An Architecture based
Collaborative Innovation Network

- Exploring the Possibilities through a Knowledge Perspective
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Executive Summary

I this thesis, I look into how Collaborative Innovative Networks (COINs) could mobilize the architect's knowledge assets. COINs are Web-based collaborating network based on peer production, e.g. like Wikipedia.

The theoretical framework of the thesis is based on the Knowledge Management theorist Max Boisot's information space. I used it to analyse the architect's ontology in a knowledge perspective.

Through an exploratory inquiry of the architect's creative process, my two main objective has been to identity whether the architect can share his/her knowledge in a COIN and also to explore the architect's incentive to share knowledge. I found that the architect's knowledge assets are dominantly tacit and difficult to articulate. As a cost-saving tool the architect uses informal artefacts (e.g. sketches, models etc.) to exchange knowledge with colleagues. These informal artefacts represents fragments of the architect's knowledge assets.

In terms of the architect's incentive to share knowledge, I classified an artistic architect and a practical architect. In relation to the incentive to engage in a COIN, I argued that it was the practical architect that had the biggest incentive. However, due to the tacitness of the architect's knowledge assets, I argued that an architecture based COIN is not without challenges. In order to deal with these challenges, physical meetings with key participants of the COIN could be an option and would help create mutual trust and better collaboration.
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2: Inspiration
At a book launch in March 2009, where the book “Byggeriets Innovation” was published, I was inspired to do the present work. It marked the end of a 4-year project of the same name. Here I became aware of the need for development and innovation in the construction industry in order to cope with the rising global competition. The solution proposed by the project "Byggeriets Innovation" was to endorse long-term cooperative relations across business units throughout the industry in order allocate resources for investment in research and development.

In conversation with Mikkel Thomassen I became aware that one of the reasons for the lack of resources to invest in specific developmental initiatives is the project-based organizational form which is widespread among businesses in the construction industry. This means that every construction project works with a fixed budget and that resources for investment in research and development are rarely allocated. According to Thomassen, one of the consequences is that the employees learn and get specialized through their daily practice, whereas the company organisation appears to be merely a “project hotel” in which knowledge is not institutionalized. Competence and knowledge is therefore primarily embedded in the employees at the individual level rather than at the business level. It was this loss of knowledge integration that caught my attention.

2.1.1: The Architect in the Construction Industry
Since there are many different actors involved in the construction industry, I decided to solely focus on the individual architect in the industry. In conversation with Thomassen, it was my understanding that the architect sees his/her knowledge first and foremost as personal assets and to a lesser degree as assets for the architectural studio. So instead of focussing on the current project-based organization form and its inability to mobilize the architect's knowledge assets, I found it interesting to elucidate the prospects for mobilizing the architect's knowledge assets.

1 Between 2005-2008 the project created 21 development initiatives that were implemented through a coalition of different companies and consultants in the construction industry. The Real Dania Fund covered 50 percent of a total budget of between 80-100 million DKK.
2 The Chief Executive at Byggeriets Innovation was Mikkel Thomassen, who is also author of the book "Byggeriets Innovation".
3 This is primarily due to my interest in management of people who are within the creative industries, which is the basis of my study programme – Management of Creative Business Processes.
assets in a knowledge network that functioned independently of the studio. This ratio became the thesis subject matter.

3: The subject Matter

3.1.1: Collaborative Innovation Networks
The inspiration for an innovative knowledge network came through Peter Gloor and what he describes as Collaborative Innovation Network (COIN). As the name suggests, a COIN consist of collaborating peers who share their knowledge in a network to create changes. The peers collaborate via the Internet, where value creation takes place through mass interaction between the peer members. Unlike the hierarchical-based activity in which decisions are taken by a few peers, a COIN is self-organizing. This means that it is the peers themselves that organise the network through their knowledge contribution and thereby reproduce and stimulate other peer members’ behaviour. In short, the knowledge generated in a COIN is a common good rather than limited to a few owners and the decisions are made by the many, rather than by the few. The common-based production function that a COIN is based on motivates peer members to contribute with their knowledge for free. Examples of COIN's can be seen especially in the software industry where Linux is one of the first COIN's which successfully managed to create competitive products on the market.

Since COIN's are self-organizing, it is not possible to predetermine either the structure of a COIN or its specific purpose and contents. This means that I have had to take a bottom-up perspective based on the individual architect, in order to discuss possibilities for an architecture based COIN. In this context, I considered the architect's creative process to be most relevant for innovation formation via a COIN.

4 Peter A. Gloor is the author of the book “Swarm Creativity” from which I draw my definition for COIN.
5 In 1991 Linus Torvalds initiated a project called the Linux Kernel. The idea was to create a free public operating system. The revolutionary aspect in Linux is linked to its co-development system. Through email correspondence, Linus Torvald mobilised a development team which in 1993 had grown to 100 peer developers and who co-created the Linux operating system without any salary fee. The release of Linux came in 1994 and ever since, more and more developers have contributed to enhance this open source operating system. Over the years open source software has challenged the traditional way of developing software and today Linux is only one out of many open-source products.
4: Thesis Angle

The architect's creative process is characterized by working in a pluralistic domain when it comes to collecting impressions and turning them into an aesthetic and functional expression. Herein lays the architect's value creation. To illustrate this practice, I chose to explore the creative process through a knowledge perspective in which the architect, who can be seen as a knowledge worker, designs a material through his/her creative knowledge. Thus, I see the creative process as an expression of how the architect's knowledge is translated into a concrete value. In a simplified version, one can say that for every construction project the architect performs, new knowledge is accumulated and gradually becomes the knowledge assets for the architect. It is my assumption that the architect's knowledge assets are to be seen as an innovation potential that could benefit the development of the building industry if it is put into play. The challenge is therefore to achieve an understanding of the creative process through a knowledge perspective in which conditions from the architect's knowledge sharing process can be identified and interpreted. Thus it is only possible hereafter to discuss the perspectives for mobilizing the architect's knowledge assets in a COIN. The question is therefore whether it is possible for the architect to create and share knowledge through an Web-based COIN?

Besides exploring the creative process in a knowledge perspective, I also wanted to obtain an understanding of the architect's incentive to share knowledge. It is my assumption that the incentive to share knowledge is related to whether the architect is interested in participating in a COIN. A basic condition for a COIN-collaboration is that peer members actively contribute with and share their knowledge. This means that the architect must be willing to share his/her knowledge freely, without claiming ownership of it. As the architect's knowledge is a personal asset, it is relevant to explore whether there are different types of architects. And the question is therefore whether some architects potentially have a greater incentive to engage in a COIN than others?
5: Research Question
Based on the questions of COIN in a knowledge-sharing context amongst architects, as outlined above, I have come to the following research question:

How can the architect's knowledge assets get mobilised in a COIN?

To answer the research question, I have formulated a set of working questions which will act as a process tool throughout the thesis.

5.1: Process Questions
- What are the characteristics of a COIN and why do they emerge?
- How does the architect create and share knowledge in the creative process?
- What is the architect's incentive to share knowledge and does this incentive vary among architects?

6: Conceptual Clarification

6.1.1: Application of COIN
In the current work I use COIN as an organizational production system. The concept of COIN is defined by Gloor as:

- **Collaborative:** Working together through mass interaction via an ICT\(^6\) platform.
- **Innovation:** The objective of COIN is to create change through innovation.
- **Networks:** A COIN is a social network. The same can be said about a company, but the difference is that a COIN is composed of loosely coupled peer members who work across corporate or business unit boundaries. There is no bound entity in a COIN unlike the company that will typically be defined as a bound entity.

Throughout the thesis I will refer to a COIN as being based on the idea of common-based peer production\(^7\) where all involved peers can participate on equal terms and have common ownership of the value produced.

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\(^6\) Information and Communication Technologies

\(^7\) Common-based peer production indicates that the value created in the community remains a common good. This means that everyone has the right to participate, develop and use the end product created in COIN.
6.1.2: The Architect in the Construction Industry
The architect is defined as a person who works with outlining new construction projects at an architectural studio. This type of architectural work is what I associate with the arch-type of being an architect. There are many other functions that an architect covers and which potentially could have equally rewarding knowledge assets in regard of contributing to a COIN. However, I have only chosen the architects who are directly involved in the creative process.

6.1.3: The Architect's Knowledge Assets
Knowledge assets expresses an expectation that the knowledge within an individual has a value, both for oneself and for the surrounding interaction partners. Therefore the term "knowledge assets" relates to the potential value that the architect can trigger through his participation in a COIN. In short, the human resource which will be the primary input in a COIN.

When I deal with the architect at the individual level, I automatically delimit myself from looking at the knowledge assets that are embedded in the company, i.e. the institutional and cultural assets. The delineation is due to Thomassen's statement, where he mentioned, that the distribution of knowledge assets lie increasingly at the individual level, rather than at the company level. However, a company will always have some sort of knowledge assets in terms of corporate culture, routines through structural processes etc. and these may be regarded as valuable in relation to the performance of a task.

6.1.4: The Architect's Incentive
As mentioned, the architect's knowledge assets are personal assets. So the knowledge exchange and participation must come from own interests. The incentive to engage in a COIN will therefore be individual and contextual, but I think it is relevant to identify what the architect's primary motivation is in relation to creating architecture. By primary motivation I mean the kind of needs that the architect wants to recover through practices. Therefore, I will link the issue of incentives for the individual architect's participation in a COIN, to whether some architects have a greater incentive to participate than others.

8 It is important to point out that I see this assumption as generally applicable when it comes to knowledge.
7: Method
In the following section I will present my method for the thesis. I will begin with my theory of science and explain on what basis I reach my inferences. Hereafter, I will present the thesis process in retrospect and continue to unfold how my inquiry was conducted.

7.1: Theory of Science: Hermeneutics
Hermeneutics has roots in ancient Greece\(^9\) and is about interpreting messages between people in a meaningful way (Fuglsang & Olsen 2004:311). Compared to my inquiry of the architect's creative process, it is in the meeting between me and the architect that sense emerges and conclusions can be drawn. In hermeneutics the interaction between me as the interpreter and the architect's subject matter forms a circular motion, also described as a spiral, since the interpretation is in principle an infinite process. Essential for the hermeneutic approach is that we cannot face the world without prejudice. It is a kind of baggage that is inevitably present so it is important to recognize this and try to challenge it through an open approach to the subject matter.

7.1.1: Hermeneutics as an Analytical Method
Much of the empirical data gathered by studying social relationships are characterized as "meaningful media" that are expressed through acts of oral speech, behaviour, norms and values (Fuglsang & Olsen 2006:338). The architect's empirical data comes from a "horizontal understanding" based on underlying conditions such as upbringing, education, culture, etc., all of which affect my inquiry result. Similarly, my horizontal understanding relates to my background and in relation to the thesis, it is most explicit in terms of my theoretical apparatus\(^10\).

By using the hermeneutic method of analysis, the aim is to gain understanding and meaningful insights from the architect's daily practice in order to obtain new knowledge. By recognizing that I, as an interpreter, am involved in the production of knowledge through conversation and dialogue, the thesis inference is neither universal in a scientific positivist

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\(^9\) The name comes from Hermes, messenger of the gods and therein lies the essence of hermeneutics - to interpret messages.

\(^10\) In chapter 1, I will present my horizontal understanding by the theory apparatus of the thesis.
way, nor purely subjective in a social constructivist way. The truth can never be enforced, it is a spiral-shaped process which I am a part of. In the following I will describe the thesis inference based on the hermeneutic method of analysis.

7.1.2: **Abduction as the Thesis Inference**
In knowledge production there are mainly two distinguished approaches by which scientific conclusions can be reached; deduction and induction. Deductive inferences are based on general principles drawn from individual events, meaning that one has an extensive general knowledge, which is used in an isolated case (Andersen 2002:39). Inductive inferences are based on a single incident that is connected to a principle or a general regularity. Here, empirical evidence helps to connect general knowledge to a theory (Andersen 2002:40). However, there is a third inference called abduction, which I will primarily base this thesis on. Unlike induction, where the classic example explains how one can observed 100 white swans to infer inductively that swans are white, in abductive inferences one will ask why these swans are white. So when using abduction one will have to go behind the phenomenon to look at the underlying mechanisms of this particular phenomenon (Olsen & Pedersen 2003:152). The reason I have chosen the abductive approach is because a COIN is not a current phenomenon in relation to the architect\(^{11}\), but rather a potential opportunity. This means that I base my inquiry of the architect's creative process for obtaining an underlying understanding of the architect in a knowledge perspective. Only then can I discuss the possibility of whether the architect can or will engage in a COIN.

7.1.3: **Abduction and the Hermeneutic Method of Analysis**
Shank and Cunningham\(^{12}\) mention, how the three types of inference have different purposes

“...abduction is the fashion dealing with potentiality, induction is the fashion dealing with actuality and deduction is the fashion dealing with regulation” (Shank & Cunningham 1996: 4). Since abduction means dealing with potentiality, one has to be able to navigate in relation to the phenomenon one investigates. To do so, Shank & Cunningham use the philosopher Charles Sanders Peirce and his semiotic theory of categorization\(^{13}\) to formulate six

\(^{11}\) I have not come across any current COINs among architects during my thesis process.

\(^{12}\) Gary Shank & Donald Cunningham are the authors of the article ”Six modes of Peircean Abduction for Educational Purposes” on which I base my description.

\(^{13}\) I will not go into detail with Peirce's semiotic theory of categorisation - instead, I use Shank & Cunningham's description of it. This means that I use Shank & Cunningham’s version of the concepts and not Peirce's
categorization classes to navigate within, in order to reach abductive inferences. Navigation in these six classes should be seen as a process to achieve insights of a phenomenon through an exploratory approach. Below, I have briefly outlined the classifications (see also Figure 1).

- **1) Hunch**
  This form is characterized by being based on subjective feelings that can lead to a determination of various options in relation to similar observations of a concrete phenomenon. These feelings can then lead to the formation of evidence (Shank & Cunningham 1996: 3).

- **2) Symptom**
  This category deals with identifying symptoms which may form the basis for a more general phenomenon. This type of inference often builds on previously gained experience.

- **3) Metaphor / analogy**
  This form deals with how to use metaphors and analogies to manipulate the similarity of a phenomenon to discover new potential conditions (Shank & Cunningham 1996:3).

- **4) Clue**
  In this form, one has come to a point where the observations are collected into to a more general indication about the phenomenon.

- **5) Diagnosis / Scenario**
  "It is the act of reasoning that also finishes off the detection process by creation of plausible scenarios from the body of clues" (Shank & Cunningham 1996: 4). This deals with the inference based on a diagnosis or a plausible scenario that comes from the clues made in prior findings.

- **6) Explanation**
  In this last type of inference one forms an overall explanation of ones reasoning. It is a sort of proof to summarize ones observations.
"A more concrete way to characterize this type of reasoning is to describe it as reasoning in order to form a general plausible explanation" (Shank & Cunningham 1996: 4).

