and shared areas of Campus Esbjerg Strand support the creation and strengthening of social ties between students from different educational institutions and study programs, as well as between students and local companies?

As the problem formulation suggests, the concept of social ties will be used to operationalize the social aspects discussed in the background section. Literature on social ties is reviewed in the next section, after which a value-sensitive design is introduced as the design framework for this thesis.

Theoretical framework

Social ties, resources and capital

As introduced earlier, the aim of this thesis is to design for a socio-technical environment on Campus Esbjerg Strand that supports connections among students and between students and local companies. To narrow the analytical focus for the following design process, different concepts from sociological literature will be reviewed and arguments for analytical choices will be made. The terms most often encountered in the review of relevant literature were social ties, social resources and social capital. Authors conceptualize each term slightly differently, and the four terms are by no means exclusive. Differences and similarities between the different terms and conceptualizations will be distinguished as it becomes relevant to narrowing down the analytical focus.

The reviewed literature analyzes social ties and networks in the context of job search, with the main analytical focus being on how the structure of one's social network affects job search outcomes. Although they do not predate literature on social networks, social ties are a good point of departure. Social ties are the links between two people in an interpersonal network, and are most often characterized by their strength, as in Mark Granovetter's seminal work on "weak" ties between social groups being an important factor in finding jobs (Granovetter, 1973). Social ties, in general, and "weak" social ties (colleagues, acquaintances), in particular, are here conceptualized as mechanisms through which people get access to information that is not available among people they have "strong" social ties (close friends, family) with (ibid.). As alluded to earlier, social ties are analytically close to social networks, which are assemblages of social ties of an individual, consisting of both stronger and weaker ties (Burt, 1997).

A different analytical focus is provided by Nan Lin's social resources theory (Lai et al., 1998; Lin, 1999). The difference being that while social ties and networks are the structure through which people are connected socially, social resources are seen as "valued goods" that are embedded in said networks (Lai et al., 1998). Having a social network grants an individual access to shared social resources, which can be mobilized for instrumental actions - "purposeful interactions for achieving a specific goal, like finding a job, buying a house or borrowing money" (Lin et al., 1985, p.248), or expressive actions - actions done for the sake of the interaction itself, which is a type of social support (Lin et al., 1985).

Lin aligns social resources theory with another sociological theory - social capital, stating that "social capital refers primarily to resources accessed in social networks" (Lin, 1999, p.471). Pierre Bourdieu was one of the first to coin the term. He conceptualized social capital as an

individual resource, mobilized through networks, which are maintained through an exchange of gifts, favours and material resources (Tuominen & Haanpää, 2022). A different perspective on social capital is provided by Robert Putnam in his work on how social capital is cultivated (Putnam, 2000). Less focused on specific instrumental actions through which social capital is mobilized, Putnam analyzes the categories and contents of social capital. Perhaps more importantly for the purpose of this thesis, Putnam's social capital consists of social networks, trust, and norms of reciprocity (Helliwell & Putnam, 2004). This widens the analytical lens to include shared norms as the substance with which social capital is produced, reproduced, and mobilized (ibid.).

To further illustrate the relevance of social ties, resources, and capital to the topic of the thesis, the application of the concepts in the areas of career, education, and social well-being will be presented. Most of the core theoreticians of social ties and resources focus primarily on how these can be utilized to find a job, advance one's career and gain a higher social status in the process (Burt, 1997; Granovetter, 1973; Lin, 1999). In these efforts to advance one's career, social ties and resources are analyzed in conjunction with human capital - an individual's knowledge, education, character, work experience and skills (Lin, 1999). Moreover, successful outcomes in job search are most often connected to access and mobilization of weak social ties and bridging social capital through instrumental action (ibid.). The more acquaintances one has, especially from different social groups, the easier it is to find a job and advance one's career.

Studies indicate that access to social capital in education is connected to higher levels of academic achievement, belonging, and student retention. Here, bridging social capital is mobilized in instrumental action to obtain information that helps students navigate their studies and achieve better academic results (Almeida et al., 2021; Mishra, 2020). A larger and denser social network is shown to provide a higher degree of social support, which leads to more positive educational outcomes (Eggens et al., 2008). The primary focus of this thesis is not on educational outcomes, however, doing better at university has an effect on both overall well-being, as well as attaining knowledge and skills that, in conjunction with social resources, help students find work after university. Moreover, higher levels of student retention are important for the overarching goal that the thesis contributes to - attracting and keeping more young people in Esbjerg.

Social capital is shown to be connected to a variety of well-being aspects as well. In relation to social well-being, social capital is shown to play a role in adopting positive social behavior (Iqbal et al., 2024), and all three elements of Putnam's social capital (social networks, social trust, and reciprocity) are connected to higher life satisfaction, happiness and sense of self-worth (Helliwell & Putnam, 2004; Tuominen & Haanpää, 2022). There is also a study showing that social capital that is tied to a physical place can lead to higher perceived safety and a stronger attachment to that physical place (Dallago et al., 2009). This study includes data from Denmark as well, and, even though it is focused on adolescents, the connection between social capital and place attachment is significant when the overarching goal is to retain young people in Esbjerg.

Having reviewed the relevant aspects of literature on social ties, resources and capital, it is now possible to narrow down how an assemblage of these concepts will be operationalized for the purpose of this thesis. The term "social ties" will be used in the thesis, because the aim of the thesis is for such links to be established and strengthened between students from different institutions and study programs, as well as between students and local companies. Considering the current level of interaction between these groups, the focus will be on creating weak ties, however, the process will not explicitly exclude strong ties. Even though social ties is the chosen terminology, the analytical focus will be strengthened with elements from theories on social resources and social capital. Social resources theory contributes to the understanding that social resources, which are embedded in social ties and mobilized through different actions, have value to the people mobilizing them, making the social ties themselves valuable as well. Social capital, particularly Putnam's conceptualization of it, contributes to the understanding that shared norms, like reciprocity, are a part of creating social ties. The additions of value and norms to the analytical understanding of social ties will help position the use of the concept within the framework of value-sensitive design, which will be introduced in the following section.

Value-sensitive design

The socio-technical framing and the design process of this thesis will be based on the tradition of value-sensitive design (VSD). In the following section, the key tenets of VSD, the ways in which this design tradition relates to the thesis, and the different ways in which it will shape it will be introduced.

The emergence of VSD in the early to mid-90s, in the United States, was a result of computing technology becoming more readily available outside elite universities and large companies (Friedman & Hendry, 2019). There started to be more and more contexts in which computational technology was used, so there was a growing need to engage with the social context within the design and engineering process of new technologies. Inspired by work in computer ethics, social informatics, computer-supported cooperative work and participatory design, the founders of VSD - Batya Friedman and Peter Kahn, responded to this need by pioneering an approach that allows engineers and designers to account for and directly engage with values, in the design process (ibid.). How VSD conceptualizes "values" will be introduced in an instance. Friedman and Kahn are from the disciplinary field of human-computer interaction, so it is no surprise that VSD takes an interactional stance on human values in technology:

"values are viewed neither as inscribed into technology (an endogenous theory), nor as simply transmitted by social forces (an exogenous theory). Rather, the interactional position holds that while the features or properties that people design into technologies more readily support certain values and hinder others, the technology's actual use depends on the goals of the people interacting with it" (Friedman et al., 2013, p.73).

