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How can the emerging technologies make Norwegian Foreign Aid more efficient?

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Abstract

This thesis takes the Ecological Economics holistic perspective to discuss and understand in which way the Norwegian Foreign Aid can become more efficient by adopting emerging technologies to assist them on this quest to detect and disclose irregularities in their supply chain, prevent corruption and contribute to strong sustainable development.

Our study is built on 7 individual interviews, relevant literature, thematic conferences and other pertinent sources due to the limited pre-existent theory on the scope at hand and the present volatile nature of the tech industry's development. The Grounded Theory method was chosen on this basis to conduct our research. To help us on a personal level to bring awareness to our bias issues, we chose Heidegger's Hermeneutic circle analysis.

One cannot ignore the disruptive power these emerging technologies are already having directly and indirectly in our environment and the impact on living beings. Today innovation is happening exponentially, like any other creative act, it is not created in a vacuum. However, aspects like mistrust in the financial system, globalisation, access to large volumes of data and the advancement in computing power, have contributed largely to the right conditions for these technologies to emerge in different fields, to thrive, push boundaries and to connect. The interconnection between social, ethical and technological innovation and the new possibilities these create together in a decentralised form are quite exciting from an Ecological Economics perspective; so is the present global economic system being challenged and on the edge of disruption.

"If we accept that the current environmental and social challenges cannot be solved within the present economic and political paradigm, then the way is clear for new and creative ground-breaking solutions." (Jakobsen, 2018, p. 181).

Contents

Acknowledgments

1.0 Introduction

"Trust in Transparency"
One of Diwala's slogans for their digital economy platform 2018

In this introduction, we will clarify our reasons to believe that the emerging technologies have an inherent opportunity to strengthen the Norwegian Foreign Aid policy and why we believe our research theme is important in today's national public debate. We will also take a short look at the 2008 Global Financial Crisis and its relation to the rise of the Cryptofinance world. The emerging technologies are already demonstrating openings for new financial trade opportunities, new management design tools and new ethics and compliance programs for good governance. Although the synergy between the different technologies are still in their infancy, the potential is there, and we believe it will transform the way we think about and give foreign Aid. We conclude the introduction with a glossary that will provide insight into our understanding of the different concepts that will be used throughout our thesis.

1.1 Motivation and purpose

"It is not the strongest of the species that survives, nor the most intelligent that survives. It is the one that is most adaptable to change."
Author unknown; quote often attributed to the scientist Charles Darwin

We live in exciting times where we hear about nature's ecosystems being threatened and destroyed in an accelerating rate, we hear about man-made physical ecosystems creating new consumers' needs and environments mimicking nature as well as the invention of the decentralized digital ecosystems where the emerging technologies live and begin to interact.

We have both chosen to study Ecological Economics because we are interested in the possibilities a paradigm shift in economic governance can offer. We believe the emerging technologies will play a key role in this shift and we are curious to find out how they may assist humankind to achieve a true sustainable development.

Sustainable development is defined as a development that meets today's needs without destroying the opportunity for future generations to meet their wants (Verdenskommisjon for miljø og utvikling, 1987, p. 42). Sustainable development is an overall goal in ecological economics and consists of three dimensions: economic sustainability (development rather than growth), environmental sustainability (respecting the tear boundary of nature) and social sustainability (freedom, justice and welfare). There must be a balanced emphasis of all three dimensions in decision making. If not, the sustainability of society will be threatened (Daly, 1996, p. 36).

We see that economic crime such as corruption and tax fraud accounts for the major leakage in our global economy. Both direct and via externalities, these leaks prevent more people from participating in the global economy and to enjoy its benefits. We are curious about new theories and innovations that can contribute to a significant reduction of corruption, especially in the scope of the Norwegian Foreign Aid policy, within the supply chain and good governance; as this will lift many more people out of poverty and give an important contribution to strong sustainable development. In an ecological economic perspective Daly (1996, p. 36) writes:

> Perhaps a more discriminating, though less numerical, principle for balancing the present and the future would be that the basic needs of the present should always take precedence over the basis needs of the future but that the basic needs of the future should take precedence over the extravagant luxury of the present.

1.2 Background
Fraud and corruption along a supply chain or in a network of supply chains is an old unsolved problem that impacts negatively, the quality of life of people, the planet's resilience as a living organism and the prosperity of businesses that practice social responsibility.

We see disruption taking place at multiple levels, both in science and in business. The exponential development and synergy between old and new emerging technologies embedded in the possibility of a global awareness to practice transparency and collaboration to solve the root cause, namely facing the challenges and finding sustainable solutions, gives us a sense of direction to pursue our research.

1.3 Scope

Our scope is founded on two "truths":

1. Norway provides Foreign Aid that accounts for about 1% of expected gross national income (GNI).

2. Mismanagement, fraud and corruption exists in the Norwegian Foreign Aid's supply chain and the "last-mileage" problem is still a challenge to solve.

Although Norway has stated a zero tolerance for corruption, the reality suggests otherwise as the ability to implement and enforce this intention depends on the recipient of the Aid; the culture in recipients' country, the local government, the financial infrastructure, etc.

We aimed to investigate how the emerging technologies (Blockchain, AI (Artificial Intelligence), IoT (Internet of Things), etc.) could contribute to strengthen good governance of the Norwegian Foreign Aid supply, with the contribution of informants currently working within these cutting-edge technologies to find sustainable solutions and disrupt the *status quo*.

1.4 Clarification of concepts

The concept of the Norwegian Foreign Aid. The Norwegian Aid budget is about 1% of expected GNI (Gross National Income). "Norway gives priority to areas that are particularly important for development: education, health, and job creation through business development. Human rights, gender equality, climate, environment, and anti-corruption are crosscutting issues in Norway's development policy" (norway.no, n.d.). NORAD, The Norwegian Agency for development cooperation does the quality assurance of Norwegian Development Cooperation. Its "main purpose is to ensure that Norwegian development aid funds are spent in the best possible way, and to report on what works and what does not work" (norad.no, 2015b).

The concept of Emerging technologies. "Emerging technologies are those technical innovations which represent progressive developments within a field for competitive advantage; converging technologies represent previously distinct fields which are in some way moving towards stronger inter-connection and similar goals." (en.wikipedia.org/wiki/Emerging technologies). Examples of these technologies are: Artificial Intelligence (AI), Distributed ledger technology (DLT) or Blockchain technology with its recording of transactions in Cryptocurrency or Smart contracts, Internet of Things

(IoT), 5G, etc. These are developing in an exponential way; the synergy between them are of great importance to follow.

The concept of Ecological Economics. Ecological economics is a field of academic research through transdisciplinary and interdisciplinary collaboration, with an understanding of the economy (the human management of limited resources) as a subsystem of the World's ecosystem from a holistic perspective; the interdependencies of all actors in the biosphere. Thereby defending that infinite growth is impossible on a limited planet and aiming to understand the root cause of any given problem in order to find a possible solution instead of just treating the symptoms. Deep sustainable solutions are needed, which do not seem possible in our current global economic system, nor in the environmental economics system, as these systems aims to reduce environmental burdens through trade-offs while further promoting economic growth. This is the position of so-called green politics. Ecological economics proposes a change of worldview and systems of values, from the current anthropocentric perspective to a biocentric perspective.

The concept of Corruption is the most complex concept we have come across in our research. Looking closer into this phenomenon in the Aid industry, we need to describe it from different perspectives to have a grasp of its unbounded presence:

- Corruption from Norway's perspective: Norway signed the United Nations Convention against corruption in 2003. At regjeringen.no (2019) we can read "The Ministry of Foreign Affairs has a policy of zero tolerance of financial irregularities in connection with the use of funds allocated to the Ministry by the Norwegian parliament.". This includes both operating funds and grant funds. A link to the guidelines, in English, for dealing with suspected financial irregularities in the Foreign Service is found on the same page (regjeringen.no, 2019).

- Corruption from Transparency International's perspective: It's classified into grand, petty and political corruption. As stated on their site:
  "Grand corruption consists of acts committed at a high level of government that distort policies or the central functioning of the state, enabling leaders to benefit at the expense of the public good. Petty corruption refers to everyday abuse of entrusted power by low- and mid-level public officials in their interactions with ordinary citizens, who often are trying to access basic goods or services in places like hospitals, schools, police departments and other agencies. Political corruption is a manipulation

of policies, institutions and rules of procedure in the allocation of resources and financing by political decision makers, who abuse their position to sustain their power, status and wealth." (transparency.org, n. d.).

- Corruption from the Ecological Economics perspective: As we addressed earlier, ecological economics is in short, a research field promoting a paradigm shift in order to be fully applied. In the meantime, Jacobsen (2018) writes "Politics should promote sustainable development and peaceful societies without corruption and bribery." (p. 56).

The concept of Money. In our study's context, money refers to the Aid funds translated into means of payment; those being Fiat currencies such as Norwegian kroner (NOK) or US dollar (USD) or Cryptocurrencies such as Bitcoin (BTC), Ripple (XRP), Ethereum (ETH), Cardano (ADA), etc. There are over 1.000 cryptocurrencies today and new projects are constantly on the rise, aiming to perform different tasks in society and in the economy. In this context it also is important to address the concept of the value of money and its diversity. When the coin was equivalent to gold, the "real" value was related to an item that had "rarity". Gold is rare in nature and therefore tends to have a stable value. Bitcoin benefits from the same rarity (since the total amount of coins has been defined from the beginning) (Pacheco, 2018, p. 41). In contrast, Fiat money is not limited, thus creating more opportunities to form bubbles since their offerings are unlimited (Pacheco, 2018, p. 41). On the diversity of currencies, Peretti (2018) writes:

> By the 1860s, there were over eight thousand separate currencies in operation in US alone. (…) With the end of cash, the world of eight thousand currencies is returning. Mobile money, bitcoin, digital vouchers, Apple Pay, iTunes, exchangeable shop credits, everything from overseas currency transfers to billion-dollar deals with the digital handshake of blockchain. All of it is money. (p. 2)

The concept of Globalization. According to Darst (2013) the concept of globalization is disputed and has many meanings depending on the worldview of the person using the term. For the purpose of his presentation "Globalization and Inequality An Overview", he defined globalization in a way that we can relate to and use in the scope of our study. More precisely, on the one hand we have the Aid industry operating on the global supply chain of finance,

services and goods, and on the other hand we have the Economic globalization's contribution to increasing inequality and consequently the increasing need for international Aid cooperation. Darst (2013) defines globalization as "the extension of commodity chains across national borders and very long distances", and by commodity chain he means "all processes involved in life of a product, from extraction of raw materials to final disposal". He adds that the hallmark of today's globalization is "outsourcing: the brand holders do not own manufacturing facilities". Thus, reducing costs and increasing profits by disconnecting from their environmental and their social responsibility. Darst (2013) says "Economic globalization has always been accompanied by the transfer of environmental and health risks.".

This chapter has introduced our scope, its purpose, the questions we seek to answer and has clarified the main concepts needed for a good transdisciplinary communication during our research. Next, we will describe the roadmap used in our study; our chosen methodology.

2.0 Method

Scientific method is a uniform set of procedures for building scientific knowledge (Bhattacherjee, 2012, p. 5). The methodology and principles underlying our research choices are described in this chapter; outlining the steps of research and detailing the research design, the qualitative inquiry, and procedures. Neuman (2014) writes "Social science research is for, about, and conducted by people. Despite the attention to the principles, rules, or procedures, social research is a human activity." (p.23). According to Bhattacherjee (2012, p.2) one will find many disagreements amongst social researchers on how to answer a social problem such as how to reduce global terrorism, for example. Therefore, he advises any student working on these types of studies to be conscious and calm in dealing with higher levels of ambiguity, uncertainty, and fault; This simply echoes the high variability of social objects.

2.1 Scientific basis

The scientific basis for the term corruption and how it's embedded in the fabric of our global economic life had to be explored before we could go further with our research design in order to answer our main research question: "How can the emerging technologies make Norwegian Foreign Aid more efficient?" Loss of financial resources (Norwegian tax money) in the Norwegian development Aid arena is a known public challenge. The size of the phenomenon

is difficult to detect as the findings will show. On the other hand, the dynamic scene of the exponential development of new technological solutions and their interaction with our human existence were also of deep interest and needed exploration before we could continue. Facing the lack of relevant scientific literature for our scope, on this new field; we chose to attend the conferences where the best speakers on the subject worldwide were invited and where they shared their latest work and thoughts. This gave us the confidence to pursue our study and invited the question of whether the disruptive technology can be part of the solution and in which way. The nature of our quest clearly pointed us towards advancing with a qualitative research methodology.

2.1.1 Bias

Our intuitive approach to the 1st aspect, the fluid concept of corruption, was Phenomenological and took the path of the Heidegger's Hermeneutic circle analysis; an interpretive technique. The name was given by the German philosopher Martin Heidegger to describe the researcher's continuous attempt to fully understand the phenomenon in its context; through repeatedly exchanging between interpreting the subjective meaning of the singular part and a holistic understanding of the whole (Bhattacherjee, 2012, p. 116-117). The continuous and repeated exchange between the literature on corruption and our own critical thinking viewed from our individual perspective and context, gave us the opportunity to revise our believes about the concept of corruption; bringing awareness to our prejudice. This exercise took several weeks and was essential to clarify our position as researchers in this study.

A note on our personal interests and backgrounds; it is important to mention that both of us are associated with Cultura Bank (cultura.no) and that one of us has a special interest in the success of the BitGate project (bitgate.no). However, no data collection was taken from these sources, although they were initially on our list of potential informants. Also, one of us read Italo Calvino's "Invisible Cities" many years ago; although Calvino's work is not referenced in this study, it does contribute to one's worldview.

Both of us are inspired by Professor Ove Jakobsen's quest to transform the anthropocentric worldview on economics through the ecological economics perspective.

2.1.2 Grounded Theory

Our approach to the 2nd aspect, the emerging technologies' possible contribution to make the Norwegian foreign Aid more efficient; was through the Grounded Theory research method, since we are exploring a whole new territory. The term Grounded Theory is used both for the product of the method and the method itself. We will use it as a method. A method that, based on empirical data, can be used to develop theory that describes phenomena within a context, for example. Grounded Theory is a systematisation and design of methodology rules. The rules relate to the analytical methods, the interview and the performed observations, which have a strong influence on all qualitative design. The method requires a continuous comparative analysis, and it is often used in qualitative analyses (Johannessen et. al, 2011, p. 201-202). Grounded Theory does not reject the use of theory; it considers theory at the same level as other types of data. Theory can therefore be included later in the research process; such as in the analysis or the interpretation phase. The researcher needs to keep an openminded approach, a theory is not the starting point for interpretation. The research question must not be too concrete and limited. Grounded Theory is best suited for questions that are open and investigative (Johannessen et. al, 2011, p. 201). A key element in Grounded Theory is that the data collection and the analysis are done in parallel. The data must be analysed along the way, so that the interpreter can gradually form an opinion on what is central to the data; thus, focus the investigation in that area. The researcher starts very openly and narrows the focus gradually (Johannessen et. al, 2011, p. 202). To maintain theoretical sensitivity throughout the analysis process is one of the researcher's prerequisite. A sensitivity to the nuances in the data, and the ability to understand and identify what is important and less important and give it meaning. There are several sources for developing theoretical sensitivity (Strauss and Corbin, cited in Johannessen et. al, 2011, p. 202-203). We will point out the two which are relevant for us; Strauss and Corbin (cited in Johannessen et. al, 2011, p. 203) writes:

> Literature on the field: theory, research and documents can provide an important indication about what is going on in the field of research. However, it is important that the researcher attempts to have some distance to existing literature before entering the field so that he is not overly coated by what he has read. (…) The analytical process the researcher goes through in a research project: the insight into and understanding of a phenomenon increases when the researcher takes a deep dive into his data.

The theoretical sensitivity constitutes the creative element of the research process. Creativity and method are obviously two different elements in the research process (Johannessen et. al, 2011, p. 203). Since we both have a creative and technical background, it is important to be aware of the strength this theoretical sensitivity can give us in our analytical process; or weaknesses if unbalance should occur, as we acknowledge in the subchapter 2.1.1 Bias. The researcher should employ a good balance between creativity and method. Grounded Theory analysis without creativity becomes an uninteresting mechanic breakdown of data; on the other hand, Grounded Theory analysis without method often loses grounding (Holm and Schmidt, cited in Johannessen et. al, 2011, p. 203). Mills' advice (cited in Neuman, 2014, p. 23) in his Sociological Imagination:

> You must learn to use your life experiences in your intellectual work: continually to examine and interpret it. In this sense craftsmanship is the centre of yourself and you are personally involved in every intellectual product upon which you may work.

The balance between creativity and method is best ensured if the researcher complies with the methodological rules and occasionally withdraws to make a critical assessment of his analysis so far (Johannessen et. al, 2011, p. 203).

2.2 Research design

We chose an explorative and qualitative research design within Grounded Theory. The exploratory approach to our research is aimed to help us understand better the research questions and not necessarily to provide conclusive solutions for the Norwegian Aid strategy. Our qualitative study is based on 7 individual in-depth interviews with relevant informants and relying on non-numeric data. We have interviewed key persons in the disruptive technology scene, in the Norwegian governmental Aid units, in the Norwegian governmental investigation units and at UNICEF Norway. Two of our informants, in different units, work specially with critical aspects and irregularities in the grant's management and Whistleblower cases. Unfortunately, we were not successful in our quest to get onboard an informant from *Riksrevisjonen;* the Office of the Auditor General of Norway. No justification was given. We believe their contribution would have enriched our data, by adding the Norwegian public sector auditor's perspective. All potential informants of interest were listed. Some names were reached through our network, mingling at conferences and through the official website of their current positions. They were all invited by email and kindly asked to accept that their

participation would be held in English. This was accepted by all participants. The interviews took place in the workplace of the informants and in a good informal Nordic way. We both participated in all the interviews and switched roles as the interviewer along the 7 interviews.

2.2.1 Interview guides

The preliminary work consisted in reading relevant and diversified literature prior to the data collection and attending relevant conferences such as: «Blockchain Days 2018», «Anti-corruption conference 2018», «Freedom Forum Oslo 2018», «Oslo Innovation Week 2018», «NORAD conference 2018» and «CryptoFinance 2018». This gave us a deeper insight into the concepts and challenges in our research; thus, contributing to the design of the interview guides (Appendix A and B). The two versions are similar. The 1st interview guide was used in the 6 first interviews. For the 7th interview, we had to adapt the questions in order to comply with the informant's new status as private participant. Both interview guides were designed to set the informants at ease and give them plenty of room to talk freely about their insights, experiences and outlooks without losing sight of the context of our scope. In order to achieve that, we focused on 4 main open questions and we gave an introduction of the context for each one. This worked very well, and we received good response from our informants about the quality of the framework and the questions. These were semi-structured and in-depth interviews providing us with interesting narratives and data. Additional questions emerged naturally during the interviews; thus, enriching our data collection from one interview to the next. We soon realized that predefined supporting questions weren't necessary to provide. We attribute the reason for this to be the good flow of the conversation and the Nordic way of ease and trust. This was true for all the interviews. Our 3rd informant, Nils Haugstveit, and our 7th informant, Nader Aeinehchi; asked to review the interview guide previously to our meeting, which we accepted on the condition of confidentiality until we have handed in our thesis. Although they knew the content of the interview guide in forehand, we still managed to collect broad and unexpected data. Nader Aeinehchi chose to change his status to "private participant"; a proactive move to be able to participate in our study. He is the only informant not representing his current position.

2.2.2 Research Ethics

To anticipate the ethical and legal implications prior to the study using Grounded Theory can be challenging, as it is difficult to predict what type of data will emerge during the study, and from which sources. Using Grounded Theory gives the potential for a rich research project, but it also requires a larger responsible attitude towards ethical and legal consideration (Birks and Mills, 2015, p.27). We were fortunate not only to get 7 reliable persons in key positions with very different perspectives, but also that everyone chose not to be anonymous, and they all signed the mandatory consent document according to NSD guidelines, the Norwegian Centre for Research Data (nsd.no). Our project was reported on their platform, then assessed and approved by NSD.

"Off the record" sound recordings on the backup devices were not transcribed. All analysed data intended for use was sent to the respective informant for quote review. Of the 7 informants, only the 1st and the 4th did not request the opportunity to review our data analysis on their contribution. We decided to send it to all our informants anyway, with the purpose to increase the credibility of our selected material from the interviews.

2.3 Data collection, organisation and analysis

In the Grounded Theory research method; the collection, organization and analysis of data is done parallel (Johannessen et. al, 2011, p. 205). Data analysis relies on coding through inductive and deductive thinking. The phases in the data analysis are open coding, axial coding, selective coding and theory derivation until saturation; thus, giving closure (Johannessen et. al, 2011, p. 205).

2.3.1 The qualitative interview

The qualitative interview will be the foundation of our data collection. The data collection method consists of these 7 elements in the following order:

- Thematization: Formulation of purpose and own understanding of the scope of our interviews.
- Planning: All the 7 stages must be given consideration in order to obtain the desired knowledge, define the selection strategy and choice of analytical method.

- Data collection: The interviews should be performed using an interview guide, allowing for the opportunity to reflect and consider the interpersonal aspects in interviews context, at the same time.

- Transcription: Preparing the interview material for analysis, transcription of the sound recorded conversation into written material.

- Analysis: The choice of analytical method is based on the problem, the purpose, the research design and the nature of the interview material.

- Quality Assessment: The data's credibility, reliability, transferability, and its accordance with reality must be reviewed.

- Report: In accordance with scientific criteria and the ethical aspects of the study; the findings and method are communicated in the form of a readable product.

(Kvale and Brinkmann, cited in Johannessen et. al, 2011, p. 164).

1st interviewed was Pål Taule Brentebråten, the CEO of BridgeBlocks AS; a consulting company focused on Blockchain, the Internet of Things (IoT), Artificial Intelligence (AI) and other exponential technologies. Our meeting took place in the company's office in Oslo on November 29th, 2018. The transcript from this interview is found in appendix C, a required example.

2nd interviewed was Kari Moe Jacobsen, Senior Adviser at The Knowledge Bank department at NORAD, the Norwegian Agency for Development Cooperation. Our conversation took place in a meeting room at NORAD's headquarters in Oslo on December 10th, 2018.

3rd interviewed was Nils Haugstveit, Inspector General at the Norwegian Ministry of Foreign Affairs. Our meeting took place in his office on December 17th, 2018.

4th interviewed was Kim Noguera Gabrielli, Deputy Executive Director at UNICEF Norway. Our conversation took place in a meeting room at UNICEF's offices in Oslo on January 14th, 2019.

5th interviewed was Svend Thorleif Skjønsberg, Senior Adviser at the Department of Quality Assurance at NORAD, the Norwegian Agency for Development Cooperation. We met in his office at NORAD's headquarters in Oslo on January 17th, 2019.

6th interviewed was Liv Marte Kristiansen Nordhaug, Senior Adviser at The Knowledge Bank department at NORAD, the Norwegian Agency for Development Cooperation. Our conversation took place in a meeting room at NORAD's headquarters in Oslo on January 18th, 2019.

7th and last interviewed was Nader Aeinehchi, a Senior Architect that agreed to meet us in the quality of a "private participant with a technology professional background from the public sector". Our conversation took place in an office meeting room in Oslo on January 21st, 2019.

All the 7 interviews were held in English and sound recorded with at least one backup device, a mobile phone. The first raw transcripts were done through the Happy Scribe online services. Giving us around 80% accuracy depending on the quality of the sound and the English accent. These were then reviewed and corrected by both of us, to match the sound recordings. Statements "off the record" were, obviously, respected and not used as data in our research.

2.3.2 Data organization
The raw data samples, the sound recorded interviews, were timestamped by the main recording device and uploaded to subfolders in our shared thesis folder on the Nord University's SharePoint cloud. A total of 7 subfolders, one for each informant. Later, the final 7 transcripts were gathered in a single folder for better overview of the files to be imported into our NVivo 12 coding project.

2.3.3 Data quality
In Grounded Theory the data can take many forms. Charmaz (cited in Birks and Mills, 2015, p. 65) states that the credibility of the research project is determined by the relevance, the matter, the scope and depth of the data (Birks and Mills, 2015, p. 65). The individual deep

interviews are the most important primary data sources we have. Therefore, we encouraged as many informants as possible to be non-anonymous, precisely to ensure a better quality of the data analysis and coding. Which later was verified through the informant's quote review.

2.3.4 Data analysis and coding

Grounded Theory is empirically driven through its three phases; the open coding, the axial coding and the selective coding phase. Part of the process of simultaneous data analysis and coding is the ever-ongoing comparison and assessment of data through its move from event to event, coding to event, coding to coding, coding to categories, and categories to categories (Birks and Mills, 2015, p. 11). Creating relationships between data. In the selective phase, the theoretical conceptualization will emerge more clearly.

The data analysis was done and organised with the software tool NVivo 12 after an initial and extended manual examination of the text data samples. We both examined the same set of agreed data separately and would come together to compare and discuss our findings and attribute them to nodes. First, we coded the interview's transcripts, one by one; influenced by the coding we adjusted how we coded the next transcript and so on; following the Ground Theory method rules. After coding the 7th and last transcript we coded literature excerpts and other relevant documents using the same approach. We ended up with a codebook with 72 child nodes (NVivo 12) (Appendix D). Each of us examined the finished codebook separately and again came together to compare, discuss and decide the parent nodes that would give us the following 7 themes (NVivo 12) or categories:

- Thesis relevance (highly relevant to our thesis)
- Q2 Supply chain (the supply network and its actors)
- Q3 TTT and Synergy (the interaction)
- Q4 Future (outlook, utopia)
- Examples (cases, programs and pilot projects)
- Statements (personal opinions of the interviewees)
- Ecological Economics (this category collected the data that was especially relevant to be discussed from the Ecological Economics perspective in chapter 5. In other words, it is not Ecological Economics data in its nature)

Our relevant findings were then organized and summarized into one narrative text for each informant. These were sent by email to the respective informant on March 29th for quote review; with the deadline to respond with their eventual comments, on the content, by April 3rd. Extra text were submitted by email to Jacobsen, Gabrielli and Nordhaug on April 10th to be reviewed asap; due to the Easter holidays coming up. Jacobsen and Nordhaug replied on April 11th and on the 15th. The result was as followed:

- 1st Brentebråten's response: No objections.
- 2nd Jacobsen's response: Minor adjustments were made, mainly to clarify the observations and context. The 2nd text reviewed had more comments and adjustments. We accepted all her changes and suggestions since they don't compromise our work; on the contrary.
- 3rd Haugstveit's response: Looks okay.
- 4th Gabrielli's response: Several adjustments were suggested to clarify observations and message. We accepted all his suggestions since they didn't compromise our work; on the contrary.
- 5th Skjønsberg's response: Several adjustments were suggested to clarify observations and message. We accepted all his suggestions since they didn't compromise our work; on the contrary.
- 6th Nordhaug's response: Several adjustments were made to both texts submitted for her review; mainly to clarify observations and message. One specific sentence was deleted on the extra text review due to it being internal information; something we did not realise during the interview. We accepted all her suggestions since they didn't compromise our work; on the contrary.
- 7th Aeinehchi's response: The message comes across.

2.3.5 Theory derivation

Theory derivation took place during and after the interviews. Literature comparison came next and finally came our conclusions and reflections after the preliminary research ended. The elements that will generate our conclusions and reflections through our chosen research method are described by Birks and Mills (2015, p. 11) as the following: targeted initial data collection, initial coding, simultaneous data collection and production, initial theoretical assessment, constant comparative analysis and identification of categories. Then moving forward with theoretical sensitivity, in-between coding, clarify a core category and achieve

theoretical saturation, and lastly concluding with advanced coding and theoretical integration. Note writing is an important part of the analysis within Grounded Theory, these were written throughout the process. Code notes will be useful to understand if the coding has been consistent, theoretical notes are for ongoing assessments regarding ideas, analyses and interpretations, and operational notes document the selection of informants, the degree of detailing, changes in the interview questions, as well as guidelines in that respect (Johannessen et al., 2011, p. 212-213).