Shank & Cunningham mention that the concept of abduction is comparable with informal knowledge production that relies on sense-oriented knowledge production. The concept of abduction is a way to infer and provide inferences of phenomena that are not yet rooted in society and thereby cannot be examined deductively or inductively. Therefore, the above six processes must be seen as an informal knowledge production which takes place before more formal science-approaches, such as deduction and induction\textsuperscript{14}, can be made. I see the six abductive inferences like a circular learning process comparable to the hermeneutic method of analysis. To illustrate this, I will review my thesis process as an abductive hermeneutic circle motion in the following.

\begin{figure}[h]
\centering
\includegraphics[width=0.5\textwidth]{hermeneutic_circle.png}
\caption{The hermeneutic circle. The six categorisation classes which form the guidelines for abductive inference.}
\end{figure}

\textbf{7.2: The Thesis Process in Retrospect}

\begin{itemize}
\item \textbf{1) Hunch:}
\end{itemize}

During my conversation with Thomassen, he stressed the need for innovation in the construction industry and that knowledge was embedded on an individual level, rather than on a company level. This resulted in pursuing the goal of mobilizing these individual knowledge

\begin{footnotesize}
\footnote{In Peirce's semiotic theory of categorisation he operates with 10 categorisation classes, where classes 7 to 9 are an inductive way to infer, while number 10 is described as deductive.}
\end{footnotesize}
assets to address the need for innovation.

- **2) Symptom:**
  With a focus on the individual level, I was looking for a production system which was not limited by an overlying dominant structure such as the project-based organisation, but which instead had an individual perspective - leading to the use of COIN as an alternative organisation form.

- **3) Metaphor:**
  The architect was framed in a knowledge perspective to form an understanding and gain new insights about his/her creative process. The conceptual framework was based on my theory apparatus.

- **4) Clues:**
  Through my analysis of the architect, I began to develop a more general understanding of the architect in a knowledge perspective.

- **5) Diagnosis / Scenario:**
  The further analysis and discussion of the potential for mobilizing the architect's knowledge in a COIN was submitted and diagnosed.

- **6) Explanation:**
  At the end, my inferences were summarized in a conclusion. Subsequently, a new circular process could begin, which I have marked by the dotted arrow in Figure 1.

**7.2.1: Critic of the Scientific Method:**
Critics of abduction will argue that one is inclined to confirm opinions and prejudices one had already before the onset of investigation. Since I use the hermeneutic method of analysis the "truth" lies in the conversation and dialogue with my respondent. Therefore, prejudices will always be present and the choices I make can always be criticized. However, in choosing the abductive inference I will not reach any unambiguous conclusion in the thesis, but rather indicate conditions for an architecture based COIN. As suggested in hermeneutics, knowledge production will lead to a spiral shape, where new discoveries will lead to new circular motion by abductive, inductive or deductive inferences. In Chapter 4, I discuss my analysis and point to further investigations which may help to substantiate the informal knowledge production of the thesis.
8: The Inquiry Design
In the following I will present the architect's creative process and how I conducted my inquiry.

8.1.1: The Architect's Creative Process
In my inquiry the aim has been to focus on the practice where the architect's knowledge is deployed in action. The creative process (see Appendix A), displays the creative process as part of a building project. The reason why I only focus on the creative process and not the rest of the building project is because the creative process involves a relatively limited amount of physical factors compared with the projection and implementation stages. And since a COIN works primarily on non-physical resources, such as knowledge, I see it as most relevant to explore the creative process.

8.2: The Qualitative Interview
I have made use of qualitative interviews as the basis for my inquiry. Through qualitative interviews I sought to gain an understanding and insight into what characterizes the creative process, and then interpret the results in relation to the knowledge perspective.

8.2.1: Selection Strategy
To gain access to participants for my interviews proved to be a difficult task without a contact in the industry. Altogether I have contacted more than 30 different architects, but it was only through Thomassen that I obtained contact with the first three interview respondents. The remaining three I found through personal contacts. Fortunately it turned out that the architects I interviewed in the inquiry were highly qualified and met the requirements I had set beforehand. One of the basic requirements was that the participants should have been project managers themselves and should have an extensive knowledge of the conditions in the industry. In addition, they should be interested in telling openly about their experiences in the creative process. Below I have briefly reviewed the respondents.
8.2.2: Short Presentation of the Respondents

**Flemming Overgaard** (Appendix 1): Is today a co-owner of the company Keinicke and Overgaard Architects. Flemming graduated from the School of Architecture in Aarhus in 1992. He has worked as a practicing architect for 10 years and has been the project manager on various projects. He took a Ph.D. at the Center for Sports and Architecture, with the aim to describe how the programming stage functions (see Appendix A). In addition, Flemming teaches at the School of Architecture in Copenhagen.

**Lena Dammand Lund** (Appendix 2): Educated architect, who has been editor of the magazine **ARKITEKTEN**\(^{15}\). Today she is the executive director of SLA, a company focusing on urban spaces, landscape and strategic advice.

**Torben Juul** (Appendix 3): Educated architect from Aarhus in 1989. Has 20 years of experience both abroad and in Denmark. Until recently he had his own department at Arkitema studio, but is now the owner and creative director of the studio 1:1 Architects.

**Erik Juul** (Appendix 4): Graduated as an architect in 1996. Has been editor of the magazine "ARKITEKTEN" and also taught at the School of Architecture in Copenhagen. Today he is self-employed and runs the studio Erik Juul Architect, a smaller studio with competences within planning, design, communication and building processes.

**Søren Aagaard** (Appendix 5): Educated architect from Aarhus and project manager at the studio CF. Møller in Copenhagen, where he works with the design, sketching, and coordination of competitions.

**Tina Saaby** (Appendix 6): Graduated as an architect in 1997. Today she is a partner at the studio WITRAZ. She has 10 years of experience in sketching, design and the daily management of a studio.

The selected respondents all represent architects who have experience with the creative

\(^{15}\) ARKITEKTEN is a magazine for members of the “Akademisk Arkitektforening” and “Arkitektforbundet” and is Scandinavia's largest and oldest architectural magazine.
process and therefore they all had equal importance for my understanding of the subject matter. Flemming Overgaard was familiar with much of my theoretical apparatus, and therefore much of the knowledge production in the interview with him was directly related to my theory. Furthermore, much of my understanding of the architect's creative process in a knowledge perspective was founded during this interview. Therefore I will describe this interview with Flemming Overgaard as an "expert" interview.

8.2.3: The Semi-Structured Interview

All interviews were conducted at the individual architect's studio and had a duration of approximately one hour. Subsequently, I made a summary report which can be found in Appendixes 1-6. I used the semi-structured interview form to provide the qualitative empirical data. This meant that the interview was conducted on the basis of a structured question guide based on my theoretical apparatus to ensure that the various themes were included. The question guide was split up in themes that were presented to the respondents before the interview began. The hallmark of this phase was that I presented my horizontal understanding of the context to open up for a dialogue with the participants.

It was obvious that there was a different degree of merging of the participant's horizontal understanding and mine. The reason may be that I had not sent the question guide beforehand, but briefly informed them about the thesis focus by email. This approach was perhaps not the best procedure since I, in some cases, experienced difficulty in understanding each other during the interview. In retrospect, better communication may have given a clearer starting point. However, in other interviews, I sensed a clear convergence between the architect and me and in these cases the dialogue was very rewarding. It was during these interviews that I so to speak came "deeper into the core" of the opinions that existed on the different themes. Overall, the production of knowledge in the conducted interviews was somewhat non-homogeneous in size, although large parts of the content had a number of common traits.

9: Application of Theory in the Thesis and Chapter Overview

In the following section I will briefly point to the most influential theorists and how I have applied them in the thesis. The section will also serve as a chapter overview.
Chapter 1: The theoretical frame
To analyze the architect's creative process through a knowledge perspective, I have used different Knowledge Management theorist. Max Boisot\textsuperscript{16} is the main theorist of the thesis and I use his conceptual frame, Information Space (I-space), as my main interpretive tool. However, I found it necessary to adapt the I-space model to answer the thesis research question. I have used Phillipe Baumard\textsuperscript{17} and Bent Flyvbjerg\textsuperscript{18} to describe four different knowledge types: episteme, techne, phronesis and mètis. The purpose is to give a more nuanced description of what knowledge is. By placing the four types in I-space, they will serve as navigation points and be related to my analysis of the architects' creative process in chapter three. Additionally I have included David Snowden\textsuperscript{19} and his theory on how sense is made in social contexts. I will use Snowden to identify how sense is made through knowledge exchanges in the architect's creative process. Since Snowden's theory can to a large extent descend from Boisot I will implement it in the I-space model as a further development of the theoretical framework. Overall, chapter one presents the theoretical framework that I will use throughout the thesis.

Chapter 2: COIN – a new Production System
To get an understanding of the characteristics of a COIN I use Peter Gloor\textsuperscript{20}. In addition, I use Yochai Benkler\textsuperscript{21} to explain why a COIN emerges based on transaction cost theory. Since my starting point is a knowledge perspective, I will interpret Benkler's theory through Boisot's I-space model in order to illustrate the advantages and implications with a COIN. The aim is to place COIN in I-space and thereby be able to discuss the prospects of an architectural based COIN in chapter four.

\textsuperscript{16} Knowledge Management theorist and author of the book *Knowledge Assets* and *Explorations in Information space*. Both books have been use extensively throughout the thesis.
\textsuperscript{17} Philippe Baumard is a Knowledge Management theorist that presents four types of knowledge that an organisation should recognise when it comes to Knowledge Management. These are: episteme, techne, phronesis and mètis, all of which comes from classical Greek philosophers.
\textsuperscript{18} Bent Flyvbjerg a social scientist and author of the book "Rationality and Power" where he describes the concepts of episteme, techne and phronesis.
\textsuperscript{19} David Snowden is a Knowledge Management theorist and Founder and Chief Scientific Officer of Cognitive Edge, which focuses on the development of the theory and practice of sense making.
\textsuperscript{20} Peter Gloor is a researcher in Computer Science, who has explored web-based collaborations based on the principles of peer production.
\textsuperscript{21} Yochai Benkler is a law professor and is author of the book “Wealth of Networks” where he has described the benefits of Web-based collaboration networks.
Chapter 3: The Architect in a Knowledge Perspective

In the analysis I will review and analyse my empirical data through my theoretical framework (I-space). The aim is to interpret the creative process in a knowledge perspective. This means that I will identify the type of knowledge an architect seeks, how sense is made in the process and finally summarize the process by placing it in I-space. Hereby my analysis will serve as a basis for the discussion in chapter four in relation to COIN.

Besides identifying the architect's creative process in a knowledge perspective, the inquiry also seeks to shed light on the architect's incentive for sharing knowledge. Therefore I have included Axel Honneth's\textsuperscript{22} theory of recognition to explore the need for recognition among architects. It is my argument that Honneth's theory is a general theory, which can be used to elucidate the recognition patterns among architects. The aim is to look at the need for recognition as a motivation to share knowledge. To explore whether these needs for recognition are homogeneous among architects I will draw on Niels Albertsen's\textsuperscript{23} distinction between an artistic architect and a practical architect. Based on my own investigation and Albert's classification I will use the theoretical framework to explain whether there are differences in the incentives for knowledge sharing between the two classifications.

Chapter 4: Discussion of the prospects for an architecture based COIN

In the last chapter I will use the findings in chapter two and three to discuss the prospects for mobilizing the architect's knowledge assets in a COIN. The discussion will be split up in two parts. Firstly, the possibility for the architect to create and share knowledge via a COIN will be discussed and secondly, the incentive for the architect to participate. The discussion will lead to the final conclusion of the thesis.

10: Chapter 1: The Theory Framework

The purpose of chapter one is to present the interpretative framework that I have used in my approach to the architect. The framework is based on Max Boisot's conceptual information

\textsuperscript{22} Axel Honneth is philosopher who published his masterpiece: "The struggle for Recognition - The Moral Grammar of Social Conflicts".

\textsuperscript{23} Niels Albertsen is a sociologist who has studied how the architectural field can be identified. Albertsen mention how his presentation of the architectural field, builds on heuristics based on Pierre Bourdieu, his own understanding and other theoreticians' understanding of architecture and the architectural ontology (Albertsen 1992:137).
space (I-space), which has its origin in the Knowledge Management discipline. Therefore the chapter begins with a brief presentation of the discipline and continues with a broader presentation of Boisot's theory.

10.1: **What is Knowledge Management?**

In the Knowledge Management discipline the objective is to identify, understand and manage knowledge processes in an organization. In a historical view, Michael Polanyi was the first to make a distinction between explicit and tacit knowledge in 1974. He argued that we know much more than we can articulate. Explicit knowledge refers to knowledge that we can codify and transfer opposite tacit knowledge, which is personal and difficult to convey and articulate. I 1995 Nonaka & Takeuchi presented the article "The Knowledge Creating Company", which stands as a hallmark within the Knowledge Management theory. Through their SECI-model they argued that knowledge can change through social interaction within the organisation and between explicit and tacit knowledge through four processes: Socialization, Externalisation/Articulation, Combination and Internalization (see Figure 2).

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24 A distinction is often made between the knowledge embedded in the organization (through practices and processes) and the knowledge embedded in the individual. The starting point for this thesis is to look at the knowledge embedded in individuals, since my focus lies in the individual architect's knowledge assets, rather than the knowledge which lies within the organization.

25 Michael Polanyi is a polymath and philosopher. He did not use the term tacit knowledge, instead he used the term tacit knowing which he referred to as things we are conscious about, but which we cannot make explicit (A. Bordum 2005:19).

26 Nonaka og Takeuchi, two Japanese Knowledge Management theorists.

27 "The Knowledge Creating Company" is the most cited article in knowledge management theory (Serenko & Bontis: 2004: 194).
Figure 2: The SECI-model Knowledge can be moved through four processes: Socialization: exchange of experiences whereby personal knowledge is being created through conversion from tacit knowledge to tacit knowledge; Externalisation/articulation: involves conversion from tacit knowledge to explicit knowledge where the former is made explicit by use of metaphors, analogies, hypotheses and models; Combination: involves transfer of knowledge from explicit knowledge to explicit knowledge – the process is structured into a system; and Internalization: new insight are learned and the process changes from explicit to tacit knowledge. According to Nonaka & Takeuchi, formation of knowledge (learning) is spread over time in the organization in a movement between the various processes in the SECI model. This movement is illustrated as a spiral process, as seen in Figure 2.

Since the model was developed in a business context, the main focus is on how to go from tacit knowledge to explicit knowledge. Once knowledge is made explicit, it is easier for the management to measure and quantify its value. Boisot criticizes Nonaka & Takeuchi for mainly focusing on tacit knowledge being a thing that can be made explicit through management. According to Boisot, knowledge occurs in three distinct variations, all of which should be included in theoretical models of Knowledge Management. The three variants are:

1. “Things that everybody understands and takes for granted”
2. “Things that are not articulated because nobody fully understands them”
3. “Things that are not said because while some people can understand them, they cannot costlessly articulate them” (Boisot 1998: 57).