People shape technologies and technologies shape human experience and society (Friedman & Hendry, 2019). Given the aim of this project to design within a shared built environment, this

socio-technical framing will be supplemented with an architectural perspective. In architecture, it is recognized that the placement of different elements within a shared space regulates social interaction, meaning that the built environment can either facilitate or restrict social interaction (Shah & Kesan, 2007). This complements the interactional stance of VSD - it is not only the interaction with, but also the placement and other spatial qualities of technologies that will support and hinder the enactment of values of people on Campus Esbjerg Strand. The example of architecture shaping social interaction is important here because social ties are created through social interaction.

Another core tenet of VSD is its focus on identifying relevant stakeholders and involving them in the design process. VSD distinguishes between direct and indirect stakeholders (Friedman & Hendry, 2019). Direct stakeholders either interact with the technology in question directly or have a direct impact on its design, while indirect stakeholders are impacted by the direct stakeholders' use of technology indirectly (ibid.). Each stakeholder group holds some values, and it is assumed that different stakeholder groups will have different values, or at least a different understanding of the same value (ibid.). The focus on different stakeholder groups suits this thesis well for two reasons. First, there are a lot of people involved in a large project like Campus Esbjerg Strand. Identifying, keeping track, and making arguments for inclusion or exclusion of certain stakeholder groups will be beneficial for this thesis. Second, the project is future-oriented, and the campus has not been built yet. The explicit focus on identifying stakeholders will give the project some concreteness, as well as ensure that no groups get overlooked in the conceptual design process.

Values

Having mentioned values a few times already, it is important to define what exactly a "value" is in VSD and how it will be used in this thesis. In short, VSD defines human values as "what is important to people in their lives, with a focus on ethics and morality" (Friedman & Hendry, 2019, p.4). Indeed, VSD has largely focused on ethics, even developing a list of values that are often implicated in technology design, including values like trust, privacy, and autonomy (Friedman et al., 2013, p. 58). However, as the loose definition of human values in VSD suggests, the framework allows for the discovery and definition of values outside of the list, and values that do not have explicit ethical implications:

"in this sense, people find many things of value, both lofty and mundane: their children, friendship, morning tea, education, art, a walk in the woods, nice manners, good science, a wise leader, clean air" (Friedman et al., 2013, p. 57).

It was already discussed in the previous section how social ties can be considered as something that people value. This will be further developed through context-specific conceptual and empirical work, which will be described in more detail in later sections. However, that does not mean that some of the values visible in previous VSD work will not be identified later in the process. If that happens, definitions of these values from VSD literature and other literature will be used to create working definitions for the design process. Context-specific understanding

from empirical data will supplement the existing definitions of both social ties and any other values, as previous work shows that universal values are understood differently in different cultural contexts (Friedman et al., 2008).

Tripartite methodology

To operationalize the previously discussed concepts and categories of VSD, a tripartite methodological framework will be utilized. The framework was conceptualized by the founders of VSD, and this section draws heavily on the work of Freidman and colleagues (Friedman et al., 2013; Friedman & Hendry, 2019). The tripartite methodology integrates conceptual, empirical, and technical investigations in the design process. To illustrate this point, each of the three categories will be described.

The initial stage of conceptual investigations can be viewed as desk research. During this stage, some of the stakeholders are identified, accompanied by educated speculation about what might be important to them. This investigation is informed by project briefs, other existing documents, as well as relevant academic literature. Some values, like project and designer values are identified during this process. Project values are values held by people that have ordered, funded or are steering the project. Designer values are the personal and professional values of the VSD practitioners themselves. Additionally, theoretical frameworks that will guide the subsequent empirical and technical work are established. Throughout the design process, the designer might return to conceptual investigations to find definitions for values discovered through empirical work or to situate findings within the established theoretical frameworks.

As the name implies, empirical investigations consist of the empirical work through which the designers engage with the socio-technical context. New stakeholders might be identified here, especially if the designers are not familiar with the context prior to empirical work. Values held by different stakeholders are identified, defined, and situated in the context where the technology in question is or will be used. Furthermore, tensions between different values and the manner in which stakeholders prioritize values is outlined. Value discovery is likely to take place early in the project, but it is important to not limit it to this stage. It continues throughout the design process, as designers engage with stakeholders in more design-oriented activities, during which new values and tensions might emerge (Flanagan et.al., 2008).

Technical investigations focus on how the technology, and the technical (and in this case also architectural) infrastructure in which it operates, supports or hinders values, and activities that help enact these values. VSD distinguishes between retrospective and proactive technical investigations. Retrospective investigations are focused on existing technology, whereas proactive investigations are focused on designing technologies that support values identified during conceptual and empirical investigations. Given that CES has not been built yet, mostly proactive technical investigations will be used in an effort to design technologies for common and shared areas that support the values of students and representatives of local companies. However, even in proactive technological investigations, it is recommended to conduct at least some retrospective analysis.

As the vague language used in the descriptions above shows, there are no strict boundaries between the three types of investigations and there is no predetermined sequence in which they should be used. There are no specific parts of the design process that need to be informed by a specific type of investigation. Often, practical considerations influence how much designers can rely on what is already known (conceptual and retrospective technical investigations) and what needs to be discovered (empirical investigations and proactive design) (Flanagan et.al., 2008). The tripartite framework informs the methodological choices of this project and helps structure both the analysis and the design process. These will be covered in the next sections of the thesis.

Methodology

Value-sensitive design allows for a certain degree of methodological flexibility, as long as the chosen methods fulfil theoretical commitments of the approach and "make good sense for the particular context, technology and human values" (Friedman & Hendry, 2019, p. 102). In this section, the methods used in this project will be described and justified based on the project design and theoretical framework. The structure of the section is based on the tripartite methodology introduced earlier to highlight how each method fits within the VSD framework.

Conceptual investigations

The methodological considerations of the project started with conceptual investigations, which began as soon as I had the idea for a thesis project about Campus Esbjerg Strand. At this initial stage, the socio-technical context was defined, stakeholders were identified, and project values, designer values and some values that might be held by participants of the project were also identified. Through conversations with people at Education Esbjerg who are involved in the Campus Esbjerg Strand project, I gained an initial understanding of the socio-technical context and the project as a whole. I built on this understanding by familiarising myself with the strategic vision concept (Copenhagen Windows, 2024) described earlier. Although the ideas and descriptions in the vision concept are broad and not set in stone, the document helped me identify relevant stakeholders and provided a basis for inclusion/exclusion criteria for empirical work. Moreover, because the document has a strategic purpose, it highlighted project values held by the stakeholder groups in charge of the project.