2.4 Literature comparison

Since research through Grounded Theory does not start with a theory as the starting point for interpretation, the theory is drawn in later in the research process. To find similarities and differences between own theory and others' theories, existing literature will first be reviewed during or after the analysis, and then compared with own interpretations and derived theory (Johannessen et. al, 2011, p. 215). Here we addressed the operationalization, analysis, hypotheses and perspectives based on the collected data; which was subject to critical reflection and comparison. The discussion in chapter 5.0 reflects this work.

2.5 Weaknesses and strengths

Our study was limited to 7 interview samples that were taken over a period of 2 months, from November 29th, 2018 to January 21st, 2019. Missing the 8th informant from *Riksrevisjonen*; the Office of the Auditor General of Norway, is a weakness in our data collection. They monitor the public sector on behalf of the Norwegian parliament (riksrevisjonen.no). They are an independent unit that report the results of its auditing and monitoring activities to the Norwegian parliament. To audit the management of the Norwegian Foreign Aid budget, is one of their duties.

Our study is exclusively qualitative. In other words, no quantitative data was collected. Neither was numeric data from secondary sources analysed and used. This choice was made based on the nature of our scope; in our view it is not fit to be quantified.

On the strengths side; by choosing not to be anonymous and by quote reviewing the selected data; our informants contributed greatly to the transparency and credibility of the findings. The face-to-face interviews adds the read of body language of the informants to their verbal contribution, giving us deeper details. Making the collected data more precise by

understanding the informant's feelings and motivation; thus, their perception of the issues addressed during the interviews. It also gave us the opportunity to participate and adjust to their individual personalities. Skjønsberg had his new puppy with him, for example; what was a great and fun additional bonus to our interview situation.

This chapter has described the chosen methodology and criteria to support our qualitative research and how we navigated through the data and our bias awareness. The next chapter deals with the selected theory relevant to address the challenges that serious actors operating in the global supply chain face in their business or policy making; as well as to highlight the relationships from an Ecological Economics perspective.

3.0 Theory

Although corruption is not the main subject of our research; it is the main root cause for the Norwegian Foreign Aid's impediments to achieve new heights in efficiency, since it interacts with the global supply chain of goods, services and finance. There is a clear distinction between the two forms of the Aid; the short-term humanitarian Aid (including emergency Aid) and the long-term development assistance. The first is intended to remedy immediate needs in acute emergencies - human or nature related; the latter aims to contribute to lasting economic growth and social development (Hansen, 2013, p. 99).

According to Elena Urlaeva (cited in Chayes, 2015) "The *first* violation of human rights is corruption!" (p. 101-102), and she points out that society talks about other social issues like child labor, for example, separately from corruption. Although governments might address issues like human rights and religious freedom in their approach to dialog with specific countries on a multilateral level; the subject of corruption hardly does (Chayes, 2015, p. 188). When corruption is the means of continuation of the entire social system, investigating economic abuses could be life threatening exactly because it touches the system (Chayes, 2015, p. 101-102).

We have a fluid awareness of the concept of "corruption", and its mediatisation gives the outline for understanding media's interest in the discussion of corruption and how the media influences what is perceived as corruption (Breit, 2014, p. 52). The mass media in a well-functioning democratic structure, both print and electronic, have a significant part to play in

combating corruption (Holmes, 2015, p. 106). The way corruption is presented in the media can be understood as a discourse. In this way the discourse of corruption is detached from the phenomenon of corruption, failing to address the connection between real actions and the way they appear in the media and thereby blurring the distinction between corruption as a phenomenon and as a discourse (Breit, 2014, p. 54). In many ways, the phenomenon of corruption is underlaid the discourse, which in turn is biased by the media's institutional conditions and social role, which again influences how the civil society perceives and understands corruption from the behavioral point of view (Breit, 2014, p. 59). Holmes (2015, p. 49) finds this unfortunate and that it constitutes a particularly difficult task, both because there is no agreement on what constitutes corruption, but also because of the difficulty in obtaining information as significant factors.

Defining corruption in a general way can be difficult due to a range of reasons. Any label would be different from country to country, and there will even be variations within the country itself. There is no general agreement amongst countries as to what constitutes abuse of power or what should be considered illegal, and analysts have therefore centered the discussion around the different forms of corruption that exists. Other analysts have, in the absence of any agreement on the definition of corruption, chosen an empirical look on the topic and all its real-life manifestations. This opens up to a broader consensus around what kind of harmful acts that is afflicting the society, and therefore also should be penalized and prevented, which also helps governments reassess their definitions and their preventive and ensuing actions in regard to corruption (Edelbacher, 2018, Kindle Locations 734-742).

Corruption is differentiated into individual corruption and systemic corruption. Systemic corruption is using public office for private benefits. These benefits are so entrenched that, without the corruption, an institution will not be able to supply any goods or services functionally (Edelbacher, 2018, Kindle Locations 780-783). Systemic corruption is also characterized through being spread throughout the entire country, with law enforcement agencies being deeply corrupted and therefore unwilling to investigate and prosecute offences of corruption (Edelbacher, 2018, Kindle Locations 788-790) (Edelbacher, 2018, Kindle Locations 799-801). Corruption can mainly be sorted into these fields; political parties who influence candidates and elections, influence on all kinds of entrepreneurs (e.g., construction industry), influence on journalists, influence on bureaucracy, and influence on the "modus operandi", i.e. on how corruption happens, for instance; bribery, kickbacks, bid fixing,

financing of parties, trading in influence, and media coverage (Edelbacher, 2018, Kindle Locations 768-771).

Our study brings the Ecological Economics perspective, which means looking at the root causes of a problem instead of fixing the symptoms. Our research aims to explore the synergy between the best practice, the human aspect and the continuous technological innovation for sustainable solutions in the Aid Industry in the scope of the Norwegian Foreign Aid.

Our literature search and choices are reflecting the deduction of Johannesen et al. (2011), they write; "The researcher must not intend to examine concrete hypotheses and assumptions, but rather find out how reality looks like in a field he doesn't know so well beforehand." (p. 201). These readings gave us the foundation to design our interview guides and discussion format. Later published pertinent articles were added to the discussion.

3.1 The global supply chain

Søreide (2014, p. 29) states that the biggest risk for corruption occurs often when authorities in poor countries with weak institutions accepts financial resources from abroad. This could apply to earnings from export of natural resources such as oil or minerals, or as the focus in our thesis suggests; transfers to a country in the form of Aid or Development loans. He continues to highlight that a political leadership having secured its personal wealth because of weak democratic processes, is often less focused on the quality of public services, and that in these situations there is a pattern of poor implementation of essential services for the population. Aid funding and low-cost loans from Development Banks may have similar consequences, but such resources often come with increased control measures, capacity building within the state institutions and demands of proper accounting and accompanying results (Søreide, 2014, p. 30). A particular challenge that Søreide (2014, p. 30) points to is for the Aid authorities to uphold their requirements for results, as they with their accompanying intention to help as the country is poor, often will continue to offer Aid even though the results are meagre, which furthermore could create unfortunate consequences such as Aid dependency and heightened corruption challenges. If those involved in corruption are not held legally responsible and accountable, there is a risk of worsening of similar challenges despite the good intentions of the Aid community. Considering the human aspect, the argument of some of the Western officials is that the recipients are at least getting some Aid even though some, or a lot, of money is skimmed of, and at least more than they would have received if the

humanitarian Aid project or program didn't exist. But as shown in ultimatum game experiments; recipients would actually prefer to walk away empty-handed rather than having to accept such an unfair deal (Chayes, 2015, p. 44).

In all the research, analyses, and papers that apply to corruption in developing states, regardless of the location of the country, it seems that the institutions in most developing states are inefficient in combating corruption, and that anti-corruption agencies, prosecution, the police, and courts fail in regard to combating corruption (Simonović, 2018, Kindle Locations 5221-5226). In the literature, one of the general observations related to developing states is the great gap between the implementation practice of legal norms and the laws regulating the operation of anti-corruption bodies in corruption cases (Simonović, 2018, Kindle Locations 5221-5226). For many transition states and developing countries, one of the most worrying complications of corruption is that it can result in a reduced Aid contribution (Holmes, 2015, p. 35). Also, it has, traditionally, been very unpleasant for non-profit organizations to address the topic of corruption and bribery in areas of conflict. The organizations - especially those who have based themselves on predominantly private donations - have feared that such disclosures will cause the donors to retreat. Consequently, there have been quite a widespread practice to withhold information, and still there is considerable skepticism in many NGO environments against giving away information about their own corruption experiences (Hansen, 2013, p. 119).

The relentless fight against corruption continues with full force as corruption is one of the major reasons for growing inequalities, poverty, dysfunctional democracies and a global insecurity (Cockcroft, 2012, p. 231). Cockcroft stresses that the power of the super wealthy having secrecy jurisdictions as a way of life; the strength of mafia bosses holding on to their power at all costs; the dangers of territorial arms races incited by corruption; and the heads of state holding on to power which can only be retained by bribes to their constituency; these will not readily yield. Any attack will need to be bold yet focused, courageous yet circumspect, sophisticated yet clear; as Cockroft (2012, p. 232) states: "the snake will die only if severed at the head".

The main factors which drive large-scale corruption forward, at a national level, is political funding and the interplay between governments and organized crime, and also the role both local and multinational companies could play using corruption to increase market share (Cockcroft, 2012, p. 115). Deals which appear to be clear-cut corruption have shown

themselves to be also designed partly to assure the interests of a political party or faction – or simply a well-embedded governing elite (Cockcroft, 2012, p. 117-118). Once funds are transferred to a party who achieves power, its committal to multinational and local companies, and maybe also to organized crime, constitutes a cocktail that, rather than enabling it to constrain corruption, will tend to stimulate it (Cockcroft, 2012, p. 120). A huge challenge in many of the developing countries receiving Aid is the powerful and dominant elite that expects and demands "kickbacks" in the process of delivering the Aid (Hansen, 2013, p. 131-132). Large-scale fraud schemes commonly have international ramifications and imply corrupt behavior from government officials as well as political leaders, and also often members of the judiciary and the police. This assertion is particularly fitting in countries that have an unstable government and are developing economically, and corrupting government officials within business ventures of international scope is sadly often, rather than being the exception, normal in some countries (Edelbacher, 2018, Kindle Locations 1097-1101). If the relationship of trust is broken by the government, people lose their faith in the governments' ability to make decisions correctly. And with moral licensing, the inclination to offer and accept bribes will then increase in the population as well. In order to understand corruption in a society, we must therefore understand what conditions strengthens people's trust in the authorities (Søreide, 2013, p. 202). It is crucial for corruption prevention that the criminal justice system is capable of holding those involved responsible. In this way we can counteract the human inclinations towards corruption, and also promote and insist that the individual is responsible (Søreide, 2014, p. 32). Holmes (2015, p. 103) highlights Max Weber and his argument that having a powerful business class separate from the state was the best way of controlling the bureaucracy, which would also include controlling corruption. Sadly, these two - the business sector and the government – are in many countries all very pleasantly intertwined, which gives a grim outlook for the control of corruption as both banks and the corporate sector could be playing a significant role in opposing corruption.

It is important to note that the risk of corruption is related to institutional organization. If remedies to protest are limited and the consequences are minuscule when the corrupt are being caught, the risk of corruption is higher (Søreide, 2014, p. 27), and since corruption can be hidden behind corporate structures and ownership, the element of financial secrecy is essential to understand risk (Søreide, 2014, p. 28). Multinational corporations themselves are significant foreign policy actors who, through their investments, modes of operation, building of relationships in the countries in which they operate, should consider expanding their

corporate responsibility to include their position in possibly facilitating the sustaining or the development of kleptocratic systems (Chayes, 2015. p. 199-200). Contracting guidelines should direct Aid officials to avoid implementing partners and collaborators whose beneficial owners are known members of corruption networks (Chayes, 2015, p. 194). Any synchronized and strategic campaign to curtail acute corruption must also include incentive and rewards for reform. That means that any loans and grants, development assistance provision of equipment and valuable contracts are all potential incentives (Chayes, 2015, p. 202). The international community's challenge to fight corruption is not just about the effectiveness and influence of the measures and actions against corruption, seeing that the governments have so much power, it is also about significant reluctance to raise the corruption-related challenges to a political level. Many actors and authorities within the international Aid society want to maintain a dialogue also with corrupt governments. Demands for democracy and respect for human rights are therefore very carefully promoted to avoid provocation. Measures against corruption at sector level funded though Aid appear to be an attempt to do something in a situation where framework conditions are not optimal (Søreide, 2013, p. 220). The corruption concern amongst the Aid donors was expressed by OECD in 2005 through the Paris Declaration, recognized by both donors and recipients, stating that governance reform and the fight against corruption should be mandatory in all Aid programmes from the OECD member states (Cockcroft, 2012, p. 111).

Norway is perceived in the global arena to have low risk of corruption. However, there are increasing number of cases disclosed that could also be understood as an increase in the awareness of the problem of corruption, including where and how it operates (Eriksen, 2014, p. 13). The risk for corruption linked to organized crime is dependent on institutional framework conditions, and even though the risk is lesser in Norway than most other countries, the high level of trust in the Norwegian system can make us vulnerable to systematic network infiltration with connections to criminal organizations (Søreide, 2013, p.161). In order to have an acceptable overview of the large sums of money supplied to Aid every year; every Aid contract must include independent monitoring and assessment (Chayes, 2015, p.195). The Norwegian Foreign Aid authorities has declared a zero-tolerance on corruption (regjeringen.no, 2019), and some of the European countries, including Norway, have also attached strict conditions to their Foreign Aid, which includes repayment requirements in the case of conditions not being met (Chayes, 2015, p. 187). A firm and consistent enforcing of Norway's zero-tolerance regime produces a risk with either having huge amounts of Aid not

being delivered or that other recipients than the intended ones must be chosen to receive it. This will imply a rearranging of the whole Aid policy (Hansen, 2013, p. 186).

Budget support is meant to produce results by increased efficiency in the system for public consumption and distribution, and the Norwegian Foreign Ministry claims that there is no evidence to support that budget support is more vulnerable to corruption than other ways of distributing Aid (Hansen, 2013, p. 87). When transferring Aid grants to a well-functioning state, the transfers is handled by the country's ordinary political bodies. The funding is transferred to the country's treasury in order to be distributed through its budget process and moved to state bodies over the established transfer system. This process is controlled through the country's system for internal control and subject to revision of the country's national audit (Hansen, 2013, p. 83). If Aid donors withdraws from the budget support processes and instead choose to spend the Aid billons on specific contracts on say climate, power or oil contracts, investing in global funds etc. this will increase the risk of corruption as the insight and control into how the Aid recipient states organizes the use of this money and if they are directed towards the intended purposes are meagre compared to funneling the money through budget support (Hansen, 2013, p. 86). Earmarked project funding can in many cases increase the risk of corruption as the possibility for double accounting appears. The recipient can then receive multiple payments from different donors for the same product or service. A donor will in these situations have insight into the management of their own funding of the project but relies mostly on the audit report to disclose financial irregularities within the accounts in the project (Hansen, 2013, p. 90).

Political will can be viewed both in a narrow and in a wider sense. A narrow understanding would include the ruling regime politicians and authorities in decision-making positions. The wider sense would also support the improvement of anti-corruption policy and include NGOs, members of social communities, and political opposition organization, and confrontations and disagreements could occur between the supporters of these two interpretations (Simonović, 2018, Kindle Locations 5062-5065). There is also a need to be aware of the fact that authorities and civil society in developing countries are not necessarily characterizing political will and political interests in the same way (Simonović, 2018, Kindle Locations 5048-5055). Only the civil society seems to have the need and interest of improving the fight against corruption and democratization of society. These different interest displays that there is a conflict, hidden or visible, in the base of political will for corruption suppression between the civil society and the corrupt system (Simonović, 2018, Kindle Locations 5048-5055).

Considering that there is a shortage of serious political will within the ruling structures, the anti-corruption laws, reforms and the establishing of anti-corruption bodies that governments of developing states formally implements under the pressure and influence of the international community, often do not give the desired effects that the public and the international donors anticipates, as the governments' aim is rather to gain favorable international business opportunities and international loans in order to present their country as brighter and better than it really is (Simonović, 2018, Kindle Locations 5436-5446). Also, measuring political will can only be done indirectly, and evidence of political will is often observed from a retrospective standpoint. This leads to a methodological predicament of often engaging in post hoc circular analytical arguments when examining the aspects of political reform and political will (Brinkerhoff cited in Simonović, 2018, Kindle Locations 5142-5154).

Consultants are engaged by the Aid authorities to investigate, govern/manage and evaluate projects and programs. The countries in which such work is carried out are; among the poorest; controlled by a family or a rich elite (clan/tribe) who dominate and acquires most of the wealth in their country; the most closed countries with weak governance; those with the least reliable planning and investigation data; and the most corrupt. In many cases the situation in the country is so dangerous for employees to travel in that the foreign service does not allow its employees to travel on project visits and inspection trips. This is important to be aware of as a backdrop when discussing the Aid authorities' real will, abilities, and opportunities to fight and resist corruption (Hansen, 2013, p. 129). When Aid funding is given to projects in areas that are considered to be in such a precarious state that the Foreign Service will not allow its own employees to inspect or monitor what the funds are really used for, Hansen (2013) finds it difficult to take the Norwegian official zero tolerance for corruption seriously (Hansen, 2013, p. 89-90). When NGOs operate in areas where state Aid actors do not dare enter; the NGO's role in these areas can be so dominant that the way they choose to or are forced to act can even contribute to the increase or the reduction of corruption (Hansen, 2013, p. 118). The Office of the Auditor General of Norway's review and documentation on the stations' lack of capacity and competence to follow up the grants in a thorough manner, in order to detect financial irregularities and initiate thorough investigations when needed, demonstrate that Norway's zero tolerance on corruption can be very different on paper and in reality (Hansen, 2013, p. 184).

There is a need for western countries and international organizations like the World Bank and the IMF (the International Monetary Fund), or any upstream of changes in the way Aid is

delivered, to gain a greater awareness of how their development assistance enrich kleptocratic ruling networks by becoming yet another "income" for said networks (Chayes, 2015, p. 194). Chayes (2015, p. 211) emphasizes that it's not potential improvements that is lacking, but rather a clear-sightedness in relation to the gravity of the endangerment that occurs, and also the bravery to design said improvements.

Corruption is likely to be widespread and in fact accepted by the people as something that is almost impossible to eliminate when the police and judicial officials are not independent, but under the restraint of political figures, corporations' heads, and leaders of organized crime groups which in these situations don't fear exposure of their illegal activities. Those who seek to disclose corruption, the so-called whistleblowers, are oftentimes when exposing corrupt officials in corporations, government, the military, or public service administrators punished in all manner of ways, for instance, losing their jobs or not being promoted (Kratcoski, 2018, Kindle Locations 293-297). Control units are important, but controls can fail, and even leaders who are aware of what is going on do not necessarily address the issue. This means that whistleblowing from individuals who happen to be in a position to reveal the problem, in many cases is the only way to disclose socially damaging corruption; in other words, the role of the whistleblower is crucial in the fight against corruption (Søreide, 2014, p. 43). The motivation to whistleblow about corruption naturally follows the desire to act in accordance with one's own moral standards and often with an expectation of positive reactions from the outside world. But whether these benefits are realized and are greater than the disadvantages of whistleblowing are highly uncertain (Søreide, 2014, p. 35). As corruption can occur in all stages of a project and can involve public employees as well as representatives of the private sector, both in the recipient country and the Aid organization (Hansen, 2013, p. 91), Bernt (2014) stresses that the instrument to trust in the fight against corruption are ultimately transparency and rules about transparency. However, in the framework of market economy, this requirement conflicts with the players' need to shield strategies in a competitive context. Information and knowledge, having a double function as both power and brand in businesses, are therefore also potential elements for corruption. In this framework we are dependent on whistleblowers from the inside to uncover unacceptable *practices* (Bernt, 2014, p. 261). Whistleblowers and the media represent the core security mechanism for democracy to act when leaders and control apparatuses fail. Increased competence among journalists and politicians on the whistleblowing phenomenon are crucial to society's ability to protect

employees when they whistleblow externally; especially when the risk level for retaliation is high (Bernt, 2014, p. 272).

In regard to informing the public and governmental and justice agencies of crime and corruption committed in the corporate world, Transparency International have been instrumental in providing publications related to numerous forms of fraud and corruption, including the yearly Corruption Perception Index (Kratcoski, 2018, Kindle Locations 352-355). Kratcoski puts forth Transparency International's statement highlighting that "it is in the best interests of all governments as well as the citizens to guarantee that good-quality services and at a fair price are guaranteed" (Transparency International cited in Kratcoski, 2018, Kindle Locations 359). They also assert that specific measures could help ensure honest procurement processes, and they see a need to push for commitments to honesty for bidders for a contract and also the procuring government agencies. This will establish promises from all partners involved to reject collusion, bribery or other corrupt practices, and independent external monitoring to ensure an agreement is not violated could also be demanded to strengthen the process further (Kratcoski, 2018, Kindle Locations 358-363).

An increased attention towards corruption within Aid does not necessarily signify an elevated level of corruption, but maybe it rather reflects the fierce increase in demands for openness, impartiality, orderliness and equal conditions of competition when awarding contracts and influential positions as increased access to information provided by various media has paved the way. Such demands for transparency and willingness to practice what has been made possible by the IT revolution has helped to reduce much of secrecy in diplomacy and foreign affairs and hence the access to many critical assistance-related documents that were previously almost automatically marked "not for the public " (Hansen, 2013, p. 135).

3.2 The emerging technologies' promises

A central challenge in the history of money has been to design a highly effective system to facilitate the exchange of goods and services, and also generate prosperity. At the same time there is a need to prevent the institutions managing that system from violating the trust accompanying that role (Vigna and Casey, 2015, p. 39).

Enter cryptocurrency – here explained by Vigna and Casey (2015, p. 5-6) - the category to which Bitcoin belongs. The simple brilliance of this technology is its ability to cut away the middleman yet maintaining an infrastructure allowing strangers to transact with one another.

It's a network-based ledger – in the case of most of the cryptocurrencies is called a blockchain – that with its ability to be a stand-in for the middlemen since just as effectively can tell us whether or not the counterparty to a transaction is legitimate. With eliminating middlemen and the accompanying fees, cryptocurrencies promise to minimize the costs of doing business and mitigate corruption inside of the intermediating institutions and also from the politicians in these circles.

Blockchain contains a record of all transactions since its creation and is continuously growing and updated. The new transaction blocks are added chronologically to the Blockchain, and all computers entering the network automatically receive a copy of the entire Blockchain's log. These computers that enter the network make their processing capacity available to process these transactions and validate them as well as send them to other computers on the network. But in order for this to happen, and to be able to view Blockchain as a true decentralized security system, this network must meet some basic characteristics; being an open, boundless, decentralized, neutral, censorship-resistant network (Pacheco, 2018, p. 74). "It's about freeing people from the tyranny of centralized trust" (Vigna and Casey, 2015, p. 8). The concept of money has become both a mental construct in addition to the "value" itself. Even though money is neither good or bad, people have provided it with transcendent values, and the supporters of Bitcoin are no different describing their currency in offering it as a solution for the world's poor as a better, more comprehensive and readily available form for money; it's like capitalism linked with a radical altruism (Vigna and Casey, 2015, p. 186-187).

After Bitcoin, Ethereum – also called Bitcoin 2.0 - is the most popular cryptocurrency. Ethereum is an operating system that allows Smart Contracts functionality (Pacheco, 2018, p. 82). Judicial corruption leaves low-income people in developing countries unable to rely on watertight contracts to support their businesses and unravel de Soto's mystery of capital. Subjecting these kinds of agreements to the dependability of the Blockchain could be the answer they've been looking for. Ethereum seeks to benefit the informal economy by disrupting contractual and legal arrangements across the board; offering Smart Contracts designed to be carried out on the Blockchain (Vigna and Casey, 2015, p. 217). There are many possible uses for Smart Contracts, for instance as a management tool where total transparency is possible and misuse/forgery/deletion of data/manipulation of evidence cannot be done without being detected. Smart Contracts was an idea first voiced by Nick Szabo, suggesting that the Blockchain could, at its crux, replace the preeminent trusted third party; the legal system (Vigna and Casey, 2015, p. 224). Smart Contracts need not be restricted to

only finance. It could also be paired with Smart Property – having titles, deeds, and different certifications of ownership put in digital form to be managed by software – and thereby allowing automatic transfers of ownership of physical assets like cars or houses, or also intangible assets like for instance a patent. And when contractual agreements are met, the software initiates the different transfers (Vigna and Casey, 2015, p. 225).

Cryptocurrency's great promise is that the poor will find it exceptionally useful and that it could liberate the "unbanked" (Vigna and Casey, 2015, p. 185). Approximately 2.5 billion adults in the world do not have access to banks, and are thereby cut off from a financial system that is commonplace for the rest of us and that we take for granted; the possibility to start a savings account, have a checking account, get credit cards, and even live in places where there are actual banks set up. Without these possibilities the so called unbanked are walled off from the global economy. They are fortunately not unreachable, and one of the most thrilling prospects supporters of Bitcoin talk about is employing cryptocurrency to guide these hordes of people "roaring into the twenty-first century" (Vigna and Casey, 2015, p. 186). Bitcoin could give them that opportunity. It gives the unbanked the ability to have a whole bank on their mobile phone; and to own this bank (Pacheco, 2018, p. 157). It is now the millions of citizens being able to manage their own businesses with solely their mobile device who will benefit from the revolution in the developing world of today, amplifying the SME (small to medium-sized enterprise); high-speed internet connection anywhere in the world (Peretti, 2018, p. 439). Vigna and Casey (2015, p. 216) points out that the root causes of financial isolation in poorer countries moves beyond people's lack of banking services and prices of money transfers; the underprivileged is commonly cut off from what the Peruvian economist Hernando de Soto phrases the "mystery of capital", meaning that the idea that economic growth and creation of wealth builds upon on clearly documented and defined property rights.

As digital money surfaced in 2000, it came with the most likely scenario of cementing the global inequality; the poor would continue with cash and the wealthy would utilize digital and mobile money. But, the service M-Pesa proved the complete opposite as it both empowered and netted the poor part of the population (Peretti, 2018, p. 22). In their first year of launch M-Pesa had seventeen million Kenyans using their service, and by 2010, more people in Kenya were using M-Pesa than were using a bank account, as they literally didn't need one (Peretti, 2018, p. 20). "M- Pesa was a revolutionary exercise in the democratization of money, using an entire nation as the laboratory." (Peretti, 2018, p. 20). It required just an old Nokia

phone, it eliminates transfer fees, lends money and simply made banks and cash extinct. M-Pesa empowered Kenya to leapfrog the usual twentieth-century phases of development: banks and infrastructure. "M-Pesa has genuinely disrupted money and has done it with the most basic technology available." (Peretti, 2018, p. 21).

Cash is being eradicated with an increased speed, and the most valuable currency is now the data gathered about you and me. Simultaneously, the Silicon Valley tech giants are cutting deals to be able to integrate Artificial Intelligence, Big data, Blockchain and Algorithms toward an all-encompassing digital grid; a controlling system over life itself termed 'singularity' (Peretti, 2018, p. ix-x). The drive to kill cash is mainly the elimination of the black economy. Kenneth Rogoff, the former chief economist at IMF (the International Monetary Fund), states that the global end of cash is a good thing, and that it's also unavoidable (Peretti, 2018, p. 22). The word 'Bank' simply means other people's money, or more correctly; other people's debt (Peretti, 2018, p. 368). The banks were able to be bailed out by the government, but the tech giants are massive compared to any one government. They constructed the world in which we live, and they are in possession of the keys (Peretti, 2018, p. 368).

When talking about the Big Five (Apple, Google, Microsoft, Amazon and Facebook), these are in reality not tech companies at all. Together forming five intertwined parts of a massively complex structure we've never seen before - by Deleuze and Guattari also called a 'rhizome'; a botanic term to describe an immense root system expanding quickly and oriented horizontally outwards in every possible direction (Peretti, 2018, p. 369). In China there are corresponding companies - Weibo aka Twitter, Baidu aka Google, Alibaba + JD.com aka Amazon, Tencent aka Facebook, Didi aka Über - who, operating on a vast canvas, are combining Big data and Artificial Intelligence to solve enormous demographic and social challenges. Their similarities are to be found through their ambitions, which is beyond territorial limits, and that they will all certainly be expanding further (Peretti, 2018, p. 416).