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28 According to Boisot it is this type of knowledge that Polanyi focus on, while Nonaka & Takeuchi focus on the third type of tacit knowledge (Boisot 1998: 57).
Boisot's theory is related to all three types of knowledge and presents a much richer and more complex theory. Where Nonaka and Takeuchi consider knowledge as a thing that can be moved around through four processes in the SECI model, Boisot sees knowledge as both a thing and a flow. This means that not all knowledge can be maintained and controlled. In the following I will review the main features of Boisot's conceptual framework, I-space.

11: Max Boisot: I-space
To make use of Boisot's theories, a clarification of the concept of knowledge in relation to information and data is needed. There is often a great misconception in the use of the terms data, information and knowledge, although there are clear definitions for them. According to Boisot, "Knowledge builds on information that is extracted from data" (Boisot 1998: 12).

11.1.1: Data, Information, and Knowledge
To explain the three concepts a model is useful (see Figure 3). It illustrates the relationship between the world which is the source of data, and the individual (an agent) who is the source of knowledge. Data is a limitless quantity of bits that we are bombarded with each day and it is characterised by the property of things. Since data comes from a limitless source (the world), it has to be structured and sorted in order to be useful for an agent. This is done through economizing filtering, which is a process based on the agent’s perceptual and conceptual understanding of the world. Information exists in between things and agents, but is demarcated from data through the perceptual and conceptual filters. Knowledge can be characterized by the property of agents, which means that knowledge can only be identified through the actions of an agent. In other words, knowledge cannot be directly observed and is therefore always subjective. Common to all three concepts is that they each involve different utility values. The practical usefulness of the data is that it involves information about the physical world (see Figure 3). This information can become knowledge to an agent so that he can act in the physical world. To make an analogy on the three concepts, one can say that a phone book is based on data, a newspaper on information, while a brain surgeon acts on his knowledge.
Figure 3: Data, information and knowledge shows the stimuli and data flow from the physical world through a perception and conceptual filter, based on the agent's expectations, and into useful information, which becomes knowledge through the agent's actions in the physical world (Boisot 2007: 20).

In the following section I will present Boisot's I-space by referring to Figure 3.

11.1.2: Information Space

I-space can be used as a conceptual framework to illustrate different social systems. In the understanding of how systems and agents act, Boisot operates from an evolutionary theoretical anchoring where he argues that all living systems must adapt their resources needed for survival. Compared with Figure 3, the world (i.e. living systems) is constantly moving towards greater complexity (i.e. increased entropy) and therefore it is necessary for the agent to reduce the amount of data in order to conserve resources and act effectively. In Figure 3, the perceptual and conceptual filters are specifically designed by the agent's previous knowledge and experiences in order to be able to act more effectively. The smaller the holes in the filters are, the fewer resources are needed for the agent to act in the world. The question is how small the holes must be to enable the agent to act effectively. This depends on the context, the agent's previous knowledge and the complexity of the actions. However, a basic assumption could be that complex tasks require access to large amounts of data. It is also important to remember that what may seem like a complex task for one agent may seem like a simple task for another agent.
Economizing on data complexity is done by the agent in an often overlapping use of two concepts, which Boisot calls codification and abstraction (also known as data-processing). In addition, Boisot uses the concept of diffusion that relates to communication (or data-transmission). The three terms represent the axes of Boisot’s three-dimensional information space, I-Space. All three concepts are reviewed below.

11.1.3: Codification
Codification means that a phenomenon is categorized. It is thus an economizing process of data in the form of the above perception and conceptual filter. However, the process is not without costs. Codification of complex phenomena requires more resources than the codification of simple phenomena. In addition, there is a risk of misclassifying a phenomenon by locking the data in an incorrect category ".. the more completely one codifies a task, the more one effectively fossilizes it" (Boisot 1998: 47). The more prior knowledge the agent has in the specific context of the phenomenon within the codification process, the fewer are the costs of codification. This also applies for the abstraction process.

11.1.4: Abstraction
By abstraction, complexity is made concrete, generalized and structured. By minimizing the amount of different categories to choose from, abstraction becomes an economizer of the data processing. Like codification, the risk of reducing the number of categories by abstraction will always be present. However, the “shredding” of data is necessary in order to use it through actions (Boisot 1998:49). It is up to the agent to revise and improve his/her filters through continuous learning.

11.1.5: Diffusion
Codification and abstraction influences the scale of which diffusion of information is possible. The more codified and abstract the information is, the more homogenate perception filters does the receiving part have (Boisot 1998:53). The diffusion process can be seen as a communicative process between the agent sending information to a potential receiver. In this process, three communicative problems may occur and these are linked to the friction on either a technical level (is the information received as it was sent?), a semantic level (is the information understood?) or a pragmatic level (is the information acted upon as intended?)

11.2: I-space as a Framework for Interpretation

I-space contains all the information that exists in the world and therefore one must imagine that the three axes are indefinite. This means that I-space can be used to illustrate numerous matters if only one gives a prior explanation of what is being looked at and in what context. A major advantage of I-space is its illustrative approach to information and knowledge, meaning that in addition to functioning as an interpretative framework it also functions as dissemination tool. I see this as a necessity when it comes to understanding a complex phenomenon as knowledge. Boisot emphasizes however, that it is a conceptual model, which means that it is not absolute. Therefore, one cannot use the model to test the theory in itself, but it can be used for interpreting different phenomena (Boisot 2007:9).

Since the I-space model is an interpretation of the information that exists in the world it is a dynamic model. Represented by the interaction between the world that moves towards greater complexity and the agent who is trying to reduce complexity. This dynamic in I-space means that information is constantly in motion, referred to as information flows by Boisot. These
flows of information contribute to: the emergence of new knowledge, some knowledge perishes, while other knowledge gets embedded in agents (individuals) or in organizational institutions. The agents' interaction in I-space is described by Boisot as a social learning cycle (SLC).

11.2.1: Social Learning Cycle (SLC):
In order for an effective learning process to arise, the process has to be in contact with the three axes of I-space and if it happens in a particular sequence, it can be called the ideal SLC (Boisot 1998:59). This cycle consists of six stages as illustrated in Figure 5.

![Figure 5: The social learning cycle goes through six stages. Through areas with high complexity and areas of low complexity. Effective learning (for individuals, organizations, etc.) lies in an interaction between these two regimens.](image)

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Scanning: Here the agent will identify threats and opportunities. The scanning process is dependent on the agent's idiosyncratic insights. This process in some contexts moves quickly, while in other contexts it may take a long time to collect data in this lower region of the I-space, which are concrete, uncoded and of high complexity.

Problem-solving: Forming structure and conformity of the data from the scanning process, reducing uncertainty and providing insights.

Abstraction: generalizing the use of the structured insights formed in the problem-solving stage. In short, the conceptualization of the obtained insights.

Diffusion: The structured and conceptualized insights are shared with the target audience. A preliminary division of the context that these insights are attached to will provide a more symmetric diffusion.

Absorption: The use of the newly acquired insights in the form of "learning by doing/using".

Impacting: The abstract (structured and conceptualized) knowledge is embedded in a concrete practice (Boisot 1998: 61).

The ideal SLC is difficult to follow in real practice and should be seen as a call to seek out all areas of I-space to achieve effective learning. Hereby the agent will go into areas characterized by information being inaccessible and difficult to articulate (high complexity), and areas where information is readily usable and articulated (minimal complexity). Boisot argues that new knowledge is best archived by moving between the tension of maximum complexity and minimum complexity, where knowledge is created, shared and stored as a social process (Boisot 1998:69).

11.3: My Representation of the I-space
After having presented I-space, I will now show my use of it. This will represent the theoretical framework of the thesis and also illustrate how the I-space model can be used as an interpretative tool.

To use I-space as an interpretative framework, I have made a simplification of the model. It is my understanding that Boisot’s three-dimensional illustration of the I-space creates some
confusion when presented on a two-dimensional piece of paper. The difference in my version of I-space, is that I have collected Boisot’s codification and abstraction axis in one complexity axis (see Figure 6). Since Boisot mentions how the two processes codification and abstraction are overlapping processes, I do not see any major problems in merging these. It will not distort the understanding of the underlying theory of the I-space, in my opinion. Thereby, in my "I-space model" the upper region of the model represents minimal complexity, which means that it is less costly for an agent to act on the information and knowledge offered here, while the opposite can be said for the lower region. Below I have illustrated this two-dimensional I-space model, which I will use throughout the thesis.

Figure 6: My I-space model is a two-dimensional version of Boisot's I-space model is composed of a vertical axis of complexity, going from maximal complexity in the bottom to minimal complexity in the top. The horizontal axis shows the degree of diffusion of knowledge. The axis of complexity covers the size of resources (time, space and energy) an agent needs in a knowledge-exchange situation. Should an agent for example exchange highly complex knowledge with a second agent, it requires more resources to articulate and share that knowledge, than were it less complex. The more complex the knowledge, the greater contextual background understanding by the recipient is required in order not to lose its original meaning.

11.4: The Value of Knowledge at the Individual Level
Unlike Boisot, whose primary purpose it is to show how knowledge can become assets in an organization, my focus is at the individual level (the individual architect). The difference, as I
see it, lies mainly in the value setting of knowledge in relation to I-space. Boisot determines
the value of knowledge in relation to neoclassical economic thinking. Here knowledge has the
highest value if it has a high utility rate and still is considered a scarcity, which is at the upper
left corner of the I-space model above (marked with the star in Figure 6). Here the agent (e.g.
a manager in a company) can relatively free of cost exchange knowledge in this area of I-
space. This value setting may be correct for a company, but it does not mean that it is correct
at the individual level. Value or validity of the information depends on the eye of the beholder.
This view is actually exemplified by Boisot himself through the relationship between a Zen
master and a bond analyst, which expresses two different value settings of knowledge at the
individual level.

11.4.1: The Zen Master and the Bond Analyst
The Zen master seeks sense of the world in the lower region of the I-space, where "the road to
true insights" lies. These insights are filled with complexity and ambiguous understandings,
which are unclear and paradoxical, making it difficult to share this knowledge with others
(Boisot 2007: 114). In the opposite region the bond analyst will be located. Here the "true
insights" are explicit, clear and measurable which, unlike the Zen master, makes it less costly
to share this knowledge. So in relation to gaining new insights, the SLC for the Zen master
and the bond analyst, respectively, will be dependent on the knowledge they seek. In the Zen
master’s sense-making of the world it would be costly to move up in the I-space because it is
difficult to articulate and thus reduce complexity without loosing the original meaning.
Therefore one must assume that the learning process will primarily be in the lower region of
I-space. Oppositely, the bond analyst will focus on SLC in the upper part of I-space. The point
is that there will be differences in what type of knowledge they seek individually, in relation
to their actual practice. This is illustrated below.
11.4.2: Learning Strategies and Paradoxes of the Values

The value of knowledge is, as mentioned, dependent on the purpose it serves. With regard to the bond analyst a paradox occurs with this type of knowledge. Since knowledge in economic terms is based on the utility and scarcity rate, explicit knowledge has the highest marked value. But because knowledge, unlike a physical good, can be shared infinitely it is not a natural scarcity. In order to deal with this, the bond analyst can follow two different strategies. Firstly, the value of the learned knowledge can be maintained by blocking the sharing of it. That is, reducing the spreading on the diffusion axis to ensure the scarcity rate, for example through patents and intellectual property rights. Secondly, the bond analyst can follow a strategy where he/she shares knowledge and simultaneously tries to acquire knowledge faster than competitors. The first strategy is referred to by Boisot as N-learning (Neo-classical learning) and is based on hoarding knowledge, while the second is called S-learning (Schumpeter learning30) and is based on sharing knowledge and thereby learning faster than competitors. The bond analyst will experience the apparent paradox mostly, since he/she searches for knowledge with a high utility rate which can therefore be shared more easily. The opposite is true of the Zen master as his/her knowledge is considered to have a low utility rate, making it a more naturally scarce resource. Below I have illustrated how the two learning strategies:

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30 S-learning is named after Joseph Schumpeter and is based on the theory of creative destruction, where new discoveries destroy earlier realizations, thereby creating a new market situation (Boisot 1998:99).
strategies can be deployed in I-space.

![Diagram of two different learning strategies, N-learner and S-learner in I-space. Note that the example of the Zen master and bond analyst is not represented in the illustration.]

**Figure 8:** The two different learning strategies, N-learner and S-learner in I-space. Note that the example of the Zen master and bond analyst is not represented in the illustration.

In chapter two I will review the two approaches further in relation to COIN and in chapter three in relation to the architect, where I will investigate whether the architect's learning strategy can be categorized as either N- or S-Learner. Before that, I will elaborate on different types of knowledge from a scientific point. These different types of knowledge will serve as benchmarks in my interpretation framework of the architect's knowledge, which I will return to in chapter three.

### 11.4.3: The Value of Knowledge in a Theoretical Perspective

As seen from the relationship between the Zen master and the bond analyst, the value of knowledge is relatively aligned with the individual's path to make sense in his/her practice. To illustrate this I will look at how different types of knowledge in a scientific optic can be placed in the I-space. To do so, I will apply Baumard’s and Flyvbjerg’s distinctions of knowledge, both of which are based in Aristotle’s knowledge concepts: episteme, techne, phronesis and mètis\(^{31}\).

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\(^{31}\) The concept of mètis knowledge is only used by Baumard - see also Appendix B for a summary of Baumard.
**Episteme** (abstract, general): This concept is based on universal knowledge. It is the knowledge we teach, and is stored as part of our knowledge heritage, for example in the form of books and articles. It is thus a kind of knowledge which can be expanded because it has a high diffusion value and can quickly be communicated out to a large number of recipients. According to Flyvbjerg, episteme corresponds to the modern ideal of knowledge, run by a general purpose, which is not bound by time and space, and it can be approached with analytical rationality (Flyvbjerg 2006:71). There is a need to "know-why" and therefore it must be articulated and measured quantitatively in order to be valid. For something to be able to be quantitatively measurable, it requires that this type of knowledge is reduced in complexity and therefore I place it in the upper part of the I-space.

**Techne** (capability, capacity to accomplish two tasks): This type of knowledge is associated with the general business term "Know-How" - the knowledge on how to perform a task. This type of knowledge is largely explicit and related to the use of technical knowledge. In Baumards table (Appendix B), under “Teaching or initiation” he describes techne as having a tendency towards the explicit and being based on "recipes" (during practices), which I interpret as relatively explicit and located in the upper part of I-space.

**Phronesis** (practical and social wisdom): In contrast to episteme we find phronesis, which is difficult to share because it is formed and based on individual experiences and "... encapsulated in action" (Baumard 1999:67). It is a type of knowledge that is practical and contextual. It is formed through trial and error, difficult to manage and thereby also difficult to measure. According to Flyvbjerg, phronesis is a deeper and more complex understanding of the practical action, an experience-based knowledge containing a large idiosyncratic value\(^\text{32}\). This knowledge is embedded in the individual and bears the imprint of being silent (Flyvbjerg 2006:73). Therefore I put it in the more complex part of the I-space model.