Another method of conceptual investigation was engaging with the theoretical literature. The literature included descriptions of norms and actions connected to social ties, resources, and capital, which are likely to be relevant for the value-sensitive design process. Identifying values in strategic documents and academic literature helped me position and make explicit my own values in relation to the design process. The conceptual investigations described here served as a basis for empirical investigations, and I will go into detail about stakeholder groups, arguments for inclusion/exclusion, project values, my own values, and other values in the analysis section.

Empirical investigations

Consisting of primary data collection and analysis, empirical investigations complement and build on the insights gained during the initial conceptual investigations. The empirical investigations for this thesis consisted of participant observation and semi-structured interviews.

Participant observation

The collaboration with Education Esbjerg granted me access to workshops that the architect bureau, NORD Architects, were organizing as a part of their project to create the proposal described in the background section. I participated in two workshops, each lasting 3 hours, during which I conducted participant observation. Along with two architects from NORD who facilitated the workshops, participants consisted of students and teachers from SDU, EASV and FMS, as well as a representative from Education Esbjerg and an external consultant. In total, there were around 35 participants at the first workshop and around 20 at the second. All teachers and students at the workshops were Danish. The purpose of the workshops from NORD's perspective was to discuss the needs of students and professors in Campus Esbjerg Strand, particularly in relation to teaching practices, studying practices, shared and common spaces, and the degree to which the three educational institutions would be willing to share the facilities of the campus. In that sense, the workshops functioned more like focus group discussions, and most of my observations consisted of listening to discussions between students and teachers. The architects used summaries of the discussions at the workshop to create concrete layout scenarios.

Participant observation at these workshops was relevant, because a large portion of the workshops concerned shared and common areas. With representatives from all three educational institutions present, it allowed me to learn about what each stakeholder group, particularly the students, value in relation to shared spaces and the social environment there. Even though the discussions were not specifically about technology, the insights gained from the workshops were still relevant to a VSD-guided design process. The type of participant observation I conducted can best be characterized as being a participating observer (Bernard, 2011) - an outsider who participates in some aspects (listening to presentations, sitting at the same table with participants) of the activity while only recording some other aspects (taking notes on the discussion process, what is being said, not participating in the discussions myself). The data from the workshops consists of my own descriptive and reflective field notes (Schensul & LeCompte, 2013), as well as agendas, visual materials and summaries made and shared by NORD Architects, which provided an expert perspective to field notes about the discussions between students and teachers.

Semi-structured interviews

The empirical investigations continued with semi-structured interviews. Semi-structured interviews were selected as a suitable method to find patterns and themes (Schensul & LeCompte, 2013) related to social ties and the common and shared spaces, and technologies of

Campus Esbjerg Strand (Friedman & Hendry, 2019). Interviews were conducted with the two stakeholder groups that are central to the project and are explicitly named in the problem formulation - university students and local companies. I got help from my colleagues at Education Esbjerg to recruit participants from both groups, as the organization is connected to a vast network of local students and companies. A purposive sampling method (Bernard, 2011) was employed during the recruitment process. With students, the aim was to conduct two interviews with students from each of the three institutions. With students from SDU and EASV the aim was to recruit one Danish and one international student, as it was expected that the important aspects of the social environment and social resources differ significantly between the two groups. Due to practical constraints, I ended up only conducting four interviews with students in total. The sampling criteria were looser for company representatives. Based on Education Esbjerg's prior experience, three companies that have a track record of participating in activities and collaborating with students were selected, and I conducted an interview with an HR representative from each of the three.

The interview guides for each of the stakeholder groups were different, but topics remained similar so that common themes and patterns can emerge (See Appendix A and B for examples of interview guides). Students were asked about the common and shared spaces and technologies on their current campuses, social ties with students from other universities and companies in Esbjerg, and their vision for how technologies on Campus Esbjerg Strand could support these aspects. Representatives from local companies were asked about how they currently interact with local students, the practical considerations of potentially being involved in the social and academic environment of Campus Esbjerg Strand, and how the new campus could support their involvement. The guides were structured with good ethnographic practice in mind. First, the participants were asked a grand-tour question (Spradley, 1979) that opened the interview with a good flow. After that, questions were grouped together in sub-topics and sequenced according to temporality and abstraction, with the more recent events and less abstract questions asked first (Schensul & LeCompte, 2013). Tell-me-more and echo probes were used throughout the interview to elicit detailed descriptions (Bernard, 2011) and "why" probes were occasionally used to uncover values behind certain statements from the informants (Friedman & Hendry, 2019). With the explicit written consent of every participant, the interviews were recorded and transcribed verbatim. These transcriptions, together with the data produced with other empirical methods, served as the foundation for technical investigations.

Coding empirical data

With the methods for collecting empirical data introduced, it is important to touch on how it will be categorized and analyzed. It starts with coding - the process of identifying "small elements in your data that can retain meaning if lifted out of context" (Belk et al., 2012, p. 139). Codes can be words, sentences or even paragraphs, with the main idea of the process being to categorize data into segments that have meaning and relevance to the project, and to assign names to the categories (Belk et al., 2012). Qualitative researchers in ethnographic studies often approach the coding process with the intention of being as unbiased as possible and let codes emerge from

the data. As this is a project with a more specific goal than mapping cultural patterns, I chose not to follow a grounded approach, but instead based my coding strategy on the categories that appear in the problem formulation, the reviewed literature and theoretical framework.

The problem formulation of the thesis contains categories like “technologies in common and shared areas” and outlines the relationship between key stakeholder groups - students and local companies, on Campus Esbjerg Strand. The reviewed literature on social ties, resources, and capital contains norms, activities and other elements of the social environment that support the creation and strengthening of social ties. Literature on value-sensitive design suggests that codes are generated both from previous conceptualizations of the topic and the data itself (Friedman & Hendry, 2019). However, the VSD-inspired codes that emerge from the data are still expected to be under the broader categories of “technology” or “values”. The aforementioned categories created a foundation for the coding process and thematic analysis. Although it is important to first categorize the data and take elements of it out of context, it is just as important to then look at the patterns in which codes appear or do not appear in close proximity in the data. Which values are most often expressed in relation to shared spaces of current university campuses? Which technologies are mentioned together with activities that help create or strengthen social ties? What is the interplay between these values? These relationships between codes will help serve as the basis for the specification of concrete design requirements for common and shared technologies on Campus Esbjerg Strand.