Google's founders, Sergey Brin and Larry Page, are the leaders of Googles new umbrella company Alphabet, which aim is simple: to explore how to improve the very nature of being a human; what humans are made of, what humans do and how our brains function. With their eyes fixed on a distant point beyond, Alphabet has honed this aspiration into a single word: knowledge; owning it and decoding it. And in a world entirely reconstructed from data insight, they will have absolute reign (Peretti, 2018, p. 373).

When considering Wall Street as the nerve center of world finance, there is also a need to consider the fact that Wall Street are not able to function outside of the infrastructure of the tech companies. For long-term banks the tech companies will be a necessity, but the tech companies are not in need of the banks, whom in fact sooner or later will be subsumed into the previously mentioned rhizome (Peretti, 2018, p. 362).

In regard to killing cash, there is a trust issue with the tech companies and if they securely can store our money, but there seems, as of yet, we have no choice in the matter (Peretti, 2018, p. 27). Peretti illustrates the crossroad we're at through the words of former president of Interpol, Björn Eriksson, who ran the most powerful anti-fraud police unit in Europe. He highlights the importance of keeping the cash circulating to halt fraud and says that the end of cash will transfer authority to the new tech giants and marginalize the poor. He also emphasizes that however damaging the banks have been regarding fraud in the past, that's nothing compared to the tech giants. As he puts it: "…one breached blockchain is enough to wipe digital money off the face of the earth with the single press of a button." (Peretti, 2018, p. 29). The dilemma we're facing now is that as the banks were a part of the infrastructure, the tech giants, like Google and Facebook, are the infrastructure itself (Peretti, 2018, p. 29).

Computer crime is increasingly becoming a danger to the economic systems of democratic societies. The Internet and electronic banking, and mobile phones, are technological innovations which are extremely practical in regard to transferring illegal profits or in other ways committing criminal acts. These forms of fraudulent bribery are endangering the solidarity of the democratic societies (Edelbacher, 2018, Kindle Locations 1083-1092).

> Privacy is necessary for an open society in the electronic age. Privacy is not secrecy. A private matter is something one doesn't want the whole world to know, but a secret matter is something one doesn't want anybody to know. Privacy is the power to selectively reveal oneself to the world. (Hughes quoted in Pacheco, 2018, p. 137)

3.3 The aspiring Outlook

Peretti (2018, p. 441) finds that SMEs (small and medium-sized enterprises) are the future, and that they are our chance to reset capitalism by using the digital revolution. A revolution in which he finds that we will all be a potent corporation of one. He finds that the tech revolution offers us a new paradigm, and that in the very areas where the infrastructure was either obliterated or never transpired – rural Wales, rural Malawi, the Rust Belt of the

Midwest in America, the Australian outback – they all of a sudden have the advantage. In one technological bounce, they could leapfrog the twentieth-century mega-cities which are held back by unwieldy twentieth-century thinking. The word adaptability will enable an individual, a company, a city, to withstand this coming revolution. The hurdles preventing adaption are but mental, not simply physical. The enemy is not the tech companies or robots, immigrants or China, it is complacency and the mentality that there is either no need to change because you are impervious from change, or that you can't change as you don't know how to (Peretti, 2018, p. 441-442).

Talking about Bitcoin, its often referred in extreme black-and-white terms, but Vigna and Casey (2015, p. 300 - 301) finds its more probable that Bitcoin will continue to grow attached to the "real" world, not necessary alongside it but with the underlying technology now adopted by numerous businesses and institutions to suit their needs; much like evolution processes in biology between and among species, and the guesswork consists now of in which direction this evolutionary track will expand. Continuing their predictions on the transformation of Bitcoin they suggest that Bitcoin will arrive somewhat less than the utopian dream of a stateless, third-party-less currency that its most passionate supporters had hoped for, but the banking state will with this development experience some forced and necessary competition and discipline. They foresee that costs will come down, and that commerce and economic activity will advance along digital lines that will eclipse the lines on a map, with the world seeming even smaller than before (Vigna and Casey, 2015, p. 311). The Blockchain could, if extended to what Bitcoin innovators believe is possible, replace many of the weak and corrupt institutions with a decentralized authority as a means for proving people's legal status and obligations, and in doing so it could "dramatically widen the net of inclusion" (Vigna and Casey, 2015, p. 217).

There is significant energy and innovative brainpower being invested in serious start-ups and development projects, and they are working through formidable legal, technical, cultural and financial obstacles to reach their goals of adopting Blockchain 2.0 solutions (Vigna and Casey, 2015, p. 226). Pacheco (2018, p. 81) stresses that the Blockchain has applications far beyond what is achievable with just money or the economy and that the adoption of it is unlimited; it will revolutionize technologies, reconstruct procedures, kill and create jobs, reduce bureaucracy, eliminate middlemen, secure accuracy, implement contracts, make decisions, apply consequences, manage Artificial Intelligence, reward people and machines, and this is only the beginning. He also finds that inefficiency or corruption often stem from the fact that there is limited transparency in our world, but that with Blockchain this may now

be within our control to correct, and he wants us to imagine the effect of transparency of funds within and between institutions and the potential this will bring - to know instantly where a process has failed, he finds it is the ultimate management tool (Pacheco, 2018, p. 83-84).

To decentralize the economy and to foster numerous forms of peer-to-peer exchanges, enables people to figure out valuable ways to spin what they control or own into a marketable business or service, also called DApp; a decentralized autonomous application which thrives in blockchain-based settings (Vigna and Casey, 2015, p. 227). Peretti (2018, p. 440) addresses that the world is eagerly waiting to have access to: drone deliveries, flying cars, driverless cars, space habitation, everything from pre-fabricated 3-D printed houses to amazing 3-D printed organs for operations, and also climate change solutions like orbiting solar panels and fake clouds to save the Earth, MedTech and gene editing, EdTech and the school in a box, work surveillance, predictive policing and pre-crime arrests, the robot/human interface, bio-policing of the body, vertical farming, iPhone technology on a tiny contact lens – "as if any of us wanted it" he says (Peretti, 2018, p. 440).

3.4 Ecological Economics

Ecological economics concerns itself with the allocation of resources, the distribution of these resources, plus the scale containing the economy (Daly and Farley, 2004 and 2011, p. 301). Economic production is about creating welfare, utility, quality of life, or whatever else we decide to call this "psychic flux of satisfaction" (Daly and Farley, 2004 and 2011, p. 63), and it is important to note that ecological economics does not demand an ending to economic development, solely to physical growth, but mainstream economists' definitions of economic advancement seem to confusingly blend these two different elements (Daly and Farley, 2004 and 2011, p. 64).

The ability to satisfy one's wants' and needs is what is determining welfare. Absolute needs are biologically determined and required for survival. Approximately 26% of the population in the Third World and 1.4 billion citizens globally presently live in extreme poverty (lower than $1.25 a day) and 2.6 billion people earn below $2.00 per day, and have difficulty fulfilling even these absolute needs. For this group increased consumption correspond very closely to greater welfare (Daly and Farley, 2004 and 2011, p. 278). Simonović (2018, Kindle Locations 4985-4990) asks us to bear in mind that the majority of this planet's population

inhabits the developing countries. So even though the independent institutions of democratic society function well in developed countries, where the civil service sector is readily developed and there is a firm control of executive authorities and independent effort of anti-corruption institutions who makes it possible to apply a P (principal)-A (agent) model to establish political will, which brings potentiality to achieve political will for corruption control to have the same influence and social power in both directions: "from the bottom up by civil society" and "from the top down by the government"; such a model is not achievable in developing countries.

Even though corruption seems to be linked to institutionalized frameworks, growth itself, or other macro elements, the micro perspective is highly relevant to understand and fight corruption. Institutions might appear as "bad" because of the decisions of many individuals, and economic growth will not flourish as a result of poor decisions made by individuals. So, it is important to remember that what we see and measure as macro results is the sum of what is happening on a micro level (Søreide, 2013, p. 27). Aid is a core instrument to abolish poverty, to preserve the biodiversity and to reduce the anthropogenic damages in developing countries (Hansen, 2013, p. 13).

Following philosopher Thomas Kuhn, ecological economics propose a "paradigm shift" or according to economist Joseph Schumpeter, a shift of pre-analytic vision (Daly and Farley, 2004 and 2011, p. 23). Adjusting the vision calls for a new pre-analytic cognitive undertaking, not continued analysis of the outdated vision (Daly and Farley, 2004 and 2011, p. 23).

3.4.1 Ecological Economics vs. Green Economy

The basic principles of material cycles, energy flow, ecosystem structure and function are governing the ecosystem itself, and ecological economics recognize the real-world link between depletion pollution through the concept of throughput and are thereby connecting environmental economics and resources. This includes impacts and feedbacks from the ecosystem brought about by economic activities that cause pollution, depletion, and entropic degradation (Daly and Farley, 2004 and 2011, p. 479).

Accepting the basic premise that the global ecosystems generate life-sustaining ecosystem services, implies that public goods are of critical importance. However, market economic theory presents limited advice in regard to the allocation and production of public goods (Daly and Farley, 2004 and 2011, p. 180). Conventional economists tend to see the entire

macro economy, as the economy as a whole. The environment and nature are rarely considered, and if forests, grasslands, fisheries, mines, ecotourist sites, wells, and so on are considered, then they are only seen as parts of the macroeconomy. Ecological economics envisions the Earth, its ecosystems and its atmosphere, as a sustaining Whole, in which the macro economy is just one of the elements within this enclosed, vast and complex system A system which is, although open to energy from the sun; nongrowing, finite, and materially closed (Daly and Farley, 2004 and 2011, p. 15).

Neoclassical economists seem to forget to ask whether the extra growth is worth the additional sacrifice or tend to believe that the answer to this question is always affirmative. Ecological economists always ask if the planned growth is worth the considerable sacrifice it entails (Daly and Farley, 2004 and 2011, p. 14). In this sense it is important to acknowledge the difference between weak and strong sustainability, as this marks the difference between ecological economics and so-called green economics. The latter subscribes to weak sustainability and denotes that resources are substitutable, meaning that depletion of a non-renewable resource such as oil is acceptable if the money is to be used to invest in economic and human capital which also benefits later generations. Ecological economics supports strong sustainability, which signifies that resources must be preserved separately. In other words, ecosystems in imbalance cannot be compensated through the development of railways or other public goods, and strong sustainability suggests rather a joint responsibility to protect the environment, society and the economy (Dybvig et al., 2013, p. 98).

Going from an empty planet (where the opportunity cost to development of the economy is inconsequential and the environment is not a scarce resource) to a full planet (where the opportunity cost of expansion and growth is critical), natural capital has now become more scarce than manmade capital. With this development, knowledge, an altogether nonrival resource, is an increasingly essential aspect in economic production and it will be sorely needed to address the immediate and critical problems in our society going forward (Daly and Farley, 2004 and 2011, p. 254-255) (Daly and Farley, 2004 and 2011, p. 17). Ecological economics replaces the goal of growth with optimal scale, followed by fair distribution, and recognizes that policy interventions are paramount to supply sufficient quantities of nonmarket goods as the market itself are inadequate for allocating scarce resources. Ecological economics' contrasting goals favors diverse uses of traditional policies plus also advocating for a multitude of alternative policy interventions (Daly and Farley, 2004 and 2011, p. 261-262).

Climate is one of the crucial services provided by Earth's ecosystems. Practically all ecosystem services are common-pool resources or public goods and requires cooperative provision. Economic analysis of our urgent climate challenges reveals that cooperation is a necessity in order to solve them. To then blindly follow an economic model that promotes competition and alleges that true cooperation is impossible, would therefore be beyond foolish. However, competitive market forces do have a role in our economy, but we need to be aware of the market's inherent incapability in regard to efficient, sustainable and just allocation of all resources (Daly and Farley, 2004 and 2011, p. 257). The already existing environmental long-term issues facing humanity is unfortunately compounded by corruption (Holmes, 2015, p. 39).

The laws of thermodynamics establish that there is a cap to growth. It is therefore difficult to explain the unwavering loyalty to uninterrupted economic growth by policy makers, economists, and the general public while looking at the limits of ecological and natural resources and also the undeniable significance of entropy to the whole economic process with the resulting oxymoron of "sustainable economic growth". The underlying belief seems to be that the economic systems entails no limits to growth or that there is no need to worry as the limits lies far in the future (Daly and Farley, 2004 and 2011, p. 111). Most ecological economists strongly reject the efforts to place monetary values on nonmarket goods like ecosystem services, which not only complicate the inherent ethical issues with sincere methodological problems, but also implies that manmade capital and natural capital are perfect substitutes (Daly and Farley, 2004 and 2011, p. 277). A new economy with a focus on optimal resource utilization must be based on a circular perspective. Both measures and results of economic activities must be considered at a meso level, and resource-efficient solutions must, as far as possible, build on the same principle that we find in the natural cycles of nature where all available resources are utilized almost without waste or pollution of any kind (Ingebrigtsen and Jakobsen, 2004, p. 56).

3.4.2 Stakeholder theory

Neo-classical economy's stakeholder theory, promoted by Milton Friedman, suggests that companies' most important task is to ensure the owners maximum return on invested capital, in other words, shareholder value (Dybvig et al., 2013, p. 116). The corporate social responsibility will then be to increase the shareholder value, which in turn will be the best for

society as a whole. In retrospect, many have questioned which conditions must be present in order for economic profitability to contribute positively to the achievement of prioritized objectives of individual and social character. The problems arise when the financial goals overshadow all other considerations (Dybvig et al., 2013, p. 117). Stakeholder theory, introduced by Edward Freeman, is the opposite of shareholder theory, in which a company's mission in society exceeds short-term profitability targets. This is done by widening their view on who is impacted by their company, which starts out with the inclusion of the usual suspects like the shareholders, the employees and the customers, but to then be extended to the impact they are having on for instance their suppliers, civil society, the government and even their competitors. The expanded responsibility ascertains that the decision-makers in a company see business strategy, the companies' environmental and social responsibility in context, and maps the most important stakeholders and systematically reviews how the company's objectives and action plans affect the individual parties (Dybvig et al., 2013, p. 118-119).

How to handle this broadened responsibility into practical actions is suggested by both John Elkington's "triple bottom line" and Archie Carrols Pyramid of Social Responsibility, also called the CSR pyramid. Archie Carroll believed that corporate responsibilities in addition to finance, which are at the base of the pyramid for all corporations, included law, ethics and philanthropy in ascending order toward the top of the pyramid. An important challenge for the managers is to find solutions that balance the relationship between the different values, as the four value dimensions are inextricably linked to each other, but strong tensions often arise between them (Dybvig et al., 2013, p. 121). The triple bottom line applies to all levels of the economy and suggests that corporate responsibility is not only related to financial values, but that corporate responsibility also includes contribution to a sustainable ecology and social justice. The fact that the bottom line is three-fold means that the companies report on both economic as well as environmental and social conditions. The three areas of responsibility will support the visions and values of the company, but which and how many parameters within each area that are reported upon depends on the industry, the interests of the stakeholders and the scope of the vision of the company. At the socioeconomic level, John Elkington suggest that the triple bottom line should form the basis of political decisions, and within the corporate economic level, the actors should incorporate the three-part bottom line into all their strategies and actions as he finds that economic, ecological and social challenges

can only be solved through dialogue-based interaction between market players (Dybvig et al., 2013, p. 125-126).

3.4.3 From competition to collaboration

In addition to the concept of sustainability being used as a term for the development within each of the three sectors of economy, nature and culture, the term can also be used as a collective term for the overall social development (Ingebrigtsen and Jakobsen, 2004, p. 16). Cultures have continually evolved in adapting to new constraints and new technologies, but the now unprecedented pace of technological changes and ecological degradation signals that we can no longer enjoy the luxury of postponing our actions (Daly and Farley, 2004 and 2011, p. 12).

Numerous studies within evolutionary biology seems to suggest that cooperation indeed has evolutionary origins (Daly and Farley, 2004 and 2011, p. 252). Much of human behavior seems to be influenced by internal motivations rather than external ones. Lots of people volunteer free time, abstain from stealing even though they know that they can't be caught, and help others even without the promise of reciprocation in the future. Of course, not everyone has this pattern of behavior, and economists therefore argue that we can design external incentives to further desirable behavior. But there is unfortunately increasing evidence that external incentives may actually overshadow the motivations of those influenced by internal motivations (Daly and Farley, 2004 and 2011, p. 248).

Free market economies stress self-interest and competitions, and rather than ostracizing the super greedy ones, modern society leans towards idolizing them (Daly and Farley, 2004 and 2011, p. 254). Cultures with economic systems that demand cooperation have historically developed low-cost mechanisms for penalizing defectors, which would incentivize even the most self-interested individuals to resume cooperating, and thereby increase the overall willingness to cooperate in general (Daly and Farley, 2004 and 2011, p. 253).

The assumption of conventional economics that human beings are always competitive, rational, and self-interested, also called Homo Economicus, goes in the face of an alternative assumption that has a much greater explanatory power; in a heterogenous population there will always be a mix of three different types of people, including Homo Economicus, where most of them are Homo Reciprocans (conditional co-operators), and some of them are Homo Communicus (pro-social citizens), which suggests that there is a wide assortment of pro-

social behavior. Studies suggest further that human behavior responds to developmental processes, institutions, culture, and societal norms and is thereby very flexible and can be seen as a potential policy variable. A heterogenous population will, with specific types of resources and specific types of institutions, sometimes come across like everyone is prosocial and other times act like everyone is self-interested (Daly and Farley, 2004 and 2011, p. 254) (Daly and Farley, 2004 and 2011, p. 250-251). And, as the nature of economic challenges is changing and rendering traditional economic theories even less adequate to guide and explain the full spectrum of economic activity, this flexibility is important to be aware of (Daly and Farley, 2004 and 2011, p. 254-255). In the choice between benefitting either the society or the individual, we see that selfish and non-rational behavior could undermine social well-being. However, we continually hear of significant sacrifices being made for others, and simple introspection suggests that we are not solely self-interested. Simultaneously, evidence of extreme selfish behavior abounds and throws light upon the degradation and lack of investments in public goods and open-access resources worldwide (Daly and Farley, 2004 and 2011, p. 243-244).

There are allocative mechanisms that must be tailored to characteristics of the resources needed to attain specific desirable ends, so to argue for an economy purely based on cooperation would be just as foolish as to argue for an economy based solely on competition (Daly and Farley, 2004 and 2011, p. 257). If it is to be possible to coordinate the activities between several actors and actor groups, it is necessary to implement coordinating measures based on systems for communicative decision making and direct the interaction between the actors on the market towards communicative interaction instead of individualized competition. Recent research shows that cooperation is also more common in nature than previously assumed, and that the cycles in nature are based on interaction between individuals and species (Ingebrigtsen and Jakobsen, 2004, p. 56).

Global climate change can be defined as excessive usage of common-pool resources towards the waste absorption capacity. The countries capable to fund research towards carbon-neutral energy sources are in fact the same countries that have produced the most significant augmentations to climate change. But this means also that cooperative provisions of those kind of technologies by these countries could indeed promote just distribution, ecological sustainability, and allocative efficiency, whereas all these goals would be undermined in the hands of private, competitive provisions (Daly and Farley, 2004 and 2011, p. 256-257). An important premise in the further discussion called is "the triple helix" and ascertain that the

three sectors of nature, culture and economy within sustainable development are individually sustainable, and that the interaction between these also need to be sustainable, meaning strong sustainability (Ingebrigtsen and Jakobsen, 2004, p. 52).

3.4.4 From atomism to holism

An increased awareness of the fundamental preconditions for the interaction between the areas of economy, nature and culture will actualize the need to find new forms of interaction, both within the economy and between the different sectors.

Ingebrigtsen and Jakobsen (2004, p. 12) distinguishes between two different arenas for interaction; an arena for competition consisting of autonomous economic actors acting independently of each other (atomism), and a co-operative arena consisting of integrated and interdependent economic actors (holism). It is also absolutely necessary to distinguish between economic, ecological and culture-related values if the economy is to contribute to a sustainable development. A new economy, which interacts closely with both culture and nature, cannot be established on this one-dimensional value system based on only money. The interaction between the three sectors of society needs to be coordinated within a communicative arena where all interests and values are represented (Ingebrigtsen and Jakobsen, 2004, p. 56).

High levels of corruption can influence people's wellbeing directly as poverty is linked to both physical and mental poor health, and that the consequent low levels of trust can increase their sense of insecurity (Holmes, 2015, p. 36), and many observers uphold that the most favorable method for the long term fight against corruption is to increase the levels of trust in society, and thereby, through ethical education, changing public attitudes and morality (Holmes, 2015, p. 93). Holmes (2015, p. 73) finds that explanations of corruption that only focuses on the individual are insufficient and that we all are subject to and conditioned by the context in which we work and live. He points out that any serious attempt to decipher and explain corruption has to be holistic, and that we can attempt both a psycho-social and a system-related explanation. People are corrupt for an abundant number of reasons. Therefore, it would be ignorant and naïve to assume there is only one underlying explanation, such as opportunity or greed. He stresses that any attempts to control corruption will be futile unless we identify the numerous factors that in combination could explain corruption (Holmes, 2015, p. 62).

An important consequence of the transition from atomism to holism is that economic activity no longer can be reduced to a competitive game between autonomous actors in a market. Just like in nature, where the individual parts affect each other, it is most relevant to describe the cooperation between the actors on the market through mutual dependence and cooperation (Ingebrigtsen and Jakobsen, 2004, p. 55).

3.4.5 Transdisciplinary Dialogue

During the 1900s, the expansion of the economy and its increased power have led to a strong deterioration of the relative position of culture and nature. Today, development thus far shows that both culture and nature are about to be reduced to mere input factors for economic value creation (Ingebrigtsen and Jakobsen, 2004, p. 13). From a historical perspective, a prominent feature of the development within the realms of nature, culture and economy is that they either encapsulated and defend their own areas, or they attempt to colonize or subdue the growing part of the other sectors (Ingebrigtsen and Jakobsen, 2004, p. 13).

An emerging recognition amongst several key research communities is that many of the challenges facing society today cannot be resolved within the framework of already established theories and models (Ingebrigtsen and Jakobsen, 2004, p. 11). Ingebrigtsen and Jakobsen (2004, p. 12) notes that pure market solutions are problematic because they are limited to issues where the solution alternatives are comparatively long an economic value scale. In order to establish a constructive interaction between the different sectors, it is necessary to have knowledge of how these sectors work separately and also be aware of the principles that apply to the interaction between them.

Improving welfare depends on the decisions by cultural, political, and religious groups about what they actually want and how they prefer to achieve their goals. Making the appropriate decisions will require people to contemplate thoroughly about their ultimate desires (Daly and Farley, 2004 and 2011, p. 284). Traditional economics assumes, at its most extreme, that a human being understands all the implications of every decision it makes, from present time and into the future, and from this carries out rational decisions that maximize their utility. But, as we know, the real world is far too complex and the people in it too imperfect to form fully rational choices (Daly and Farley, 2004 and 2011, p. 241).

A paradigm shift within the economy allows for a better understanding of some of the most important environmental and societal challenges we face in the beginning of the 21st century.

For instance, shifting from the linear perspective on the value chain in business economics to a circular perspective could show that both the cause and the solution to the problems of a company may lie with actors who are in another part of the cycle and this view thereby offers possibilities to identify issues and to support solutions that arise in the interaction between the different parties (Ingebrigtsen and Jakobsen, 2004, p. 41). Ingebrigtsen and Jakobsen (2004, p. 12) believes that there is a need to develop new arenas that capture the complex challenges facing modern society and argue that in situations where different values encounter each other, it is necessary to establish arenas for communication and collaboration. Establishing formalized arenas for communicative and dialogue-based interaction is a must to ensure that all parties concerned are included when preparing and implementing concrete solutions. This way, all parties are made responsible in the joint effort to realize the goals of sustainable development (Ingebrigtsen and Jakobsen, 2004, p. 14).

3.5 Research questions

Our main question that we would like to see answered is: How can the emerging technologies make Norwegian Foreign Aid more efficient?

Because the perception is that the Norwegian public agrees in being a Foreign Aid donor country. However, their opinions and beliefs are divided when it comes to the use, distribution and management of the funds sponsored by their tax money (notes from the NORADS conference 2018). We believe that every effort to protect our resources with a holistic view will fulfil its core mission, to serve and be served in the best way to insure a sustainable globalization.

To find paths to a possible answer, we deep dived into the selected literature and landed on more specific questions that ultimately would help us design our interview guides, such as:

- Where does the potential for increasing transparency and optimize efficiency lay along the global supply chain of the Norwegian Foreign Aid?
- How can the exponential emerging technologies and the engaged tech community offer solutions to increase transparency and optimize the efficiency of the supply chain?
- Are the Norwegian Agencies/donors integrating these disruptive technologies in their strategies?

- What is the role of tech in the protection of the Norwegian economic resources, resilience and integrity, in the near future?

- How is the outlook for the Norwegian Foreign Aid in the near future?

This chapter has given us the theoretical support to ask the pertinent questions in the scope of our study and to explore the empirical data. Our findings are presented in the following chapter.

4.0 Findings

The chapter presents quote reviewed summaries from the transcribed 7 individual non-anonymized in-depth interviews. Our findings on the challenges the Aid Industry is facing today, and its possible solutions using technology, are also based on selected literature and keynotes from relevant conferences attended and videos. Some of the findings are global evidences that also apply to Norway as a donor country and an international actor in the global Aid Industry network.

4.1 The global supply chain of the Aid Industry

The following question aims to understand the weak and vulnerable spots in the global supply chain where the Norwegian Foreign Aid operates and from an empirical perspective.

4.1.1 Where does the potential for increasing transparency and optimise efficiency lay along the global supply chain of the Norwegian Foreign Aid?

Jacobsen interviewed December 10th, 2018

Jacobsen works at NORAD (The Norwegian Agency for Development Cooperation, she works with digitalization and innovation mainly, as they are a small team working on that. They are at the present time exploring how the new technologies and digitalization can be used both in NORAD's internal works and processes to make them more efficient and how NORAD can also promote that in what they are doing in the implementation of projects in developing countries. Jacobsen believes the potential for increasing transparency and optimize efficiency is almost everywhere along the global supply chain of the Norwegian

Foreign Aid. Of course, NORAD work with transfers and transferring funds through this whole supply chain. Consequently, there is a lot of room for increasing the transparency and the efficiency of how it reaches the end user. They see potential in using Blockchain to increase the transparency, however they would also have to look at some of the implications on the internal side as well and how that would really change the way that NORAD works today. She notices that one of the challenges in adopting Blockchain is the step from off-chain to on-chain; the honest input of truthful information that is still not digital is still a challenge. There is still a huge hurdle to overcome there, she says.

Removing the possibility of corruption in the information input side is also one of the challenges NORAD is interested in, how the system can be strengthened so that they could be able to take advantage of those technological opportunities. When working with new technology, it's important to understand the connection to society around it, and it is here that NORAD's expertise comes in. Jacobsen thinks that is in the connection between technology and society that some of the challenges lie but then again also if they can overcome these; enormous opportunities in the whole chain will arise. They are now working with digitalization, looking both at how to use it internally in the internal workings and in processes to make them more efficient, and how to promote that in what is being done in the project's implementation in developing countries. Regarding NORAD's internal management and auditing tools, they have good internal systems for results reporting and control systems for detecting and dealing with irregularities, but it is hard to trace everything that happens until the end user, and Jacobsen remarks that technology could be a part of this system (Jacobsen, interviewed December 10th, 2018).

Haugstveit interviewed December 17th, 2018
Haugstveit is the Inspector General at the Norwegian Ministry of Foreign Affairs. His office provides an oversight within the system. A form of auditing within the system, although they are not auditors or do typically internal auditing. However, they do similar auditing exercises within the Foreign Service, at home and abroad. In 2018 they visited seven embassies abroad to verify that they work in accordance with the rules, regulations, instructions, standards and ethical guidelines. They also receive reports concerning possible irregularities regarding their Development Cooperation. They work in high risk environment and the risk is everywhere; in all parts of society.