**Mètis** (conjectural intelligence): The last type of knowledge belongs to a few individuals or a small group of individuals and is difficult to elicit. It is "... to explore the unexplorable, to go beyond the evident and the observable" (Baumard 1999:67). In Greek literature a man of

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\(^{32}\) Aristotle emphasized the practical nature of phronesis is extremely important in relation to the understanding of social science – the value between man and society (Flyvbjerg 2006:74).
Mètis is a man who "displays at the same time a greater grip of the present, several aspects of future events, and has a rich experience accumulated from the past" (Baumard 1999:68). It is an almost chaotic knowledge which is constantly changing in an ambiguous domain. Positioning mètis relative to the I-space is difficult, due to its ambiguous nature and since it can only be maintained in the present. In some regards, mètis resembles what Csikszentmihalyi is talking about in his concept of flow. The focus on flow is described as a state where the purpose and goals reach a higher unity. My location in the lower region in I-space is based on the inarticulate character of métis: "...in métis we discover a body of knowledge that is tacit and individual" (Baumard 1999:66).

**Figure 9: episteme, techne, phronesis and métis in I-space.** The various oval-shaped circles represent the individual SLC processes. I have set the guideline for individual sense making as being deductive/inductive in relation to episteme and techne, and to a greater extend abductive in relation to phronesis and métis. The location of the three strategic orientations is based on my meta-science section about the inferences in the thesis.

The different types of knowledge represent various types of values for the individual. If we go

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33 Mihaly Csikszentmihalyi is a well-known psychologist who operates with nine elements to describe the feeling of flow – a feeling that is regarded to be the source of individual creativity. These are: clear goals, immediate feedback, balance between challenge and skills, action and awareness are merged, excluded distractions, no worries for failure, self-consciousness disappears, time becomes distorted, activity becomes autonomic (Csikszentmihalyi: 1997: 111-113).
back to the Zen master, I would argue that he/she will seek métis and phronesis in order to obtain the path to the "true insights", while the bond analyst would seek episteme and techne as his/her path to valuable knowledge. However, although they are described as opposites, this is a gross simplification since each individual contains all four types of knowledge. The difference is that they are each attracted to different regions in the I-space in order to create sense and gain new insights in relation to their practice. That is why they will focus on different types of knowledge.

11.5: Narrative Knowledge - a tool for making sense
In Boisot's example of the Zen master and bond analyst, he does not use the four types of knowledge. Instead, he describes the Zen master's knowledge as being predominantly embodied knowledge, while the bond analyst's knowledge is abstract symbolic knowledge. As a bridge between the embodied knowledge and the abstract symbolic knowledge, Boisot uses the concept of narrative knowledge. This type of knowledge consists of text, images, metaphors and icons, all dating from the link to the embodied knowledge. Narrative knowledge can represent parts of the embodied knowledge, with the precondition that the sender and receiver share a common code and a minimum of common context (Boisot 2007: 130). Boisot argues that narrative knowledge has the function that it can reduce regulatory costs of understanding between sender and receiver, since the narrative knowledge brings the contextual background knowledge into play. Thus narratives are means to apply and act on embodied knowledge (Boisot 2007:124). Conversely, abstract symbolic knowledge can also move down in I-space and create new discoveries. Narrative knowledge thus has the function to ensure consistency between the embodied knowledge and symbolic knowledge, as illustrated below (Figure 10).
Figure 10: Embodied, narrative and symbolic knowledge in I-space. Narrative knowledge should be seen as a connector between the two other types of knowledge.

The reason why narrative knowledge is interesting is because it opens up the possibility of being able to share tacit knowledge (embodied knowledge). It was also the same focus that Nonaka and Takeuchi argued for through their Externalisation/Articulation process in the SECI model (Figure 2). The difference, as I see it, is that Boisot argues that it is only fragments of tacit knowledge that are brought into play through the use of narratives and that embodied knowledge cannot be fully articulated. Despite the differences and similarities between the SECI and I-space models, the main point is that narrative knowledge can contribute to making embodied knowledge assets.

11.6: David Snowden – Sensemaking
David Snowden is a knowledge management theorist who builds on much of Boisot's theoretical understanding. I will implement his theory in my theoretical framework, I-space, as it will provide me with an essential tool for the analysis in chapter three. Snowden examines the relationship between the agent and different contexts. His approach is sense making\(^ {34}\), where it comes to creating meaning in complex contexts in order to make decisions. Snowden divides these contexts into five domains that are the basis of his sense making

\(^{34}\) “a motivated, continuous effort to understand connections (which can be among people, places, and events) in order to anticipate their trajectories and act effectively” (Klein et al., 2006) – reference:

[link to Wikipedia article on Sensemaking](wikipedia.org/wiki/Sensemaking)
model called Cynefin\(^{35}\). Four of the domains describe cause and effect-relationships divided into levels of complexity, while the last domain describes the state where the agent cannot identify causal relationships in a given situation. The model is illustrated below (Figure 11).

![Cynefin model](image)

**Figure 11: Cynefin model** divided into four domains.

The five domains of the model can be explained as follows:

**Simple:** In the simple domain there is a logical connection between cause and effect, making it virtually free of costs to make sense in this domain. Snowden also describes this domain as knowledge that is *known* – a general type of knowledge. The hallmark of the agent's approach in this domain is *sense - categorize - respond*. Acquisition of knowledge in the simple domain can be achieved through teaching.

35 Cynefin (pronounced kun-ev'in) is a Welsh word. It relates to the English word *habitat*. However, Snowden argues that there is no English word that can do it justice. He explains:”*it links a community into its shared history – or histories – in a way that paradoxically both limits perception of that community while enabling an instinctive and intuitive ability to adapt to conditions of profound uncertainty*” (Snowden 2002:5). Human interactions are partly influenced by one's personal experience and partly through collective experience. I define Cynefin as a precondition for all human activity, where the involved individuals at any time will be influenced by their own Cynefin.
Complicated: In this domain the link between cause and effect is more complicated to understand and it requires more resources to make decisions herein. Therefore, it is referred to as knowable - knowledge that still can be acquired through teaching, but on a more professional level. The agent approach this domain by sense - analyse - respond.

Complex: In this domain the logical connection between cause and effect ends. Sense making is formed in retrospect, and therefore the acquisition of knowledge is through a more practical learning. The approach is to probe - sense - respond. This domain is complex and the agent will therefore try to navigate on the basis of patterns.

Chaotic: In this domain any link between cause and effect has ceased. Therefore, the agent should act - sense - respond. Snowden points to the fact that because of the disruptive nature of this domain it is important to act (Snowden 2002: 9).

Disorder: The fifth domain denotes the state where the agent does not know what causes exist and therefore moves to a comfort zone to make decisions.

Compared to the I-space, I argue that the Cynefin model may be placed in I-space, if it is based on a comparison of complexity. Where the simple and complicated domains are relatively straightforward and free of cost for the agent to form sense, the opposite is the case for the complex domain. According to Snowden, most social knowledge-exchanges happens in the complex domain where the agent tries to form patterns in order to constitute sense and decision making. Therefore the complex domain should position itself in the lower region of the I-space. In the chaotic domain the agent's actions are not rooted in any kind of pattern recognition, such that no agent understands what exactly is happening in this domain. It could mean that the chaotic domain would be even deeper than the complex domain, since agents act from knowledge they are not confident in or do not have the ability to communicate by other means than through their actions. Below I have placed Cynefin in I-space, based on the level of complexity in the different domains.

Figure 12: Cynefin in I-space. The four domains are based on the level of complexity. Note that I have not included the fifth domain and will not use it in the analysis, since it is a state where the agent does
not participate actively.

11.7: The use of my Theory Apparatus
In chapter one, I have presented my own version of Boisot's I-space model as the thesis overall framework for interpretation (See Figure 6). The purpose is to interpret the architect's creative process through this model. I argued that the value of knowledge on an individual level depends on what knowledge the individual seeks. By introducing four types of knowledge: episteme, techne, phronesis and mètis, individual values will rise depending on what type of knowledge the architect seeks. I placed the four types of knowledge in the I-space model in order to form a theoretical framework for my exploration of the architect's creative process. With that same objective, I presented Snowdens Cynefin model. It describes how agents make sense in four different cause and effect-relationships. By highlighting the architect's creative process based on the four domains in Cynefin, the theoretical frame can visualize the architect's creative process as seen through a knowledge perspective in I-space. This will be used in chapter three to identify the architect's knowledge assets and whether it is possible to mobilize these assets in a COIN.
Chapter 2: Collaborative Innovative Networks

I will begin by presenting COIN through Gloor. The aim is to describe the general characteristics of a COIN. In addition, I will present Benkler\(^{36}\) to explain why COINs emerge as an alternative to traditional business organizations. By comparing COIN with the company in I-space, I will explain the benefits and limitations of a COIN in a knowledge perspective.

12.1: Characteristics of a Collaborative Innovative Network (COIN)

A COIN can be seen as a knowledge network that primarily operates through the Internet. Gloor mentions how a COIN is situated in an ecosystem of collaboration knowledge networks (CKNs) that are divided into a COIN, which is the heart of the ecosystem; a Collaborative Learning Network (CLN); and a Collaborative Interest Network (CIN). The coherence of the ecosystem is shown by his formula: \(\text{CKN} = \text{COIN} + \text{CLN} + \text{CIN}\). Below is shown how the various networks are linked (Figure 13).

![Figure 13: COIN, CIN and CLN](image)

Unlike a hierarchical-based business organization, there is no formal leadership in a COIN. A COIN exists through the voluntary contributions of knowledge by its peers and must be seen as a self-organizing system (Gloor 2004:93). The peer members organize themselves around a common vision to create change and achieve a common goal. The vision thereby becomes a COIN's reason of existence and once this is achieved, the COIN will stop existing. Therefore a COIN is characterized by a limited lifespan. Gloor defines COINs through three conditions:

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\(^{36}\) Benkler uses the term *common-based peer production* to describe phenomena like Wikipedia and open source communities. I will use the term COIN synonymous to common-based peer production when I present Benkler.
• They innovate through massive collaborative creativity.
• They collaborate under a strict ethical code.
• They communicate in direct-contact networks.

(Gloor 2004: 9).

To describe the structural mechanism for a COIN, Gloor describes it as a swarm of creativity. A COIN is based on loosely coupled relationships (swarming), whose behaviour is influenced by either positive or negative feedback from other peers. Every peer-interaction creates an impact in the COIN by either amplifying behaviour through positive feedback or diminishing behaviour by negative feedback. This influence can lead to a behavioural change of the COIN as a whole if it obtains sufficient positive feedback.

It is crucial that a COIN consists of as many peers as possible since the basis for creating value lies in the accumulated amount of knowledge input and less on the individual contributions. Therefore, by mobilizing as many peers as possible, the value of a COIN is increased. One could say that the intelligence and ability to perform complex tasks increases with the number of peers.

For knowledge exchange in a COIN system to function, trust is a fundamental condition (Gloor 2004:22). This is due to collaborating via the Internet where peers share their knowledge without necessarily knowing each other in the real world. To ensure mutual trust their behaviour will be guided by an ethical code and a common set of values which function as the glue in the network. To achieve mutual trust Gloor mentions three basic conditions:

- Meritocracy
- Consistency
- Internal transparency

37 Meritocracy is an organizational structure that rewards and promotes people solely based on merit (skills and talents). It is up to the individual peer to contribute with a relevant input to the community, thus meritocracy becomes a reward mechanism. For the individual peer it also becomes a motivational factor, since peer recognition can only be achieved through the quality of ones work.

38 The community has to behave in a predictable way, governed by an often unwritten ethical code. The egalitarian form of the COIN community creates a necessity for a common shared vision, something of common interest. This vision has to be consistent and bound in an ethical code that does not change radically over a period of time.

39 This transparency is of big importance when it comes to the essential part of knowledge sharing - building
I see the three organizational conditions as an attempt to establish an overall framework for building trust among the members of a COIN. Gloor also mentions that social capital in the form of mutual trust is the dominant currency in a COIN. Any interference by commercial interest will therefore create a risk of conflict and upheaval, because it can influence the organizational conditions for mutual trust.

Despite this potential conflict of interest, Gloor sees huge benefits in applying COIN in a commercial context, so that the innovation potential that a COIN forms over time can be connected to the market. In an innovation context it has great potential, since COIN-members are characterized by being core segments themselves, and this creates a symbiosis between any given COIN and the market (Gloor 2004: 237).

There are many COIN constellations, some are purely based on common-based peer production, while others can be seen as a hybrid between a COIN and a Firm⁴⁰. In the thesis my main focus is on whether it is possible for the architect to conduct knowledge exchanges through a COIN. Therefore I will delimit myself from the many constellations that Gloor presents.

13: COIN - A New Production System
Gloors presentation of COIN lacks a more thorough description of how COINs differ from the traditional business organization, and what implications there might be by collaborating in a COIN. For this purpose, I will draw on Benkler who explains how COINs emerge as alternative production systems compared to traditional production systems – such as the company and the market. In his article “Coase's Penguin”, Benkler builds on Ronald Coase’s theory⁴¹ as to how COIN’s emerge. Firstly he states why firms emerge "When costs of a production system successfully through an organization is lower than the cost of achieving the same output through the market, then firms emerge" (Benkler 2001:20). After using Coase's

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trust. The currency of a COIN is social capital and in order to withhold this, transparency is essential (Gloor 2004:144). Since a COIN is based on common ownership, implications can arise if unilateral appropriation by some members of the COIN appears.

⁴⁰ See Appendix C for an example of how the hybrid works, according to Gloor.

⁴¹ Ronald Coase, an economist and noble price winner. He introduced the transaction cost theory in 1937 to explain and define the firm in relation to the market.
theory to explain why firms emerge Benkler turns to Demsetz\(^{42}\) to explain how property rights occur. "When the costs of implementing and upholding property rights are lower than the cost of not having them, then property rights will emerge" (Benkler 2001:20). Benkler uses these two arguments two create a four-box matrix, as illustrated below.

<table>
<thead>
<tr>
<th>Copy Right</th>
<th>Copy Left</th>
</tr>
</thead>
<tbody>
<tr>
<td>No-property more costly than implementation costs of property</td>
<td>Property implementation more costly than opportunity cost of no-property</td>
</tr>
<tr>
<td>Market exchange of (x) cheaper than organizing/peering (x)</td>
<td>Pure markets (e.g. farmers)</td>
</tr>
<tr>
<td>Organizing (x) cheaper than market exchange/peering of (x)</td>
<td>Market with firms</td>
</tr>
<tr>
<td>Pure commons (ideas &amp; facts; highways)</td>
<td>Common property regimes</td>
</tr>
</tbody>
</table>

**Figure 14: Firm and market matrix.** It is divided by market vs. firm and property vs. no-property.

Since the matrix is based on a theory formulated in the industrial society, Benkler criticizes the traditional systems for not being fit for today's information society. He says ".. it was a system that was developed in the Industrial Society where coal and steel was the main input in the production process, which was dependent on clear property rights to control resources and outputs” (Benkler 2001: 4). The point is that COINs are well suited to organize activities where knowledge is the main resource, and this fits better into the information society in some contexts (Benckler 2005: 5). Thus an extension of the matrix above is needed, which includes COIN as an alternative production system opposite the more traditional ones\(^{43}\).