Technical investigations

The technical investigations of this thesis project already started with the previously described participant observation and interviews. There, I learned about technologies in shared and common areas on current university campuses, the preliminary layouts of common and shared areas of Campus Esbjerg Strand, and the visions that different stakeholder groups have for technology on Campus Esbjerg Strand. This is a good example of how the different types of investigations can overlap in VSD. To complement the participants’ accounts of technologies in their campuses, I took tours around the common and shared areas of SDU, FMS, and EASV campuses, wrote notes and took photographs, focusing specifically on the technologies in these areas and the surrounding elements of the built environment. As previously mentioned, instead of an in-depth retrospective analysis, the technical work of this project will mostly consist of proactive design with the aim to support the values identified in conceptual and empirical investigations (Friedman & Hendry, 2019). The current technological setup and the preliminary plans for Campus Esbjerg Strand, which were uncovered during technical investigations, however, complement the proactive design process with already existing technologies and more concrete frames for the built environment that the design artifacts will be used in.

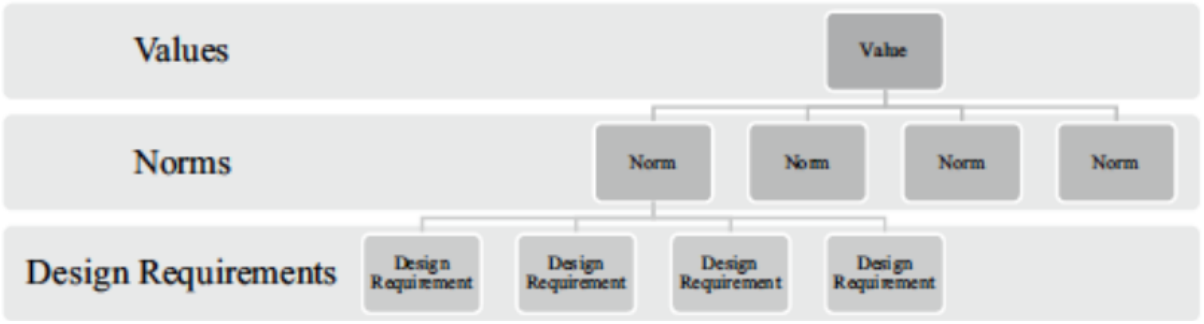
Translating values into design requirements

Up until this point in the thesis, the aim to design shared spaces and technologies that support social ties has been mentioned multiple times, but these descriptions were missing a concrete

plan on how to achieve that. Building on the previous investigations, I use Ibo van de Poel's values hierarchy for VSD, which provides a framework for how to translate values into design requirements (van de Poel, 2013). A values hierarchy consists of three basic levels - values, norms and design requirements (see Figure 1), although each level can contain multiple layers depending on the specifics of the design process. The top level - values, consists of identifying, defining and describing the values present in the design space, which I did during conceptual and empirical investigations. I have already created a working definition of a "value" earlier and I am going to use van de Poel's definition of a "norm" for this framework. Norms are "prescriptions for, and restrictions on, action" (van de Poel, 2013, p. 258), which can be understood as the users' ability to carry out certain general objectives, goals, and capabilities that are related to the corresponding, overarching values. The ability to carry out these norms is the foundation for the design requirements - the lower level of the hierarchy, that the design artifact(s) should possess.

Figure 1

The three basic levels of a values hierarchy (van de Poel, 2013, p. 264)



This process of translation (values -> norms -> design requirements) is referred to as specification, because it adds specificity and context with each step (van de Poel, 2013). Value definitions do not include domain-specific context, norms include some context (who can do what, how, where and at what times), and design requirements include very specific context (specific, distinguishable features of specific technological artifacts). The further I engaged in specification, the more I applied the domain-specific knowledge I gained during conceptual and empirical investigations. The reverse process (design requirements -> norms -> values) is what van de Poel calls design "for the sake of", meaning that already existing design requirements must exist because they support more general norms and values (ibid.). The two approaches are not exclusive. While I expect to mostly conduct specification, there might be explicit mentions of specific norms or design requirements already in the empirical data. These can serve as a starting point for a "for the sake of" analysis, where new values and norms are identified and can be included in the design process.

Some value and norm conflicts might arise during the design process. The first approach used to handle value conflicts in this thesis relies on the assumption that there are multiple ways to specify a value within a values hierarchy (van de Poel, 2015). As conflicts arise, the design space is opened to a re-specification of the clashing values and norms, which can sometimes help

mitigate the conflict (ibid.). In instances where values or norms clash strictly due to technological limitations, it is possible to draw on emerging technologies to mitigate the conflict, as long as it is reasonable to imagine that the emerging technology could be used in a university campus in the near future. This is known as the innovation approach to mitigating value conflicts (ibid.).

The process of creating a values hierarchy will translate general values into semi-specific norms and specific design requirements. The values hierarchy constructed in this thesis differs from most others found in literature, as it will contain design requirements for different technologies across common and shared areas of Campus Esbjerg Stradn, instead of focusing on one technological artifact.

The analysis and the design process

Conceptual investigations

Like mentioned in earlier sections of the thesis, the design process, following value-sensitive design principles, begins when the initial frames of the project are set and negotiated. This early phase has already been partially described in the section on background. A brief review of it will be provided, as well as detailed description of the rest of conceptual investigations.

My conceptual investigations started with the strategic vision concept (Copenhagen Windows, 2024), where I found out which educational institutions were going to be housed in Campus Esbjerg Strand - SDU, EASV, and FMS. Moreover, I learned about the next stages of the CES project. At that point, the next step was for NORD Architects to create a proposal for the layout of the campus, taking in consideration the needs of all three educational institutions, with a particular focus on shared and common areas. The types of shared and common areas and technologies that were going to be on CES were not very concretely defined yet, meaning that both the context of use and technology - two of the suggested starting points for a VSD project, were not suitable as starting points (Friedman et al., 2013).

However, the vision concept included a few explicit project values, as well as preliminary insights about what direct stakeholders, particularly students, value in the context of a new, shared university campus. Project values, which directly reflect Education Esbjerg's values (and by extension - the municipality's and local industry's values), included a closer collaboration between universities and industry, making Esbjerg more attractive to young people and, in general, regional development through transformation. For local businesses, it was important to attract and keep skilled employees in Esbjerg. Student values included mental health, social well-being, success in their studies, and a smooth transition from university to full-time work.

At that point in the process, I chose to focus on interpersonal connections because it was the common thread between some of the values held by different stakeholder groups, particularly students. Interpersonal connections can in and of themselves be valuable, but it seemed like, in this case, it was also a prerequisite or an instrument that supports the previously described

values. Here, it is also appropriate to reflect on my own values, which very directly influenced my decisions during the initial conceptual investigations. Advancing my career is currently very important to me, so it was easy to see value in having more of a local industry presence on Campus Esbjerg Strand, as it can foster connections between students and companies, which can result in better career opportunities. Moreover, being employed by Education Esbjerg makes me biased towards the organization's goals and vision to an extent, so it also made logical sense to support the stated project values.

I then reviewed literature on social ties, resources, and capital to add a theoretical lens to the key value of the project. This particular section of social science literature was chosen due to the instrumental nature in which "the social" was described in the strategic vision concept. Through the literature review, I identified values, norms, and other categories that are connected to social ties, which can be useful later in the design process. This included values like belonging and safety, norms like social support and reciprocity, and categories like instrumental and expressive action.