Regarding detected irregularities along the supply chain, Haugstveit explains the procedure. They find projects, probably related to one contract, and see if there are any discrepancies from the plan. The project proposal and the project budget are an integral part of the agreement. They would have procurement regulations as part of their contracts, and the subcontractors would follow those. In case of large programs, these would go out for international tender, but more often they would be of a smaller scale, and goods and services would be acquired locally. It could also be a foreign company, and relatively seldom would it be a Norwegian company. It would mostly be from the region in question or larger multinational companies.

When funding an organization working with human rights, gender issues or religious society, there is an assumption that they would be more serious and to take better care of the money. However, even though The Norwegian Ministry of Foreign Affairs financially support and promote the ideas they share, Haugstveit doesn't see any tendency towards this as these organizations are just as exposed to misuse of funds as businesses with less idealistic purposes. And they would certainly share with other donors if they have a problem with a certain organization, he says. However, when Haugstveit and his team receive cases related to procurements, they are mostly related to procurements at the local level and of a relatively small scale.

Looking at the way the money was spent and whether or not this spending is in accordance with the agreement, there is very often grey zones also, Haugstveit explains. Also, it would certainly be a red flag if an organization would have, say a bank account in a tax heaven or if the organization has a link to an organization established in one of these jurisdictions, as it makes any follow up very difficult. Haugstveit and his team recognize that whenever a larger company is involved, they deal with a more professional structure, and therefore making it more difficult to detect if they do something wrong. When companies are less professional; that's exactly why auditors can detect it and disclose it.

Haugstveit emphasizes that they themselves detect almost nothing. It's mostly the concern of the organization receiving the funds, and their internal control mechanism or their auditor that would detect things. It could also be an external whistleblower, but typically, it's their internal control mechanisms that could tell what happened; and then they report it to Haugstveit's unit. Sometimes the Norwegian embassies play a key role at providing the primary support. They have relatively few cases of corruption, but then corruption is also more difficult to

uncover, Haugstveit says. Most of the cases that they closed and where they took some measures where embezzlement. Which often involves falsification of documentation; False receipts, for example. Embezzlement is a form for stealing, but in a more sophisticated way.

When Haugstveit's team suspect that money have disappeared or been used for purposes that they were not intended for, they follow the case, find out what has happened and decide how to react. In some cases, they find that nothing wrong happened, maybe it had just not been reported or documented properly. In other cases, they are able to prove that the money has not been spent in accordance with the contract, and in worst case there's been fraud or corruption. In that case, they would ask the partner to pay the money back. Probably between 15 and 20 million Norwegian Kroner would be paid back this year. This number also includes NORAD as they do the exact same work in their fraud unit, headed by Svend Thorleif Skjønsberg (one of our other interviewees), and Haugstveit and Skjønsberg work closely together. Not on specific cases, as they don't interfere in each other's responsibilities, but they follow the same guidelines and sometimes compare notes on in regard to how they should react.

In the "Report on financial fraud cases 2017", Haugstveit shows us that Norwegian NGOs are on the top of their list last year. However, this doesn't mean that these Norwegian NGO's are more corrupt than others. But it means that they have internal control mechanisms that have uncovered some fraudulent behavior within their organization or within their partners organizations. Which they also report to Haugstveit's unit. They are very consistent about that, Haugstveit points out. Whereas other governments are not that eager to report. Some development organizations in other countries blacklists companies as part of their security measures, or debarment as it is called. Some also practice cross-debarment, which is following who others has blacklisted to include these in their own blacklisting. Norway do not practice neither debarment nor cross-debarment.

Haugstveit raises the question: If this fraudulent behavior happens at the headquarters level in Oslo, would they uncover it? That would be a lot more difficult. That would eventually depend on the auditing, he answers. Regular auditing would very seldom really reveal that kind of problems within the organizations. It could happen, but it doesn't happen very often. But when they do a forensic audit, they go deeper and can find out what has been going on, he adds. Sometimes it would be an external whistleblower, often in the organization itself. In a large Norwegian NGOs, the Norwegian Ministry of Foreign Affairs often accept that they do their own investigation, because some of them have internal auditors and their experience is

that these are very good. In many cases they accept their findings and conclusions and use that as a basis for their conclusion on the case. This shows that there is a high level of trust in these large and very professional organizations. Haugstveit's unit is not working on preventing fraudulent activities from happening. However, maybe their existence means that it's less tempting to engage in it, because of the knowledge that the Norwegian Development Cooperation and Haugstveit's unit are following this closely; and react if they find out that the money wasn't spent in accordance with the agreement.

How can you build security? Haugstveit asks. If you deal with a corrupt society, you cannot trust anyone; because everything can be bought with money, he says. He also emphasizes, considering the ecological economics point of view, that the natural resources are also threatened and harmed by corruptive practices. Haugstveit adds that since they are very often working in societies exposed to difficulties with financial irregularities and corruption, the most important thing they can do to improve their Development Cooperation or to safeguard against corruption and fraud is to do good partner assessments before signing agreements or contracts. As he sees it, their risk analysis is not good enough. Too often they see after the fact that the partners may not have sufficient internal systems to take good care of these financial responsibilities. To the question on how he sees his work making a difference in the global context, he finds as both corruption and fraud are a major problems in the world, and especially in developing countries, he believes that he and his team are making a difference, but that they can become better at all levels along the whole supply chain and seek out how they can become more transparent. Haugstveit finds that transparency is one necessary element in a total and much broader solution. However, he recognizes that they are much better today than they used to be thanks to technology being more available. It has made the task easier, Haugstveit emphasizes.

Because there are so many different ways of delivering Development Aid, it has to be implemented in many different ways. Haugstveit thinks professional handling of funds is the key as there is a long chain before it reaches the recipient, and misuse of financial resources occurs in all kinds of situations and societies and across a wide specter of partners. So how this could be controlled all along this chain, that I still don't know, he says. He finds that how to apply and when to apply these new technologies should perhaps depend on the specific risk analysis that they're making before entering into agreements, but the risk is very different from one case to another, he says. He gives us the following example: They are part of an international work group delivering Aid to Syria, which is quite complicated. This was

initiated by the U.S. – USAID – with a view to exchanging information between some of the donors. There is one really big risk in regard to the Development Aid in Syria; that is procurement - food and kitchen equipment, blankets, clothes, etc., - and that is where things go wrong. In the case of Syria, you need to control the procurement process to make sure that the items are real, that you get the right quality for the right price and so on, he explains. He recalls one solution used by the British where they had an NGO provide the procurement but then selected a UN organization to do the delivery on the ground. This is big business and its organized crime, he says. Also sometimes done by people involved in Development Cooperation which is a completely different risk. Haugstveit stresses that it's no quick fix, there is no technology, nothing that can solve this once and for all, he says. (Haugstveit, interviewed December 17th, 2018).

Gabrielli interviewed January 14th, 2019

Gabrielli is the Deputy Executive Director at UNICEF Norge. UNICEF Norway is part of UNICEF that is an UN organization. But UNICEF Norway is organized as a foundation in Norway and legally independent of the mother organization. UNICEF Norway does not get the state budget funding from the MFA (Ministry of Foreign Affairs), this goes directly to UNICEF's HQ. UNICEF Norway currently gets info work funding from the MFA. The funding is coming from the MFA, which means that it's a different funding model than having an agreement with NORAD on funding as the other Aid organizations has. UNICEF have offices in over 190 countries, and in 34 OECD countries. The UNICEF Executive Board consists of representatives of the member states. Norway is one of the board members of UNICEF. UNICEF is the third largest receiver of Norwegian Aid in total with approximately one point eight billion NOK. A large share of that is called regular resources without any earmarking's, and goes to innovation, research, administration etc. They also have education funding, a thematic funding, and some of it is earmarked for children, women and for girls. They also receive a smaller amount for WASH (Water, Sanitation and Hygiene program) and others. Then they receive money that is earmarked in projects that is given for example from Norwegian embassies to UNICEF on the ground. The funding goes to the UNICEF country office, and they have a quantum program over five years which is developed between the headquarters in New York and the program division and the country office. And it is decided in the board of UNICEF, which gives a quality insurance.

UNICEF has different kinds of modalities of funding and in principle none of them are controlled from Norway, Gabrielli informs us: -We don't report anything from here. All work that UNICEF is doing is being carried out on the country office. The money that is thematic, or not earmarked, goes into the UN system. They don't have any project follow up from Norway which Gabrielli think is a good idea because that's one less administration level. The shorter the chain the better is Gabrielli's stance.

Gabrielli explains how the reporting works: in the UNICEF system it depends on what sort of money it is. If the money is earmarked project money, then there will be a specific report from the regional office handling that project to NORAD, which is the donor. Norway gives one billion NOK that is not earmarked or softly earmarked. Softly earmarked means that the funding is put aside for one topic for example education or health, but that UNICEF decides how, where to use the funding and which is the target group as long as it is within one area for example education. As Gabrielli points out: the donor just wants to know - how many children have you reached? With soft-earmarked funding Norway gets a thematic report from UNICEF headquarters; one for Education, one for Health. Norway gives a lot to education and to WASH, and then they get a general report annually. The thematic reports are given to all the states that have given money, and also presented to the UNICEF board. As the annual reporting is not as detailed as with earmarked funds, Gabrielli explains it's about finding the balance between using resources on the reporting itself and to ensure that the information that is given will maintain the donors trust in the system knowing that the money is being well spent.

UNICEF has certain areas of intervention. There are two different contexts; the development context and the emergency context. UNICEF does not implement themselves, as opposed to other Aid organizations; they're looking at who is the best partner to execute on the ground. To split the implementation itself and the revision of the implementation is important, Gabrielli explains. That doesn't mean that there is no corruption or problems in UNICEF, all actors being in the worst places in the world have problems with this, he points out. The question is how do you create systems that work well? He asks. In their aim to better the world for children they seek to strengthen and increase the amount of international cooperation. They aim to make sure that they are not creating double sets of institutions or systems in the areas they are working in, so they seek to choose long term partners to cooperate with. There are some overall criteria for choosing the best partner, Gabrielli explains. They use local partners and international partners to carry out the best sort of work

according to very specific criteria, and it usually means that they are larger players. They can be small as well, but in most cases, it is the government e.g. the Ministry of Education. They will always first, and as long as it is possible, first seek to work with the government in the region or in the country. The exceptions are where there is no functioning state, no organizations, no civil society or nobody to implement. They are looking for partners within the areas of education, nutrition, and water, and sanitation. In development policy they are using approximately half of their funding on education and on health. But they are also working on other areas. For example, UNICEF gives vaccines to half of the children in the world. Which shows, even though in the global context UNICEF's total budget of approximately 60 billion NOK, UNICEF can do a lot and spend the money efficient even though people think it does not, Gabrielli says. An advantage with being a large trusted organization such as Save the Children, Plan International, SOS, World Vision, Red Cross, or UNICEF, is that they have capacity in many countries, so they are able to learn from similar contexts and they are able to scale up. UNICEF have offices in 190 countries, which means that they have the possibility to add more security and perhaps also better systems than smaller organizations in difficult situations, because that cost a lot of money. But Gabrielli thinks this is an area where also technology can be helpful and that there's a lot of possibilities with regard to data. They are also looking into more possibilities of increasing efficiency on Norwegian work which is not directly linked to the donor chain, but more on how to organize program work on the ground and how you inform the way of making decisions.

When looking at technologies, UNICEF has a venture fund, a fund that invests in start-ups, originally based out of California. But they realized that if you want to develop things for developing countries, it should be the countries and the users locally themselves that develops it. That's why UNICEF at that point has more than 15 innovation labs around the world and a venture fund that support small companies and start-ups mostly based in developing countries. Now, the labs have increased in number. One of the innovations that came out of it was RapidSMS (*https://www.rapidsms.org/about/)*, where you can send questions to young people, like a weekly survey or poll. It has been developed in different forms and Gabrielli explains: Let's say there is a vaccine campaign going on. You can send out an SMS to all the young people because this is for youth between 12 and 18. All the people that is registered get an SMS asking: Did you have a visit from a vaccine team this week? All this information goes into a system which creates a map that highlights which regions didn't get a visit. So, then you can question: Is there corruption? Didn't they do it? Is the weather bad in that area?

Or is it an area of the town that wasn't registered? Is that why they didn't get a visit? And real time information is then available. RapidSMS or RapidPro is now being used for U-Report (*https://ureport.in/about/),* where there are now 6 million children or young people around the world that are registered in 15 - 20 countries, and its used in different kinds of dialogue with children. It can be everything from a vaccine campaign to asking, "do you have flu in your area?", then it's also possible to see where that flu originated. And as 80 percent of Africa's population now have a mobile phone, the possibility to have a dialogue with youth with simple technology to get answers and also to work on transparency is a very important part of the work we are doing, Gabrielli says. Gabrielli stresses the importance of also working with the corporate sector, as they have a lot of technology and a lot of possibilities that UNICEF don't have and believes that the Norwegian Foreign Aid has to heavily increase their cooperation with the corporate sector (Gabrielli, interviewed January 14th, 2019).

Skjønsberg interviewed January 17th, 2019

Skjønsberg works at the Fraud and integrity unit at NORAD and finds that it's a matter of contributing to sound use of resources, which with NORAD's aim are predestined towards poverty and education, and his main target is to protect Norwegian funds. He sees how much the misuse of funds is creating negative development. Being a part of a larger project promoting sustainability and development goals enables him to participate in making the Aid administrations part of the supply chain more efficient by taking away some of the loopholes and by identifying red flags in transactions and use of funds. This helps NORAD to prevent, detect and of course also investigate and react whenever there are corruption or financial irregularities. In the global context the Norwegian Development Aid, today about 35 billion NOK annually, is a very small amount of money, but, as Skjønsberg points out: it's still a lot when being used extremely strategically. Skjønsberg recognizes that the lack of coordination and the lack of transparency and openness constitutes a huge threat to both the Norwegian funds and other Aid funds. In co-financing programs, even though the Norwegian funds is well protected, it's often the weakest spot in the supply chain that will attract criminal behavior, and other funds in the same program that is not as well protected will be affected. To address this, Skjønsberg and his colleagues are advocating openness and donor coordination and coordination among all actors in the supply chain. With the array of ways of channeling funds, Skjønsberg stresses the need for controls which must be applied to the risk on every level.

Knowing the cash flow, he finds that the initial challenge is to map the cash flow and identify steps and actors in the whole supply chain. In developed financial systems the I.T. systems can be audited which brings immediate transparency in the records and the cash flows, but even this environment is not immune to large schemes, even banks have been involved. Skjønsberg calls for more sophistication in their systems to address this. It's not necessarily requiring a technical approach as he says, but he applauds every instance where you could increase transparency by using technology. An example is the need for systems to map down the cash flow to get an overview of the actors and the cash flow together, which he recognizes is a weak element in the supply chain. They are working on awareness in this area, but not in a systematic or technical advanced way. This must also go along with the development of society as such, with the prevailing technical environment, existing platforms etc., he points out.

Procurement; another area for high risk is the procurement process. In emergency situations, the risk presents itself when stressing up the procurement process in situations where you undertake waivers in procurements (by-pass formal procedures and competition, due to e.g. urgency), and thereby deviate from the normal bureaucratic procedures established to secure proper procurement, and thereby at best creating accountability gaps. The big challenges appear very often related to the procurement by the end implementer – often a local NGO-Situations arise with both money transfers (bribery, kick-backs or other forms of corruption and with the quality of the product; you're suddenly discovering that you are definitely not receiving what you're paying for (the quality is lower or the quantity is reduced). This is why it's vital to actually check what is delivered, check the supplier. Also, third party controls by use of spot checks of registers and costs versus participants in meetings and events. Aid today is rigged towards pre-described control mechanisms, and the most important element from the Norwegian side is the financial audit, which might have some value when it comes to prevention, but in regard to detection we all know the global figures, Skjønsberg points out. Norway has the last years placed more emphasis on multilateral funding and use of global funds, and thereby delegating the control to the multilaterals; the World Bank, the U.N. system, banks and other large institutions. They have a lot of competence and activities going on to control the management of funds, however you might often identify so called "accountability gaps" along the chain of delivery after the funds has passed the highly specialized level of these institutions.

The big professional agencies and also International NGOs are gradually shifting towards a higher degree of spot checks, third party controls and also now using Vipps mechanisms both in Asia and Eastern Africa, which Skjønsberg says might deter some of the challenges at part of the end sign. In Development Aid people think there is just one or two or three answers, but it's extremely complex, Skjønsberg reminds us.

He also points out the unbalance in continuation when the European donor agencies, like NORAD or UD, has a high turnover with who has the Aid portfolio responsibilities and there is seldom more than a couple of years before a new employee takes over, but the recipients are there often for life. It's a challenge for the donors to conserve the institutional memory and the continuum of the case-handling as well as the recipients do.

Skjønsberg is highly in favor of budget support, perhaps a bit in contrary to the prevailing mode among donors. However, a precondition for this instrument is trough assessment of national systems – due diligence – and strengthening of these systems prior to disbursements, Skjønsberg says. Unless there is a shift away from the traditional "project approach", which easily imply manipulation by receipts and fragmentation due to lack of capacity in the systems, ; things are going on in an uncontrolled way, and we as assurance providers will strive to see more than elements of what is going on. There will be sub-optimized situations also in the future, Skjønsberg says. It is necessary to know the financial instrument, and that is part of the problem; sometimes there are drivers out there which creates speed, and then budgetary support could be chosen with good intentions but without really checking that the financial management is sufficiently robust; the Accountant General, the Minister of Finance, the Parliament or the control institutions like the National Audit offices are strong enough to handle the support: Skjønsberg emphasizes the importance of institutional support in the efforts to move towards a more holistic support system (Skjønsberg, interviewed January 17th, 2019).

Nordhaug interviewed January 18th, 2019
Nordhaug is the manager of a project called Digital Empowerment Project in NORAD, and she is very keen to explore technology as an equalizing force for reducing global inequalities. Looking at the global situation today you have about half of the world's population being Internet users, which means around three point eight billion people that are about to become digital citizens within the next years in some ways. She recognizes that there will be some

sort of last mile there, but many people are about to become internet users, and Nordhaug finds it is very important that they make sure that people become digitally included in a way which empowers them, and is safe and does not harm them, and which can make them more capable of realizing their own potential.

She also thinks it's important to be aware of the many developing countries where aid funding is no longer the most important source of income, and to see aid as part of the totality of revenue streams for these countries together with natural resources, remittances, taxation and so on. That way they can find out where aid money can make a difference and catalyze a greater impact.

An obvious potential in increasing transparency and optimizing efficiency lies in reducing the number of levels and middlemen or middle-women in the supply chain, she thinks. Both from an efficiency point of view, i.e. reducing administrative costs, and also in regard to everything that can get lost at each different level. It's also easier to monitor the fewer intermediaries you have to go through. Nordhaug thinks there is a tremendous potential for reducing intermediaries just for the sake of simplicity and cost reduction.

Nordhaug also highlights the possibility of having a direct route for anyone that can actually access and download something from the internet, and she gives us the example of EduApp4Syria, where they reach users directly with an empowering learning resource. EduApp4Syria - an international innovation competition which has sourced two open source smartphone applications with the aim of helping Syrian children learn how to read in Arabic and improve their psychosocial wellbeing (*https://norad.no/eduapp4syria*) - one of the first of this kind of interventions ever, can be directly used by the end user and directly downloaded, and demonstrated that the children using these games for self-learning had a 50% improvement in their oral reading fluency compared to those who didn't play these games. In addition to downloads, they are also aware of extensive file sharing via Bluetooth among Syrian refugees, ensuring broader uptake of the games also by those without internet access. As these kind of innovation projects require a lot of administration and planning, and are very complex to manage, this kind of intervention is not going to be representative of everything that NORAD does, because it can't be, she emphasizes; you need the right expertise. And we could never have done this project without external expertise that we've worked with, for instance in game-based learning from NTNU, Nordhaug says. In this project they have also had Facebook helping with outreach by providing the game developers with free ad credits

and some advice on how to promote, and they are seeing it has a big impact on number of users.

Nordhaug thinks that there is a tremendous potential for the type of codable or programmable transparency that Blockchain offers, the type of transparency that you can encode, she says, and then having the immutable record and track of that process, which Blockchain can ensure. She does not think this will necessarily solve the last mile challenge, meaning that whatever you feed into that Blockchain needs to be of high quality and trustworthy, and that is not necessarily solvable in all projects. I don't think Blockchain is a fix for everything, Nordhaug says.

Nordhaug finds there is also high potential related to cash transfers and transfer of digitally native assets, such as rights, entitlements, and so on, on the Blockchain. But at the same time, she is aware that there are still challenges even with these models sometimes. There is still a need for someone to enforce that law stating your right to that land or title, and if the state does not enforce your right, that title is not worth anything, even though it's on the chain and you can prove it's yours. She finds that there are many aspects that are analogue, that need to go hand-in-hand with the technology, but she still finds that Blockchain holds tremendous potential for reducing the number of intermediaries and for having simple verification through smart contracts. It's very nascent in development assistance, so I'm very keen to see what comes, she says.

Other aspects of Blockchain technologies that can play a big role is to incentivize more volunteerism and engagement of different kinds of stakeholders to contribute, she continues, and maybe get badges, tokens somehow, some kind of recognition that can actually be worth something, enabled through Blockchain based systems. She thinks that Blockchain is going to impact all industries, all sectors, and that it's going to change a lot of business models and reduce a lot of intermediation, or at least that any kind of intermediation has to have a clearer sort of value add. It can't just be recordkeeping and verification, she says, because the Blockchain can do that so much better. I think it has great potential, but there are many things that have to be solved for instance around energy use and transaction processing capacity, before the technology can really scale, she points out.

Another challenge with Blockchain is that it has been coopted by the bitcoin discussion. Hence, the discussion around Blockchain is not very informed, which Nordhaug find is a hindrance. It's a complex debate and it's a debate that requires a lot of outset skills, but she

thinks this general-purpose technology will probably emerge over the next 10-20 years, like A.I. has already. She points out that A.I. is not something that's coming; A.I. is something that's been with us for a long time and it's just that advances in processing capacity, programming, and access to more data has really changed and accelerated the pace. She finds there is tremendous potential for using A.I. in development assistance, but points out the challenge with the quality of the data, as it takes a lot of data for running machine learning algorithms that draw upon A.I. And data quality is often poor, especially in the least developed countries. She therefore stresses the importance of being aware of those populations you cannot capture in these models (Nordhaug, interviewed January 18th, 2019).

Aeinehchi interviewed January 21st, 2019

When thinking about supply chain it's the transportation from A to Z where there is a set and a series of middlemen. Things can be removed, modified or replaced. That is where I believe that a technology like Blockchain will have a significant role to ensure that the transportation from A to Z is kept intact, Aeinehchi says. At the same time, for cryptocurrencies like Bitcoin, even though all the transactions are transparent, and they are in a public database, we may or may not know the owners of those addresses. And he also highlights the project Monero (*monero.io*), where it's not possible to know either the origin or the destination of the transactions. which is fantastic from a privacy perspective but not very good in terms of transparency, so where is the balance point? he asks. In wanting to make the supply chain more effective, there is a need to have solutions that make the supply chain faster and cheaper. Depending on the situation, whether the economical or financial aspect is involved or not, cryptocurrencies may or may not be a solution for that, Aeinehchi says.

When talking about transparency, it's not always that you get transparency out of the box, Aeinehchi points out. When looking at the data, which could be masses of data, we as people are not programmed to absorb and process in those amounts, but machines do. Irregularities will not always be easy to detect, but Aeinehchi believes that Artificial Intelligence could be a measure to detect irregularities, because Based on the advances which have been done within Artificial Intelligence, it's possible to detect regularities, he says. Aeinehchi strongly believes we need a transparent society, and that we have to build systems that are private but at the same time there is a need to be able to make them transparent when it is necessary, he emphasizes (Aeinehchi, interviewed January 21st, 2019).

4.2 The emerging technologies in the Norwegian Foreign Aid's strategies

At the CrytoFinance 2018 conference held in Oslo, we learned that The Norwegian Tax Administration is working on a project combining artificial intelligence and Blockchain to improve their capacity to tackle economic crime in the shadow/parallel economy. Thus, enhancing the tax administration's ability to detect suspicious economic criminal activities, increase their tax revenue and consequently contributing to the reduction of corruption. This raised our curiosity and the will to find out if similar synergetic projects were being implemented the Norwegian Foreign Aid's strategies. The theme raises other questions regarding the fine line between the individual rights to privacy, the society's request for transparency and the security of today's infrastructure.

4.2.1 How can the exponential emerging technologies and the engaged tech community offer solutions to increase transparency and optimise the efficiency of the supply chain?

Brentebråten interviewed November 29th, 2018

Brentebråten, with his background in helping companies implement and find out what Blockchain technology is, have a strong interest in technology and emerging technology and how they will affect our future and believes that technology can help transform the world into a fairer place, mainly because of its properties of transparency and security.

Brentebråten points out the aspect of security of today's digital infrastructure: The major problem is with how the Internet today is built and that it was built to be done then secure, which has led to various cyber-crimes, and we see terms such as cyber warfare emerges, he says. Furthermore, he believes that if the estimated 100 billion devices connected to the Internet by 2020 are insecure then that's a very profound problem. Brentebråten have confidence in that if those devices were connected with a Blockchain, then these security risks could be diminished, promoting transparency and security. He reminds us that there are several supply chain projects within the Blockchain sphere. He gives us the example of the Danish shipping company MAERSK, as they use Blockchain technology to track containers with their subcontractors, a centralized Blockchain controlled by MAERSK. With a Blockchain as management tool, one can design it to know the provenance and the destination

of a transaction in its ecosystem, he explains. A donor can submit money and later see where that money went, and in this case, it would be very easy to follow the trace of the money.

An important feature of a public Blockchain is its immutability. Brentebråten quotes the saying in the tech community: - "What goes on the Blockchain stays on the Blockchain". Meaning, one cannot corrupt it. When one has registered a transaction on a public Blockchain, it stays there. Brentebråten brings this aspect into our scope and affirms that a corrupt agent taking off with some money before it reaches its meant destination will be very visible on the Blockchain. He suggests that the Blockchain could help Aid agencies to transact more efficiently and more accountable. In Brentebråten's opinion, an Aid organization that chooses to use an open Blockchain, where everyone can go and verify every transaction, will be much more credible and can claim their accountability. This will also be true for their subcontractors operating on the same Blockchain. Another powerful feature of the Blockchain that Brentebråten emphasizes is that it's just one ledger, which every actor collaborates to maintain and write on, which is more efficient for all the collaborators as they don't have to spend a lot of valuable resources to maintain their own ledger.

Going back to the MAERSK example, Brentebråten points out the difference between the choice of a public and a private Blockchain. In the setting of the shipping company, the information about the location of the containers is probably better protected within their closed ecosystem, but Foreign Aid activity is totally different, and he believes that a public Blockchain would be better suited, because it is accountable to everyone, at least the donors and the taxpayers. Brentebråten brings up the Norwegian Aid start-up, Diwala (www.diwala.io) as a successful example of an Aid project running on the Ethereum Blockchain. There are other alternatives, he says, like the high secure Bitcoin Blockchain and its interesting upcoming second layer features. EOS (eos.io) which is also very fast, could also be an option. There are several blockchains, and one of the newest and specially interesting is Cardano (www.cardano.org) because it's developed by a collaboration of universities. It carries the scientists support, governance and regulations as a trust asset; and KYC (know your customer). All the white papers that are published on that Blockchain are peer reviewed, which gives credibility.

Another fast-growing technology Brentebråten mentions is Artificial Intelligence and deep learning, and he points out that Artificial Intelligence alone is not transparent at all, but quite the opposite. Adding input data and applying algorithms will produce an output result, but we

have no idea why it made that output, he says. However, when combining Artificial Intelligence with the Blockchain and Internet of Things (IoT): then the options can be very interesting, Brentebråten points out. He is giving us the example of its use for a more sustainable farming: getting all that data appended to the Blockchain and sharing that data with all the other farmers in the region would be like a platform where everyone would upload data so that anyone could benefit from sharing data, so that the algorithms would become even smarter.