**13.1.1: The Emergence of COIN**
In order to explain why COIN has emerged, Benkler once again turns to the same logic reasoning “..we could say that when the cost of organizing an activity on a peered basis is lower that the cost of using market, and the cost of peering is lower than the cost of

\(^{42}\) Harold Demsetz, an economist with focus on property rights.

\(^{43}\) Even though COIN may seem to be something that evolved in the software industry it has been around in the academic world through peer-review. However, academic work is often owned by publishers and in that way not a free public good.
hierarchical organization, then peer production (red. COIN) will emerge” (Benkler 2001:21). This extends the matrix into a six box tabulation, shown below.

<table>
<thead>
<tr>
<th>Copy Right</th>
<th>Copy left</th>
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</thead>
<tbody>
<tr>
<td>No-property more costly than</td>
<td>Property implementation more costly than</td>
</tr>
<tr>
<td>implementation costs of property</td>
<td>opportunity cost of no-property</td>
</tr>
<tr>
<td>Market exchange of x cheaper</td>
<td>Pure markets (e.g. farmers)</td>
</tr>
<tr>
<td>than organizing/peering x</td>
<td>Pure commons (ideas &amp; facts; highways?)</td>
</tr>
<tr>
<td>Organizing x cheaper than</td>
<td>Market with firms</td>
</tr>
<tr>
<td>market exchange /peering of x</td>
<td>Common property regimes</td>
</tr>
<tr>
<td>Peering cheaper than both</td>
<td>Proprietary ”open Source” efforts</td>
</tr>
<tr>
<td>market exchange and organization</td>
<td>Peer production processes/COIN</td>
</tr>
<tr>
<td></td>
<td>(free software: academic science etc.)</td>
</tr>
</tbody>
</table>

**Figure 15: Firm, market and COIN tabulation.** The table shows a visual framework of the emergence of the firm, property and peering, in the context where the organizational form is a function of the relative social cost of property vs. no-property and market vs. firm-based vs. peering.

According to Benkler, COIN has emerged as a consequence of the new paradigm in society where access to web-based technology on a worldwide scale has been of great importance. These conditions are summed up below into four attributes, all of which affect the individual peers' social costs of engaging in a COIN system.

**Information has become the object of production** – the raw material is dividable, meaning that informational goods in their natural form are a pure public good. Because information and knowledge has become the most significant resource, it has a positive effect in relation to a COIN. The increased amount of free information via the internet makes the social cost of using it as input in the production markedly lower (Benkler 2001: 23). Benkler sees intellectual property rights as a barrier constructed with legitimacy in the legal institutions and
which impose qualities on information that may make it into a trading good on the market (increasing the scarcity value). The consequence of imposing informational goods such "unnatural" qualities is that it is very costly to maintain these restrictions, both legally through the preservation of property rights for the individual firm but also on a broader society-level. Therefore, one of the reasons that COIN is gaining ground is that the cost of limiting the information is greater for both markets and firms than to leave it in its natural form and thus freely available to peers in a COIN.

The dramatic decline of physical capital costs of information production. New technologies push this decline even further and have made the cost for the individual peer to contribute very low. Everybody has access to a computer and the internet in today's society, which means that anybody potentially can participate in a COIN.

Effective exchange over time and space allows the production process to function. An important difference to Coarse’s initial starting point for the transactions is that due to the shift from physical goods to informational goods (i.e. knowledge) as the main resource in the production system, focus should be on the social exchange of knowledge rather than on physical goods (Benkler 2001: 7 ). Benkler sees this attribute as a radical reduction in costs to create, share and manipulate knowledge. The Internet has been the main factor in making COINs possible, as knowledge exchanges can take place virtually. The technological development of the internet is a concrete example. A prime example of the usefulness of Web 2.0 is Wikipedia, with its collective collaboration: The myriad of inputs from ordinary people who have share their knowledge for free and create a dynamic knowledge pool that each day increases in utilitarian value for all users of the internet. Wikipedia and the many "open-source development communities"44 have shown a web-based production system (a COIN) that is able to generate competitive content.

Access to highly variable idiosyncratic knowledge by peers that are highly motivated to use their talents in the production function. Benkler mentions the fourth attribute as the key benefit of COIN and as the main reason it has emerged. It is about the idiosyncratic nature of human knowledge that creates value through a COIN and that has enormous potential. Since

44 E.g. Wikipedia, Open office etc.
"Peer production relies on making an unbounded set of resources available to an unbounded set of agents, who can apply themselves towards an unbounded set of projects and outcomes” (Benkler 2001:32). The traditional way of organization relies on bound contracts and properties to minimize uncertainties when it comes to employees, resources for production (material or immaterial) and projects (e.g. through contracting). The decisions are always limited to the internal cost or transaction costs by using the market (Benkler 2001:6, 32). However, “human intellectual effort is highly variable and individuated. It is very difficult to standardize and specify in contracts – necessary for either market-cleared or hierarchically organised production” (Benkler 2001:30). This leads COINs to an advantage over the traditional system, since COINs can tap into a larger and more variable talent pool. “The point is that even if the firm had the information about which person was best suited for the job, then achieving this information would be too costly compared to the relative efficiency gains by bringing the next-best person in charge of the project” (Benkler 2001:32). For both the market's pricing mechanism and the company's way of controlling employees through property and contracts, it applies that they are not ultimate. The result is that a lot of potentially useful knowledge is not utilized effectively. There are simply too many costs by controlling and price-fixing knowledge in relation to the potential loss, according to Benkler.

The four attributes must be viewed as basic societal conditions that have allowed COINs to emerge since they have all reduced the social costs for each peer. Benkler's argument is that a COIN occurs if the social cost of each peer is relatively lower than that by performing the same transaction, either through the market or the company. I will use Benkler's argument to explain how it could be interpreted in a knowledge perspective through the use of I-space. The purpose is to illustrate what the social cost implies - that is, make it scalable with respect to the complexity axis in the I-space.

13.2: Placement of the Market, the Firm and COIN in I-space

Before I can place Benkler's tabulation in I-space, I will define a transaction as a social exchange between x number of agents, where informational goods in terms of knowledge are

45 Benkler sees the individual peers of a COIN as individuals engaged in information processes, which I interpret as a process where knowledge is converted into assets for the COIN. The more people who participate, the greater the assets that are created.
exchanged.

**Market**
A precondition for the market is that it is based on the assumption of perfect information before the price mechanism can function. It requires that information is explicit so that it can be understood by everyone. Therefore I have placed the market at the top of I-space in this context (Figure 16). In the real world perfect information does not exist, since not everyone has access to all information simultaneously.

**The Firm**
I have previously argued that in a business context the value of knowledge is considered to be at maximum if it is explicit (see the theory of Boisot). The high utility rate means that it becomes difficult to keep this knowledge. Here, an N-learner company ensures its knowledge through property rights, patents, etc. so that knowledge can be embedded within a bound entity before it can be sold on the market. The company's aim with this strategy is to try and gain ownership of knowledge, which is regarded as an asset - a thing. A feature of this strategy is the hoarding of knowledge and therefore I place it on the left side of I-space (Figure 16). Because of the company’s economic interests, it will be located predominantly in the left part of I-space.

**COIN**
Unlike the company, I see COIN as a production system that is clearly based on an S-learner strategy. COIN exists solely by virtue of its members' knowledge contribution and therefore it is necessary that knowledge is shared among members. According to Benkler’s tabulation, COIN will be based on "Copy Left". It is the massive knowledge creation and sharing that ensures a disruptive nature, with members constantly affecting the existing knowledge in the system through their inputs. A concrete example is Wikipedia, where the validity of knowledge is ensured through free access to edit any content. If there are errors in the system, it will quickly be discovered and addressed through mass interaction. Therefore, I place COIN at the right side of I-space. However, it is not unproblematic to determine the location of an SLC course for COIN on the complexity scale of I-space. In the following section will deal
with this issue. I will refrain from mentioning implications for the company or the market, as this is not relevant to the research question at hand.

Figure 16: The firm, market and COIN in I-space. The SLC process (transactions in the form of knowledge exchange) in relation to I-space. COIN's location is marked as a dotted line (for explanation, see the following text).

13.3: Challenges in Relation to COIN

Benkler sees the limiting factor for a peer to participate in a COIN as the social costs: “Peer production is limited not by the total cost or complexity of a project, but by its modularity\(^{46}\), the granularity\(^{47}\) of its components, and the cost of integration” (Benkler 2001:25). With this quotation Benkler argues, that the capacity of a COIN depends on the knowledge components each peer contributes with. If these are sufficiently fine-grained, they can easily be transferred to other peers. For each peer it means that modularity and granularity determines the minimal investment he/she must make in order to form a knowledge component. Translated into

\(^{46}\) Modularity is a designation that is prevalent in the context of network theory. It can be compared to a community, which often includes or overlaps with a network (Newman 2006: 1). For Benkler, it is a module/community which produces "components" - such as a line of code, a program, etc. - which obviously is dependent on the context of the COIN in which it operates.

\(^{47}\) Granularity in this context is the ease with which data can be transferred to other peers. It is about finding a balance between "Fine granularity" where facilitated data is transferred frequently and "Coarse granularity" where more heavy data, which is harder to transfer to other peers, is transferred. The optimal balance paves the way for an ideal parallel production between the peers involved in the production system.

www.en.wikipedia.org/wiki/Granularity # cite_note-0.
Boisot’s terminology, I see it as a question of the costs of the codification- and abstraction processes for each peer. The lower these are, the relatively greater potential does a COIN have to attract many peers. Compared with having to integrate the many contributions of knowledge in a value-adding context, the costs associated with the sharing process (diffusion process) are the limiting factor. In this optic, it is important to remember that a COIN is a social system and that the diffusion "runs easier" if there is a common framework of understanding between individual peers. In this way, I argue that Benkler's quote can be translated to Boisot’s terminology as follows:

“A COIN is not limited by the complexity of the project, but by the social cost of reducing the complexity of knowledge and coordination costs of the diffusion process” (my own quote).

With the above quote, I argue that the limiting factors for a COIN depends on the social costs by movement along the complexity axis and coordination costs of movement along the diffusion axis in the particular context. According to I-space, the social costs will be the lowest in the upper region of the I-space, while they would gradually increase the further down in the I-space one moves. A COIN operating in a context where the knowledge content generated and shared is relatively explicit and will have the lowest cost. This is exemplified by Wikipedia. Had the SLC for Wikipedia been plotted in the I-space, it would be placed at the far top of I-space, since the knowledge that is shared is explicitly due to the fact-based context. This means that social costs are relatively low resulting in a large attached community. If a COIN operates in a context that takes place in the lower region of the I-space, I see two primary challenges for a COIN: mass interaction and the ICT platform.

**Mass interaction**

Firstly, a COIN depends on mass-interaction, which means that the diffusion rate of knowledge must be high in order to reach many recipients. By sharing complex knowledge it will require the recipient to acquire some contextual background knowledge to understand and integrate the sender's knowledge contribution. This acquisition of contextual background knowledge should be seen as an increase in the costs associated with entering a COIN. Therefore, the consequence of a COIN to operate in the lower region of I-space can result in mass interaction to fail because the cost of participation is too high.
ICT platform

Secondly, as a COIN operates through an ICT platform, it complicates the sharing of more tacit knowledge. Compared to the SECI model, sharing of tacit knowledge goes through a social process, which is not equally possible through an ICT platform. Gloor mentions that in some cases it may be needed for key peers to meet face-to-face in a COIN (Gloor 2004:77). I interpret this as a need to interact on a more social level, in order to share more tacit knowledge and to build mutual trust among participating peers. Benkler deals briefly on the issue of ICT by referring to recent technological advances of the ICT platform that will reduce some of the coordination costs and ensure a better integration of knowledge inputs in a COIN. Boisot also sees new technological improvements as an opportunity to interact in the lower regions of the I-space. He uses the term *bandwidth effect* about the development of ICT technology to argue “The implication here is that recent developments in ICT, in contrast to earlier ones, do not systematically move up the codification and abstraction scales of the I-space. If anything, in the contest between a personal and an impersonal transactional order, the new ICTs favour a re-personalization of communication in the lower regions of the I-space” (Boisot 2007:161). Next to a *bandwith effect*, Boisot also uses the term *diffusion effect*, that also is a result of the widespread use of ICT. The *diffusion effect* indicates a shift in bound organisational institutions, e.g. firms and other command-and-control bureaucracies, to more loosely coupled networks. I see both of the effects as having a positive impact on COIN as an organisational production system, which the following figure will show.
Figure 17: Impact of ICT in 1-space. The technological development of ICT-platforms by a bandwidth effect has a positive effect on COIN by lowering the costs of coordinating and has a diffusion effect that lowers the cost of accessing a COIN (Boisot 2007:161).

Development of ICT platforms will eventually show whether it is possible to represent the complexity that exists in the real world via cyberspace, so that social exchanges can take place in the deeper layers of I-space. In chapter four I will discuss the challenges of using ICT in a COIN and look at what implications there are in relation to the context in which architects operate.

13.4: The Incentive to Engage in a COIN
The reason why people voluntarily engage in COIN projects according to Benkler, is first of all that humans are inherently creative people. This is expressed in a desire by humans to unfold themselves, either spontaneously or out of curiosity. When there is a problem, it lies in the human nature to try to resolve it. Secondly, people engage in a COIN with incentives such as: peer recognition, access to a "real paid job" and acquiring new skills which can be used in other paid jobs (Benkler 2001:24). However, Benkler considers the question of what incentives the members have to be trivial, arguing that: ".. Given a sufficiently large number of contributions, incentives necessary to bring about contribution are trivial." (Benkler 2001: 24).
Neglecting the issue of incentives may seem trivial if a COIN has achieved a sufficient number of peers and thereby continuously attracts new peers in order to reproduce the system. Nevertheless, I believe that the issue of incentive is relevant to consider. In regard to the thesis knowledge perspective, it is important to elucidate whether the architect is interested in sharing his/her knowledge. Thus, I see the incentive issue as a clarification of the learning strategy of the architect. Which of the two strategies is chosen, N-learner or S-learner, depends on whether you are interested in entering a COIN or not. In chapter three I will return to the issue of incentive.

14: **Summary of Chapter Two**
In the table below, I have identified key characteristics of a COIN and placed them in contrast to the Neo-economic understanding of a firm.