Stakeholder considerations

VSD has a strong focus on identifying direct and indirect stakeholder groups, involving them in the design process, and supporting their values. However, in this thesis project, beyond conceptual investigations, it was difficult to meaningfully involve all of the previously identified stakeholder groups - Education Esbjerg, Esbjerg municipality, local companies, educational institutions, professors and students, due to time constraints.

Therefore, for empirical investigations, I chose to focus on direct stakeholders, i.e., the groups who will physically present on Campus Esbjerg Strand regularly and use the technologies designed in this thesis project. Given the explicit focus on students and local companies, these direct stakeholders were included in empirical investigations. It is important to highlight once more that the extent to which local companies will be present on Campus Esbjerg Strand was not very clear during conceptual investigations. However, there was an explicit desire for a more direct interaction between students and local companies from all sides. Designing the shared spaces and technologies in a way that supports the needs and values of local businesses is a step towards increasing their presence on Campus Esbjerg Strand.

At this point, there still remained a question about another direct stakeholder group - the professors and teachers of the three educational institutions on Campus Esbjerg Strand. After the initial conceptual investigations, the empirical investigations started with the first workshop held by NORD, in which the teachers were also involved. At the workshop, I learned two things - the professors and teachers were already very well represented in the process of planning the campus, and they mostly talked about how the campus needs to support their current teaching and research practices, not so much the social aspects that are at the core of this thesis. These two factors, combined with the time and resource constraints of the project, lead to a decision to not conduct interviews with teachers and not directly involve them in the design process.

Analysis of empirical data

This section contains descriptions of the main themes from empirical and technical investigations. The themes are the result of the previously described coding process, and all analytical statements in this section are based on the empirical data collected for this thesis, unless otherwise stated. The main themes and sub-themes mostly consist of the categories and codes that were established during conceptual investigations which heavily influenced the manuals for how data was collected. Additionally, there is one key theme that emerged from the data during the coding process.

Common and shared areas

These are the common and shared areas of the current university campuses of SDU, EASV and FMS, as well as some of the new areas that were discussed in the context of Campus Esbjerg Strand.

Common areas of current university campuses include a library, a reading hall, a canteen, cafes, coffee kitchens, hallways, open seating areas adjacent to hallways, student bars, and areas directly outside of the building. CES is expected to have all of these areas as well, with the addition of a common, walkable rooftop area. Shared areas include study rooms, group rooms, some classrooms and some specialized facilities where specialized equipment is available (tech labs, workshops, studios). In addition to these, CES is expected to have a fitness center and hybrid working areas (areas that could be shared by students, teachers, start-ups, local companies etc., as opposed to mostly being shared by students, like the current study rooms).

Students use these areas regularly - before lectures, in-between lectures, after lectures, and on days when they study independently. However, it is not common to use these areas in the afternoons and evenings, at which point the campuses are relatively empty. Company representatives are currently only present in these areas a few times a year, mostly in the larger common areas or classrooms. Overall, company representatives did not emphasise areas of current campuses in their answers, their visits to campuses are much more characterised by the purpose of the visit than by the area in which it takes place.

Common and shared areas in the context of current campuses mean that they are shared by students across different study programs. In the context of CES, they will not only be shared across different study programs, but different institutions as well. The general consensus in the most recent planning workshops was that 40-50% of CES would consist of common and shared areas.

Technologies

In addition to common and shared areas on current university campuses, the technologies currently present and used in these areas were also present in the data.

Digital technologies in common areas include different kinds of monitors. There are large monitors in the hallways for displaying information from the university, monitors in open seating areas and libraries, and small tablets next to entrances of different rooms. Non-digital

technologies in common areas include coffee machines, vending machines, and power outlets, as well as puzzles, Lego bricks, pool tables, and foosball tables.

Shared areas, like the study or group rooms, also have monitors, similar to those in libraries and open seating areas. Different specialized facilities have a wide variety of tech, such as monitors, 3D printers, sound recording equipment, photo and video equipment, VR headsets, and other technologies. I will refer to these as "specialized technologies". Workshops at FMS have machinery and mechanical equipment as well.

LinkedIn - a social media platform for professionals, was often mentioned, not in the context of current or future campuses, but in the context of how social ties are created and strengthened between students and companies, which will be described in more detail in the next session.

Social ties

This section is a description of how social ties are being created and strengthened between students on current campuses, between students from different schools outside of the campuses, and between students and companies. Building on the previously established understanding of social ties as a value, the norms connected to this value are also described.

On current campuses, students walk, sit, eat, play games, have conversations, and otherwise spend time together with other students from the same university - their classmates or friends from other study programs. They also work together on school tasks and projects with their classmates. In addition, students participate in different organizations that are related to their professional area or study direction, whenever these organizations meet on campus. Overall, the data showed that the social environment and student interactions on campus are characterized by three norms. The first norm is the students' ability to select who they socialize with. The second is their ability to feel and see that there are other students present and that the campus is not empty. The third norm is the students' ability to exchange information and collaborate with other students to achieve their academic and professional goals.

First interactions with students from other universities usually happen during events like pub crawls, beer tastings, regional excursions, conferences, networking events, workshops, language classes, and different leisure activities, such as bouldering or wakeboarding. Most of these events are organized by Education Esbjerg. In general, during these events, students exchange some basic information about each other, engage in activities and talk about these activities. These interactions are characterised by external structure - someone else arranges these events and purposefully determines specific topics and activities that the event is going to be centered around. This point is further strengthened by students saying that they rarely meet the people again, unless they interact again at a later event. External structure, in this case, is a type of prescription for action, making it a norm that supports creation and strengthening of social ties between students from different schools. Another norm that emerges here is the ability to participate in the same activity, to share an experience, especially one that is novel or challenging in some way. It is worth noting that the students expressed a desire to have more

interaction with students from other universities, especially with students that study similar programs and are active in the same professional areas.

Students and company representatives also interact mostly at different events - career fairs, case competitions, guest lectures, networking events, mentor events, and tours around the company's facilities. At these events, they exchange information. Company representatives tell students about the company's industry, their expertise, "who they are" as a company, specific projects and tasks they are currently working on, and opportunities for student assistant positions, internships and collaborations. Students ask questions and tell companies about their interests, competencies and professional goals. These events are arranged by universities, professors, and Education Esbjerg, and most of them are explicitly formal and oriented towards professional conversations. There are events that are meant to be less formal, for example, a company-student speed meeting event, but even there the conversation topics are mostly professional. Depending on how the interactions at these events go, the student and the company representative might "connect" on LinkedIn afterwards, where they either continue the conversation about concrete collaboration opportunities, or, at the very least, the student sees the posts that the company representative makes about new opportunities at the company. Similar to students on campus, companies expressed their desire to be selective in which students they establish ties with. Similar to interactions between students from different universities, the creation of social ties between companies and students is characterized by external structure. Company representatives, in particular, emphasized the necessity for the interactions to have a very clear structure and purpose, as it provides companies the opportunity to allocate the necessary resources and represent the company properly. That ability to present yourself is another norm that characterizes interactions between companies and students. This norm is connected to the value of identity - a value that emerged in the empirical data, which is described in the next section.