Going back to the importance of transparency, he suggests that if the entire tax system was on the Blockchain then that would be transparent. He also mentions another interesting project: the SingularityNet (singularitynet.io), a decentralized platform for AI-Economy with its own cryptocurrency. It is a Blockchain with Artificial Intelligence services connected to it, meaning that for each new service that is connected to this network, the network grows, and grows its capabilities as an organism. Brentebråten agrees that if we translate this mindset into the ecosystem of Aid, today's competition of resources and knowledge of the subcontractors could turn into collaboration which can offer better solutions to solve the urgent problems and challenges they are facing. Inside this ecosystem all actors could share this exponential knowledge and grow with it, together. Another advantage of this collaboration, he continues, would be if a subcontractor cannot provide a service then there is an option to just reach out and outsource it to an actor that can provide that service, and also the possibility to have automatic settlements with a cryptocurrency for instance.

He reminds us, more than once during our talk, that not all technologies are about transparency; It can as well be adopted by an authoritarian regime to control its people. The government can get strong control when combining these technologies and use it on their population, if they abuse it. In the Aid context Brentebråten believes there are great opportunities to use these technologies to make a fairer world, however we must not forget that it can also be misused. He mentions China and their ubiquitous surveillance system, where they also use Artificial Intelligence for facial recognition to identify the population in order to amongst other things find and arrest those they view as criminals, and points out the need for awareness as we in our eagerness to invent are inventing more and more ways to do harm to ourselves as well. He gives us the following scenario: Say you have an Aid project, and you go to some underdeveloped country and you want to give them these tools; Artificial Intelligence and Blockchain, and they turn it against their population. That could be a scenario that we have to be aware of. As Brentebråten mentioned earlier, Blockchain is no guarantee

for transparency because it can be misused. One can have corrupt agents uploading bad data to the Blockchain and then it doesn't matter if every move inside the network is traceable, if the data there is untrue. He believes that at some point, in the context of the Aid Industry, this network must be connected to trusted institutions on each side. It could be a trusted NGO or institution. We still live in a world where most of the economic system is analogue, and we must adapt the technology to that, he says. But there is a need to consider the whole chain from the donor exchanging his money into cryptocurrency, to the receiver getting the cryptocurrency and exchanging these to his local currency; you need someone to do the exchange on both sides - this the Last Mileage problem. unless this evolves, and everything we transact is recorded in the Blockchain; like buying your groceries, medicine or vaccines etc., meaning no transaction outside the Aid's Blockchain. According to Brentebråten having an internet access and a phone is enough to reach much more people, thus reducing Last Mileage problem. He believes the infrastructure to access the services is there and that the main challenge lays on convincing the local merchants in the Aid countries to accept cryptocurrency as payment. Brentebråten is confident that we are going that way, and this is a transitional phase. Because it's a much more efficient way to do transactions. He believes that at some point in time we will leave this old banking infrastructure, and the efficiency just finds its way in the end. Blockchain is still in an early stage; it is not a mature or a general-purpose technology yet. As the technology matures, it will be more accepted and more mainstream in the years to come, Brentebråten says (Brentebråten, interviewed November 29th, 2018).

Gabrielli interviewed January 14th, 2019

Gabrielli explains that UNICEFs innovation office works on Big data and how to use it and they have Artificial Intelligence come in to respond to this. He finds that here is a lot of possibilities and that mobile technology is what has been the most developed. They are cooperating with Telenor in Pakistan and Myanmar, where mobile technology has been used for birth registration in order to help more people get an ID card so that they get access to health and education. In a pilot project they had in one region in Pakistan it increased the birth registration 90 percent in that state.

They are looking into Blockchain as well and looking into teaming up with Diwala (diwala.no) who are using Blockchain to help refugees secure their identities and

certifications. They are also looking into other kinds of uses of Blockchain. Questions they are trying to identify at this stage is: What do we need? Where do we need to have stable access to data? When do we need this? There is a project on Big data just now in UNICEF, where they have an agreement with Bloomberg, in which people from Bloomberg is working in the UNICEF innovation office in New York analyzing data sets and providing news and a lot of analyses for finance.

Gabrielli finds that one of the most interesting agreements that UNICEF now has on Big data is Amadeus, the system that include all the big travel agencies. That's the latest agreement they have, and every month they get all the data Amadeus have on movement data so they can see how people are moving. There have also been long negotiations with Google and Facebook to exchange UNICEFs data from around the world with use of the two giants' search engines. Another example of use of Big data is where Telenor, UNICEF and a university looked at: How can you combine the temperature with movement data in mobiles? If you want to know how the Zika moves, or Dengue? They already know that if it's this warm most likely Dengue will surface, or in that area the mosquitoes that can lead to Dengue. That information in itself doesn't give good reach, but if in addition you can see how people move, you can also see how the viruses are moving. UNICEF have also used this information for piloting it with emergencies. With say Ebola, how do people move? Having all this theoretical analysis, the expectation is maybe for people to take the easiest way but looking at the movement data there is the realization that people sometimes move differently.

The former executive director UNICEF globally employed a twenty-eight-year-old genius as the head of innovation, which was a very young age for that office and not very common in UNICEF. And at 32, he got the recognition by Time magazine that he was one of the cleverest people in the world. UNICEF had been innovating for ages prior to this to develop better vaccines, products and ways of working, but Chris Fabian and his team systematized the innovation thinking in UNICEF and put for example mobile technology and emerging technology and innovation on the agenda on the agenda. The other UN organizations have to a big extent adopted UNICEF's principles of innovation.

In Malawi UNICEF have test lanes for different kinds of use of drone. They can also use drone in emergencies, in instances where you don't even get planes in. In some cases, you can use satellite pictures and if they are not too pixelated the drone sometimes can land. Then they

can be used to for instance get quick replies to a HIV test, something that used to take three weeks in some parts of Africa. Or, they can simply be used to get an overview.

The next meeting Gabrielli has scheduled after our interview is technical discussions with satellite experts from New York and from the space center here in Norway (Gabrielli, interviewed January 14th, 2019).

Aeinehchi interviewed January 21st, 2019

Aeinehchi's passion is to be a part of a bigger movement, that drive the Norwegian and the global society towards new advancements that are yet to come. Currently, he works with disruptive technologies like Artificial Intelligence, Blockchain and Cryptocurrencies. He believes that these technologies will significantly change the world as we know it today, and that Artificial Intelligence and machine learning will assist us way beyond the current mainstream software. Blockchain and similar technologies will make persons, as institutions more efficient and the ownership of values will be more secure, he states. They will also help fight against corruption and censorship and value privacy and transparency through mathematics and cryptography. This will radically change our view of third part institutions like banks and governments, he emphasizes. Cryptocurrencies are yet to evolve and deliver a longstanding promise; to help billions of people around the globe to get access to the banking system. A more secure and effective banking system based on Blockchain or similar technologies that are more transparent; yet more private. Are the ideas that once established will help billions of people around the world. Aeinehchi believes that cryptocurrencies are probably going to replace the money as we know it today. However, not necessarily replace the Krone (NOK), the Euro (EUR) or the Dollar (USD). It could be the backend for these currencies.

On the topic of Artificial Intelligence (AI) Aeinehchi points out the importance of China in its development. Not having GDPR (General Data Protection Regulation) gives them leverage. They have collected and stored massive data sets. One of the key elements needed for good AI output is to have very good Artificial algorithms and models, and training data, which China has. This makes China very special in the field, and they will make a lot of advances within AI in the coming years, Aeinehchi points out. Addressing the importance of Trust, Transparency and Traceability; Aeinehchi cannot emphasize enough the importance of having and preserving the balance between privacy and transparency. Another fundamental aspect of

transparency is traceability; it's important to ensure that the traces are themselves traceable. He describes the following scenario: As the most trusted system administrator, one would be able to modify the log files. By going into the database, make modifications and go to the log files, which are the traces register, and ensure that the database could be manipulated without leaving a trace of these actions. Here is where Blockchain technology makes sense; because Blockchains are immutable; it means they cannot be changed they cannot be altered. We cannot delete anything, we cannot replace something, and we cannot change it. This is one of the beauties of Blockchain technology, but also its disadvantage. He gives us an example; if someone introduces say child pornography into Bitcoin then the entire Bitcoin will be illegal due to the inherent fact that its ledgers containing this information cannot be deleted or altered. There needs to be some counter act measures before this technology can be adopted in a wide scope, he says. The advantage of adopting this technology is mainly to ensure that the traces are themselves traceable. The idea of traceability is to enable us to trace something back to its origin.

One cannot discuss the concept of privacy without bringing up the concept of secrecy, these two concepts are often mixed. On this subject Aeinehchi describes privacy as a choice, one has to decide when and what to share about oneself; however, privacy is not an absolute right. Sometimes there is a need to break privacy for other aspects, like if the police need to know about someone's illegal activity. There is a need to build systems that are private but with the option to make them transparent when necessary. What is the higher purpose? Aeinehchi asks. We trust in our government in Norway. But what if we didn't have trust in our government, in some other part of the world? Would we let those governments break into our privacy? So that's the dilemma. As the definition of privacy differs from country to country and from context to context, and in regard to finding a good solution which balances the privacy and transparency, two aspects which often can be found in contrast to each other, Aeinehchi finds it's not necessarily about finding THE solution, but rather to explore and reach a balanced solution in each particular case (Aeinehchi, interviewed January 21st, 2019).

4.2.2 Are the Norwegian Agencies/donors integrating these disruptive technologies in their strategies?

Jacobsen interviewed December 10th, 2018

Jacobsen believes there is a potential of growth on the internal side of NORAD; a potential in doing the things, that they do today, more efficiently by using new technologies. She also believes there is an enormous potential for reaching more people through democratizing access to services. They are looking at some of the hurdles and some of the challenges in reaching people through digitalization and emerging technologies. One of the main challenges the team keeps returning to; is the infrastructure and the access to services. They are focused on promoting digitalization and access and at the same time making sure that they reach the most marginalized people and that they are not strengthening the gap and the digital divide. Jacobsen works with Vision 2030 that's providing financing for innovation projects to be implemented in developing countries. Norwegian actors from the private sector, from civil society or from the research community can apply for these funds. This is done in collaboration with Innovation Norway and the Research Council. NORAD provide risk reduction of the funding and assistances with entering those markets. When the NORAD team look at digitalization, they believe that this can contribute towards reaching more people in markets that would maybe otherwise have been underserved. They are also working on a new initiative regarding the global digital public goods; creating new digital goods that can and should be accessible to everyone which are open source.

The NORAD team is looking into where Norway can provide inputs in the global arena and Jacobsen gives us the example of YR (*yr.no*), the Norwegian service weather forecasting, which is already used quite a lot in developing countries. Being a free service with a license that allows for reuse, they are looking for new ways to provide this data and reach new users. Another interesting project they are working on is the Global Digital Library where early grade reading resources are made openly available in a range of languages. Jacobsen explains the goal is to include more than 100 languages within 2020. They also work towards making global digital public goods relevant for the sustainable development goals readily available in one place, and the goal is to make all the services more available on a bigger platform which makes it easier for people to find them and to do this in collaboration with other actors internationally. They are working on a prototype for this together with UNICEF Ventures. Jacobsen emphasizes the importance of working in collaboration with other donors and other

countries and collaborate with the private sector to ensure that we can really work together and create these opportunities.

Jacobsen mentions again the issues of access when working with the UN's Sustainable Development Goals and the importance of leaving no one behind and they do see that there is a risk when they are working with emerging technologies; that they will not immediately reach the hardest to reach. They are exploring ways to reach areas that are not yet connected to ensure that they reach the marginalized groups that are hardest to reach. NORAD is realizing that the synergy of the emerging technologies could be possible; however, they are not in a phase of implementing it yet, says Jacobsen. She mentions a report issued by DANIDA (*um.dk/en/danida-en/*) the Danish development agency; where they also write about the potential of using Blockchain. This really came much more into play this year, she explains. So, it's absolutely a theme in the Aid community. In Jacobsen's opinion Blockchain is a decentralized distributed technology that changes the role for the centralized states, for example in the chain of transfer of development Aid. It has potential for the Development Agencies but there would also be a need to retain control and verification of inputs. She adds that Blockchain and AI in combination could be very interesting, but for now, they are working more on seeing how they can collaborate with other actors in the implementation of projects in developing countries (Jacobsen, interviewed December 10th, 2018).

Haugstveit interviewed December 17th, 2018

Haugstveit points out the importance of addressing the question about being more insistent towards their partners on the issue of transparency. Inviting them to publish the information about the agreement on their website, for example. He believes it is often part of the dialogue. They cannot ask all recipients to do so since some of them are not on a digital platform, yet. However, this is constantly improving; following up with new technologies and to use it. But they must find their way of being transparent, he says. It is important to find a way to reach the potential beneficiaries off-line to convey what the Aid is providing.

It's part of Haugstveit's job to, already when they decide to enter a partnership or to support an organization, request them to inform on their website about the possibility to whistleblow anonymously. In that case it would come to the Norwegian Ministry of Foreign Affairs. Haugstveit agrees that transparency in a local Aid project is also interesting to broadcast at national level or even at international level, as this can spread and nudge neighbouring

countries, or even faraway countries, to follow the example. Two African countries, Uganda and Malawi, stand out today as being the less transparent; but again, to what extent is this reality? It's certainly the number of cases that the Norwegian agencies can detect, however other countries may be just as bad, but they are not able to detect or disclose the problem to the same extent. However, Haugstveit's unit cannot always exchange all the information, because some of it would be related to specific persons and the regulations on privacy could be broken, but he expects that UD from the outside are quite transparent. Haugstveit's unit publishes quarterly on the website of the Minister of Foreign Affairs the cases that they close, not the ongoing cases (Haugstveit, interviewed December 17th, 2018).

Gabrielli interviewed January 14th, 2019

Transparency is a very important part of the work we are doing, Gabrielli says. Then there is also the question: How can the corporate sector - they have a lot of technology, a lot of possibilities that we don't have - how can we work with them? Gabrielli explains that they are also using something they call EduTrac (*http://causetech.net/innovation-zone/unicef-innovation/edutrac*) (*real time information systems*), where you ask the children: Did your teacher come to school today? And why is that interesting? Gabrielli asks. Because the regional or even the local, head of the school system reports back on how much funding he or she needs for the salary of teachers who went to school. But if that person doesn't control that the teacher go to school or if they don't even hire a teacher, then this is about both transparency and traceability as well as corruption, Gabrielli says (Gabrielli, interviewed January 14th, 2019).

Skjønsberg interviewed January 17th, 2019

Skjønsberg and his unit often see that they might protect one path, one channel of funds; one program or one project. However, if that investment is well protected the potential offenders will find other ways to go around the system and they will obviously go for the weakest spot. They see that when it comes to the Norwegian Foreign Aid, the risk is of course smaller in Norway. The check-and balances are functioning, the institutions are operating, the laws and regulations are respected by i.e. consequent follow-up and enabling cross-institutional cooperation, in short; the control environment is generally spoken very good. Even IT-audit is

at hand, enabling the authorities an immediate transparency in the records of the cash flows, for example.

Although the possible implementation of emerging technologies in the Norwegian Foreign Aid's work is not Skjønsberg's field, there has been many venues where they have discussed this issue. He emphasizes the importance of looking into the whole chain of aid delivery, the chain of transfer of funds, and see where the risks are and thereafter asses to which extent increased use of IT is feasible. Skjønsberg gives us an example where they had a large scheme of corruption on the program management side. They took advantage of the transferring system to the final user. They were manipulating the procurements and the distribution of funds, the budgets, before it came to that level. Some of the largest schemes they have encountered is fairly sophisticated computerized attacks on bank accounts, and Skjønsberg finds that the Aid industry as such will not be able to control this and that these kinds of attacks falls under the responsibility of the other entities in our society like the police and the banks. Skjønsberg mentions the need of having more sophisticated systems, which partly implies tech in every instance where you could increase transparency. Skjønsberg defends making the whole system of Development Aid more risk based; by finding out where the risks are and have systems to map down the cash flow. That is a weak element. A way of making that more sophisticated could be to have a software which shows where the money is; tagging it all the time and getting an overview of the actors and the cash flow together (Skjønsberg, interviewed January 17th, 2019).

Nordhaug interviewed January 18th, 2019

Nordhaug finds it's really important to find out where Aid money can make a difference and catalyze a greater impact, she says. One obvious angle is to focus on the most marginalized, the leaving no-one behind angle; focusing on those that are very hard to reach through the market, with services for instance, she says. One example is those that are not living in an area or near an area with access to internet. The infrastructure investments in order to provide 3G, 4G (and over time 5G) access are quite significant, meaning that this is not something Aid funding can do by itself, she points out. The question is then what kind of public/private partnerships can be of help to ensure access to critical infrastructure and services, and using digital technologies for empowering the most marginalized? I think that's a very important topic, both Aid related and tech related, Nordhaug says.

There are many areas that are vital for how society evolves. One area which is tremendously important is access to credit, and Nordhaug thinks there could be a lot of potential there in using A.I in combination with Blockchain, to document credit history and allow financial services for new population segments for instance. Another one is regulatory frameworks related to how you auction mobile licenses. Opening up the banking sector for competition is a challenge in many countries, in order to make sure that you can get mobile banking going. Often there is a monopoly on the bank industry and government agencies and people connected to the government with a very strong vested interest in not having any changes. That's one of the reasons why this has happened very fast in some countries, and not happened at all in other countries, Nordhaug explains. There are many areas where capacity building and training advice that does not necessarily have to cost a lot of money, can make a difference, but you also need political will, she continues. There is tremendous potential for using technologies to empower civil society and media who are monitoring and creating checks and balances in society, I think that side is very important, and I'm a big fan of enabling access to services directly to the extent possible, she says (Nordhaug, interviewed January 18th, 2019).

4.3 The Outlook

Some ideas and ideals for a good society, once seen as utopian, have become real. Although they don't include all the citizens of the world. Slavery still exists, for example. To continually imagine and pursuit new utopias, for the global community with nature included, is of most importance if mankind is to continue to walk on this planet. In this context, asking our informants about the outlook in the scope of our study seemed pertinent.

Brentebråten interviewed November 29th, 2018

Brentebråten points out that transparency in governments, banks and the commercial world, would offer the ability to have more accountability in our society. Technology can also lower the barriers to entry for the unbanked, he says. You just need a device with an internet connection and then you have access to financial services straight away - making it a low barrier to entry, security and transparency - that's what I think this technology can provide to the world, he says.

It could also be used for tracing the funds and the quality of the product by having it being reviewed by persons or communities that the delivery is according to the contract.

Another interesting service is where a donor, through peer-to-peer technology, gives directly to the refugee and there is actually no NGO's involved.

With a government or country that runs all its ledgers on the Blockchain, there is less room for corruption, which means that they will have to stay accountable to the people they serve. If there is global adaptation of these emerging technologies in a good way, there is perhaps less need for refugee situations in the first place, Brentebråten says.

In regard to privacy, Brentebråten thinks Europe is going in the right direction with its new implementation of GDPR, while he thinks China is going in the wrong direction with their extensive surveillance. America have no strong traditions for privacy and are undecided, but they are building a lot of tech to make a profit without necessarily seeing the consequences of what they are building. But failing to anticipate bad consequences has made some of them, like Facebook, now try to address this and to do some changes, Brentebråten says (Brentebråten, interviewed November 29th, 2018).

Jacobsen interviewed December 10th, 2018

Jacobsen has been involved in the work on improving internal communication in NORAD. One of the key issues is being able to communicate across the different silos that they are often working in. And she finds technology has a good potential for doing that. To our question about if there is enough flow of information internally and whether or not they have enough information sharing in the administration part of the development Aid pipeline, she finds that there is potential for improvement in this area. She gives us an example; they recently started using Workplace internally and even though it seems like a small change, this has opened up communication between people and made it easier to know more about what other colleagues are working on. The comments from her colleagues so far have been positive; they think it's interesting to see what's happening in other areas, now that they have added insight to what co-workers are working on in other parts of the organization. Information can easier be shared across. She has been able to share information about innovative new solutions and digitalization with more co-workers, also those that she may not interact with on a daily basis. This has opened up for some new discussions and interest in digitalization across different thematic areas. The main motivation for working with

digitalization in development projects is to ensure digital inclusion and empowerment and to reduce the digital divide globally. Upon question on whether implementing new technologies in the administration and management of development aid, Jacobsen thinks that this could have some potential, but this is not the focus of NORAD's work on digitalization for development and these questions are not within her area of work.

On a side note regarding the flow of information across the organization, we were informed that the whistleblowing team works separately from the rest of the development aid management because their cases are strictly confidential, and they are only involved once there is a whistleblowing case or questions regarding potential misuse of funds.

Back to the core theme of our conversation, Jacobsen thinks that the Principles for Digital Development (*https://digitalprinciples.org*), endorsed by a number of development organizations, are useful guiding principles for how NORAD can work with digitalization in development projects. NORAD has endorsed the principles a few weeks ago. The principles are about being collaborative, designing for scale, using open standards, open innovation, open source, and ensuring the safety and data protection of the user. These are nine principles for digital development projects that are easy to see the importance of but that are not always adhered to, she says. She thinks they give good guidelines and set the direction for how to work with digitalization in development.

Jacobsen finds it's very interesting that we are looking at these questions. It's very timely, it's very relevant, she says. NORAD is also working on many of these questions and she thinks the development actors are really starting to open their eyes to the impact that emerging digital technologies are going to have. She finds there is a lot of excitement, and they see the potential, but they want to make sure that they are doing it in ways that are empowering, supporting digital inclusion and reducing the digital divide.

For NORAD as a public agency with the development goals as their main objective, Jacobsen found it interesting to see for example at the Oslo Innovation Week how in the last two years a lot of things had changed in the tech scene, and also how important sustainability and the sustainable development goals have become for a large range of actors. I think that our contribution is to look at how we can find new solutions and how we can use emerging and new technologies in the best way to contribute towards those goals, Jacobsen says. Also, in their collaboration with the private sector the goals are becoming a lot more aligned as the private sector is getting much more involved and excited about this. I think that's really good,

and it's very exciting to see, Jacobsen says. She finds that in the near future they need to focus on this collaboration to make sure that they're going in the same direction as they have a lot of things to contribute to each other. From NORADs side they have a lot of experience over several years learning and experiencing that even with the best intentions, the need to make sure that you're actually getting the intended results on the ground as well, as that can be very difficult. They can contribute towards an understanding of what one needs to keep in mind; the understanding of the local context, that solutions that you are bringing from one place are not necessarily as easily implemented in other places and also a lot of unforeseen consequences that can happen when working with development on the ground. Jacobsen also thinks they can learn a lot from the private sector and from civil society with the really exciting things that are happening now, especially in the collaborations and developing new solutions and new technologies and learning from each other. If we all work together in that arena, I think we're going to have very interesting solutions in the short term and in the long term, Jacobsen says (Jacobsen, interviewed December 10th, 2018).

Haugstveit interviewed December 17th, 2018

Haugstveit informs us, there is a debate now in regard to how the Norwegian Ministry of Foreign Affairs should be organized, but it's not yet concluded. So, we'll see in the weeks and months to come how they choose to organize that. A decision that will be made at the policy level.

He is also positive about the emerging model to connect Aid to the private sector but emphasizes that this model needs institutions around it all the time and that there are different types of corruption in the different sectors which is important to be aware of.

I do think there is a need to work more on what is the focus of your thesis, he says, and he can see at least I two reasons: In order to have impact in the field they need all those resources to create concrete results. And if those are diluted or wasted or not used properly, it would have a reduced impact in the countries they are meant to support.

The other part is that Haugstveit finds it extremely important to sustain the support in Norway for high level of Development Cooperation. That people need to know that they are following those funds very closely, and when they are not spent properly, MFA will react. And in some cases, even ask for money to be paid back. I think that is very important for the good standing that Development Cooperation has among the Norwegian public, because the support is

amazingly strong, he exclaims, people know very little about what we actually do in our Development Cooperation, but they still support it! And then it's important to know that, ok, we're serious about this and we do everything possible to make sure they are spent in accordance with the agreements, Haugstveit says. I also think the use of Blockchain technology and these more modern ways of monitoring the financial resources could be PART of a solution, it's not THE solution, just as there's no there is no quick fix in this, he reminds us. The challenge is, that even though the tech side had a good grasp of how to use this technology and its advantages, to bring this down to a concrete level. Haugstveit invites concrete application to one or two or three Development programs or projects to show them how this could be used in real life. Because that's the missing connection, he says. However, there is no quick fix; there is no technology, nothing that can solve this deeper misuse of funds and people, once and for all. The human aspect regarding the deficiency of ethics and moral; nevertheless, in the best case the use of modern technology can be one part of a much broader solution (Haugstveit, interviewed December 17th, 2018).

Gabrielli interviewed January 14th, 2019

There are different ways of engaging in international Aid or foreign policy, and as Deputy Executive Director in UNICEF Gabrielli like to influence processes with long term goals and with the bigger picture in mind. He is heading a department that originally was a traditional advocacy department working towards the Government and the Minister of Foreign Affairs and in a Norwegian context towards the Ministry of Interior on children in Norway. But now they have widened the scope, partly as a response to the national development and also the SDGs (The UN Sustainable Development Goals), and his department is now also responsible advocacy towards the business world, funding that they can use on the Program and UNICEF on the ground. Working on children's rights in global value chains, that is a different kind of advocacy because they believe that if you want to deliver sustainable solutions for children rights, for everyone, you need to have a combination of social economic and the climate dimension of sustainability, he says. They work with investors and with companies directly to try to change the way they create growth. One way is to give away some part of their growth to create better programs for children to health for example. Another way is to change the companies' behavior that will affect children. They estimate that around 1 billion children are affected directly by the global value chains of international companies, which is 40 percent of

all children in the world. Either directly as child workers or violence or through their working parents.

They are now doing advocacy both traditionally with inviting companies to give more money to UNICEF so that they can do more for children, or advocacy work towards inclusion and rights in business policy. We are also working closely with the Norwegian Oil Fund, so NBIM (*Norges Bank Investment Management*) is now one of our partners, he says. We have an agreement with them until 2021. When you are investing in 9.000 companies; how can you do a change? he asks. Just a small change in your investment, can mean a positive change for children. This is non-traditional public advocacy work, which is important, he says. As a pilot with NBIM they are focusing on the textile sector. NBIM is invested in 300 companies, some of the largest in the world. In this pilot they have a network of 10 to 15 of the largest companies and they also work with 11 factories that the companies' source from in Bangladesh. We need people to work with advocacy because it is crucial, but sometimes it feels like you want to work closer to the children on the ground, he says. But of course, when you get good results it's a different kind of motivation than seeing the children into their eyes. At the end of the day, if the Norwegian Oil Fund make sure that 10 or 15 of the largest companies in the world are little better to the children and their working parents, that would potentially mean a big difference, Gabrielli emphasizes. They are also in talks with the Telenor broadcast to use satellites to map schools and address the issue of access to internet. If you know that all the schools have internet, then you can send info via internet. If you want to help the population, say in an Ebola outbreak, he says, the most simple thing that UNICEF should do together with the government is to send out information about how you protect yourself against Ebola, and if you don't know how many schools there are, or where they are, how do you send out information? he asks, and quotes UNICEFs motto: how can we reach every child the best way? Usually we say that we want to make sure that the child survives. So that includes fighting child mortality and vaccines are obviously a very important thing for us. That's number one. After that it's to help them grow up and to flourish and develop into their full potential, he says.

Gabrielli finds it's a good idea to start using much more technology; creating new ways of funding start-ups on the ground for example, because it's a necessity to create systems that create growth as well in the countries they help. If you don't educate people, who's going to get the jobs? And who's going to develop the country? He asks. He thinks education and

health will still be an important thing for Norwegian Aid and the corporate partnerships and also Norway as investor (Gabrielli, interviewed January 14th, 2019).