<table>
<thead>
<tr>
<th>Explanation</th>
<th>Firm</th>
<th>COIN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decision form</td>
<td>Hierarchical</td>
<td>Self-organizing</td>
</tr>
<tr>
<td>Demarcation of the peers/staff</td>
<td>Bound</td>
<td>Unbound</td>
</tr>
<tr>
<td>Collaboration form</td>
<td>Small scale collaboration</td>
<td>Mass Collaboration</td>
</tr>
<tr>
<td>Learning strategy</td>
<td>N-learner</td>
<td>S-learner</td>
</tr>
<tr>
<td>Starting point for actions</td>
<td>Focus on economical growth</td>
<td>Focus on the vision</td>
</tr>
<tr>
<td>Currency</td>
<td>Economical capital</td>
<td>Social capital</td>
</tr>
</tbody>
</table>

*Figure 18: Coin vs. Firm*

COIN has emerged as a phenomenon primarily due to technological changes in society which have reduced the social costs, thus creating the incentive for peer contribution. Looking at the social cost of a transaction of informational goods (knowledge) in a knowledge perspective, the size of the cost depends on the context in which a COIN has to function. By placing COIN in I-space, a COIN with a predominantly explicit context has a greater use and proliferation value than a COIN in a more tacit environment. This is largely due to the mass interaction a COIN relies on, which means that complex knowledge contribution will increase the social cost for each peer. Another implication factor is that a COIN operates through an ICT platform, which increases costs, especially in contexts at the lower region of I-space.
In relation to the individual peer's incentive, I argue that the key note is that peers mainly focus on an S-learning strategy, since this strategy is a basic condition for a COIN. A COIN is a radical expression of this strategy in relation to the company, but it is through this strategy that COIN has its strength in relation to generate innovations through mass collaboration.
15: Chapter 3: The Architect in a Knowledge Perspective
In this chapter, I unfold my study of the architect in the building industry. The study is divided in
two parts. Firstly, I want to examine the architect's creative process where the architect's statements
will be interpreted according to my I-space model. The inquiry's objective is to identify the
architect's knowledge production and knowledge sharing process in a concrete context, the creative
process. Secondly, I want to explore what incentives the architect has for sharing his/her
knowledge. For this part, I have included new theorists, including Honneth's theory of basic human
struggle for recognition. In addition, I will include Albertsen who has elaborated on the dominant
set of values prevailing among architects. I have chosen to emphasize these two theorists in order to
classify different architects in terms of their incentive to share knowledge.

16: The Creative Process
I will begin my analysis of the architect's creative process by presenting what I would call the initial
stage (see also Appendix A). It is the stage where the client's program is presented to the architect
and also the stage where the architect gathers additional information in order to fulfil the building
constructor's needs. The initial stage can best be described as the factual guidance that the architect
is related to in the sketching stage. It is my understanding that the initial and the sketching stages
cannot be distinguished directly, because there is an iterative movement between the two throughout
the creative process.

16.1: The Initial Stage
The client's program presents the needs that the client wishes the architect to realize in the form of a
project presentation. Depending on the building type, the developer's level of detail in the program
will vary. For example, the program for an opera house contains relatively more information than
the program for a one-family house. Another factor which will depend on building type is the frame
under which the project is performed, such as publicly offered competition, invited competition,
commissioned work, etc. When the client's program is presented to the architect, then it is up to the
architect to interpret and analyse this program. One may be tempted to say that the ability to do this
is basically the essence of the architect's work and determines whether the project is realized.
However, it is an extremely complex process that cannot be equated with problem-solving. The

48 The program refers to the client who hires an architect to draw a building.
reason is that the client's program is not adequate enough. Among the interviewed architects it was mentioned how "the client was unable to define his needs until he saw some possible solutions" (Flemming: Appendix 1). The architect must therefore extend the framework of the client's program and give an added value, something the client is unable to express in his program. However, this does not change the fact that the client's program, detailed or less detailed, is the general guideline for the architect which he/she on one hand must remain true to and on the other hand extend and interpret. Søren explains how they, in a competition where the contact between client and architect is minimal, read the client's program "more than 50 times" (Søren: Appendix 5) in an attempt to decode what the client's intentions and desires are.

Besides the information stated in the client's program, a large amount of background information that is considered relevant to the project is also collected. This background information can vary a lot, e.g. from technical information on soil samples to user surveys, and is often a requirement from the client's side. In some cases there will also be a need to collaborate with other architects, engineers etc., who are specialized in the given area. In addition to the collected information, the respondents mention how old cases are studied as an inspiration for the ongoing project. All in all, it is very different what information sources are involved and in what order it happens. An exact identification of the collection of background information depends on the given circumstances and should not be seen as chronologically predetermined. Different architectural studios will typically have their own method, but whether it is followed rigorously is doubtful. The whole process in the beginning of a project is about being open, work diverging and avoid starting to draw at this stage as it will lock the project onto a specific mindset. Several respondents directly speak about how they try to displace the images which appear in their minds (Lena: Appendix 2 and Tina: Appendix 6). It is difficult since the architect thinks in pictures by visualizing the collected information into the current project. Therefore, the visualization already begins at the initial stage, consciously or unconsciously. Furthermore, the need for collecting additional information may arise in the sketching stage. So as mentioned, a clear demarcation of when the initial stage ends and the sketching stage starts cannot be made.

Compared to my interpretation of the Cynefin model, I would define the initial stage as a process that primarily takes place in the simple and complicated domains. The architect approaches the
many unknown factors that appear at the beginning of a project by collecting factual information through sense - categorise/analyse - respond. The information which the architect cannot collect through reports or own analyses, it is possible to buy through the involvement of external experts and advisers. Since the link between cause and effect in this domain is relatively simple, it can save the architect many costs if they work thoroughly and analytically in this stage by eliminating uncertainties through facts. The importance of the initial stage is emphasized by Tina (Appendix 6) "the more information the better - it's the fuel for the rest of the project".

16.2: From the Initial Stage to the Sketching Stage
Where the initial stage focuses on gathering factual information, the sketching stage focuses on translating this information into a synthesis - a visual expression. Søren (Appendix 6) describes the transition as follows: "you move something factual (information in the client's program) into an imaginary picture you have in your head - you do not have any fixed ideas about what is happening". So where the initial stage focused on factual information, the sketching stage focuses entirely on bringing creativity into play. Characteristic for the sketching stage is that it is an abductive approach to gaining insights where the goal is to find the "true form". In the interviews the working method is describe as being based on an open intuitive approach, using one’s “gut-feeling” and being mentally present during the process. The architect bids in with a qualified guess at what the solution could be, without being able to explain it deductively or inductively. However, the "true form" does not exist, “there is always one thousand ways of doing things” (Tina: Appendix 6). I interpret the transition as a shift in focus from episteme and techne knowledge during the initial stage to phronesis and mètis knowledge in the sketching stage. It is in the practical, sentient and cognitive form that the architect's creative core competencies lie. Below I have illustrated the transition in I-space.
Figure 19: From the initial stage to the sketching stage. The transition between the initial and sketching stages. There is a different focus on the knowledge used in these two stages. Whereas the initial stage focuses on episteme and techne-based knowledge collected through inductive/deductive methods, focus in the sketching phase is on a more practical type of knowledge characterized by phronesis and creative knowledge through mètis. Since the "true form" is unknown, the working method is abductive.

16.3: The Actual Sketching Stage
The sketching stage is all about gaining new insights through an iterative process. The very process in which an idea occurs is a cognitive process which cannot be articulated: it just happens. An idea pops up in the architect’s consciousness and is then transferred into a material (often a paper sketch). It is a non-verbal process and must be regarded as tacit knowledge that is not explicable or as Flemming denotes: “Black-box thinking” (Flemming: Appendix 1). It takes place inside the head of the architect and occurs in some cases when the architect is alone or in direct interaction with other architects. Lena (Appendix 2) also describes how the ideas can arise when you take a walk on the beach, when you are heading to bed, or in the interaction with colleagues through dialogue, critique or reflection.

Drawing on Boisot, the process of embedding the idea onto paper can be compared with a transition from the architect's tacit knowledge to an explicit expression in the form of a sketch - equated with
Boisot's codification (to name an idea) and abstraction (to reduce the number of categories that the idea may be codified within) processes. Overall, it means that when an architect articulates his/her idea, e.g. in the form of a sketch, the merit of the idea is open for discussion with other architects in the group. At the beginning of the process where most ideas are still uncertain, architects work with rough sketches rather than build detailed models. A concrete example is the use of manifold-paper\textsuperscript{49} where changes can be made rapidly. The manifold paper also functions as a dialogue tool in which feedback can be enshrined in the situation. If the architect is at a meeting with the client, the use of sketches is a medium to communicate through and to include feedback. I see the use of unfinished rough sketches as an important tool that allows the architect to communicate parts of his/her tacit knowledge. In the following I will present Ina Wagner\textsuperscript{50}, who has studied the architect's collaborative practice with particular focus on the role which artefacts (sketches, models, etc.) act as communicating tools\textsuperscript{51}.

\section*{16.4: The Importance of Artefacts in the Sketching Stage}

Wagner operates with a broad spectrum of physical artefacts (books, models, notes, pictures, sketches and CAD drawings) all designed to stimulate, inspire and enable communication and knowledge sharing (Wagner 2007:73). The advantage of the physical artefacts is that they help the architect to engage and relate to their existence through the use of the senses. Artefacts mobilize the architect's tacit knowledge and ensure a better interaction and understanding between the actors involved. They represent a mix of symbolic value and an abstraction that helps the architect to express properties like space, light, atmosphere and materials (Wagner 2005:359). Wagner calls the artefacts of network organizing-devices “individual thinking tools” that organise interactive communication. The artefacts have a value because of their physical presence. In her study, Wagner observes how desks of different architects are filled with artefacts. Their presence means that they are within instant reach, "..which some architects find absolutely crucial, while other architects see them as a comforting reassurance of their presence"\textsuperscript{52} (Wagner 2007:74).

\begin{footnotesize}
\begin{itemize}
\item \textsuperscript{49} A type of cheap transparent paper.
\item \textsuperscript{50} Ina Wagner has published several articles about the importance of artefacts in relation to the architectural practice.
\item \textsuperscript{51} Wagner uses the term coordinating tools which I believe refers to communicating tool.
\item \textsuperscript{52} The same was true at my visits. Previous and current project models were represented as an exhibition and the studio was filled with various sketches and pictures. In this way they gave me an impression of the studios architectural profile and culture represented by the artefacts.
\end{itemize}
\end{footnotesize}
Early in the sketching stage, the artefacts are characterized by being informal representations (Wagner 2005:359; Figure 20). This will typically be unfinished sketches, pictures and simple models, which all serve the purpose of being open for extensions, modifications and new interpretations. Throughout the process there will be a development of artefacts resulting in adjustment and increased specification through iteration. Interaction with others in one’s team happens ad hoc and in an informal way, yet the process seldom ends in chaos (Wagner 2005:367). This is because although artefacts can be extremely complex to understand, they are based on sophisticated notes and sketching techniques that have been developed over decades and learned through training and education. It is a kind of common language which all actors within a team
know, a bit like the CAD standard\textsuperscript{53}. In drawing or forming artefacts the architect will try to select places that are open to improvements and inputs from others. This is very important for the coordinating function of the process, ensuring inputs from other architects. If the architect does not adjust to this general language, coordinating tasks between architects cannot be done. So in this sense, the artefacts will be the source to ease the cost of coordinating (Wagner 2005:398). The cost saving effect is clarified by placing the artefacts in the I-space, which I will show below.

16.4.1: Artefacts in I-space:
I have argued that mobilization of the architect's embodied knowledge is needed for value creation in the sketching phase. It is in the lower region of I-space that the architect's creative abilities lie (see Figure 21). As I mentioned in the theory section, Boisot distinguishes between three types of knowledge, namely embodied, narrative and symbolic knowledge. Artefacts can be equated with narrative knowledge, representing fragments of the embodied knowledge in the form of a visually explicit expression. I interpret artefacts as the link to ensure the sharing of tacit knowledge, both internally between architects and externally between the architect and client. In this way, the use of artefacts is a relatively economical way to bring the architect's embodied knowledge into play. Because the artefacts are explicit in their expression they become the subject of sense-making in the sketching stage. Where informal artefacts will increasingly be linked to the internal sense-making between architects, the formal artefacts are more closely linked to opinions between the architect and the client (Figure 21).

During the final presentation of the project to the client, it is also vital to communicate one's knowledge through narratives to give the client insight into the large amount of background knowledge underlying the final result. Several respondents mentioned how Bjarke Ingels\textsuperscript{54} is particularly skilful in including narratives in his presentation of the underlying ideas of the final project. It is an indication that narratives have an important role in communicating the underlying embodied knowledge. Instead of leaving it to the client to decode and create sense in what he/she is presented with, the narratives will have an important role in minimizing the risk of drawing false conclusions. Figure 21 illustrates how feedback is given between the actors involved, thus creating

\textsuperscript{53} Computer-Aided Design (CAD) is a software program employing a common standard for designing objects either in reality or virtually. In construction, it means that all actors can “speak” the same language through CAD.

\textsuperscript{54} Well-known Danish architect who owns the studio Bjarke Ingels Group (BIG).
a learning process.

Figure 21: Artifacts in I-space. The artefact’s role during the sketching stage. I describe artefacts as narrative knowledge. Furthermore I distinguish between informal artefacts, being open to modifications from other involved architects, and formal artefacts that are more detailed models or sketches guided towards the client. The difference lies in the degree of complexity which has to be adapted to the recipient's background knowledge in order for the artefact to make sense. The actual physical artefact is of course explicit, but it is through the narrative story that a sketch, model etc. makes sense for the recipient. Artefacts and narratives thus provide fragments of the sender's tacit knowledge and help to enhance the recipient's understanding and interpretation thereof.

After having looked at the importance of artefacts in the sketching stage though I-space, I will return to which domain the sketching stage operates in and how the overall creative process can be illustrated in I-space.

17: The Creative Process in I-space
As noted above, informal artefacts play an important role to conduct cost-minimizing by communicating the architect's embodied knowledge. However, there is a risk associated with making tacit knowledge explicit. As a guideline, to ensure that the wrong categories are not "cut off" by moving up the complexity axis, the architect's Cynefin55 throughout the project prevents this from happening. The architect's Cynefin is the underlying framework inside which the idea should

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55 See also the theory section under David Snowden.
be placed and is set by the involved architects and the overall architectural profile of the studio. In addition to mirroring the idea of the architect's Cynefin, the client's program and the collected information that has been made in the initial stage also stands as a guideline. Over time, a perceptual and conceptual understanding of the nature of the project is built through feedback loops and this will ultimately be translated into the "true form". It is typically the project manager who decides when that time arises. Since time is a scarcity in a project-based working environment, it is important to make as many iterations as possible. In the interviews, an example was given that the architects sometimes made between 50-150 models of varying degrees of detail. Below is an illustration of how the creative process is a constant mirroring between the architect’s Cynefin and the client’s program (Figure 22).

![Diagram of the creative process]

**Figure 22: Interpretation of the creative process.** The spiral of the much iteration taking place during the creative process. The star at the end of the time line marks the target - the "true form".