Identity

Identity emerged as a theme in the empirical data, as both students and company representatives stressed the importance of identity in different ways, in relation to both social ties and Campus Esbjerg Strand in general. Therefore, at this stage, it was deemed necessary to include identity as a value in the design process.

Identity is difficult to define, as the term is commonly used in everyday language and in many professional and academic disciplines, including value-sensitive design, where it is defined as *"people's understanding of who they are over time, embracing both continuity and discontinuity over time"* (Friedman et al., 2013, p. 59). This definition captures individual identity. While there are sub-themes about personal identity in the empirical data, there are also sub-themes about organizational identity, and even the identity of the city of Esbjerg.

To supplement the VSD definition of identity, one of the definitions of identity from the Cambridge Dictionary will be used - *"the fact of being, or feeling that you are, a particular type of person, organization, etc.; the qualities that make a person, organization, etc. different from*

others" (Cambridge, n.d.), expanding the understanding of identity as a value beyond the individual level.

In the context of university life, students spoke about how they derive a part of their identity from the school at which they study, their study program, and from the professional field their study program belongs to. The company representatives emphasized their company's core expertise, their brand, and reputation - all elements of an organization's identity. The identity of Esbjerg and the surrounding region was also a prominent topic, particularly among company representatives. They spoke about the sea, the industrial heritage of the city, the transformation towards greener, emerging offshore industries, and how the new campus could be a representation of it, while simultaneously encapsulating Esbjerg's growing ambitions. This echoes some of the project values - making Esbjerg a more attractive city and overall regional development.

It was outlined in the previous section that, in the data, identity is shown through the ability to present yourself, both for companies and students. In addition, it is about being able to sense the representations of your identity in the surrounding environment, which creates a sense of belonging. The importance of identity and its connection to social ties will become more evident in the next section, where the interplay between the themes is analyzed further.

Recontextualizing the themes

In the previous subsections, themes from the empirical data were analyzed out of context as much as possible. It is now appropriate to analyze the interplay between shared and common areas, technology, social ties, and identity. This analysis will provide important context for the further specification of the values of social ties and identity.

Technologies provide common and shared areas with additional purpose and give students a more reason to go to a specific area. For example, students go to a common area because there is a coffee machine there, they choose to do collaborative schoolwork in a study room because that particular room has a monitor in it, or they go to a workshop or lab because it has specialized equipment there that they otherwise do not have access to. Moreover, technology can direct and instruct people on which areas they need to go to or have access to. This is exemplified by monitors in hallways that display information about what is going on on campus and the small tablets next to some rooms that show if the room is available and allow students to book the room. In this sense, technologies are a part of the built environment, which acts as a regulator of the social environment in this instance (Shah & Kesan, 2007).

Common and shared areas affect the creation and strengthening of social ties in multiple ways. Together with the technologies in them, they regulate how many people can be in a space or have a reason to be there. Broadly speaking, this is how areas and technologies can provide some of the external structure that characterizes social ties between students from different universities and between students and companies. Moreover, if an area and the technologies in the area can attract a lot of students, it can support the sense that there are others present on campus, which is important to students. This is further evidenced by students expressing

frustration when common areas like the canteen or student bar are closed during certain hours of the day or only open on certain days of the week. Administrative restrictions that deny access to areas give students an additional reason to not be on campus at all at certain times. Furthermore, shared areas like study rooms with monitors allow students to collaborate on tasks. This is an example of the interactional relationship between values and technology (Friedman et al., 2013), where social ties (value) are supported through the use of monitors in study rooms, because this interaction allows for collaboration on academic or professional tasks (norm). Outside of the campus, LinkedIn is used to strengthen ties between companies and students. It allows both parties to be selective about who they engage with. For companies, interaction on LinkedIn also saves resources, as it is often not possible nor desired to meet students face-to-face beyond the 3-5 times a year when the previously described events are organized.

The campus' built environment contributes to the students' sense of identity, as students expressed a need for a space that "belongs" to their program, a space that is "just theirs", which they know they can go to any time. A specific example of how technologies in common areas are used to create a sense of identity can be seen on the current FMS campus. There are elements of machinery and other equipment displayed in the hallways of the campus, which highlight the technical education that their students receive at the school. Having your own area with your own technologies also allows you to present yourself better, as evidenced by companies' preference towards welcoming students on their own premises, because that is where, often through industry-specific technologies, they are able to best present their core expertise. Companies are not able to do this on campus, which might be another reason for why they do not currently have a reason to be present on the campus more than the few times a year where they attend career fairs or give presentations. Identity of Esbjerg and the region was mostly mentioned in connection to the aesthetics of Campus Esbjerg Strand, as participants expressed the need for elements of local nature, heritage, industries and ambition to be visible in architecture and design, including in common and shared areas.

Having placed social ties and identity in the spatial and technological context of Campus Esbjerg Strand, it is now time to discuss the interplay between the two values in this specific context. On the one hand, they complement each other. A lot of the activities through which students from different universities could create social ties on CES are connected to their academic and professional interests and thus, their identity. Similarly, the ways in which students and company representatives already build social ties is almost exclusively connected to their shared professional interests, and presenting this part of their identity to the other party. In that sense, supporting the value of identity on CES is also beneficial for creating and strengthening social ties there. On the other hand, there is a clear tension between social ties and identity in relation to the physical space of CES. For social ties to be created in common and shared areas, there need to be areas that are shared between the three schools. At the same time, each school and study program would like a space of their own, a space they identify with. Given that there will be finite space in the building and the fact that it is likely that 40-50% of the campus area will be common and shared between the universities, it might not be possible to have separate areas for

a social environment with students from other schools, and areas that are closely linked only to one's own program. Therein lies the importance of balancing the two values in the design of technologies on CES. If the students (and companies to some extent) do not feel like there is an area that they identify with, they might choose to not spend as much time on CES. If they are not present on the campus, then the efforts to design technologies that support social ties on CES become less effective.

In this section, social ties, identity, and the shape these values take in this specific context has been discussed. Additionally, the norms that support these values and some of the activities through which said norms are carried out have been identified. Finally, the relevant spatial and technological context was described and analyzed, and the importance of balancing social ties and identity in the design of CES was highlighted. These insights will now be used to construct a values hierarchy and specify design requirements for technologies in common and shared areas of CES.

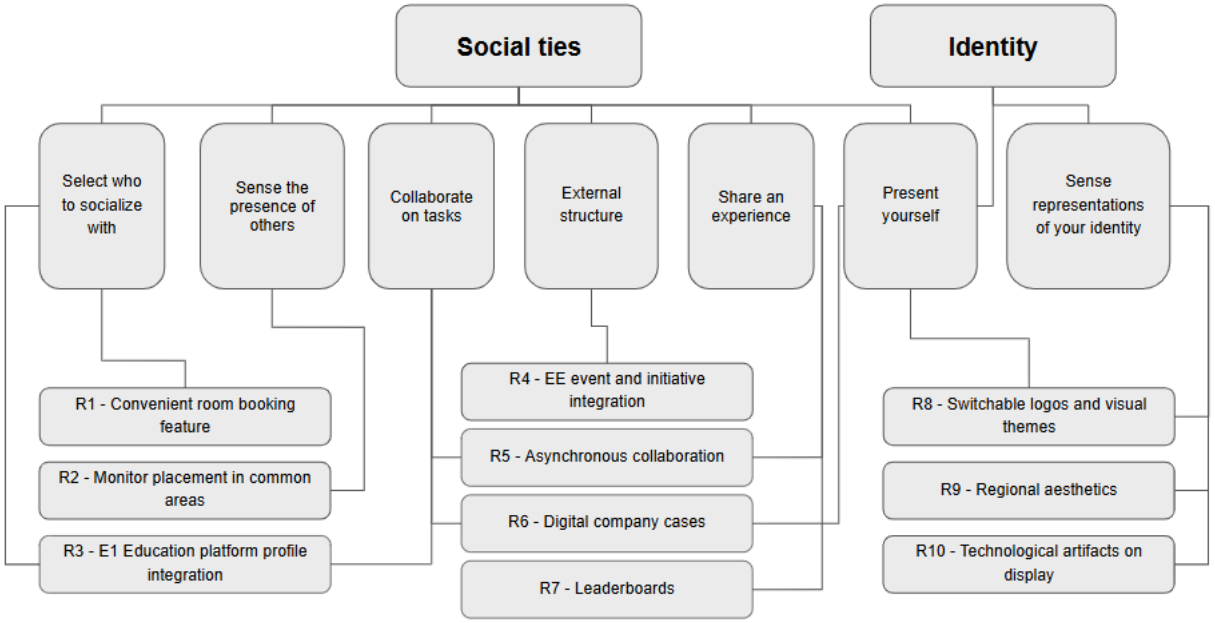
Values hierarchy

Referring to van de Poel's (2013) values hierarchy framework for value-sensitive design, the two top layers of the hierarchy - values and norms, can be filled with the values and norms that were identified and discussed in the previous sections. The highest level - values, contains social ties and identity. The second level - norms, specified from the value of social ties are the abilities to select who to socialize with, sense the presence of others, collaborate on academic and professional tasks, receive external structure, share an experience or a physical activity, and present yourself. The norms specified from the value of identity are the abilities to present yourself and sense representations of your identity in the surrounding environment. With the top two levels filled out, the third level - design requirements, has been specified from the norms (see Figure 2).

In this section, there is a brief description of each requirement and an argument for how it supports the norm from which it was specified. The design requirements are not specified for one specific technology, but include recommendations for design requirements for different technologies across common and shared areas of Campus Esbjerg Strand. Each requirement supports at least one norm, and there are some requirements that support multiple norms. It should be noted the values hierarchy does not contain all features and functionality that the mentioned technologies should have, only the ones that demonstrably support social ties and identity. Moreover, this is not an exhaustive list of requirements, and it is possible to specify more requirements, provided that the conceptual and empirical findings are respected.

Figure 2

Values hierarchy for requirement specification for technologies in common and shared areas on Campus Esbjerg Strand



Design requirements

R1 - Convenient room booking feature

- Norms - select who to socialize with
- Area - hallway and group room
- Technology - tablets in front of each group room, an internal booking system

Some of the shared group rooms can be booked by the students conveniently for being with their classmates, friends, student organization, or other social groups.

R2 - Monitor placement in common areas

- Norms - sense the presence of others
- Area - open sitting/working areas
- Technology - monitors

Open sitting spaces in common areas that have monitors, are placed in close proximity and in a central area of the campus. That way, students that want to stay and work on campus after lecture hours are more likely to be closer to each other. This can be complemented with the placement of vending and coffee machines in the area.

R3 - E.1 Education profile integration

- Norms - select who to socialize with and present yourself
- Area - workshop, tech lab or studio
- Technology - specialized technologies, E.1 Education

Whenever students work on a project or a task using shared, specialized technologies (see R5 and R6 for examples), they can add the case, task, project description, and results to their profile on the E.1 Education platform. Companies can see students' portfolios on the platform, as well as select and contact students for opportunities based on their portfolios.

R4 - Education Esbjerg event and initiative integration

- Norms - external structure
- Area - entrance area or canteen
- Technology - large monitors, QR codes, E.1 Education

Events and other initiatives organized by Education Esbjerg for students and company representatives are promoted. Scanning a QR code that is on the screen takes the user to the sign-up page for the event on the E.1 Education platform.

R5 - Asynchronous collaboration

- Norms - collaborate on academic and professional tasks and share an experience
- Area - workshop, tech lab or studio
- Technology - virtual reality headsets, virtual reality software

Virtual reality headsets with educational software are available to students at a shared workshop. For example, in a virtual reality environment of an offshore platform, students from different relevant programs (machine technology, offshore technician, and environmental and resource management) collaborate on cross-disciplinary projects. The different tasks of a project can be done asynchronously so that students can do them when they are available. Students can see who their co-collaborators are with easy access to their profiles (see R3).

R6 - Digital company cases

- Norms - present yourself and collaborate on academic and professional tasks
- Area - workshop, tech lab or studio
- Technology - specialized technologies

A specialist from a company remotely uploads a real-life case that can be viewed and completed through one of the specialized technologies on campus (compatible with R5). This could, for example, be done on a 3D printer and the connected modelling software. A student or a team of students studying to be production technologists, who use these technologies for their work, solve the case. The company showcases the type of projects they are working on and the students showcase their skills and interests to the company.

R7 - Leaderboards

- Norms - share an experience or physical activity and sense the presence of others
- Area - fitness center
- Technology - treadmill with screen and a digital record system

When the weather is bad and people would rather run indoors rather than outside, they can use the fitness center and register their runs on the treadmill. Other runners can see the run results, the pace and either try to beat others' times or simply who else runs at the same pace as them.

R8 - Switchable logos and visual themes

- Norms - present yourself and sense representations of your identity
- Area - open work spaces, group rooms, classrooms
- Technology - various monitors, an integrated catalogue of logos and visual themes of

When connecting to a monitor, students can select their school's logo from a selection menu. Once a logo is selected, the monitor displays it while in use. Unique logos and visual themes for different study programs and companies can be added to the catalogue and selected as well. When company representatives come to campus for a presentation, lecture or case collaboration, they can select their company's logo. If the area where the activity takes place has more digital technologies (for example, a tech lab), then the visual theme and logo is displayed there as well.

R9 - Regional aesthetics

- Norms - sense representations of your identity
- Area - various
- Technology - the non-interactive parts of various technologies

Visual elements of Esbjerg's identity are incorporated into visual design of various technologies on campus. Particular focus on this should be in areas, where it is not possible to incorporate these elements in the architecture of the campus.

R10 - Technological artifacts on display

- Norms - sense representations of your identity
- Area - hallways, open study spaces
- Technology - artifacts specific to different industries

Technologies that are specific, perhaps historically significant for an industry, are displayed in the common areas in one part of the campus. Like the example from FMS described earlier, but not limited to one educational institution. For example, technical education programs from both FMS and EASV can have an area, where technologies specific to their industry are displayed.

Discussion

Having presented the results of the design process, it is important to discuss the results in the context of the chosen theoretical and methodological frameworks, as well as how theoretical and methodological choices during the design process affected the results.

The analysis, from conceptual investigations to the values hierarchy, shows how technologies in common and shared areas of Campus Esbjerg Strand can help create and strengthen social ties, by supporting certain norms through specific functional, spatial, and visual requirements. This specification process started with the conceptualization and operationalization of social ties as a value. This lent itself well to empirical work, as the value was relatively straightforward to incorporate in guides for interviews and participant observation. It was not difficult for students and company representatives to talk about it, even without a concrete technological focus, like there usually is in a value-oriented semi-structured interview for VSD (Friedman & Hendry, 2019).

However, the subsequent specification from social ties to norms was not as straightforward. For example, contrary to expectations, the norm of reciprocity, which was one of the norms identified during literature review/conceptual investigations as a key component of social capital (Helliwell & Putnam, 2004), did not show up in the empirical data. For that reason, it, and other norms from the literature were not included in the values hierarchy, with more a focus on the norms that emerged from the data. This resulted in the specification of very context-specific norms with definitions that lack detail because they are based solely on the empirical data. Alternatively, reciprocity and other norms could have been included in the values hierarchy and the specification of social ties into norms could have been based solely on literature, as it is common to rely on different academic disciplines when constructing a values hierarchy (van de Poel, 2013). Doing so might have resulted in a more general, transferable layer of norms. In that case, however, it might have still been necessary to supplement the specification of norms with empirical work, as the general norms from sociological literature would be difficult to translate directly to design requirements. Another layer of norms would need to be added to the hierarchy, which is also something that is done by practitioners of the framework (ibid.).

It was previously described why it was reasonable to choose a value as the starting point for this value-sensitive design project. The project could have, however, benefitted from identifying and focusing on multiple values earlier in the process. This is supported by the emergence and inclusion of identity in the values hierarchy, and other themes from the empirical data point to it as well. The most emblematic theme was that neither students nor companies have enough time to be on campus specifically to create the kind of social ties that were the focus of this project. It is reasonable to assume that their time is taken up by other activities that they find value in. For a design project that relies on the presence of direct stakeholders on campus, identifying and incorporating values beyond social ties and university campuses could have improved the results. Students are present on campus to gain new knowledge and skills - things that are valuable to them. The circumstances are different for company representatives, as they do not have many reasons to be on campus. This resulted in the values hierarchy containing relatively few design requirements that support social ties between students and companies in instances when company representatives are actually present on campus.

When introducing the interactional stance of VSD, arguments were made for supplementing it with the perspective of architecture as a regulator of social interaction. The interdisciplinarity of this combination could have been better explored with methods like participatory design walks (Kanstrup et al., 2014). It would have allowed for a more in-depth exploration of the spatial context and led to insights about the movement of students through the campus, areas for social interaction, use of technologies, and provided a means for triangulation of interview data. It would be beneficial to conduct such participatory design walks when CES is finished and inhabited. However, they were not conducted for the purposes of this project, because the results produced from doing them on, for example the SDU Esbjerg campus, might not have been transferable to a much different campus environment, like CES.

Resource allocation during the design process has been an overarching theme in the discussion of the findings of the thesis. It has general implications on value-sensitive design projects, and tripartite methodology can be used to illustrate this point. For this project, a large part of the efforts was allocated to empirical investigations - efforts to create a detailed understanding of how social ties are created between students and companies, with a particular focus on the context of the university campus and the technologies currently used. Empirical work, like participant observation and semi-structured interviews, is resource-intensive due to the time required to design data collection guides, recruit participants, collect data, code it, and analyze it. In a thesis project where time is limited, it requires trade-offs in other areas. As mentioned earlier, instead of empirical investigations of social ties, norms, and the relevant context, a more conceptual, literature-based approach to values, norms, common and shared areas, and technologies used on campus could have been used. Conceptual investigations require less resources, and this trade-off would have left more time for technical investigations, such as value-oriented mock-up and prototyping sessions (Friedman & Hendry, 2019), which would have resulted in the specification of more detailed design requirements than the ones produced in this project.

Future work

Given the large scope and degree of complexity of the Campus Esbjerg Strand project, and the relatively narrow scope and limited resources of this thesis project, there are multiple ways in which the findings would benefit from future work.

Organizational, administrative, and academic tensions between the three educational institutions could potentially hinder how much cross-institutional interaction happens on CES, limiting the unique possibilities a shared university campus presents. Further work in educational management is needed to meaningfully resolve these tensions. Similarly, the involvement of the local industry in CES is highly dependent on how much educational institutions and teachers want them to be involved. There is further work to be done in exploring the academia-industry tension in the context of Esbjerg. The role of academic institutions is, of course, not to serve private interests. However, with changes like the recent reform of master's programs, some programs might consider adopting a more industry-friendly approach.

The design requirements specified in the values hierarchy provide a good foundation for development and implementation of technologies in common and shared areas. It would be best to do so when CES is already built, because it would allow prototyping and testing in the actual, physical context of use. Moreover, due to technological innovation, by the time CES is built, there might be technological solutions available that could further improve the recommended requirements.

Conclusion

Based on the findings presented thus far, it is now possible to answer the problem formulation the thesis set out to answer:

How can technologies in common and shared areas of Campus Esbjerg Strand support the creation and strengthening of social ties between students from different educational institutions and study programs, as well as between students and local companies?

By borrowing from sociological literature to conceptualize social ties as a value, it was possible to position them as the starting point of the design process based on a value-sensitive design process.

In order to better understand the context in which social ties are currently created between students and companies, and to gain insights about the current campus environment, empirical data was collected. The data was thematically analyzed and used to construct a values hierarchy with the purpose of specifying the value of social ties into norms and design requirements. This process resulted in the specification of 2 values (social ties and identity), 7 norms, and 10 design

requirements, ranging from specific monitor placement in open seating areas to asynchronous collaboration on company cases.

The list of values, norms, and requirements presented is not exhaustive, and the thesis discusses theoretical and methodological alternatives that could be deployed to supplement it, as well as other areas of future work that would help ensure that the findings of the thesis have the intended effect. The findings of this thesis are intended to contribute to making Campus Esbjerg Strand a place that provides students with a strong social environment and career opportunities, which will contribute to the overall goal of making Esbjerg a more attractive city for young people.

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