Skjønsberg interviewed January 17th, 2019

In the matter of who should be in charge of the funds and who should do what, there was a report from the group which was heading the reform process of Norwegian Development Aid which recommended that the government should decide upon one out of two possibilities. The first one was to include NORAD into Ministry of Foreign Affairs (MFA), and the he second option was that NORAD should be strengthened. KRF (krf.no) has called for a third possibility; that NORAD should become a ministry. Today it's an agency and should be called a ministry. That's on the administrative side. The (then) Minister of Development, Nicolai Astrup, stated that it is out of the question to have a development ministry, because we need to link the Norwegian Development Aid closely with the Norwegian foreign policy (*https://tv.nrk.no/serie/dagsrevyen/201901/NNFA19010919/avspiller*). It's very interesting stuff for us, Skjønsberg says, as no one is, to my knowledge, really in favor of de-linking it, but it is a matter of how strong should that link be. What would I like to see in the development? That's one thing, and what I think would happen is perhaps a very different thing, Skjønsberg says (Skjønsberg, interviewed January 17th, 2019).

Nordhaug interviewed January 18th, 2019

Nordhaug, who is a political scientist, has worked with very specialized people and also had on-training on certain topics to be able manage and be a coordinator for technology projects. She finds that the skill side of things is something that is desperately lacking within many aid organizations as these are complex issues and they're evolving so rapidly. She thinks we need to think of it differently, and try to recruit more broadly, because they have a lot of political scientists, economists, lawyers; a lot of people that are very good at specific things, but maybe first of all; naturally risk averse. It often comes with the territory, but she finds there is a need to work in a different way with technology and innovation; as with EduApp4Syria, they did a lot of assessment and then they chose an innovative tender which was only the fourth such type of tender in the Norwegian public sector outside of petroleum. It was a very novel instrument, and they could not say in advance if that was the right way to do it because no one else had done it. That is the challenge with innovation; if there is always a requirement to

document that it works beforehand, which often is required, then the only projects that will be started are by definition not innovative. Nordhaug thinks that the acceptance for taking real risks, not only pretend risks, and for failure, is very important and also that it's a mindset. Integration of the mindset and the opportunity to fail quickly and just adapt and iterate, is something they need to work on, she says. She finds there is a need to bring in people that are information scientists who have a background in tech or that are experts, to help shape from the ground up how they will collaborate in the future. She emphasizes that they still will fund others, but that it's also important to get that mindset in and have a minimum of strategic thinking and expertise on those topics to be able to manage these kinds of projects well, and not only fund others.

It's very trendy to talk about the potential for leapfrogging in tech, and it's a term that is being used too much, she thinks. Nordhaug finds that even though it's in a way a cliché, many clichés have some truth to it, she says. At the same time, looking at our own country, one of the things Norway is struggling with in some sectors, like for instance in NAV - Welfare provision - the systems there, or in the police or in health, the struggle is really to remove our old systems, Nordhaug says. Back when every institution was designing its own program for everything that would cover all their needs and they had lock-in to one vendor, or a few vendors, the solutions from those vendors were often not interoperable. There were many decisions that were made that have not stood the test of time, she says. In many sectors there is a huge debt in the sense that there's a huge investment needed, and there's so much focus in the media on how to get these investments right, she says. In developing contexts where there isn't much legacy and the population have the tendency for adopting mobile devices very quickly, and there isn't the same type of physical infrastructure, Nordhaug finds that there is a huge potential for building new and more vibrant business models. At the same time, she also reminds us that there are a lot of government decisions that have to be made to get that right. She finds that's an area where aid can make a difference is in terms of capacity building and supporting governments in making good policy decisions relating to enabling regulatory frameworks for instance, she says. One of the things Norway has been pretty good at, she points out, is our registries: *Brønnøysundregistrene* (Brønnøysund Register Centre, the Norwegian government agency responsible for the management of several Norwegian public registers) and those kind of relatively user-friendly systems, good access to information, the high level of transparency and making it relatively easy to start a new business. I think that's very important, Nordhaug says. NORAD is also funding the Norwegian tax authorities to

collaborate with developing country tax institutions in a program called Tax for Development and has a long tradition of petroleum related development assistance through Oil for Development.

Digital technologies have the potential for scale in many directions and to many user segments. It will require a lot of personas and user testing, but, as Nordhaug emphasizes, you can at the same time, in theory, reach a lot of users that are hard to reach via the various middlemen and intermediaries you need to go through. So, I think there's a lot of potential there, she says.

At the moment Nordhaug is working closely with the former Minister of International Development, now Minister of Digitalisation, as part of his participation in the U.N. Secretary General's High-Level Panel on digital cooperation (*www.un.org/en/digital-cooperation-panel*). An important aim of the Panel is to arrive at new ideas for digital collaboration models. In this High-Level Panel, the Minister has in particular advocated for the concept of digital public goods, meaning open source technologies, openly licensed content and open data that conform with minimum standards for privacy and security. The minister has advocated for establishing a mechanism to allow individuals and institutions in low- and middle-income countries to more easily discover and engage with what already exists in order to use and adapt for their own purposes. This would represent an alternative to everyone having to start from scratch and try to develop their own systems, which is very challenging and not an effective way of using resources, she says. But she can't say that they've seen impact on the ground from that recommendation yet, because the report is still in the drafting stage.

On the subject of; more specific project interventions, she emphasizes the importance of getting the right partnerships when they are working on direct interventions like EduApp4Syria and the Global Digital Library. She also points to the need to spend resources on marketing and communication to make sure that end users are aware of this opportunity and that they can trust it. This may imply working with PR agencies and agencies that are not normally part of development interventions, but Nordhaug thinks that those kinds of new partnerships need to be built. She gives us an example: Facebook has for instance helped with the outreach of one of the EduApp4Syria games. They're not helping NORAD, but they're helping the team behind the game directly with free ad credits, which seems to have had a big impact on number of users.

She also finds the idea of reusing and improving rather than everyone having to develop their own pet projects from scratch appealing, as she sees a huge tendency towards fragmentation. But that also leaves less room for branding and logos and requires a mind shift. She finds there needs to be more of a "no logo no ego" approach when building broad partnerships and alliances with many stakeholders, while also acknowledging each stakeholder. Taking on a kick-starting and facilitating and enabling role, without having to plant the flag too much, can be particularly valuable (Nordhaug, interviewed January 18th, 2019).

Aeinehchi interviewed January 21st, 2019

Aeinehchi is not quite sure whether tech itself will protect our resources. He finds it a very broad question, and asks us back: what are resources? To convert it to his daily work, he would think about protecting the data and the systems. In that aspect he believes that some of the systems would definitely benefit from Blockchain technology, but he finds the Blockchain may not be adequate to be used in all different systems. It gives the possibility of building systems that could make sure different documents were identified and protected even in case of disasters, natural disasters and war migration. It could be used to protect resources, and it could be intellectual properties as well. It's about protecting and having a global evidence of something that has happened in a particular time and knowing it cannot be altered, Aeinehchi says. But, today most of the Blockchain technologies are not very environmentally friendly, he points out.

But probably will technology, along with other measures, together protect our resources.

Aeinehchi have written extensively about "Cradle to Grave Blockchain" and many talented people in the tech community are thinking along those lines. It is back to transparency and traceability. He gives us the following example: If you happen to be in a dispute with a bank, or an insurance company, or government or some big institution, you are the weaker part in this dispute and they are the ones having the systems, log files and databases with your data. Even if you ask for permission to have insight into those databases and log files you will be receiving a very limited data sample, and even not all laws are regulated in such a way that you can have access to your own data. So, by having your own Blockchain you will be an equal part in such a dispute situation. We have had these Blockchains - Cradle to Grave Blockchains - with us for many years; a tremendous number of receipts, and data, and documents. The problem is that we don't have them when we need them. So, if you don't have

your birth certificate, or medical journal, when you are running from a war, or when you are in a dispute with an insurance company, and even if you want to use those documents you may be asked whether those documents have been tampered with, but by using Blockchain technology and cryptography, it could actually give you the equal power that institutions have had. From that perspective it could protect your rights and your resources. This is to protect you as the individual.

Blockchain technology could also be used by institutions, he says, but in a different way. And if you ask me how that different way is? That is the question I've been struggling to find an answer to, for the past years, he says, because usage of Blockchain technology could be very helpful, but it may be problematic from different aspects like GDPR (General Data Protection Regulation). And, what if someone falsely, or wrongly, wrote something to that database and it cannot be altered then we have a problem, he points out. You cannot operate in that block, but you can tell later that the input on the previous or earlier block was a mistake, so you can trace, but what if someone reads only the next to last record? So how do you ensure that the last record is broadcast and read by everyone? From a technical perspective you have to think about all those edgy corners, he says. That is one of the reasons many institutions are still reluctant to use emerging technologies like Blockchain. We just need to let this baby grow up and see when it falls, and learn from it, before we can use it in mass production, he says (Aeinehchi, interviewed January 21st, 2019).

4.4 Keynotes from attended conferences

We were fortunate to attend major national and international events held in Oslo during our research period, providing us with some of the latest work, experiments, projects and research in the field of the emerging technologies that we address in our scope. Being a dynamic field with an unprecedented exponential development, we found it more relevant than exploring existing literature available. Thus, turning our attention to the people working hands-on and creating disruptive solutions, some of them in the spirit of the UN's 17 Sustainable Development Goals; just eleven years away. Another positive and enriching point in this approach is to witness first-hand the dialogue and the panel discussions held at these events. These contributors don't operate in a vacuum and this aspect is totally present when they come together. Our study is not about coding, the algorithms or other deeper technical knowledge behind this newer science. Our study aims to find connections, the synergy and

establish the relationships in a wider perspective and bring it back to the Norwegian Foreign Aid's context.

Under the "Oslo Big Data Day 2019" (BI Norwegian Business School, March 19th, 2019) in the parallel session hosted by BitSpace, a panel with Norges Bank, EY, BitGate, Arcane Crypto, NBX and Matthew Bryce discussed "Digital Assets in Norway". Magnus Jones, Tax Technologist at EY, shared how EY does much more then auditing. They have a clear focus and a global perspective on the Blockchain field, with their 14 core Blockchain hubs, exclusively with Blockchain developers, around the world. EY has also around 700 people with in-depth knowledge in this technology. In Norway around 20 people work mainly within the legal framework, providing technical implementation to companies and assisting the authorities. This shows their commitment to be in the forefront of this industry in the global arena. Peder Østbye, special adviser at Norges Bank (Norges Bank, the central bank of Norway, manages Norway's foreign exchange reserves and the Government Pension Fund Global), assesses the benefits and risks associated with new technology. He also works on the Norges Bank's project "Central bank digital currencies" (CBDC). Further information is found in their publication "Norges Bank Papers NO 1 | 2018". This publishing shows the relevance of the current financial disruption taking place globally and the openness of the Norwegian state towards their stakeholders.

At the "Oslo Big Data Day 2019" (BI Norwegian Business School, March 19th, 2019) Sarah Mannion spoke about how Nvidia's long experience in gaming technology is taking Big data to a whole new level. They recently realised that the technology they created to power games, to power those fast moving and shooting games, are good for data and AI. It is this same technology that is now powering AI and powering autonomous vehicles, they use this technology for its decision-making capabilities. They focus on collecting the fast-growing amounts of data and accelerate its processing by adding GPUs to the data centre. This technology is also in the 'heart' of machine learning and deep learning. All other features are stacked on top of this foundation; their newest big business is Education. Why is this important? Because it's our understanding that this has the potential to create ever larger disruptions in the field of knowledge and 'smart auditing'. It's our understanding that AI is being developed as an extension to our human capacity to process and correlate such large amounts of data; AI is to do more than quantitative analysis, its 'ability' to do qualitative analysis is the next frontier.

At the "SHE Conference 2019" (Oslo Spektrum, March 6th, 2019) Torgeir Waterhouse, spoke about "Artificial Intelligence and bias". When it comes to AI, bias is one of the big issues, because humans are behind the technology. Assuming that, around 50% of today's investments in AI and start-ups occur in China, that will lead to Chinese culture and legislation, for example, to influence how the system functions. The same goes for USA with around 40%. Just from this configuration we get bias, because it influences the technology. AI needs data, a lot of data and whatever it does it is based on data, the input data. Which again is imperfect, because there is always bias in data. One of the many tasks AI does is to interpret patterns; patterns recognition. The quality of the output depends on the volume and the quality of the input data. AI is not human intelligence and cannot be compared to people. AI can easily be misused, due to its selected bias input to favour a wanted outcome by a specific group of people; this is bias in practice. AI is also called machine learning in a simple form. Waterhouse gave the example of Microsoft's A.I. chatbot, Tay. Tay "learned" by interacting with humans on Twitter and had to be taken offline after about 24 hours online, due to its increasing corrupted "opinions". What do the machines learn and from whom? Is the question. If you learn from the wrong data, you will get corrupt outcomes. AI bases their systems on data; so, it's important to assess the right data to input. Another question arises: Do we understand the technology? And the consequences of it? Do we understand the data and the consequences of it? Being perhaps the most important question: Do we understand the people? He concludes by asking: Are we having the right discussions? And how to make sure AI gets the best possible data available? No matter how "intelligent" a system is; if the data is broken, the output will be biased. This is one of the major issues going forward in succeeding with AI. The focus needs to be in fixing the data. Waterhouse gives us the brilliant example of our historical data being broken, because it suggests that men are the only functional beings on the planet.

At the "UBI Nordic 2019 Conference" (Chateau Neuf, April 6th, 2019) Hilde Latour presented her "Mission Possible 2030" at the "Plenary Session I: Targeting the Sustainable Development Goals". She started by reminding us that we, in 2015, as part of the United Nations' countries, defined 17 sustainable development goals and agreed to achieve those goals by 2030. Goal 1: No poverty; She believes the most efficient way to eliminate poverty once and for all is by giving a universal unconditional basic income (UBI). It not only eliminates poverty, it also ends hunger (goal 2), reduces gender inequality (goal 5) and reduces inequality within and among countries (goal 10). UBI is a periodic cash payment to

be paid without the need of bureaucracy or middlemen; in other words, to be paid directly to the recipient and to be spent freely. UBI is meant to be a guarantee for whatever happens one will never fall below the poverty line, making this line a stable floor from where one can decide how to spend their time and energy and go for their potential. Latour moved to the example of Namibia where facing a period of extreme draught, Aid was given by direct cash instead of food. Some bought food for themselves, so they could work on the land. Others bought food for their cattle or seeds to grow crops for the next season. Basic income pilots and cash transfer programs around the world show that UBI has positive effects on several domains, such as crime. Pointing out that in all countries many crimes are poverty related. Back to Namibia as an example, they saw a decrease 30% of total crimes rates within one year when people were receiving a basic income. Including an impressive decline in illegal hunting. It also shows a positive effect on health, people change their eating patterns, choosing healthier food because they can afford it. Sanitation improves in countries where these facilities are insufficient. It reduces stress and stress related health issues, confirmed by the recent experiments in Canada and Finland. It contributes to end child labour, to improve the quality of working conditions and to create new businesses. It contributes to community participation and empathy. It improves education, children stay in school longer and adults can improve their skills and knowledge for a career change. According to Latour, based on the evidence gathered from several basic income experiments and cash transfer programs around the world, basic income alone contributes to 11 of the 17 sustainable development goals directly; with one simple intervention, she says.

At the same conference and during the "Plenary Session II: Solutions for a Brighter Future", Nir Yaacobi spoke about the non-profit project the Good Dollar, aiming to address the global inequality beyond the UN and government cooperation due to today's trends of more nationalism and less globalisation. Meaning the Good Dollar project aims to find a way to make UBI independent of government. He mentions 3 problems: U, B and I. U: For Universal How to make it Universal? How to identify every single real and unique recipient and register them to the system? B: for Basic. What is basic need in the global context? And the last problem is I: for Income. How to finance it with a system that is not compulsory? These 3 problems are the hurdles to overcome in order to implement a global non-governmental UBI. However, Yaacobi and his colleagues behind the Good Dollar project, believe that the beginning of the solution may lay with the new technologies that have emerged in the last ten years like the Blockchain and the Smart Contracts. Through the Good Dollar project, they are

running a series of experiments to try solving these hurdles using cryptocurrency mined according to an algorithm and distributed immediately and equally to all users. For the identification problem, several start-ups around the world are working on solving the valid identification through the Blockchain. And, as to the value of this currency, this will increase by its good use and circulation. Assia and Ross (2018) say "The Good Dollar experiment is sponsored by leading global investment platform eToro as its first funding partner. The team is tasked with the development of open-source solutions making the practical implementation of UBI possible with blockchain technology. Good Dollar's mission is to build open-source solutions for efficient allocation of resources according to principles informed by research on UBI and related policy proposals." (p. 15). The Good Dollar Research Agenda is among other things "to assist local communities, non-governmental organisations and governments in experimentation with and implementation of UBI policies utilising novel blockchain based solutions." (Assia and Ross, 2018, p. 18).

This year's "Horisont" conference (Det Norske Teatret, March 20th, 2019) was titled "Research that saves the world" (translated). Morten Goodwin, Associate Professor at University of Agder and Deputy Head of Centre for Artificial Intelligence Research, held the presentation "Artificial Intelligence + UN's Sustainable Development Goals = heart" (translated). AI is a technology, a powerful tool. It's not robots with awareness! AI are data programs that are trained with data and they get more powerful by being fed with more data and more computing power. AI is a technology that relates back to the 50s. However, its relevance today is linked to the bigdata available and the progress in computing power. In 2012 we learned through a worldwide image recognition competition that AI was better than humans at recognising pictures and differentiate objects/patterns; this opened the path of innovation in fields like medicine. AI diagnosing Diabetic retinopathy in 2013, is one of the examples. Later also, lung cancer, breast cancer, skin cancer, pneumonia, etc. Translated into to the 3rd UN's Sustainable Development Goal, Good Health and Well-Being, means that AI is a powerful diagnostic tool to assist doctors in saving time and lives. To make it powerful, it needs data. Meaning that a worldwide data pool of skin cancer pictures, for example, would increase the knowledge exponentially. It is a tool, a powerful tool to be shared and used for good, in this case. When it comes to the 4th UN's Sustainable Development Goal, Quality Education, AI is also a growing powerful tool assisting humankind in adaptive learning/teaching. Meaning the learning/teaching process can be custom-made according to the student's/recipient's level and progress. It can reach the masses and provide "one teacher

per student". Goodwin mentions Daphne Koller and her work in this field. AI application in education might also contribute to decrease the number of school dropouts. Goodwin ends his presentation pointing out again that AI does not revolutionises by itself, AI is a tool, a very good tool that can probably be used in all the SDG; in some much better than in others. AI is a tool to assist Mankind.

4.5 The human deviation

Designed by humans, the multinational Odebrecht. A good example of grand corruption; with its impressive scheme of greed, power, the use of technology and custom-made software to facilitate their operations worldwide. Meaning, operating in the global supply chain and building in developing countries using a sophisticated management tool intended exclusively for the abuse of money and power.

Odebrecht is a Brazilian based construction group founded in the northeast of Brazil in the 1940s. Now well known for being involved in one of the biggest corruption cases in history. In 2010, they had 181.000 employees across 21 countries. They were caught for grand corruption during the Petrobras investigation "Lava Jato", the Brazilian oil giant. Executives confessed to paying bribes to corrupt officials in exchange for contracts in different parts of the World besides Brazil. Odebrecht tried to settle cases with governments in order to be allowed to tender for future big infrastructure projects (Gallas, April 17th 2019). Odebrecht was among the strongest competitive construction companies, they won contracts in Latin America, the Middle East and Africa (Gallas, April 18th 2019). According to Gallas (April 18th 2019) "Investigations revealed that Odebrecht elevated corporate corruption to a whole new level by creating in 2006 a 'department of structured operations', which worked exclusively in handling illegal payments to officials." And adds that "Odebrecht technicians even came up with a special software to make bribery payment run more smoothly." Odebrecht's bribery department managed its own shadow budget. The company created a whole system only to pay bribes. It operated in a sealed room, like a bunker (Pressly, 2018). Salvador (cited in Pressly, 2018) says "this room is totally isolated from external communication - internet, phones. And entrance is restricted. Even me, as the manager, I'm not allowed to enter." Pressly (2018) says "Odebrecht admitted guilt in a cash-for-contracts corruption scandal in 12 nations." They bribed politicians, political parties, officials of state-

owned enterprises, lawyers, bankers and facilitators in exchange for lucrative contracts in Brazil and abroad.

The "Corruption Hunter Network" headed by NORAD (the Norwegian Agency for Development Cooperation) showed interest in the investigations regarding Odebrecht and its connections with other countries in the making of the agenda for their 24th meeting in 2017, to be held in Ålesund, Norway. However, "The meetings of the network are closed to secure confidentiality and follow Chatham House Rule." (*norad.no*, 2015a).

This chapter has shared the narrative extracted from our primary data collection and other pertinent findings; keeping in mind the scope of our study. Next, we will discuss these findings from different perspectives.

5.0 Discussion

This chapter links and discusses our empirical findings to the relevant theoretical concepts.

The Norwegian Foreign Aid operates in the global supply chain of goods, services and finance; thus, operating in a complex, enmeshed and opaque network of flows and outflows. The emerging technologies, such as the newer applications of AI are already embedded in these chains and the crossover is a reality, however, to what extend is not clear. With that said, it seems important to have more actors involved in creating an open and long-term sustainable synergy for an equitable quality of life worldwide.

Although Norway is a small donor country measured in billions of dollars, it is among the big donor countries in the world measured in development Aid per capita; giving close to 1% of its GNI every year for that purpose. This is about 0.3% above UN's official development assistance target of 0.7% (*data.oecd.org*).

Our findings confirm that irregularities and corruption in The Norwegian Foreign Aid's work are difficult to detect and disclose. Mainly because of the loss of oversight due to the complexity of the partnerships, auditing challenges and outsourcing of services, for example.

With a policy for zero tolerance for corruption, it came as a surprise for us that Norway practice neither debarment nor cross-debarment, and do not blacklist companies as part of its security measures or consider companies blacklisted by other entities.

The findings also suggest that strong, professional, organised and well-connected companies operating in the Aid Industry and partnering in development programs are less likely to get caught for any kind of corruption. Some multinational companies will even go the extra mile to become good at it; like in the Odebrecht case. On the other hand, the small, many times local and less professional partners neglect the paper work; thus, getting the auditors' attention.

When looking at the supply chain of the Norwegian Foreign Aid, we discover the myriad of different ways leaks in this chain might happen and the importance of awareness around how the media portrays corruption in all its manifestations: bribery, kickbacks, graft, extortion, embezzlement, various forms of fraud, bid fixing, financing of parties, trading in influence, and up to high scale schemes. All these elements need to be considered to measure the efficiency with which Aid funds reach their intended destination. Almost all countries in the world have implemented anti-corruption laws, but these are unfortunately not consistently observed or enforced. (Simonović, 2018, Kindle Locations 4942-4953).

It is indeed referred to as the Aid *Industry*, which signifies its great importance for all parties involved, both those with good intentions and those lacking them.

From the donor side the mandate seems quite straightforward compared to the challenges with implementing it, and we found that throughout the Aid supply chain two of the biggest challenges in monitoring the chain relates to the procurement process and the 'last mileage' challenge including the unbanked.

Both Haugstveit and Skjønsberg shed light on how this is particularly palpable when it comes to the process of procurement, highlighting how the process can become more precarious when actors within the operation speed up the process to achieve exactly this unbalance. They both found that more unannounced checks and checkpoints is crucial for better efficiency in this area.

The 'invisible' part of the Aid supply chain called the last mileage consists of the last and unsupervised part of the chain. The challenge is to know whether the recipients in this part of the chain have in fact been reached, as these people mostly are poor and 'off grid', with no

ID, no bank account or other important documents, and therefore inaccessible to even ask for feedback. Brentebråten highlighted how tech could help the unbanked to gain low entry access to the world economy with no need for ID as a way out of poverty. In this setting it is important to ask what is considered poverty, when looking at poverty vs. quality of life from a holistic viewpoint, this might not automatically be in the interest of those it may concern. Is moving from say, a secure community to urban misery any better? There are many implications, even though the intentions are good. Nordhaug reminds us that the last mileage challenge will also rear its head when an increasing amount of people are about to become digital citizens within the next years.

On the solution side of the equation we found that budget support and opportunities to whistleblow ranked high as elements for alleviating and detecting corruption throughout the chain. Another important element outside the supply chain itself is political will, but it is important to note that is can only be potent and effective when bold policies are implemented unchained from the grasp of corruption. The mechanisms that disproportionately influences the decision-making processes represent a serious risk to our resources and values (Eriksen, 2014, p. 15).

Crucial to obtaining more efficiency in the Aid supply chain, both Skjønsberg and Haugstveit mentioned that internal and external support of the entire system is important. Skjønsberg emphasises the importance of institutional support, referring to budget support, in the efforts to move towards a more holistic and effective approach. Earmarked project funding can in many cases increase the risk of corruption as both the possibility for double accounting appears, and as Gabrielli mentions it can to a higher degree seem to satisfy the interest of the donors and their need for information about the where, who and when rather than utilizing the full extent of the funds towards the receivers of the Aid. We suggest that, in a holistic view, this seems to be a less efficient way of giving Aid. If the intention is to have a high level of efficiency and to support the whole system while delivering Aid, this requires, as Haugstveit, Skjønsberg, Jakobsen, Brentebråten, Nordhaug and Aeinehchi suggested; trusted institutions throughout the whole supply chain, and especially in the areas of input and output. As Brentebråten and Nordhaug point out: we still live in a world where most of the economic system is analog, and we have to adapt the technology to that. We discovered that the new emerging technologies, at least when funds are already added into the supply chain, could be of great assistance towards offering the needed traceability, security and transparency.

All our informants connected to the Aid Industry, 5 out of 7, are aware that corruption does occur in their organisations or partnerships. All 7 informants believe that the emerging technologies can, in some way, assist to prevent or detect corruption and increase the efficiency of the supply chain by protecting the resources from the sender to the rightful receiver. They also agree that shortening the supply chain to a bliss point is preferable, although, in some cases, this will question the core of the way the Norwegian Foreign Aid works, internally and on the ground. At NORAD's Knowledge Bank department where Jacobsen and Nordhaug work, although they are a small team, they are looking into the use of Blockchain technology to be used in their internal and external work. They already have a list of concerns; like how to secure that only trustful data is put on to the chain or how to ensure that the new solutions don't contribute to an increase of the digital divide. However, their main projects in hand are in the field of education, through digital platforms.

As the findings show, the complexity of the paper trail in the Aid Industry is enormous, so is the lack of highly qualified manpower and resources to keep up with the development and detect sophisticated schemes that embezzle the system. The loss of funds in the system seem to be more affordable, than the total cost to audit the system with today's forensic units, software programs and management models.

Another stop in the supply chain that taps the efficiency of the funds and grants provided, are the expensive intermediaries. They earn billions of dollars in fees every year for their money transfer services to developing countries. The use of peer-to-peer fund transfers in cryptocurrencies would turn today's intermediaries obsolete and the total sum of the fund would reach its destination; a person or a local NGO, for example. This translates into efficiency.

Vigna and Casey (2015, p. 39) addressed the challenge, in the history of money, to design a highly effective, safe and trustful system to facilitate the exchange of goods and services. Currency transfer is part of this desired system. A true Blockchain is a true decentralised security system; an open, boundless, neutral and censorship-resistant network, as described by Pacheco (2018, p. 74). Cryptocurrencies sensibly designed to run on it, seem promising to overcome this historical challenge. Our informants Brentebråten and Aeinehchi agree that this technology is still in an early stage, however as it matures it will go mainstream. Aeinehchi goes further, anticipating that a more secure, effective banking system needing to be more transparent yet more private might be built on similar technologies but not necessarily based

on the Blockchain technology. We can claim, the belief that Cryptocurrencies are here to stay and evolve is established in the Aid community. New and more sophisticated Cryptocurrencies will be created in response to demand or problem solving. On the other hand, the views on the end of cash are still blurry.

The technologies we are developing today at an unprecedent speed can change the world for the better, but also for worse as Brentebråten and Aeinehchi pointed out. It is therefore important to have all the debates open and public. The collective awareness is an important element in the prevention against secrecy, mismanagement and power misuse. The free access to open-source technology, information and data sharing is already proving good Aid impact. Jacobsen gave us the example of yr.no, assisting farmers in developing countries with weather forecasting, and the Global Digital Library, a growing platform in content and users contributing to literacy, learning and knowledge in many languages. The Global Digital Public Goods is in the making, a collaboration between NORAD and UNICEF Ventures having also the UN's SDG in mind, easily accessible in one place; a large platform that invites for international collaboration and aims to reach more people, highlighting the importance of leaving no one behind. Jacobsen is concerned that the when working with emerging technologies they might miss the hardest to reach. Being aware of this hurdle, the NORAD team is exploring new ways to solve this 'last mileage' problem or the 'disconnect' of the end-user to their Aid supply chain. Vigna and Casey (2015, p. 216) argues that the root cause for people's financial isolation in poorer countries goes beyond their access to banking services, it is linked to the "mystery of capital"; in other words, clearly documented and defined property rights are needed in order to participate in the regent economic model. This points to the need of a global effort to look into ways to close this gap. The unbanked also need to be reached, however this seems to be an easier task and more a matter of political will than a lack of infrastructure. The M-Pesa service, a mobile phone-based money transfer service, has expanded to several countries and has proven to profit and empower the poor part of the population. Although it operates on existing tech it does gives us a clue and sense of direction. The Good Dollar cryptocurrency project is on the quest to empower people through the UBI and they are conducting several experiments. Funding this open and transparent research project could be of great importance to advance the knowledge in this field regardless of one's opinion on the implementation of an UBI. Brentebråten mentions SingularityNET (*singularitynet.io*), a decentralized AI network, as one of the most interesting Blockchains. Its features and properties nourishing collaboration and exponential knowledge

gain and sharing seems to be a good fit for the Aid Industry and its problem-solving urgency; it should be considered by the Norwegian Foreign Aid's policymakers. Money transfer, funds and grants, is a big part of the Norwegian Foreign Aid. Both the theory and findings suggest that a peer-to-peer transaction in cryptocurrency running on a true decentralized Blockchain can be the most efficient way to transfer Aid money.

The Norwegian Foreign Aid is present in many leading and important digitalization projects in the Aid Industry. Although NORAD is aware of the possibilities the synergy of the emerging technologies can give, they are not in the phase of implanting it yet. On the other hand, UNICEF has just made an agreement with Amadeus, known for its software systems that assist travel companies, an international network processing services in real-time; in this agreement the purpose is to get data to study how people are moving. On the same topic of the use of Big data for good intended purposes is UNICEF's collaboration with Telenor and academia to find a way to combine temperature with movement data on mobile phones in order to follow and understand the origin and spreading of infectious diseases, such as Zika or Dengue, for example. In contrast, UNICEF is at the negotiating table with giants like Google and Facebook. UNICEF has the data and the tech giants have the infrastructure. Google and Facebook are two of the giants Peretti (2018, p. 369) calls The Big Five; which today are not tech companies at all, but a complex root structure like a 'rhizome' formed by the five. This should raise the discussion of security and privacy. Peretti (2018) argues that these five giants (Apple, Google, Microsoft, Amazon and Facebook) built the world in which we live in and they hold more power than any government. They are also powerful in finance. Peretti (2018) points out that giants like Google and Facebook are the infrastructure itself; long-term banks will still need these companies but for these giants the banks are of no value. Why is this important to discuss? Because inevitably the Norwegian Foreign Aid is running on these channels; thus, should they be aware of the advantages, the risks and the dilemmas in their strategies regarding partnerships. The fine line between the individual right to privacy, the society's request for transparency and the security of today's infrastructure comes also into play. The 'property right' to one's own data is also pertinent to address in the Aid Industry, since a lot of the Big data is collected and stored without the consent of the receiver being tracked.

The emerging technologies, as the evidences show, can be used for good or for opportunistic purposes. However, casting light on any shadow and light will prevail. All our informants urge for a secure system that features transparency, traceability, trust, accountability and yet

protect our right to privacy, even though the concept of 'right to privacy' is not Universal. On a side note; Zcash (*z.cash*) aims for its Blockchain to be GDPR compliant by default and Bitmain (*bitmain.com*) launched a new chip for mining Bitcoin and Bitcoin Cash in a more energy efficient way. Why is this important to mention? Because it shows that the tech community is targeting to solve critical issues related to their young, yet exponential developing industry. Issues that also affect the Aid Industry.

Both Haugstveit and Skjønsberg believe that the greatest risk and opportunities for corruption lay in procurement processes and poor auditing capacity. Our understanding is that this process and capacity is built on trust and tidy paperwork. Procurement and audit are the two areas on the management side of the Aid Industry; thus, the Norwegian Foreign Aid work, where the emerging technologies seem to have the highest potential for increasing efficiency in the short term; this is where Smart Contracts and 'smart' auditing come into play. The advances in the field are promising. Rozario and Vasarhelyi (2018) say Smart Contract permitted by Blockchain technology have proven to have the potential to change supply chain and financial industry practices and question to which degree the auditing profession will be disrupted by these technologies. They also add that the private sector has been proactive regarding exponential changes in technology; on the other hand, the external auditing profession seem to show some effort towards responding to a digital and modern economy.

The synergy between emerging technologies like AI, Blockchain and IoT; the combination of these technologies that seem to give very interesting possibilities, such as those applied to achieve a true sustainable farming, as Brentebråten explained. On a side note, the 2nd edition of the AI for Good Global Summit brought together experts in AI and in Aid to advance sustainable development targeting the SDGs. On another note, the Vatican partnered with Microsoft to offer an international prize on ethics and AI. Why is this important to mention? Because it gives us a peek under the global veil of influences and reveals to us how disruptive these technologies really can be.

Dykes and Kossow (2018) at TI (Transparency International) reviewed the linkages between Blockchain, Bitcoin and corruption and confirmed that there are still many challenges to surpass before these technologies can deliver their promise and be scaled up. Though, Cryptocurrencies are increasingly accepted as a legitimate investment. To be noted, the Norwegian tax return for 2018 includes a new entry to report tax on Cryptocurrency, meaning Norway recognizes these as legal investments. Also, the central bank of Norway is working

on its "Central bank digital currencies" project; the Cryptofinance is weaving into the Norwegian economic fabric. Dykes and Kossow (2018) show that Blockchain/DLT has a real potential to improve data management like land registries and protect the land titles against fraud and corruption. As we discussed there is a link between financial isolation and property rights in today's economic model. One of the challenges, is trusting the verity of the input data. Our informants addressed this issue and Waterhouse said, "The focus needs to be in fixing the data.", although he was referring to AI; it still is true for the other technologies to perform 'truthfully'.

Skjønsberg and Haugstveit brought to our attention that their units work on whistleblowing and corruption cases at NORAD and at the Norwegian Ministry of Foreign Affairs, although they don't collaborate directly on the ongoing cases, they do exchange experiences with each other; these units are detached and closed to the other departments in their organisations. It's a one-way communication due to privacy rules and sensitive or forensic information. Jacobsen also mentions this. One of the key elements they depend on to disclose a greater number of cases of corruption schemes or other management behaviour draining the Norwegian Foreign Aid system for its resources, is the whistleblower. It is important to ensure their safety, to lower the bar for blowing the whistle, to give them a safe and easy channel to do so and to educate civil society on the social and economic importance to report these situations. To motivate civil society to civic participation. How technology can in general ensure the protection of a Whistleblower is not clear in our study. However, in the field of education, bringing awareness and broadcasting the importance of protecting the Aid resources in order for it to reach its truthful destination is in our understanding not only possible but desirable. Why not as a part of the global digital public goods project? (NORAD and UNICEF Ventures).

Haugstveit defended that the Aid funds must be handled in a more professional way and Gabrielli defends that the Norwegian Foreign Aid must heavily increase their cooperation with the corporate sector.

In the Aid context, collaboration presupposes to work together in creating solutions aiming to close the gaps listed in the UN's SDGs. From an Ecological Economics perspective this can be understood as local and, at the same time, a global collaborative effort, bottom-up top-down, pushing the boundaries of several fields to create a society in which humans have a high quality of life in interaction with a living Nature and a lively culture.

Zsolnai (2011) discusses the concept of environmental ethics for business sustainability with the purpose to derive operational principles. He looks at different sources. For the purpose of our scope; Hans Jonas' call for new ethics to fit our technological age and Peter Singer's awareness-based ethics are important to address in the development work because the Norwegian Foreign Aid through their development projects are involved in empowering people and governments through creating new long-term business opportunities. This is a valuable opportunity for strong sustainability through tech assisted education, not disregarding the local ancient knowledge about the environment, to vault over the economic, social and environmental degradation aspects of our modern 'western' society's legacy. Singer (cited in Zsolnai, 2011, 894) says "If a being suffers there can be no moral justification for refusing to take this suffering into consideration.". The Aid industry can help developing countries or communities to advance beyond the 2030 SDGs.

Despite the complex technological disruption happening around the world in different fields targeting the SDGs; the main ideology behind it seem to be the philosophy and practice of the green economy. An Economy that efforts to 'green' the mainstream economy. It works like a protection belt; thus, not questioning the hard-core values of main stream economy: growth, competition, egoism and strategy. This protective belt focus on green growth, CSR as a marketing strategy, business ethics for better reputation and green strategy (Jakobsen, 2018, p. 18-20). Jakobsen (2018) says "Green economy makes serious attempts to improve the dominating economic system by diminishing its most immediate symptoms while leaving the inherent underlying troubles set aside and entirely untouched." (p. 19). He adds "Green economy is based on the failing assumption that unlimited growth is possible because of human capacity to make technological innovations." (p. 19). Jakobsen (2018) argues that for a successful implementation of the Ecological Economics values, the present mainstream economic values must shift radically towards qualitative development, cooperation, solidarity and partnership. Jakobsen (2018) concludes that Ecological Economics is not possible to implement within the political and economic system we have today. It's our understanding that the technological optimism from an Ecological Economics perspective lays in its potential to bring and raise the collective awareness, provide access to quality education, nourishing critical thinking, empower people to civic engagement and to make better choices for themselves in harmony with other beings and nature, among other effects. Jakobsen (2018) writes "The only way to build a sustainable society is to cultivate such drives in human nature as intelligence, happiness, serenity, and thereby the peacefulness of man." (p. 163).

The private sector depends on the market, the demand of the consumers, and the public sector needs good politicians as facilitators for innovation and good decision making. Politicians need the people to be elected and society needs transparent and traceable systems to trust the results.

We need politicians to be bold, to be visionaries; to lay the right conditions for social and technological innovation to happen and at the needed pace. To have a holistic platform for policymaking that stimulates the capital and human resources to drive the development in the right direction. Facilitating the creation of good solutions at all levels and to promote peace. Also, we need academia, the research and experiments, to push boundaries for innovation to materialise. Ethical innovation must also happen in this development. The private sector, as we know today, have the capacity to invest in research, test the market and upscale solutions. These features are valuable for the environment and society when used for good, meaning a sound partnership between the private sector, the public sector and academia; with the active participation of the civil society. A civil society with quality education is essential. According to UN's 4th SDG (un.org) "Obtaining a quality education is the foundation to creating sustainable development. In addition to improving quality of life, access to inclusive education can help equip locals with the tools required to develop innovative solutions to the world's greatest problems.".

Taking the Government Pension Fund Global into account, Norway is in a privileged position to the drive the advancement of the sustainable development work in a more efficient way. By not only continue to withdraw its investments from disreputable companies; but also investing wisely in transparent partnerships, social and technological innovation and projects that can provide the largest positive impact.

Looking at the policies implemented and measures aiming to improve our impact on the environment across different countries, we observe a tendency to choose the green economy perspective rather than an ecological economic view, showing that, sadly, there seems to be an unfortunate mix of, either not being aware of the difference between these two perspectives, or choosing to ignore them altogether. This undermines the efforts towards the goal of improving our climate, especially when choosing to ignore the alternative, but also, landing in the belief that the green economy will improve the environment; this will actually prevent a further examination of whether or not this is actually true. Open economies with

good conditions in regard to investments and industry have in general fewer problems with both corruption and competitive crimes (Søreide, 2013, p. 210).

Aid has a global impact and climate is one of the crucial services provided by Earth's ecosystems. The vastness of the challenges both in regard to corruption and climate is recognized and stated by the UN's 17 Sustainable Development Goals. Practically all ecosystem services are common-pool resources or public goods and require cooperative provision. Economic analyses of our urgent climate challenges reveal that cooperation is a necessity in order to solve them. To then blindly follow an economic model that promotes competition and alleges that true cooperation is impossible, would therefore be beyond foolish. However, competitive market forces do have a role in our economy, but we need to be aware of the market's inherent incapacity in regard to efficient, sustainable and just allocation of all resources (Daly and Farley, 2004 and 2011, p. 257).

As Holmes (2015, p. 39) highlights: the existing environmental long-term issues is unfortunately compounded by corruption. Aid in all its forms seek to rectify that imbalance. Even though the intentions are good, we see from the current climate research and levels of corruption that we do not have the luxury of not being efficient and effective to be able to make an impact while we still can. Corruption maintains the loop of the status quo, and we can in this sense see the correlation between 'containing corruption' and 'promoting good governance'. This is evident, especially in the case of systemic corruption, looking at our discoveries around the Norwegian 'Zero tolerance' stance that suggests a mutually excluding reality where refusing to partake in corruption will halt the process and contradict the intention and mission of being able to provide Aid. It is obviously a major dilemma for people who, in many cases with their own lives on the line, try to save other civilian lives and to alleviate pain and suffering, but then also having to pay bribes to gain access to an area of war where their emergency services are urgently needed. By not giving in and paying such bribes, they risk more lives being lost than if they pay and are given access to provide the urgently needed help. At the same time, they then legitimize bribes and encourage continued use of such illegal methods when they pay. As long as Norway supports NGO activities war zones where brutal corruption is a central part of the agenda, the effectiveness of the official Norwegian zero tolerance for corruption is limited (Hansen, 2013, p. 119). In the continuation of these eye-opening facts it's misleading to not acknowledge that also well-regarded analysts have rightfully argued that corruption could sometimes actually be beneficial, and that it could even be morally justifiable (Holmes, 2015, p. 46).

We can already see moves towards a paradigm shift as Brentebråten points out that there is going to be a transition from the old structures to the new, even though the banks, for instance, make a lot of money on the existing infrastructure and don't really want to shift to this new efficient way of operating as it is not very profitable for them.

Representatives with an ecological viewpoint might dismiss tech because of its many harmful manifestations to nature and the ecosystem, but it is important to recognize that tech is a tool, and the crucial aspect is why, and with which scope and intention we implement this tool. Daly and Farley (2004 and 2011, p. 257) advocate that there are allocative mechanisms that must be tailored to the characteristics of the resources needed to attain the specific desirable ends, so to argue for an economy purely based on cooperation would be just as foolish as to argue for an economy based solely on competition.

If it is to be possible to coordinate the activities between several actors and actor groups, it is necessary to implement coordinating measures based on systems for unrestrained decision making and direct the collaboration between the actors on the market towards communicative interaction instead of individualized competition. Recent research shows that cooperation is also more common in nature than previously assumed, and that the cycles in nature are based on interaction between individuals and species. (Ingebrigtsen and Jakobsen, 2004, p. 56).

This chapter has discussed our findings and theory from different viewpoints, aiming to shed light on other possible paths to strengthen the core mission of the Norwegian Aid policy in the global arena. Open research questions can't always be answered. The conclusion that follows, although wide, is pertinent.

6.0 Conclusion

"Capital as such is not evil; it is its wrong use that is evil.
Capital in some form or other will always be needed."

Mahatma Gandhi

The chapter summarises the results from the discussion chapter and concludes on that basis, bringing the conclusion back to our framework and study scope. Our closing insights invites

The Norwegian Foreign Aid to aim for further transparency, continuous dialogue with the stakeholders and wider transdisciplinary collaboration between the tech community, academia, the private sector, the public sector and the civil society.

Our thesis asks in which way the emerging technologies can make the Norwegian Foreign Aid more efficient. While this question cannot be answered with a clear conclusion, it was explored from several perspectives in the spirit of Ecological Economics.

Although our study is limited to the Norwegian Foreign Aid, they operate in the global arena. Thereby, from a holistic point of view, their work is a part of the 'whole' and also inherent as a 'whole'.

The purpose of Ecological Economics is to raise awareness regarding our decisions as individuals and as mankind, and the consequences of those decisions in the sustainable development of the Economy, the Society and Nature; calling for balance to be achieved between all three. True efficiency seems to mimic nature, the path of less resistance and the capacity of resilience, suggesting there is a bliss point for coherence, a seamless flow. As utopic as it may seem, it is important to aspire for higher ethical solutions.

Humans have throughout history made different attempts to solve the challenge of trust for consensual exchanges to happen. To oversee the terms of these relationships we have created systems of authority like the police, the judiciaries, central banks, etc. These institutions are today being challenged by the disruptive technologies. Corruption is proven to be the root cause of the mistrust in governments and public institutions; thus, systemically decreasing the quality of life of the citizens they are meant to serve and the environment they are meant to protect. An individual's concept of quality of life is obviously interdependent with the context in which the individual lives. However, satisfied individuals at the emotional, physical, material and social levels tend to be kinder; thus, more collaborative and engaging in sounder relationships. Thus, making them less dependent on Aid. This translates into efficiency.

The topic of corruption and its different forms emerges in our thesis as the main backdrop for the Aid Industry's inefficiency; thus, setting us on the path of researching how the emerging technologies could help the Norwegian Foreign Aid become more efficient. The related and extend literature review was needed not only to widen our understanding of the concept of corruption and its consequences, but also to reduce our bias and meet our informants in the best way possible to ensure the richness of our data collection.

Although all seem to agree that emerging technologies and their synergy are in its infancy, a new economic era is here. No one can be indifferent to giants like Facebook emitting their own Cryptocurrency; With their existing infrastructure, global span access, Big data storage and enormous number and diversity of users. The way we perceive money will necessarily change, as will the global supply chain of goods, services and finance. The systemic effect and consequences of this bold move is, at this point, 'impossible' to grasp. The future of the Norwegian Foreign Aid policy depends on it too, since its existence is interconnected with the 'whole'.

The right course of action from those in decision making positions and the awareness of the civil society as consumers and voters, play a decisive role in the great interplay for good.

As we understand, the big challenges the Aid Industry faces are various forms of corruption, mismanagement and the poor capacity to audit its global supply chain. The use of intermediaries for money transfers is also tapping into the funds making it less efficient. The Norwegian Foreign Aid is no exception. The possibility of having a holistic system, shared between stakeholders, that can provide trust, transparency, traceability, accountability and real-time data information, among other things; even sort out big amounts of data beyond the human capacity and make sense out of it all or a peer-to-peer smooth transaction reaching the hardest to reach, is quite remarkable and should be envisioned and explored in order to guide us for better decision-making at all levels in society. We do not ignore the current news on cyberwar, the global race to own the power of data, to attract the best talent, to control the infrastructure or a new powerful cryptocurrency supply, for example. However, we are among the optimists that embrace development through the joy of education, awareness, collaboration, creativity and critical thinking.

The breach between the private and the public sector in the willingness to experiment with, or adopt new technologies is increasing. The private sector is far ahead. Although collaboration is the key to sound advancement, the imbalance between the actors might back-fire. It is urgent for the Norwegian government to get even more involved and facilitate its sector to qualitative development and narrow the gap.

"Instead of trying to solve problems by transforming reality to fit the model, it is more appropriate to change the model to fit in with reality" (Jakobsen and Storsletten cited in Jakobsen, 2018, p. 20).

There is no doubt that technology will play a big part in the achievement of the UN's SDG by 2030 and beyond. The near future of The Norwegian Foreign Aid's strategy or even its existence at all, will inevitably be shaped by these fast and loose developments and the ethics evolving with it.

7.0 Further research

"(...) Imagine no possessions
I wonder if you can
No need for greed or hunger
A brotherhood of man
Imagine all the people
Sharing all the world (...)"

Excerpt from the lyrics of the song "Imagine" written by John Lennon and Yoko Ono

Sciences are required for human development; no argue there. However meaningful progress, it must rely continually on a broader and open transdisciplinary collaboration in order to find "the best" solution and practice at all time; thus, giving the opportunity for a deeper sustainable development. For further research it could be interesting to study the impact of the Aid provided through the emerging technologies on the quality of life of the end recipients, such as the earlier unbanked; or study how this new way of Aid impacts the world population growth/degrowth, for example.

8.0 Reflection on one's own role as a researcher

"A journey of a thousand miles starts beneath one's feet"

Old Chinese proverb

The two researchers behind this study are, obviously humans; thus, challenged by their own feelings, mindset and expectations. It is not easy to walk the talk, to hold the flow and the joy of collaboration. We too faced several dilemmas through this process. As first-time academic researchers, the learning curve was clearly even steeper; so was the fear to fail.

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INTERVIEW GUIDE

A 60 min. open, individual and semi structured interview

SCOPE

"How can the emerging technologies make the Norwegian Foreign Aid more efficient?"

INTRO

Intro Kari Elisabeth: I'm Norwegian and chose to study Ecological Economics as I'm intrigued by the possibilities that alternative economic governance can offer. I follow with interest how these ideas can be supported by the new emerging technologies. Both combined and separate the two areas gives an exciting input to an otherwise dire outlook regarding our planet's growth and sustainability. My background is costume design and production.

Intro Nazaré: I am Norwegian/Portuguese and an architect trained in both countries. I have a fascination for the emerging technologies and the curiosity to find out how they may assist humankind to achieve a true sustainable development. This is one of the reasons I chose Ecological Economics when I decided to take an MBA.

Intro setting: Explain confidentiality and anonymity. Inform and agree to audio recording. Ask the informant if something is unclear and if there are any questions.

START RECORDING

INTRO TO QUESTION 1 (includes intro to Ecological Economics)

Ecological Economics seeks, in a nutshell, to rethink economics in a way that takes our

"only" Planet into account. It's a transdisciplinary field of academic research that aims to address the interdependence and co-evolution of human economies and natural ecosystems over time and space. It is distinguished from environmental economics, which is an area of mainstream economics that studies the financial impact of environmental policies.

Combining our interests and concerns regarding the exciting and interesting times we live in, we landed on the following research question: "How can the emerging technologies make the Norwegian Foreign Aid more efficient". So, this is the framework for our discussion today.

QUESTION 1.

(Aid & Tech)
What's your main motivation or passion to do the work that you do? And how do you feel it makes a difference in the global context?

INTRO TO QUESTION 2.
When we talk about efficiency, our focus is on the total money supply chain from the donor (Norway) to the final product, service or user, considering all the transactions needed (legal or not) to accomplish the project/Aid investment. NORAD's mandate is to promote effective management of funds for development assistance and ensure that Norwegian development cooperation is quality assured and evaluated. The reports show that the evaluation phase on site can be challenging and even put the controlling agents at risk. The whole chain needs to be safe, efficient and transparent to be properly evaluated.

QUESTION 2.

(Aid)
From your working experience in this field and in your opinion, where does the potential for increasing transparency and optimize efficiency lay along the supply chain we described?

(Tech)
How can this exponential tech, we are witnessing, and the engaged tech community offer solutions to increase transparency and optimize the efficiency of the supply chain we described?

INTRO TO QUESTION 3.

(Aid & Tech)

The Norwegian Tax Administration is working on a project combining artificial intelligence and blockchain to improve their capacity to tackle economic crime in the shadow/parallel economy. Thus, enhancing the tax administration's ability to detect suspicious economic criminal activities and increase their tax revenue and consequently contributing to the reduction of corruption.

QUESTION 3.

(Aid)

Is your organization working on a similar strategy to address and improve the donation/funding efficiency and traceability? (The follow up question works for Yes and No) And what are your thoughts on that?

(Tech)

The 3 Ts: "Trust, Transparency and Traceability" are often mentioned in the speech of the tech community as one of the major contributions the emerging tech can give to a sustainable development. What are your thoughts on that?

INTRO TO QUESTION 4.

The UN's 17 Sustainable Development Goals are on the rise and creating a rush for new profitable business opportunities. This was addressed in the recent Oslo Innovation Week. One of the new terminologies is Finpact - Global impact through Financial Technologies, meaning it's an open global race with room for exponential innovation.

QUESTION 4.

(Aid)

To finish our conversation in a proactive note. How do you see the near future of the Norwegian Foreign Aid?

(Tech)

To finish our conversation in a proactive note. How do you see the role of tech in the Norwegian Foreign Aid in the near future?

(Aid & Tech)

Looking back to our conversation, would you like to add anything else?

Thank you very much for participating in our project, we really appreciate it.

STOP RECORDING

Appendix B: Interview guide revised for a private participant

INTERVIEW GUIDE Revised for the interview with Nader Aeinehchi January 21st

A 60 min. open, individual and semi structured interview

SCOPE

"How can the emerging technologies make the Norwegian foreign aid more efficient?"

START RECORDING

INTRO

Since you asked us to send you our interview questions previous to our meeting today, our conversation will have a slightly different format from our other research interviews and that's fin. This means we will jump over the introduction to each question and that you are more than welcome to talk beyond our core questions, however, please keep in mind the scope of our thesis. I would also like to add to the record that you agreed to meet us as a "private participant with a technology professional background from the public sector". Although you don't have special knowledge in the field of aid, you do have as a Senior Architect a deep knowledge in the field of uncovering irregularities, or even corruption, through applying technological solutions to the system. This can be of great value for us and our research, so thank you for agreeing to meet us.

QUESTION 1.

What's your main motivation or passion to work in the synergy field between the emerging technologies? And how do you feel it makes a difference in the global context?

QUESTION 2.

How can this exponential tech, we are witnessing, and the engaged tech community offer solutions to increase transparency and optimize the efficiency of the supply chain?

QUESTION 3.

The 3 Ts: "Trust, Transparency and Traceability" are often mentioned in the speech of the

tech community as one of the major contributions the emerging tech can give to a sustainable development. What are your thoughts on that?

QUESTION 4.

To finish our conversation in a proactive note; how do you see the role of tech in protecting the Norwegian economic resources, resilience and integrity in the near future?

QUESTION 5.

Looking back to our conversation, would you like to add anything else?

Thank you very much for participating in our project, we really appreciate it.

STOP RECORDING

Appendix C: Transcript from the 1ˢᵗ interview.

A required example.

TRANSCRIPT INTERVIEW 1:

* (…) along the transcript means (pause/thinking)

* (Text or *cursive text*) our own notes and comments

Pål Taule Brentebråten BridgeBlocks. 29.11.2018

START RECORDING

Pål:

My name is Pål Thaule Brentebråten. I'm co-founder of BridgeBlocks which is a consultancy company in the Blockchain space. We help companies implement and find out what Blockchain technology is. My previous experiences are in another company called Bitspace, which is one of the earliest Blockchain startups in Norway. Today they are almost launching their exchange platform kit. Besides that, I have a strong interest in technology and emerging technology and how they will affect our future.

Nazaré:

Thank you. We will make an introduction for each question just to set it in a context.

Pål:

Okay.

Nazaré:

So, the intro for question one: Ecological economics seeks in a nutshell to rethink economics in a way that takes our only planet into account. It's a transdisciplinary field of academic research that aims to address the interdependence and coevolution of human economics and natural ecosystems over time and space. It´s distinguished from environmental economics which is an area of mainstream economics that studies the financial impact of environmental policies, combining our interests and concerns regarding their existing and interesting times we live in. We landed on the following research question: -How can the emerging technologies make the Norwegian Foreign Aid more efficient?

So, this is the framework for our discussion today. So, our question one is: -What your main motivation or passion to do the work that you do and how do you feel it makes a difference in the global context?

Pål:

Several things. First, it's (…) I believe that technology can and can help transform the world into a more fair place, because of its properties such as transparency, so it can make not only governments, but also the commercial world, Banking and things like that more transparent, more open. And then we have the ability to have more accountability in our society. And then there's the aspect of security. There is a major problem with how the Internet today is built and it was built to be done then insecure, which has led to various cybercrimes. So, we see terms such as cyber warfare emerges. There were some very scary attacks a couple of years ago. Some actor almost brought down the entire internet and it did that by leveraging a swarm of Internet of Things, devices, small devices that are connected to the Internet, and I think that's if these devices were thrown on the Blockchain these kinds of attacks would be impossible. So, it's also about security. There's estimated that in 2020 there will be 100 billion devices connected to the Internet and if all these devices are insecure then I think that's a very profound problem. And I know that if it was connected with a Blockchain that then we could mitigate a lot of these security risks. So, it's transparency. And security. And third one that I want to mention yes. It also lowers the barriers to entry for the unbanked. So, you have no (…) You don't have to show your ID to start with crypto currencies such as bitcoin. You just need a device with an internet connection and then you have access to financial services straight away. So, it is a low barrier to entry, security and transparency. That's what I think this technology can provide to the world.

Nazaré:

Is it correct to understand that you mean also empowering people by giving them this entrance?

Pål:

Yes! They will be empowered with financial services that they…

Nazaré:

…can access to the economy?

Pål:

Yes! Exactly! That they will have access to a global economy that they previously did not have the access to.

Nazaré:

Nice! Question number two. The introduction is: When we talk about the efficiency, our focus is on the total money supply chain from the donor - in this case Norway today through NORAD - to the final product, service or user. Considering all the transactions needed - legal or not - to accomplish the project aid investment, NORAD's mandate is to promote effective management of funds for development assistance and ensure that Norwegian development cooperation is quality assured and evaluated. The reports show that the valuation phase on site can be challenging and even put the controlling agents at risk. The whole chain needs to be safe, efficient and transparent to be properly evaluated; accountability. So, the question is: - How can this exponential tech we are witnessing, and the engaged tech community offer solutions to increase transparency and optimize the efficiency of the supply chain we described. So, in this context.

Pål:

Hm. So there are several supply chains projects within the Blockchain sphere. You have the Danish shipping company MAERSK. They track containers on the Blockchain with their subcontractors. And in Norway I think there's a shipping company, DNV GL (greenship.org) who is also doing something similar. There is a London based company called Provenance. They were quite early, this linking the Blockchain to supply chains, and they have developed a product for tracking, or for tracking any material or item in the supply chain from A to B so you can see the full history from where it originated to where it is today. So, you will have a history of the item. You could also exchange the item for transactions, so in a financial setting you will… like, this is how Bitcoin works today, you can take any transaction and then you can go back in time and see where the transaction originated from, all up until the very first transaction that happened in 2009. So, with a Blockchain you can have a provenance in this ecosystem where the donor, he submits some money, and then he could, with the Blockchain he could later see where that money went. He could see that was cashed out to some family in some remote country in Africa or something. So, he could, with the Blockchain, it will be very easy to follow the trace of the money. So that's one thing. And the second is that … one of the advantages that I didn't mention in the last question was also that public Blockchains is immutable. So, what goes on the Blockchain stays on the Blockchain is the saying. So, you

cannot corrupt it. When you have put a transaction there, it stays there. So, you cannot have bad actors from the aid side for instance. You cannot have a corrupt agent taking off some money before it goes to the people in need because that will be very visible on the Blockchain. So, all the money is going directly to the ones who need it. So that... and if an Aid organization chooses to use a Blockchain, then they can have, in my opinion, much more credible claim that they are accountable if they can show that this …if they can have an open Blockchain where everyone can go and verify every transaction. Because then you know that hasn't been tampered with. It has... it's been going from A to B without any interference.

Nazaré:

Is this true also for subcontractors?

Pål:

Yeah.

Nazaré:

Because following your answer, what usually happens, or one of the forms of giving this aid, it's not peer to peer in the understanding they believe that people might not manage money, but that's another discussion. So, it will go to subcontractors, that again will provide a service or a product, or even a building, could be from cars to concrete, whatever, and then converge again to the user to the final user. So that would also be traceable.

Pål:

Yeah.

Nazaré:

In and out. I mean, and the quality of the products will also be traceable?

Pål:

Well it depends how you set it up. But you can imagine a system where the donor he wants to donate money, so he sends some money through the blockchain and it ends up with some subcontractor instantly which provides some service to some guy. You could have that...

Nazaré:

Mm. Or community?

Pål:

Yes, or community. Then you can have that guy sign that he has received the service and that it was satisfactory. It was within some parameters of satisfaction.

Nazaré:

…according to the contract?

Pål:

Yeah. And that signature could be digital and appended to the Blockchain, and then you'll have full history of that; yeah - this morning they went to this service, and according to the community that received it, it was fulfilling the criteria. Yeah, so that is totally possible. And it doesn't have to be peer to peer, it could be network of subcontractors like the shipping company MAERSK, they have only subcontractors in their Blockchain network. And you could have the same if you have one organization in; say Norway and then you have many other subcontractors.

Nazaré:

NGO's and others?

Pål:

Yes. So, the Blockchain will be kind of a network that could help them transact more efficiently and more accountable. So it will be just, instead of, each company having their own ledger, because this is how it works today, so that... this NGO in Norway sends money to a subcontractor, and then it has to audit his ledger, and then, when the money comes to the subcontractor he has to audit his ledger and so on. But the power of the Blockchain is that it's just one ledger, which everybody collaborates to maintain and write to, which is more efficient for everyone because you don't have to spend a lot of resources maintaining your own ledger etc. But it's also easier to track transactions. Because now you have to ask this company, and then you have to ask this (….) I's much more work to trace transactions today when everyone has - because you have to check all the ledgers that the transactions went through. When with Blockchain and you can just check one ledger and then you'll have your answer within minutes.

Nazaré:

And which Blockchain are you referring to? The Blockchain? Or, since we're also talking about smart contacts I assume? Since you're talking about the proof with the signature?

Pål:

Mm. (confirms)

Nazaré:

So, the public one that you mentioned in your answer, so I guess you mean by that decentralized, nobody can corrupt?

Pål:

Yeah, I think (..) you know you have public Blockchains and you have private Blockchains, and I think that if (…) and they have both have their uses, and you know the MAERSK shipping Blockchain that I have been speaking of is a private Blockchain, it's just a subcontractor's, but it depends on what is the goal of the Blockchain, what problem is it's going to solve. And if it's…

Nazaré:

…1% of the national, Norwegian national product? (laughing)

Pål:

Yeah, but if it's in the public sphere, then I think the best choice will be a public blockchain because this data is of public interest.

Nazaré:

Mm. (Nodding)

Pål:

And then it's best to, because in the setting of MAERSK, the shipping company, the public doesn't have very much interest of the data of where the container… That's more that's probably better protected within their closed ecosystem. But Foreign Aid is totally different. And I think a public Blockchain would be better suited, because then it is accountable to…

Nazaré:

…everyone.

Pål:

Everyone, at least the donors and the taxpayers, and...

Nazaré:

Can you give an example of a Blockchain that could be…

Pål:

…could be used for this? Ethereum…

Nazaré:

You don't have to, but if you have one in mind that could… involve these services?

Pål:

Yes. Yes. So Ethereum (www.ethereum.org) is doing this with the startup Diwala (www.diwala.io), they're using Ethereum. But you could also use alternatives, I think to some extent you could use bitcoin Blockchain, it has at least it has some interesting second layer features that is coming, where that addresses the slowness of the system. But you have several; you have a new one called EOS (eos.io) which is also very fast. And the last one I can mention is Cardano (www.cardano.org). I am not sure if it launched yet, but that looks also very good.

Nazaré:

Is that with a K or a C?

Pål:

It´s with a C. Cardano is (…) It's very interesting because it's developed by a collaboration of universities. So, it's a lot of (…) Also all the white papers that are published on that Blockchain are peer reviewed.

Nazaré:

Fantastic.

Pål:

Which you don't see in a lot of other Blockchains. So, I think that's going to be…

Nazaré:

It gives credibility.

Pål:

Yeah, yeah, yeah, it's credible. And it's… It solves a lot of the problems with the, you know, the older Blockchains. And it also supports or at least the scientists support, governance and

regulations as a trust sentiment in laundering, and KYC *(know your customer)* at Out of the box. So that looks very interesting. And the guy that builds it is the co-founder of Ethereum, so he doesn't work in Ethereum anymore. He's now working on this one.

Nazaré:

He's also in Canada?

Pål:

He may be, but his name is Charles Hoskinson.

Nazaré:

I´ll look it up.

Pål:

Yeah, I'm not sure where he is. I met him in US once. So, but I don't know if he lives there, I think he is American or Canadian.

Nazaré:

Yes. Then we go to question 3. And the intro is: The Norwegian Tax Administration is working on a project combining artificial intelligence and Blockchain to improve their capacity to tackle economic crime in the shadow parallel economy. Thus, enhancing the tax administrations ability to detect suspicious economic criminal activities and increase their tax revenue and consequently contributing to the reduction of corruption. And the question is: The three T's: trust, transparency and traceability are often mentioned in the speech of the tech community as one of the major contributions the emerging tech can give to a sustainable development. What are your thoughts on that?

Pål:

Can you repeat the last…?

Nazaré:

The three T's: trust, transparency and traceability are often mentioned in the speech of the tech community as one of the major contributions the emerging tech can give to a sustainable development. What are your thoughts on that? And the intro addresses also this combination of Artificial Intelligence with the Blockchain, so we are a step forward maybe?

Pål:

Yeah ok. So…

Nazaré:

And this is the Norwegian Tax Office, they have this project.

Pål:

Yeah, I think these three keywords you mentioned, yeah. But probably not all technology, if you should just have, for instance, Artificial Intelligence alone, it's not transparent at all. It's quite the opposite, because we don't know what artificial... or we don't know... It's just like a black box. We give some input and then we get an output, but we have no idea why it made that output. And when you apply algorithms to, let's say, the fate of if a person should get a job or not - or maybe you give a person leave because the AI has found out that he's not working efficient enough, -then then you don't really know why it made that choice. And so, I think there has to be... I think we must not forget that not all technologies are about transparency and...

Nazaré:

I agree. And that's why the combinations.

Pål:

Yes, but when you combine things; sure, there is applications, very… very big applications when you start to combine Artificial Intelligence with the Blockchain and Internet of Things (IoT): then it can do lots of interesting stuff. For instance, you could have in agriculture; let's say your farm is having all these little sensors in the field and it's a little mistier, and you know, everything; parameters in the soil and the weather and maybe a camera off the plants that will detect if your plants are affected by a virus or something, and then you can have Artificial Intelligence do analytics and try to optimize the yield of the crop...

Nazaré:

Spare resources?

Pål:

Yes. And you, then you could have everything...

Nazaré:

But in the Aid context?

Pål:

Then you, you could, get all that data appended to the Blockchain, so that you could share that data with all the other farmers in the region. And so, the Blockchain would be like a platform where everyone would upload data so that anyone could benefit from sharing data, so that the algorithms would become even smarter.

Nazaré:

Yes, learn, learn by others experience.

Pål:

Yes. And there's also another interesting project in the United States called the SingularityNet (singularitynet.io) (Decentralized platform for AI-Economy with its own cryptocurrency), which is the Blockchain where you can (..) you will have this Artificial Intelligence services, and all these services are connected to the Blockchain. And, say my service is doing language translation and I ask this service to translate from the Norwegian to say Swedish, then and, but the language service doesn't have Swedish. So, then it will ask any of the other services on the Blockchain if it can if they have, they can provide the service and if one of them do they need to pay some cryptocurrency to that service, and it will gain this this capability to translate from... So, it will just outsource that and get the results back and give me the translation. So, this means that for each new service that is connected to this network, then the network grows, and grows its capabilities as an organism kinda.

Nazaré:

That sounds very interesting also if we translate it into Aid, to the ecosystem of Aid, that the competition between the, and I don't mean money wise, I mean competition of resources and knowledge of the subcontractors.

Pål:

Yes.

Nazaré:

that can offer better solutions to solve the problem.

Pål:

Yeah.

Nazaré:

Inside they could share this knowledge and grow with it.

Pål:

Exactly.

Nazaré:

That's interesting.

Pål:

So it could have (..) Yeah if a subcontractor cannot provide a service then you could just reach out and get... outsource that to someone that can provide that service, and then you can have automatic settlements with a cryptocurrency for instance. So, yeah!

Nazaré:

So, the Tax Office is into something? (Laughing)

Pål:

Yeah.

Nazaré:

Although they are aiming for increasing their revenue and tracking and... but the analogy is still, and in the story you just told. Example. Translates.

Pål:

Yeah, if the entire tax system was on the Blockchain then that would be transparent.

Nazaré:

But I… meaning putting also that Artificial Intelligence to track and learn all the (…) little defaults.

Pål:

Oh! Yes! Like small agents in the network.

Nazaré:

Spies (laughing) Intelligent spies.

Pål:

Yeah.

Nazaré:

Then we go to the last question. I forgot to mention it was four questions, if we only have time for three, then we'll do three, but if we I'm glad we can go to forth: The UN's 17 Sustainable Development Goals are on the rise and creating a rush for new profitable business opportunities. This was addressed in the recent Oslo Innovation Week. One of the new terminologies is Finpact - Global impact through Financial Technologies, meaning it's an open global race with room for exponential innovation. So, in this context the question is: To finish our conversation in a proactive note, how do you see the role of tech in the Norwegian Foreign Aid in the near future?

Pål:

Hm, yeah well you have (…) already you have this startup called Diwala that is using Blockchain technology to help foreign (…), or not foreign, but… but refugees to document their skills and certificates and education onto the Blockchain so that it's much easier for them to get a job when… when they land in some Western country later. Because when, what usually happens is that when they finally arrive at some destination and they want to get a job to provide for the family and they have lost all their papers, because perhaps they had to run from their papers or they lost them on… on the journey, so the idea is that if you can have, in the refugee camps, then you can go and you can have some kind of NGO there that can verify the skills and issue new certificates on the Blockchain. And so, when they then come to the country of destination then they can just show their digital certificates on the Blockchain. Which helps them then get a job and much quicker adoption into the new society. So that's one example. And I think there's so much else we could do you know.

Nazaré:

Please talk. (Laughter)

Pål:

Hehe, yeah like you could have, like we just, said like a network within the NGO's and subcontractors where you could have some intelligence to it to optimize services. It is **also** interesting to see services where a donor gives money directly to, like from peer to peer, so you can give directly to the refugee. There is actually no NGOs involved. That's could be a thing. And perhaps, you know, if there is global adoption of these emerging technologies in a good way then perhaps there's also less complex and need for refugee situations in the first place. You know if you have like a government or a country that runs all its ledger on the

Blockchain or there's less room for corruption. Which means that they will have to stay accountable to the people they serve. Which could, you know, reduce conflicts et cetera in these countries. Also, a little ahead in time perhaps, there could also be, I think, because as seen in agriculture right now all the farmers are digitalizing their crops, they are putting all the sensors to monitor their crops and they are experimenting with Artificial Intelligence to optimize them. So I think that at some point in time you will have like one intelligence that will have some intelligence system that can see all the crops in the entire world, and it can optimize the food production so that we don't produce more than what is sustainable, and then it can also reallocate resources to the people that need it. So, I think we can have a much fairer distribution that way. But that's a little in the future, as it is kind of like communism without humans in it. But I think that's… that's going that road anyway. Because the computer can… can read all the data in the Internet in a couple of seconds, so no human can analyze all that data. But the computers can actually make sense of all that data, and we are getting all that data from all the sensors installed in all these crops. Yeah. So that's I think it is fair distribution and perhaps also more fair and accountable Foreign Aid. And perhaps less complex as well because for us all because we move toward a more fair world hopefully. But… but as a side note you know it could.... technology unfortunately, it can also be used in a bad way, so...

Nazaré:
So, please tell.

Pål:
(laughter) Yes. So, let's (…) Blockchains for example could just as easily be used by an authoritarian regime, and that would be a huge problem because then the government they would be able to track every transaction you do, and then they would know exactly what you spend your money and when you do it. So, they have a total control of (…) and they will have total visibility into your private economy. And they could put in, they could actually put in mechanisms to freeze transactions and block transactions. That would be very bad, I think. And also, with Artificial Intelligence we (…) One used case with Artificial Intelligence is facial recognition that recognize users faces. And we've seen this in China, it is very ubiquitous in China right now.

Nazaré:
Stop recording.

(Pål needed to answer an urgent phone call)

Nazaré:

Start recording.

Pål:

I think I was speaking of ways technology can be used for evil, and I think I was speaking of China and the way they are using Artificial Intelligence for surveillance. So that's (..) so in China its (…) they have deployed a massive amount of cameras everywhere. And they have Artificial Intelligence to process all this data that is coming in through the cameras, and they use facial recognition specifically to identify the population. And that way they can, you know, if someone jaywalks or if someone steals toilet paper in a public toilet, then they can find them. But there is also you see if there is a warrant for some criminal guy then they will find it pretty quickly. So, I think they have arrested thousands of people already with this system because they will easily detect persons that are wanted by the police. So, I think the thread was an authoritarian regime they can use this technology to build strong authority. So (…) and to enforce it. So, we have to be careful that we don't go down that path where, if we want to build you know a more fair world than we also have to ensure that the technology in this countries is not used for bad. Because that could just as easily happen.

Nazaré:

That's true with all innovations really.

Pål:

Yes. Yes. But I think that, on a personal note, you know, in these times we live in now, that we are inventing more and more stuff that is exponentially more powerful and which can do a lot harm. A lot more harm than you know what's previously (…) You know the steam machine couldn't really abuse that so much. To some extent yes, but Artificial Intelligence and the surveillance system in China is one thing. So, I think that we are inventing more and more ways to do harm to ourselves as well.

Nazaré:

So, the combination of Artificial Intelligence with the Blockchain in the public ledger... then again, that's more (…) Again that's more democratic, I guess.

Pål:

Yes. But you could if there's a democratic regime. If you see an authoritarian regime then it could be used to surveil the people, it could be used to…

Nazaré:

But then it would be not the public ledger, that would be controlled by them too, or did I misunderstand?

Pål:

Well yeah. It could be. It doesn't matter if it's public or private. But the parties that they can see, they can see all the transactions that their citizens have, and they could, you know, have some intelligence address the transaction and try to predict if they are doing something against the regime for instance. And if you write something on social media than they can you knows freeze your funds and stuff like that. So, it's. You can get a pretty strong control when you combine these technologies on your population if you abuse it. So, I think that's... there is some very great opportunities to use this to make a more fair world. But we must not forget that it can also be misused. And especially if you say have an Aid project, and let's say you go to some underdeveloped country and you want to give them these tools; Artificial Intelligence and Blockchain, and they take them, they turn it's against their population. That could be a scenario that we have to be aware of.

Nazaré:

If that was the product of the Aid, not of the management tool. As a management tool it would be beyond their borders.

Pål:

Yeah.

Nazaré:

That's the context we are talking about.

Pål:

Yeah. So, if it's managed by the NGO that's of course…

Nazaré:

Or the donor.

Pål:

Or the donor. Yeah.

Nazaré:

One of the critiques is, this is my last question, one of the critiques in this project is, or the challenges, is: ok, you can control the whole chain or have the transparency. But what happens in the end of the pipeline the last few meters where someone has to transform this in cash and run into the jungle to give the cash? So, does the corruption move further in? Or can the technology be involved in a way that we can give the guarantee that it really reaches the end destination?

Pål:

Mm. Yeah, it's a good question. Yeah, It's (…) Blockchain is no guarantee for transparency, because it's, like I said, it can be misused, you know you can have bad agents that upload bad data to the Blockchain, and then it doesn't matter if you know you can trace everything, if the data there is untrue. And then of course you also (..) at some point you have to connect it with trusted institutions on each side because once the money comes to a guy, he needs to find someone to trade with. He has to (…) If I send cryptocurrency (…) If I send Bitcoin to a guy in a refugee camp, then he has to find someone to exchange these bitcoins with, unless the guys that sells food and stuff, you know, start accepting Bitcoin.

Nazaré:

On the cell phone, for instance.

Pål:

So yes… yes. So, it's not like a magic bullet. You need to think that through as well. We call this the last mileage problem. Because it's... we still live in a world where most of the economic system is analogue, and we have to adapt the technology to that. So, you need some way of exchanging that money on the other side, and that has to be, that could be an NGO, trusted NGO or institution. But you know I wouldn't really recommend it that it's left up to the refugees to figure out what to do with these money because then they can get scammed, they can get you know (…) so you have to (…) If you want to do the Aid, you have to consider the whole chain from the donor exchanging his money into cryptocurrency, to the receiver getting the cryptocurrency and exchanging these to his local currency. So, you need someone to do the exchange on both sides.

Nazaré:

Or unless this evolves and everything, we transact in the block...

Pål:

Yes… yes, exactly.

Nazaré:

That you can buy your groceries, or medicine or vaccines.

Pål:

Exactly!

Nazaré:

With the transaction. Because you mentioned earlier about having an internet access and a phone was enough.

Pål:

Yes.

Nazaré:

So if that infrastructure could be built, then you would reduce this mileage, the last mileage.

Pål:

Well it's... The infrastructure is there. It's more like (…) convincing merchants in these countries to accept it as payment, because if they don't accept it as payment then you will have to exchange it for some currency that they accept as payment.

Nazaré:

But do you believe this is a transitional phase? We are going that way? That this will be adapt more and more?

Pål:

Yes, I have... yes, this will (…) Yeah, I think that because it's so much more efficient work to do transactions so that some point in time I think we will just you know, leave this old banking infrastructure just like the cameras and the digital cameras. There's going to be a transition. Even though Kodak they invented a digital camera, but they didn't want to go down that road because they made so much money on you know chemicals and film. But and the same is with the banks, they you know they make so much money on the existing

infrastructure they don't really want to jump to this new efficient thing that isn´t very profitable for them. But I think you know what happened to Kodak, that someone else took the digital camera and ran away with it then and it, Kodak is out of business and (…) efficiency just finds its way in the end. So yeah, it's you know, it's I think also the, you know, Blockchain it's very early stage as well. So, it's not a mature or a general-purpose technology yet, we're not there. So, I think also as the technology matures, it would be more accepted and more mainstream and more use in the years to come.

Nazaré:

So you believe we are we are on the right path?

Pål:

For…?

Nazaré:

For a… for the benefits for a more equal and fair world.

Pål:

Maybe. I think we are, and I think there is one side pulling in one direction and one side pulling (…) but I'm not sure really which side we are landing on at the moment. I think China has some very scary authoritarian technology and if that spreads to Western countries that will be very bad. So, it depends really on how we use this technology, and if we can use it for good instead of control and stuff like that. But you know you have some lights, like Europe they had the GDPR to enhance privacy. So, I think Europe is going in the right direction. China is going in the wrong direction, America they are kind of undecided, I think. They don't have strong traditions for privacy. But... and they have also built a lot of tech that has done harm. For instance, Facebook, and I think they are (…) a lot of tech comes from the United States. But today I think they are very bad at thinking more of (…) They don't see the consequences of what they are building. They don't. They build it, make profit and then there are some years and then (…) they failed to anticipate all the bad consequences of what... But some of them figured out that this bad and then they started looking for (…) Facebook have done some changes to try to address these problems. So, we'll see...

Nazaré:

You had a couple of questions?

Kari Elisabeth:

Actually they were being covered. Cause, you went down the: -what if it goes bad, like what if the wrong information ends up on the Blockchain, and like the last mileage problem.

Pål:

Yes.

Kari Elisabeth:

Like if somebody that is supposed to sign is being coerced to sign, and those kind of things. And, also in regards to Artificial Intelligence rather being like the agents than the deciders of, like you have to set up the parameters right. So, I think you have answered all of those things that I had, like being the devil's advocate over here.

Pål:

Yes, good.

Kari Elisabeth:

Yes. Thank you.

Nazaré:

Thank you very much for participating in our project.

Kari Elisabeth:

We really appreciate it. Thank you.

Pål:

You're welcome.

Nazaré:

And now we stop the recording.

STOP RECORDING

Appendix D: Coding

Name	Description
17 UN sustainable development goals	UN- sustainable development goals 2030
Access	Energy. Internet. Satellite.
Accountability	
Advocacy	
Agencies. NGO's. Clusters. Conferences. Communities. Spaces. Scenes.	
AI	
Aid. Development Cooperation	https://www.britannica.com/topic/foreign-aid Foreign aid, the international transfer of capital, goods, or services from a country or international organization for the benefit of the recipient country or its population. Aid can be economic, military, or emergency humanitarian
Audit. Detect and disclose	https://en.wikipedia.org/wiki/Audit https://en.wikipedia.org/wiki/Information_technology_audit
Awareness. Critical thinking. Principles	
Big data	
Blockchain. Smart contracts	

Name	Description
Cases. Examples	
Challenges	Hurdles. Digital divide. Democratization. Last mileage
Compliance. Procurement regulations. Contracts. Partners. Governance	
Control centralized vs decentralized.	
Corporate sector. Investments. Shares	
Corruption. Fraud. Money laundering. Leaks. Tax havens. Grey zone. Bad management	https://lovdata.no/dokument/NL/lov/2005-05-20-28/KAPITTEL_2-15#%C2%A7387
Cryptocurrency. Fiat money. Money. Cash. Bank	"Money" as a concept
CSR. Human rights	
Culture. Society. Context	
Digitalization	
Dilemmas within policy making	Also, very ØØ. Remember Ove J.'s lectures. One of the tools to overcome a dilemma is to organize "dialogues" and take into account the different perspectives.
Economy	

Name	Description
Efficiency	
Enthusiasm and optimism	From the informant perspective
Equity	
Funding. Financing. Resources. Earmarked	
Future and Impact	See also: http://www.track.unodc.org/Pages/home.aspx
Global value chain	
Government. States. Political will. Institutions. Transitional power.	
Human. Individual core values	The human aspect, the ethics, the moral.
Infrastructure	Energy. Internet. Satellite.
Innovation and Start-ups	
Last mileage	
Norwegian public	
Open source	
Organization and strategy	
People Reaching and Empowering	Recipient of Aid
Pilots	Trial programs or projects. If OK, then to be scaled up!

Name	Description
Potential and advantages	
Privacy. Confidentiality. Secrecy	
Programs. Thematic areas	
Projects. Purpose.	
Q1a Main motivation or passion	QUESTION 1. (Aid & Tech) What's your main motivation or passion to do the work that you do? And how do you feel it makes a difference in the global context?
Q1b Contribute in the global context	QUESTION 1. (Aid & Tech) What's your main motivation or passion to do the work that you do? And how do you feel it makes a difference in the global context?
Q2 Transparency and efficiency along the supply chain	QUESTION 2. (Aid) From your working experience in this field and in your opinion, where does the potential for increasing transparency and optimize efficiency lay along the supply chain we described? (Tech) How can this exponential tech, we are witnessing, and the engaged tech community offer solutions to increase transparency and optimize the efficiency of the supply chain we described?
Q3 Tech synergy for efficiency and TTT	QUESTION 3. (Aid) Is your organization working on a similar strategy to address and improve the donation/funding efficiency and traceability? (The follow up question works for Yes and No) And what are your thoughts on that? (Tech) The 3 Ts: "Trust, Transparency and Traceability" are often mentioned in the speech of the tech community as one of the major contributions the emerging tech can give to a sustainable development. What are your thoughts on that?

Name	Description
Q4a Future of Norwegian Aid	QUESTION 4. (Aid) To finish our conversation in a proactive note. How do you see the near future of the Norwegian foreign aid? (Tech) To finish our conversation in a proactive note. How do you see the role of tech in the Norwegian foreign aid in the near future?
Q4b Protecting the Norwegian economic resources	QUESTION 4. (Nader) To finish our conversation in a proactive note; how do you see the role of tech in protecting the Norwegian economic resources, resilience and integrity in the near future?
Reporting. Follow up. Reaction. Blacklist	
Risk	
Safeguard. Prevention	
Security	
Services	See also: http://www.track.unodc.org/Pages/home.aspx
Statements	Clear statements given by the informants
Supply chain and Peer-to-peer	A....XXX...to Z and A-Z
Synergy. Singularity	
Systems. Networks. Management tools.	
Technologies	
Thematic areas	

Name	Description
Thesis relevance. Discussion	
Traceability	
Transparency	
Trust	
Unbanked	
Whistleblowing	Any kind! External, internal, etc...
ØØ Bottom up and Top down	
ØØ Collaboration and Stakeholders	Cooperation/Collaboration between for example: Agencies, Private Sector, Public Sector, Civil society, Tech community and Academia
ØØ Dialogue	
ØØ Globalization and Sustainable Globalization	Sustainable Globalization NB! Connect with the UN 17 SDG
ØØ Holistic view	
ØØ Paradigm shift	