Compared to my Cynefin model in I-space (see Figure 12), I interpret the term “black-box thinking” as something taking place in the chaotic domain, in the lower region of the I-space (see Figure 23). One can compare the movement in the chaotic domain as an individual process where actions cannot be explained. There is so much complexity and it is impossible for the architect to understand what is happening - as a result, actions are done intuitively (act - sense - respond). Since the architect most of all works in a collective process, the intuitive actions have to make sense for more than just the individual architect. So where the idea arose impulsively in the chaotic domain, the discussion of its rationale takes place in the complex domain through narrative knowledge.
Thus, I argue that the dialogue and narrative about a sketch is an expression of trying to form sense in relation to the architect's Cynefin, the clients program and the collected factual information from the initial stage. The hallmark of the sketching stage is that it is very much the architect's embodied knowledge that is involved in an iterative process whereby new knowledge is formed. The "true form" is not something the architect knows in advance, but is something that has to be moulded through trial and error. The connection between cause and effect occurs only in retrospect. Therefore I see the formation of the "true form" as something taking place in the complex domain of the creative process.

![Figure 23: Different domains during the creative process. The creative process as a knowledge spiral that is in contact with the chaotic domain, the source of creativity, and the simple/complicated domain, the source of functional requirements. The collective sense-making occurs in the complex domain in search of the "true form".](image)

Because the architect is operating in a field of high complexity, there is a risk of making incorrect conclusions. In the interview with Torben (Appendix 3), he mentioned how they let an outside person look into the creative process and force the involved architects to explain their experiences and insights. It was refereed to as a "screening process" and can be seen as a concrete action to ensure where the project was at in relation to the client's requests.
17.1: Summary of the Creative Process

Figure 24 summarizes my interpretation of the creative process in I-space.

![Figure 24: Summary of the creative process. An illustration of how interactions between the two phases of the creative process take place in I-space.](image)

As shown in the model, the initial stage is placed in the upper region of the I-space, while the sketching stage takes place in the lower region of I-space. The search for the "true form" is the target of the creative process and is carried out through a linkage of symbolic knowledge (the client program and factual knowledge) and architect embodied knowledge (the architects' Cynefin and creativity). In that way one can argue that functionality and aesthetics merges. As a tool to connect the two stages, I see artefacts and the narrative knowledge playing an important part. Here I distinguish between informal and formal artefacts. The informal artefacts are less costly to produce, while they represent a higher complexity, meaning they are open to modifications. This however, requires a common contextual background knowledge between sender and recipient in order for them to make sense. Therefore, I see the informal artefacts as something that primary works internally among the participating architects, because they have a common language making it possible to share complex knowledge. To decode the meaning of informal artefacts they are associated with narratives, metaphors and analogies to express the complexity they represent. The same can be said with the formal artefacts. Although less complex, they help create a dialogue with the client who does not have the same level of contextual understanding.
The black arrows passing between the architects and artefacts illustrate the feedback which occurs in sense making about the legitimacy of an artefact. Through criticism and reflection of the artefacts, decisions will be made on whether the process is moving towards the "true form" or not. From the I-space model above, the artefacts are physical representations of the architect's embodied knowledge through their explicit expressions. They are an economical way of making the architect's embodied knowledge tangible and shareable. The completed building (the final artefact) therefore represents a large amount of embodied knowledge boiled together in a manifested expression.

After analysing the architects’ creative process, it is clear that they operate in a complex and sometimes chaotic domain where knowledge-creation and knowledge-sharing takes place in a social process at the bottom of I-space. This means that the knowledge assets provided by the architect is difficult to express verbally and is instead shared through physical representations. Having to share these knowledge assets in a COIN does not immediately appear to be an easy task. Nevertheless, I will discuss the prospects of mobilizing the architect's knowledge assets in chapter four.

18: The Architect’s Incentive for Knowledge-Sharing
In the second part of my inquiry, I want to shed light on what motivates the architect and what impact this has on the incentives for sharing knowledge with other architects. In the following I will introduce Honneth's theory by linking it to the architect through Albertsen's classification of the architectural field. Later in the second part of my inquiry I will return to Boisot.

18.1: The Struggle for Artistic Recognition
Honneth argues that man, at a general level, is an approval-seeking individual, striving to establish relations based on mutual recognition. The main theme of Honneth is that the struggle for recognition comes at a mutual inter-subjective level, as the individual cannot develop his own personal identity without recognition from others. The theory of recognition is based on this fundamental condition of mutual recognition. This is why Honneth does not go into contextually specific content but instead examines the conditions necessary for individual self-realization. The main thesis is that the specific contextual content changes over time, while the formal conditions
fundamentally remain the same over time. The theory is based on recognition in three spheres:

- The private sphere (emotional recognition in the form of love)
- The judicial sphere (legal recognition)
- The solidarity sphere (covering cultural, political and work-related communities)

(Honneth 2006: 11).

Since the three spheres are integrated, it means that a violation in one sphere can lead to loss of confidence in another sphere (Honneth 2006:13). Recognition in the private sphere is a precondition for the individual's fundamental self-confidence, which triggers a general respect in terms of rights, self-respect and self-esteem for an individual in the judicial sphere, and finally gives self-appreciation in the solidarity sphere.

Recognition is formed by shared beliefs of both "sender" and "recipient" in a mutual relationship. Hereby mutual recognition becomes a great motivation and something that binds social relationships together, but it can also create conflicts. If the individual is not recognized positively in the three spheres, there is a risk of feeling contempt that may prevent individual self-realisation. The overall aim of the theory is on one hand to explain the cohesion of society and on the other hand to justify the conditions for conflicts through the struggle for recognition.

18.1.1: Recognition in Subgroups
In modern society the values and objectives in life are pluralistic and abstractly defined by set values that both have to be open towards fulfilment of different self-realizations and at the same time express an established appreciation system (Honneth 2006:169). This means that there is a constant tension between the openness and encirclement of the valuing system in society, leading to a permanent cultural conflict. As a consequence, different subgroups emerge each with their own interpretations of society's general appreciation system. In the subgroups the ethical values are defined substantially and these values are hierarchically determined in terms of more or less valuable behavioural norms. For the individuals to position themselves high in the hierarchy, the

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56 In this way, Honneth's theory can be understood as a general theory. I will not go into a discussion of whether Honneth's theory is generally valid in all cultural and social contexts as it would be too comprehensive to unfold in this thesis.
individual must acquire "reputation" and "prestige" in the judicial sphere, defined by the degree of individual skill and performance.

I see the architect as being in a subgroup in society. Throughout my interviews I had the impression that they may have a strong sense of solidarity and unity, but at the same time have a constant rivalry within the architectural subgroup. However, I will use Honneth’s theory of recognition as a general term in the sense that the architect is struggling for recognition in order to gain self-realization. It is this struggle that I argue to influence the architect's incentives for knowledge sharing.

18.1.2: The Values in the Architectural Subgroup

In order to validate my argument I will explore the valuation system of the architectural subgroup. In my study of the main motives behind the architect's actions, it is necessary to uncover the core values of the architectural subgroup and to see whether these values can be considered homogeneous or pluralistic. This will be relevant in terms of discussing whether different classifications of architects within the subgroup exist. To support my study of the architects’ core values and how the architectural appreciation-system works, I will include Albert's heuristic identification of the architectural value field, based on Bourdieu. The architectural field here refers to Bourdieu's concept of a field. A field is a socially structured space that is filled with competition and conflicts. The various actors (in this case architects) are struggling to position themselves through the power and resources they bring to the field (Roosby 2002:6). The architectural field designates the field that the architects are struggling in by showing their skills through architectural competitions. The field can be described as a game where actors fight for resources in the form of three types of capital: economic capital (material value), social capital (resources and power which the architects obtain through their network and relationships) and cultural capital (the architects’ knowledge and abilities that are acquired throughout their education, training, etc. and which are often related to prestige and status). Bourdieu operates with a final concept of capital, symbolic capital, which incorporates the three other forms of capital as representatives.

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57 As I understand Bourdieu there is a more confrontational outline in the way he explains human interaction in regard to Honneth who takes a more solidarity view at human interaction. Despite this diversity in tone, I think that they may well be linked in relation to the understanding of the valuation system which exists in the architect's field.
18.1.3: The Architectural Illusio

The reason why the “game” continues to be played lies in its *illusio*, which highlights the architects' operational investment in a competition (Albertsen 1997:138). Without *illusio* the game would not exist, since believing in the game is a fundamental precondition for its reproduction. Whereas Bourdieu's concept of *habitus* can be associated with the rules of the game, the concept of *illusio* associates with the urge to play the game (Albertsen 1997:140).

The architectural *illusio* is formed through the architect's education and imparted through practice. The architectural competition, in particular, represents this *illusio*. Medals and prizes are given as symbolic capital for the winners. An example of the impact of *illusio* appeared during my interview with Søren, where he posed the following question rhetorically "they have a whole wall with awards and medals, what is it that drives them to have medal number 49?" And continues "it is never enough, they will never be satisfied" (Appendix 5).

It was my clear understanding that *illusio* is a fundamental driving force for all of my respondents to a greater or lesser degree. The desire to engage in an architectural competition was expressed by Torben (Appendix 3), who sees the "pure" architectural competitions as the most fun, because here you are competing against former employees and therefore there is much prestige at stake. It is an opportunity to achieve artistic recognition in the form of prestige and reputation by showing your professional skills. The need for artistic recognition is an integrated part of being an architect. This is emphasized by Søren (Appendix 5): "It is placed deep inside me - I can almost feel it when we talk about it" and he continues: "as a narcissism where you sort of get reflected in your own image, to achieve your own set of values. Gradually you discover that it is purely Sisyphean work".

In the interview with Søren the feeling associated with artistic recognition was most clearly expressed. However, most of the respondents acknowledge the widespread need for artistic recognition among architects in general. While any architectural project should be seen as a fusion of functionality and aesthetics, it is very much the aesthetic value that dominates the architectural

58 A key concept in Bourdieu’s theory is *habitus*. It is defined as "a sense and place and role in one's lived environment, both embodied and cognitive" (Roosby 2002: 6). One's habitus is a product of one's history, but is also "open-ended in terms of being under constant development as new experiences are acquired". Habitus is produced in a socially structured space - the social field. Compared to Snowden's Cynefin-concept, Bourdieu’s habitus concept shares many of the same aspects.
Albertsen clarifies the hierarchical structure by dividing the architectural field through a vertical axis representing the quantity of cultural capital, and a horizontal axis that goes from an artistic to a practical pole. Since the core values are aesthetic, cultural capital is perceived as more important than economic capital, which thereby forms the hierarchy in the field.

![Figure 25: The architectural field, based on my interpretation of Albertsen's arguments (Albertsen 1997: 144).](image)

Although the two extremes seem to have conflicting perceptions of the architect's role and values, the practical architect still wants to achieve artistic recognition. This is outlined as follows: *Practical architects treat their artistic colleagues with respect, artistic architects treat their practical colleagues with contempt. Practical architects often express a desire to be, or be seen as artistic, the reverse never happens* ((Prakl, 15f from) Albertsen 1997: 144).

There seems to be an asymmetry in the field when it comes to the need for recognition. Compared to Honneth the standard norms are set in light of whether one’s contribution realizes the group’s core values. If the individual architect has a lifestyle which corresponds to these standard norms, he/she will achieve prestige and reputation. The constant rivalry for positions within the field reflects this dividend. Architect's who are at the top in the architectural field are the ones who are considered to contribute the most in reproducing the values of the architectural subgroup and these
architects get the most recognition. Even though there is a fundamental drive for artistic recognition, there is a divided hierarchy. The two extreme poles contrast to each other, but they both wish artistic recognition. The reason for this is, according to Flemming (Appendix 1), the inculcation that happens at the educational institution. "We are trained at the Art Academy, and when the professional must be assessed, it is in the aesthetic evaluation the criteria lies" (Appendix 1). The hierarchy is composed of these values and those located at the top are also the architects whose professional qualities best descend artistic works. Since the recognition, according to Honneth, takes place in a mutual relationship, the core values in the field are reproduced by the artistic architects. In other words, artistic architects will appreciate other artistic architects and this will be repeated throughout the system. This self-perpetuating mechanism creates a certain form of conservatism that makes it difficult for the practical architect to receive any recognition. The qualities and values that the practical architect has are simply not appreciated in the field. However, there is a change under way, according to Flemming, who argues that especially younger architects to an increasing degree acquire skills located more towards the practical pole (Appendix 1).

The younger architects, who are moving towards the practical pole, see themselves as being part of a "knowledge economy", while the artistic architects see themselves as part of a "Product Economy" (Flemming, Appendix 1). From a knowledge perspective, the difference lies in whether architects are interested in sharing knowledge in the process (e.g. informal artefacts in the creative process), or whether it is only the finished product that is shared (e.g. formal artefacts). Flemming (Appendix 1) argues that the artistic architect is characterized by mystification and by trying to conceal his/her knowledge during the process. This will create an artistic patent, where only the finished product is shared, in contrast to the practical architect who is more likely to share knowledge during the creative process. Drawing on Boisot's learning strategies, I see that the two different approaches to knowledge can be divided into the artistic architect as an N-learner and the practical architect as an S-learner.

I have not been able to verify whether this is a conscious strategy from the artistic architect's hand. However, I would argue that since the artistic architect struggles to maintain the position in the architectural field, he/she is less interested in sharing competences, neither with other competing artistic architects nor with the practical architects. By sharing e.g. informal artefacts there is a risk
that the "recipe" for making artistic work will be stolen by other architects who rank lower in the architectural field. For the practical architect, the S-learner strategy could be seen as a way of breaking with the traditional value hierarchy, and to acquire knowledge faster.

Based on Flemming's remarks and in relation to the focus of my thesis I have noted some additional features to Albertsen's categorization between the artistic and the practical architect (Figure 26).

<table>
<thead>
<tr>
<th>Learning strategy</th>
<th>Artistic architect</th>
<th>Practical architect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collaboration form</td>
<td>Focus on the individual</td>
<td>Focus on the collective</td>
</tr>
<tr>
<td>Focus</td>
<td>Art (artistic work)</td>
<td>Commerce (the client's needs)</td>
</tr>
<tr>
<td>Incentives for knowledge sharing</td>
<td>The finished product (e.g. formal artefacts)</td>
<td>The finished product and the process (e.g. informal artefacts)</td>
</tr>
</tbody>
</table>

*Figure 26 The artistic and the practical architect.* The tabulation is based on my interview with Flemming and illustrates how the artistic architect will be more reluctant to share knowledge (e.g. in the form of informal artefacts) during the creative process, than the practical architect.

In my inquiry of the architects' incentive for sharing knowledge I found it important to investigate whether there is a correlation between the participant’s location in Albertsen's architectural field and their learning strategy in relation to acquisition of knowledge. Based on my interviews, I will place the respondents in the architectural field below.

**The Respondents in the Architectural Field**

Albertsen mentions how most of the architects can be placed in the middle of the field where the relation between art and commerce is balanced. Compared with my respondents it was also my impression that they were generally in the middle of the field. Torben said directly that he would place himself in the middle of the field, but had ambitions of moving higher up the hierarchy (Appendix 3). In the interview with Søren, I got the notion that the only value that mattered at his studio was the ability to create artistic value (Appendix 5). Based on that statement I place him towards the artistic pole. Conversely, my interview with Tina indicated that she to an increasing
degree belonged to the more practical architects, where focus was more on cooperation in the process and less on the struggle for artistic recognition (Appendix 6). The remaining architects did not give any specific indications on where they could be placed, so I have placed them in the middle of the field. In Figure 27, the architectural field with my respondents is illustrated.

![Figure 27: My respondents in the architectural field.](image)

Despite my somewhat pre-cautious positioning of the respondents, I noted that it was the artistic architect who laid highest in the hierarchy and that this was a general perception among the respondents. Erik mentions how 100 randomly polled architects would agree on who was at the top of the hierarchy, based on their artistic qualities (Appendix 4). However, this does not confirm whether these artistic architects will also follow an N-learner strategy. The present investigation yielded no conclusive indications of whether my argument was correct or incorrect. The respondents all mentioned how they had no problem with sharing e.g. the finished projects (the final artefact), but when it came to sharing knowledge in the process the answers were more unambiguous. One of the main concerns was whether competing architects would “steal” this knowledge and use it in their projects. However, several of the respondents would be interested in a knowledge sharing scenario if the overall frame was based on common property of the value being produced (Appendixes 2, 5 and 6). The respondents gave rather hypothetical answers to a hypothetical scenario and it was difficult for me to interpret these. In chapter four I will discuss
whether there is a correlation between the classification of the architect and the relationship to knowledge sharing by pointing to the architect's incentive for participating in a COIN.

18.2: Summary of the Architect's Incentive for Knowledge Sharing

The second part of the inquiry referred to the architect's incentive to share knowledge. Here I used Honneth’s theory of recognition to shed light on how the value system worked. Among architects there seems to be a general desire to get artistic recognition and it is the aesthetic values that are dominant. So in order to position oneself high in the architectural hierarchy, one has to gain prestige and reputation through one’s artistic qualifications rather than economical qualifications. Because the architect believes in the value system through the architectural illusio, the system is constantly being reproduced through mutual recognition. By using Albertsen’s classification of the architect as being either artistic or practical, I argue that the artistic architect will have a desire to conceal his knowledge with a kind of artistic patent. Thereby the artistic architect follows an N-learner strategy. Conversely, the practical architect has a larger incentive to share knowledge in order to acquire new skills which makes him/her follow an S-learner strategy. Through my interviews, I was able to place my respondents in the architectural field of the I-space model, although with some precaution. In the following chapter I will discuss my findings and arguments in relation to mobilizing and engaging in an architectural COIN.
Chapter 4: Discussion of an Architecture Based COIN

19.1: Part 1: Can the Architect’s Knowledge Assets get Mobilised in a COIN?
Throughout the thesis, I have consistently avoided to describe the specific purpose of an architect based COIN, based on the argument that it is up to the participating peers (the architects) to decide its purpose. However, in order to unfold the discussion I will use the I-space model to classify four different types of COIN.

One can infer that a COIN's location in the I-space could be classified by the type of knowledge the participating peers wish to gain insight in. Comparing the four types of knowledge I have used in the thesis, would classify it as either an episteme-, techne-, phronesis-, or a métis-oriented COIN. Subdividing the four knowledge types based on the complexity axis in my I-space model would mean that an episteme-oriented COIN will be located in the upper region, followed by techne, phronesis and finally a métis-oriented COIN which will be located in the lower region of I-space. Based on inquiry results in Chapter three I argued that the core value creation for an architect was situated in the lower region of I-space. The search for the "true form" was done by a focus on phronesis and métis knowledges. So in order to mobilize the architect's knowledge assets through a COIN, the discussion must focus upon whether it is possible to form a phronesis/mêtis-oriented COIN, where knowledge exchange among the participating architects takes place in the lower region of I-space.

What does a phronesis/mêtis COIN mean? From a knowledge perspective, it means that the knowledge inputs that each architect contributes with is experience-based in terms of phronesis and creative in terms of métis. It is not knowledge which can be verified inductively or deductively, but rather a qualified guess at a possible solution. Thus, a COIN collaboration would be abductive. Compared with my inquiry, this form of collaboration is not unknown for the architect, but having to transfer it to the conditions set for a COIN can be problematic. Firstly, it requires a large common contextual understanding amongst the participating architects. In the interview with Tina (Appendix 6), she mentions how she has experienced that the working process takes longer time (more resources) the more people involved in the
process. Tina also mentions that it requires a great attention to the conceptual guideline for a project. In my analysis, I pointed out how the architect must always navigate between the client's program and the architect's Cynefin. This will also be extremely important in a COIN so that the collaboration does not end in chaos. Although there is a widespread "common language" among architects, I consider it costly for the architect to participate in a COIN, especially since it is based on mass collaboration.

Secondly, the problem is that many of the informal artefacts used as knowledge-sharing-tools are physical representations, which would not be possible in an ICT-based COIN. In addition, many of the knowledge creation-processes happen in direct feedback with colleagues and is therefore dependent on a physical space. It is my view that mobilization of the architect’s knowledge assets may be treated as a social process, which to a large extent depends on face-to-face interaction. Therefore, there may be a need for physical meetings during a COIN collaboration, both to shape a "common language", and to discuss the conceptual guideline.

However, I also see a positive impact by a COIN collaboration. For example would an architect based COIN mean that a knowledge inputs (e.g. informal artefacts) would get feedback from a larger number of architects. This could mean that the value of the final product increases. Another strength of a COIN collaboration is that the end-user feedback could be involved during the process itself. That way, COIN could create a more democratic process by giving access to all stakeholders.

In chapter two, I mentioned how technological development could contribute positively by reducing the cost of social knowledge exchanges. Boisot uses the term **bandwidth effect** as a parameter for this. As the technological development of ICT platforms improve (bandwidth increases), it will be less costly to perform knowledge exchanges in the lower region of the I-space. One of the benefits by operating from an ICT platform is that it will be possible to organize large amounts of data. A COIN scenario with mass collaboration where different architects all share their artefacts (sketches, photos, videos, etc.), ideas and feedback, can easily create a complexity in the amount of information that is available. The advantage of using an ICT platform is that it can organize and sort large quantities of artefacts by relevance, which ultimately becomes a cost saving factor for the architect. In this way, ICT can help the
architect to assemble and form meaningful knowledge from large quantities of fragmented knowledge. It is this development which is taking place through Web 3.0\textsuperscript{59}, the semantic Web, where algorithmic codes can provide making sense of large quantities of fragmented knowledge, both when it comes to texts, images and narrative videos. In this way ICT helps the participating architects to be able to handle large amounts of knowledge, thus minimizing the costs for the individual. I therefore see the development of Web 3.0 as something which could have a positive effect on mobilization of the architect's knowledge assets in a COIN. Other technologies, such as video conferences, 3D-printers etc., also have a positive effect. The question is whether the technology will be able to "assemble" the various artefacts in a meaningful context so that a genuine collaboration between architects could take place. I believe it is worth trying to use COIN in an architectural context and see if it works. Although I will stress that a COIN has to be based on a strong vision, that attracts a large number of architects, in order to reach a critical mass and become a self-organising production system. Whether it will become a success will depend on the ability to create a “common language” that minimizes the social costs for the individual architect to engage in a phronesis/mètis-oriented COIN.

19.2: Part 2: Will the Architect Share his Knowledge in a COIN?

Part 2 of the discussion relates to my classification of the artistic architect at the one pole and the practical architect at the other pole of the architectural field. In chapter three I argued that the artistic architect was characterized by he/she having an N-learner strategy in relation to secure and hoard his knowledge, while the practical architect had an S-learner approach focusing on acquiring knowledge faster than competitors. Compared to engaging in a COIN, I consider it a necessity for the architect to acquire an S-learner approach. The whole idea behind a COIN is that it is the masses who together create and own the value, not the individual. Since the artistic architects risk losing their position in the hierarchy by sharing their knowledge in a collegial COIN cooperation I would argue that it is the practical architects who have the greatest incentive to participate in a COIN. In chapter three I also

\textsuperscript{59} Web 3.0 is an evolving development of web 2.0 – and referred to as a the semantic web. Since the web contains more than 48 billion pages (August 2, 2009) web.3.0 is dealing with structuring all of data in a meaningful and more intelligent way for the benefit of the user. http://en.wikipedia.org/wiki/Semantic_Web
argued that the field's value hierarchy is reproduced through mutual recognition, which made it difficult to change. In this aspect the architects' illusio and the cultural influence from the educational institutions can be seen as a barrier in order to give the architect an incentive to participate in a COIN. The dominating view that the struggle for individual artistic recognition is the primary goal of the architect's self-realization can have a negative effect on the spread of a jointly owned COIN. However, several of the participating architects suggest a shift in the field from the artistic architect towards the practical architect. If this trend is true it will have a positive effect on the conditions for an architectural COIN.

According to Boisot's conceptual diffusion effect, I mentioned in chapter two, how ICT has created a movement towards the right side of I-space. This is a movement favouring organisational forms with more open and transparent structures, such as COINs. The question is whether Boisot’s diffusion effect explains the trends that many of my respondents suggested. Would this mean that the development of ICT not only at an organisational level, but also at an individual level favours the practical architect? Whether this shift is a widespread trend and whether it will mean that the architect to a larger extend could be classified as acquiring an S-learner strategy could be interesting to investigate further. My assessment is that developments in ICT favours the individual architect's ability to share knowledge by making it less costly, thus giving the architect a greater incentive to engage in a COIN. Below I have illustrated my argument in the I-space.
Figure 28 ICT and COIN in an architectural context: Illustrated are the two poles of the architectural field in my I-space model. The artistic architect as an N-learner with an SLC with minimal diffusion at the left side, whereas the opposite describes the practical architect classified as an S-learner. Furthermore, I have placed the SLC for an architect based COIN in the bottom right, since I argue that it is in the lower region of I-space that the architect's knowledge assets are stocked in the form of phronesis and métis knowledge. The development of ICT platforms show a general shift towards greater diffusion and the possibility of cooperation in more complex parts of I-space, indicated by the to arrows - the diffusion effect and the bandwidth effect.

As Figure 28 shows, the conditions for COIN grow as technological developments of ICT platforms improve. Knowledge will flow more freely and it will create new conditions for the architect's working practice. That does not mean that the artistic architect will disappear, but it is my belief that in the future, architects will experience a greater demand for sharing their knowledge - requested both by clients and the business environments where they conduct their practice. The increasing usability of the Web and the ever growing flow of knowledge will have an eroding impact of the architectural practice by creating a more network-based organisational structure on a global scale. It is my clear conviction that it will be the architects who adapt to this COIN-like environment the best, that will have the competitive advantages.
20: Conclusion
In the thesis I have sought to explore how the architect's knowledge assets can be mobilized in a COIN. By examining the creative process in a knowledge perspective and the architect's incentive to share knowledge, I have come to the thesis conclusions.

Based on my findings in chapter two I have come to the following characteristic of a COIN:

- COINs are self-organized, based on an unbound set of peers who create a commonly owned value. The individual peer involved in a COIN can be characterized as distinctly S-learners.
- The location of a COIN in I-space depends on what type of knowledge the participating peers want to seek insight into.
- Further development of ICT will have a positive effect on COIN collaborations in the lower region of I-space.

In chapter three, I unfolded my analysis of the creative process through a knowledge perspective. My main arguments are:

- In the creative process, the initial stage takes place in the upper region of I-space, whereas the sketching stages takes places at the lower region of I-space. In search of the “true form” the architect focuses on phronesis and mètis knowledge. Hereby, the architect's knowledge assets can primarily be found in the lower region of I-space.
- In order to mobilize the architect's knowledge assets, informal artefacts are an essential tool with a cost-saving effect in knowledge sharing processes with colleagues.

In the second part of my inquiry I analysed the architect's incentive for knowledge sharing.

- By introducing the architectural field, I classified two types of architect's, the artistic architect and the practical architect. Based on my theoretical framework, I conclude that the artistic architect follows an N-learner strategy, whereas the practical architect follows an S-learner strategy.
- Based on my inquiry, I note that there is a misalignment towards the practical architect in the architectural field.
In chapter four my inquiry analysis was related to COIN. I made the following points:

- An architecture based COIN would be characterised as a phronesis/mètis-oriented COIN. This creates a relatively high level of social costs for the participating peer. I argue that the high level social costs could prevent an architecture based COIN in emerging or reduce the number of participating architects.

- In order to reduce the level of social costs, I suggest a focus on creating a “common language” between the participating architects and physical meetings with key participants.

- Another factor that reduces the social costs is the development of ICT-platforms. I argue that e.g. Web 3.0 could help the architect to structure large amounts of informal artefacts, and thereby create better conditions for an architecture based COIN.

- In terms of the architect’s incentive to engage in a COIN I argue that the practical architect, due to the S-learner strategy, has the biggest incentive to participate in a COIN.

- In my inquiry I noted that there is a misalignment in the architectural field, going from the artistic architect to the practical architect. In order to explore whether this will yield more S-learner architects, I point to new inquiries.

All in all, I had found three essential conditions for an architecture based COIN:

1. The artefacts (knowledge inputs) shared must be informal. This means that they open up for modification and feedback from other architects.
2. The artefacts shared have to be based on a "common language" so that other architects have the opportunity to interpret the meaning and thereby use them.
3. The architect has to share his/her informal artefacts openly, which means that he/she must follow an S-learner strategy.
21: Perspectives
The inspiration for this thesis came, as mentioned, at a book launch for Byggeriets Innovation. In the following perspective, I want to look at whether the framework for a COIN can be adapted in order to create better conditions for innovation in the construction industry.

21.1.1: The Framework for a COIN
Throughout the thesis I have studied the prospects for mobilizing the architect's knowledge assets in a COIN. Thus I have defined COIN as an alternative production system based on common rights. However, there will also be different types of COIN's – some less radical in their S-learner approach than others. An essential argument by Gloor is that companies can actively use COIN's to create innovation for the benefit of their own competitiveness. It can be characterised as a hybrid between a business organisation and a COIN.

In order to create better conditions for innovation in the construction industry, I see it as an advantageous for an architectural studio to use COIN to strengthen their competitiveness. One example could be that one or several studios joined together and created a COIN1. Because of the openness of a COIN, it would potentially be possible to access external knowledge assets, get direct feedback from stakeholders (clients, people who have to live in the buildings etc.) and thereby enhance competitiveness. It would still require that the involved studio operated with an S-learner strategy and thereby be at risk that the generated knowledge could be stolen by other competitors. For the studio this risk must be weighed against the potential advantage of having a significantly larger knowledge pool to work upon.

Another framework for COIN could be a hybrid with an institutional actor, e.g. Real Dania. This hybrid could have the possibility of facilitating the development in the construction industry in general through the use of COIN as a production system. Such a constellation could also have a more interdisciplinary profile where other actors in the industry would participate. However, it must be stressed that an interdisciplinary profile could create higher social costs for the participating peers, since there may be a greater lack of common contextual background knowledge in terms of different disciplines. For both of the frameworks, it is my argument, that the challenge is to create mutual trust, because it is a basic condition for knowledge exchange to take place.
**Target audience:**
As the content of my thesis is within in the construction industry my primary target audience is all stakeholders in this industry, particularly people who work in architectural studios or somehow have a shared practice with architects.

**Credits:**
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Literature List:


