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THE ARCTIC
UNIVERSITY
OF NORWAY

School of Business and Economics

Aranica: Commercialization of a Drone Mapping and Sensing Technology

—
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FOREWORD

I can still recall the first day I arrived in Tromsø in the summer two years ago, the beautiful sea view accompanied me in the bus journey all the way to my new home in Kvaløya. Not to mention the first time of seeing northern light, the first day of polar nights, the first time of trying whale meat and the first time to have sunshine in my room at 12pm. There were many, many first experiences, but most importantly, this is the first time I study about one of the most exciting subjects – Entrepreneurship in a foreign country.

It has been 5 full months of fun experiences studying about the technology of Aranica and writing a master thesis about it. But it has also been difficult times and struggles for me to understand the technology therefore to forego with the research. I would like to thank Professor **Elin Merethe Oftedal** for not only all the mentorship, advices and kind support throughout writing the thesis, but also giving me the opportunity to have an unforgettable experience with BCE program in Tromsø and advices for an unfortunate personal experience in Business.

There is also a special thanks to **André Kjellstrup** for coming up with the idea behind Aranica AS that served as the basis for this thesis. A sincere gratitude also goes to the CEO **Kristian Bøckman** for contributing the time to tirelessly assist me with information and data.

I also would like to thank **Dagfinn Sætra** from Nord Connect for his valuable feedback and advices on the presentation contents for the Pre Springboard and Springboard together with the Business Plan. There are also **Kjell Åge Rognli** and **Lene Wium** who gave feedbacks and advices on presentations for Pre Springboard and Springboard, which were truly appreciated.

During my two years study, the restaurant **Beijing Home** I have worked part-time at, has not only become a reason for supporting myself financially, but also my family in Tromsø. I cannot express my appreciations enough to the owners of the restaurant – **Song Yang** and **Liu Zheng**. A sincere gratitude also goes to **Hans Regnar Mathisen** for supporting the business during this special difficult time while the road in front of the restaurant is under construction.

Last but not the least, I would like to express my yearning for my dear grandpa, who has unfortunately passed away in February this year during my stay in Norway.

ABSTRACT

Power industries nowadays are struggling to find efficient ways to inspect power lines when there is no need for repair. Moreover, 99% of power used in Norway is from hydro power, there are thousands of water dams waiting to be examined after the winter season has passed and things start to defrost. Traditional methods for inspecting power lines such as helicopters endanger human safety during the operation, sad incidents caused by helicopter power line inspections have happened again and again in the U.S. as well as other countries around the globe. Aranica – a spin-off company from NORUT, offers mapping and inspection services with drones.

This thesis will break down the technology from Aranica and explore a successful commercialization route for the company. In particular, the research will devote itself to finding the answer to which elements in the Norwegian Market allow for commercializing of drone mapping and sensing technology. The author of this thesis will conduct an exploratory research combined with descriptive research in order to find out the answer. In-office interviews, online secondary data, and email questionnaires will be used for gathering data for further analysis.

The Innovation Study, Market Study and Business Plan will be presented in chapters in this thesis. The Innovation Study will use Blue Ocean Strategy Canvas and BEC/BUM framework to find out the competitive aspects of Aranica and help indicate the market direction with innovation type. The Market Study will go through a thorough industry and market analysis therefore to decide a marketing strategy for Aranica. The Business Plan will offer a comprehensive view on the commercialization strategy of Aranica.

Keywords: Aranica, spin-off, entrepreneurship, Blue Ocean Strategy, drone technology, mapping, inspection, commercialization.

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ABBREVIATIONS:

RPAS: Remotely Piloted Aircraft Systems

UAS: Unmanned Aerial Vehicle

AUVSI: the Association for Unmanned Vehicle Systems

NORUT: Northern Research Institute

1 INTRODUCTION

This is a decade of drones (O'Connell, 2011). The development of drones started in the 50's and matured rapidly in recent years in the military context. Drones are now entering the civil market, opening a promising new chapter in the history of aviation.

In the United States, integrating UAS into the National Airspace System has created economic opportunity, too. Between 2015 and 2018, the industry is projected to generate \$13.6 billion, and will grow organically and sustainably—culminating in more than \$82.1 billion in annual revenue by 2025 (source: [AUVSI's 2013 economic impact report](#)).

Civil drones present a huge potential for developing innovative applications in wide variety of sectors to the benefit of European society, creating jobs and achieving useful tasks. [1]

However, if we consider the broader surveillance properties of both currently available and future drone technology combined with their armed capability, some so far unaddressed legal implications come into sight. First, the rapidly growing surveillance capacity of drone technology combined with ever more sophisticated armed capabilities may suggest a capability for exercising a degree of control and authority over territories and persons that may trigger the extraterritorial application of the European Convention of Human Rights (ECHR), and thereby making an array of human rights obligations topical to drone attacks if carried out by member states. Apart from the UK, European states have not as of yet used drones for armed attacks. However, there is little doubt that in the future armed drones and remote-controlled fighter planes will become standard military equipment for most European states. This makes it relevant to consider how drone technology may trigger obligations extraterritorially under the ECHR. The legal implications of using drone technology within the context of the ECHR may also be used as a point of departure for discussing other human rights obligations ensuing from the employment of drone technology (Rosen, 2013).

As civil aviation is evolving itself towards more automation, drones' technologies will also be crucial for the competitiveness of the European aeronautics industry as a whole. Aranica, a company located at the very north of Norway, offers different services with data collected by drone activities. The company assembles the drones to adapt to different purposes of

[1] Remotely Piloted Aircraft Systems (RPAS). European Commission. Website: <http://ec.europa.eu/enterprise/sectors/aerospace/uas/> Date: 07.02.15

collecting data, collects data with different drone activities and processes the data into formats needed according to requirements.

The technology was started by a group of researchers from NORUT – a research center in Northern Norway, the group manager Kjell-Arild Høgda and research leader Rounne Storvold are both experts in remote sensing and have been doing research on remote sensing with UAV (drones) since 2006.

Aranica is now owned by Norinnova-the technology transfer office of University of Tromsø and incubated in the Norinnova incubator. The COO of Aranica, André, has his office located in NORUT in order to keep close contact with the researchers to develop products according to customer needs.

This thesis will focus on the commercialization of Aranica, with a particular focus on the market approach. This chapter, the introduction will be covering the importance of the study and main research questions of this thesis. Further studies such as innovation study, market study and business plan will also be highlighted in this chapter.

The importance of the study

The topic of this thesis is the commercialization of Aranica, a drone mapping and sensing technology. The importance of studying how to profit from technologies developed by universities and institutions is also one of the main reasons for this thesis.

A drone, in a technological context, is an unmanned aircraft. Drones are more formally known as unmanned aerial vehicles (UAV). Essentially, a drone is a flying robot. The aircraft may be remotely controlled or can fly autonomously through software-controlled flight plans in their embedded systems working in conjunction with GPS. UAVs have most often been associated with the military but they are also used for search and rescue, surveillance, traffic monitoring, weather monitoring and firefighting, among other things.

As for today, the wide use of drones for different purposes has inspired scientists specialized in remote sensing, the science of gathering data on an object or area from a considerable distance with radar or infrared photography to observe the earth or a heavenly body.

Traditional tools such as satellite and airplane bare high cost and limitations such as distance, inflexibility and danger threat to the human operator. The industries that need mapping and sensing services are in need of better and affordable technology. The surveillance capacity of

drone technology helps withdrawing the risk for pilots. The argument is that the drone technology, in addition to its strategic value, offers effective precautionary measures in the form of the capability of making preoperational assessments of targets (Rosen, 2013).

Using drones for remote sensing, has solved the problems of being too distanced, inflexible and dependent on human from satellite and airplane. It shall bring a new era for monitoring and mapping. [2]

It is also interesting to look at the industries that are in need of the drone mapping and sensing service, as mentioned in the definition of a drone, the usage of search and rescue, surveillance, traffic monitoring, weather monitoring and firefighting has opened a wide spectrum of market for the drone mapping and sensing technology.

According to the Association for Unmanned Vehicle Systems (AUVSI), the UAV market is estimated at \$11 billion, and is expected to grow to \$140 billion over the next 10 years. As UAV operations shift to the commercial market, speaking from experience, agriculture seems to be taking the lead and agriculture is expected to capture approximately 80% of the known market. Of course that's not to say that other industries are not cognizant of the recent advancements and wide array of impactful use cases that drones bring to the table. In the last 18 months, we've seen interest from other billion dollar sectors such as insurance, utilities, emergency response, mining, and life sciences. [3]

From another perspective, the technology transfer office Norinnova of UiT The Arctic University of Norway plays an important role in providing the formation, knowledge and resources to commercialize this drone mapping and sensing technology from NORUT. It is interesting to look at the commercialization of Aranica, as for today, there are many spin-off companies from universities and research centers. Aranica, taking the knowledge from the northern research center – NORUT, is interesting to look at.

There is an immersing gap between scientific research and practical. How to bring sophisticated research results into actual practice? Academia nowadays are putting much hope

[2] Helicopter crashes during Colorado power line inspection, three dead. Reuters. Website: <http://www.reuters.com/article/2014/01/27/us-usa-helicopter-crash-idUSBREA0Q1OP20140127>. Published January 24 2014. Date: 03.03.15.

[3] Drones exposed: the market and the technology. AgFunderNews. Website: <http://agfundernews.com/drones-exposed-market-technology.html>. Date: 03.03.15.

over spin-off companies, therefore they can transfer the knowledge into industries. Academic spin-offs, that is, firms founded by staff or graduates of academic institutions that exploit research outcomes, are expected to bridge scientific research and economic exploitation. (Norman, 2005)

However, there is an opinion that in spin-off companies, knowledge is not so much transferred from academia to industry, but rather co-produced in an interactive process which includes continuous interaction between industry and academia (Leydesdorff, 2012). Spin-offs are seen capable for exemplifying this mode of knowledge production. We would then expect rather a continuous exchange of knowledge or a co-production of knowledge, with strong and long lasting interactions between spin-offs and their parent organizations.

Aranica, with its COO located right in the research center, has proved its capability and role in helping the academia and industry to co-produce together for a better result.

Therefore, it is important to bring Aranica into industries with its own technological advantages for needing industries. It is also important to look at the commercialization process of Aranica as it functions as an incubator for the academia and industry to co-produce a better technology. The value of the technology for the industry will be huge, moreover, the experience of helping academia and industry collaborate is valuable for future spin-off companies to look at.

There are also several commercialization strategies been put into assisting the development of university spin-offs, the importance of committed individuals has been emphasized during the early phase of start-ups, especially the technological competences. (Rasmussen, Mosey& Wright, 2011)

1.1 Research questions

Research questions are considered as important guides for the direction of the research and how to collect, analysis and demonstrate the data. Research questions represent an attempt to ‘tame’ curiosity. Curiosity should not lead to questions being asked in a ‘haphazard fashion’ (Lewins, 1992) but in relation to what is already known about the topic of interest (White, 2009).

Aranica was born from remote sensing researchers. Drones, technically referred as Remotely Piloted Aircraft Systems, can replace traditional tools such as satellite and airplane and perform better without concerns such as human safety, distance, flexibility and space.

The potential market for Aranica lies in different industries such as construction, power, forestry and etc. with its advantages over traditional remote sensing methods.

The main focus of this thesis is how to commercialize Aranica successfully, after innovation study, the technology's incremental nature requires itself to be a disruptive technology in order to achieve success in its commercialization. We realize there are different elements in the market that can play important roles in Aranica's commercialization, due to the technology geographical limitation in service delivery, therefore the main research question is "*Which elements in the Norwegian Market allow for commercializing of drone mapping and sensing technology?*"

The research question for innovation study is "*How does innovation type influence Aranica's market positioning?*"

In innovation study, we look into analyzing Aranica's technical functions, the innovation type of Aranica will strongly affect its preferred market, therefore leading an indication to help forming market strategy.

The research question for market study is "combining the results from innovation study, what is the best market strategy for commercializing Aranica?"

In the market study, different markets for Aranica will be identified and different market segments will be evaluated. Therefore leading indications of specific potential clients.

The research question for business plan is "how to get clients for Aranica?"

1.2 Methodology and Frameworks

1.2.1 Innovation Study Framework

To study the nature of Aranica's innovation, we start from learning about Aranica's technology first, comparison of Aranica with its competing technologies is essential in the process understanding Aranica's technology. Tools such as Blue Ocean Strategy canvas will be used to compare Aranica's technology with competing technologies on different factors.

Then the customer utilities of Aranica will be discussed and BEC/BUM framework (Buyer Utility Map) will be used to illustrate Aranica's current offerings in 36 areas.

Innovation type of Aranica will be identified after comprehensive understanding of the product and what it can offer. For the innovation study, it is important to identify whether Aranica is incremental innovation or radical innovation. According to Rice et al. (2002), because services mentioned above already exist with other traditional methods, but using

drones for collecting data improved the process of the work and the performance, therefore, Aranica is still incremental innovation.

The following table Figure 1 presents the relationship between different innovation types and what is discontinuous innovation.

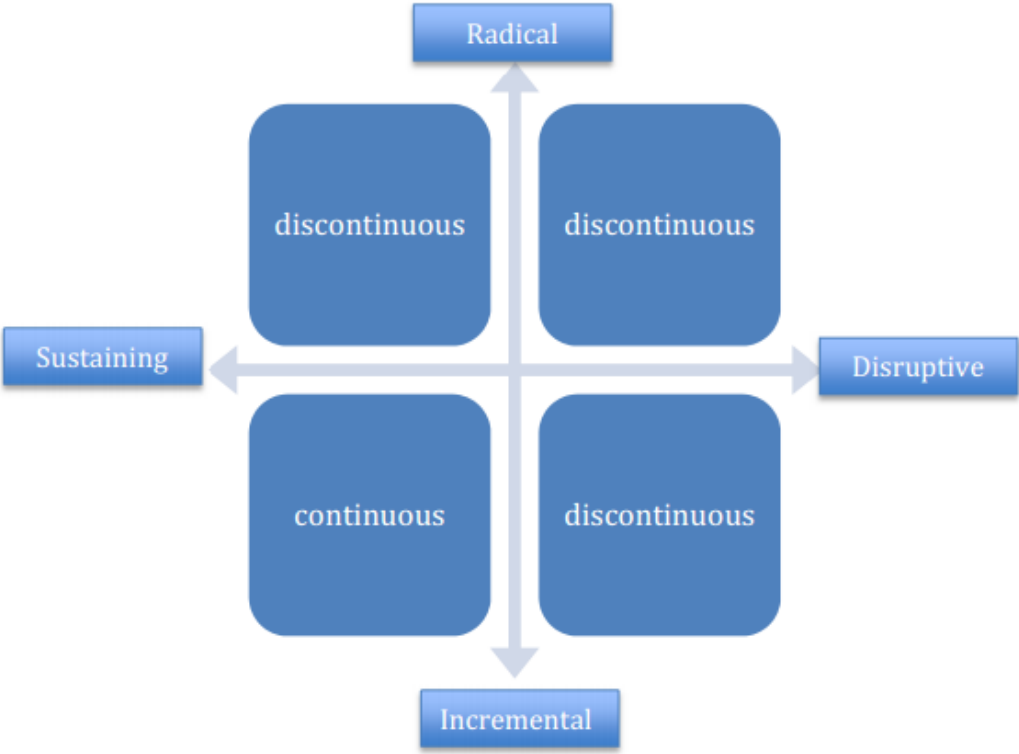


Figure 1

With Christensen’s theory on discontinuous innovation, we strongly suggest Aranica to innovate in the market side, to become disruptive innovation therefore achieving discontinuity in the innovation.

Following above table Figure 1, it is very important for Aranica to go for disruptive innovation. “A disruptive technology or disruptive innovation is a technological innovation that improves a product or service in ways that the market does not expect. A disruptive technology often leads to either lower-priced products or products designed for a different set of consumers.” (Crooker, Baldwin & Chalasani, 2009)

There are simply two ways to achieve disruptive innovation, they are new market disruption or lower-end disruption. This also gives an indication for Aranica’s market strategy.

From the competitor's perspective, when innovations happen in an incremental manner, the well-established companies have an advantage and they can reinforce their dominance and leadership. However, with disruptive innovations, the new entrants to the market can beat the incumbents by commercializing a simpler, more convenient product that sells for less money and appeals to a new or (previously) unattractive set of customers (Crooker, Baldwin & Chalasani, 2009).

From the customer's perspective, traditional methods such as satellite and airplane in comparison to Aranca have much higher criteria for customers, the companies that are currently using those services are generally large enterprises. There are difficulties to change processes in big enterprises with regards to bureaucracy and influences on other chains in the company such as employment, adaption to new process, company training and etc.

Small businesses have similar needs to large businesses, a model that profitably and effectively serves them can be scaled to serve medium and large enterprises with relative ease. Small businesses are also extremely low-risk proving grounds because there are so many of them that failure with any one customer won't lead to large reputational damage. Also, small businesses desperately want these products but can't access them, they will be happy with much less functionality than large enterprises that have many products to choose from (Christensen & Overdorf, 2000).

From the company's own development perspective, disruptive innovations occur so suddenly that no company had a routine process for handling them. Start-ups lack resources, but that doesn't matter. Their values can embrace small markets, and their cost structures can accommodate low margins. Their market research and resource allocation processes allow managers to proceed intuitively, every decision need not be backed by careful research and analysis (Christensen & Overdorf, 2000).

Disruptive technologies often offer change either in products or in services that are typically simpler, more efficient, easy to use versions of existing products or services already in the market. They more than often target new customers and low-end customers by lowering the prices or designing products/services for a different set of customers. (Islam & Ozcan, 2012)

To examine further on the technology on its disruptive nature, we are using Blue Ocean Strategy for customer utilities and product utilities in order to provide a more comprehensive understanding of the product and what it can offer.

For IPR and freedom to operate, Aranica currently doesn't own a patent, however the technology is know-how and free to use.

1.2.2 Market Study Framework

The purpose of market research is to gather data on both current customers and future customers. The collected data can often lead to business decisions. This therefore reduces the risks involved in making these decisions. [4]. The aim of this market study is to identify and examine the potential of Aranica-the drone mapping technology. Due to multiple potential appliances of the product, each of potential market has to be examined and analysed in order to find out favourable markets for Aranica considering Aranica's own current conditions such geographic location, competence alliance and company relationships.

An analysis and screening the external marketing environment of the company will be conducted, all buying and selling behaviours no matter in b2c or b2b businesses will be affected by external environmental forces (wright 2004). It is also being highly recommended that environmental factors and ecological imperatives must be recognized if the business is to achieve a sustainable industrial development as a long term objective. (Gupta, 2013)).

Kotlet's PESTEL analysis is the most common approach for considering the external business environment, this includes Political, Economic, Social, Technological, Environmental and Legal factors. Political factors refer to the degree of government intervention in the economy. Political influences can be discovered for Aranica during the development to Norwegian economy, laws and regulations should also be considered as guidance of what Aranica can do and cannot do. An important political factor to be considered for Aranica is that governments simply put restrictions on the flying of unmanned aircrafts for safety concerns. The state of economy also plays a crucial role in the success of business (Wright et al. 2004), therefore it is also important to consider economic factors. Social factors decide how the product will be perceived by the public therefore supported. A raising awareness and public resentment towards drones used in wars should be taken into consideration during the commercialization of Aranica, the civil drone mapping service. In the end, technological factors will pertain to innovations in technology that may affect the operations of the industry and the market

[4] Discovering customer needs through research. Business Case Studies. Website: <http://businesscasestudies.co.uk/barclays/discovering-customer-needs-through-research/purpose-of-market-research.html#axzz3aFssxb7u>. Date: 04.03.15.

favourably or unfavourably. This would discover what Aranica can bring to its potential markets technologically.

The next step is to choose the customers by segmenting the market and selecting target markets. There is one constraint that all companies cannot connect to all customers in the broad or diverse market, companies simply need to focus on customers within their capacity, therefore dividing market into groups of consumers with distinct needs and wants is wise. Segmentation is dividing the market into homogenous groups. (Goyat, 2011). After market segmentation, an analysis of different market segments including market size and potential will be performed in order for picking preferred segments for Aranica.

The ultimate goal of competitor analysis is to know enough about the competitors to be able to think like the competitors do the firm's competitive strategy can be formulated with the competitors' likely actions and responses. (Czepiel & Kerin 2010). The first step of competitive analysis is to identify competitors. This might not be as quite obvious as it might seem. We used two approaches as known of demand-side based and supply side based, in Aranica's case, they are companies that are aiming at the same customers and companies that are using the same technology.

Next, a SWOT analysis will be conducted to determine Aranica's internal strengths, weaknesses and external opportunities and threats. Firms have a better chance to develop a competitive strategy by looking at its own strengths and upcoming opportunities (Kotlet et al. 2008). If a company cannot take advantage of external advantages because of its own weaknesses, it might seek for resources from outside such as financial investment or a merger, if the external threats are so large and the weaknesses internally are so dire, the only possible way for the firm to survive might be to divest or liquidate. (Wright et al. 2004). SWOT analysis is a precursor to the strategic planning process. It promotes (1) a better understanding of barriers to change, innovation, and the transfer of knowledge to practice; (2) improved outcomes; and (3) more efficient allocation of resources. (Harrison, 2010)

With above analysis, we find out the market entry strategy and market strategy for Aranica. A market strategy is a long-term course of action designed to optimize allocation of the scarce

resources at the disposal of a firm in delivering superior customer experiences and promote the interests of other stakeholders. [5]

We also refer relationship marketing as a way to build long-term relationship with customers. Relationship marketing gives management possibilities to cut down the costs for marketing by focusing on the ultimate market segment – the individual customer – effectively and efficiently. It also enables businesses to profit customer by customer by focusing on those who receive, and return the best value (Gordon, 1998).

1.2.3 Business Plan

According to Sherman [6], effective business planning is critical when it comes to the success of an entrepreneurial company’s long term success and its ability to raise capital and grow in the future. Business planning is the process of setting goals, explaining the goals and then mapping out a document on how to achieve these goals.

A business plan is a written document with a purpose to describe the nature of a business: its market and business environment, strategy, operations and sales and expected financial results. Business Model and the business’ competitive advantage should also be defined in the plan. (Engel & Teese, 2014)

The business plan in this thesis has used the outline of business plan from Lars Edvard Fodnes (2000) as a reference. We conducted a market analysis, identified the business model, competency needed and potential risks. In the end, we also developed a strategy and financial plan for the future.

See detailed outline in below table Figure 2.

Business Plan Framework	Content
1. Summary	An outline for the whole business plan
2. The idea	1) Introduction to the idea

[5] Definition of marketing strategy. Slideshare. Website: <http://www.slideshare.net/angelahausman/definition-of-marketing-strategy>. Published February 22 2011. Date: 05.03.15.

[6] Sherman, A. J., Morin, D. S. & LLP, O. Business planning: building an effective business model. Entrepreneurship. Website: <http://www.entrepreneurship.org/resource-center/business-planning-building-an-effective-business-model.aspx>. Date: 03.04.15.

	2) Business objective, protection and model
3. Market	1) Expected market segments and market sizes 2) Competitors
4. Management	Key personel and competences (current and future) within the company
5. SWOT	
6. Strategy	1) Pricing and market communication 2) Organization setting milestones
7. Finacial Plan	1) Sales forecast 2) Expenses forecast 3) Income statement
8. Risk	

Figure 2

The business plan is the final conclusion combined our previous innovation study and market study, it also lays out concrete implementable guidance for Aranica.

1.2.4 Methodology

Most research can be divided into three different categories; exploratory, descriptive and causal. Each serves a different end purpose and can only be used in certain ways. A lot of research projects require a combination of exploratory, descriptive and/or casual techniques (Hair et al. 2006). Exploratory research suits the best at the beginning of your total research plan. It is most commonly used for further determine company issues, areas for potential growth, alternative courses of action, and prioritizing areas that require statistical research. [7]

An exploratory research combined with descriptive research will be conducted for Aranica in this thesis. As we are not suggested to contact customers for primary data, we will use

[7] Penwarden, R. Exploratory research: what is it? And 4 ways to implement it in your research. FluidSurveys. Website: <http://fluidsurveys.com/university/exploratory-research-4-ways-implement-research/>. Published June 12 2014. Date: 02.05.15.

secondary data from existing books, start-up journals, magazines, reports and articles. The internet will be our main source for finding secondary data.

We will also carry out in-office interviews, which are conducted at a manager’s place of work (Burns & Bush, 2010). This method will enable researchers to ask complex questions and getting comprehensive answers as the managers are interviewed in their comfortable locations. Figure 2 shows all the interviews we have done and the objectives for doing the interviews. However, for this study, as we are restricted from talking to potential customers in order not to influence Aranica’s relationship with customers, only limited interviews can be conducted.

respondents	Interview objectives	Alternative
Kristian Bøckman (CEO)	To gain understanding of Aranica’s technology including its utilities, discuss business plan models and strategies	
Executive from power companies	Understand companies issue and current solutions, testing Aranica’s solution comparatively	Due to lack of contact and concerns of breaking Aranica’s customer relationship, we interviewed Kristain Bøckman for questions planned.
Executive from construction companies	Understand companies issue and current solutions, testing Aranica’s solution comparatively	Due to lack of contact and concerns of breaking Aranica’s customer relationship, we interviewed Kristain Bøckman for questions planned.
Executive from oil companies	Understand companies issue and current solutions, testing Aranica’s solution comparatively	Due to lack of contact and concerns of breaking Aranica’s customer relationship, we interviewed

		Kristain Bøckman for questions planned.
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Figure 3

We also sent out an email questionnaire to competitors anonymously in order to gain understanding of what the competitors are offering and their current status including pricing, customers and etc. 7 emails were sent out, unfortunately 0 respondent replied.

In order to evaluate the market segments, online secondary data has been collected, including approximate market size, pricing and current solutions.

1.3 Limitations

Due to limited ability and experience to understand the technology and market, we hope we are going to the right direction with identifying the technology utilities and markets.

Due to limited access to primary data, our most customer information has been obtained from one person, we regret if the information has been inaccurate and manipulated. However, we received amazing amount of help from Norinnova, Kristian Bøckman, André Kjellstrup, Dagfinn Sætra for understanding the technology, searching for market information.

Further, with the given amount of time (6 months), we had limited our research as it takes time to understand the technology and market.

2 INNOVATION STUDY

2.1 Introduction

There are several particular purposes for doing the innovation study of Aranica. An innovation study may appear as an academic task and have limited practical value, however, through a theoretical analysis based on established innovation literature, one can categorize the technology to understand what the common challenges are for the specific type of innovation. A Blue Ocean Strategy Canvas will be used to compare Aranica with its competing technologies in order to find out the key values Aranica should be offering to the customers as well as the identical values Aranica can offer therefore moving to a Blue Ocean in the future. Secondly, the innovation study should make clear to the reader what the values, functions the technology has. A BEC/BUM framework (Buyer Utility Map) will also be used to illustrate Aranica's current offerings in 36 areas. The third purpose of the innovation study is to find implications of the market for Aranica according to its innovation type, therefore it can lead the direction of the following market study.

2.2 Technology Description

To put Aranica's product in a few words, it is a remote sensing service done by data collected by drones. This then leads to many questions, what is remote sensing? Who uses remote sensing and why? Are there anything else apart from drones that can remote sense?

Technically speaking, remote sensing is the acquisition of information about an object or phenomenon without making physical contact with the object and thus in contrast to on site observation.

There are different people using remote sensing for different purposes. For example, the geographer, who looks for changes on the Earth's surface that need to be mapped; the forester, who needs information about what type of trees are growing and if they have been affected by disease, fire or pollution; the environmentalist, who wants to detect, identify and follow the movement of pollutants such as oil slicks on the ocean; the geologist, who is interested in finding valuable minerals; the farmer, who wants to keep an eye on how his crops are growing and if they've been affected by drought, floods, disease or pests; the ship captain, who needs to find the best route through the northern ice packs; the firefighter, who sends out his crews based on information about the size and movement of a forest fire. There are of course many more.

Below Figure 4 is an illustration to explain how drones would do 3D mapping:



Figure 4

Humans can see this world in 3 dimensions is because our brain combines two images perceived by our two different eyes. In Figure 3, the drones are taking thousands of photos of an object from different angles, and a software program can combine those images like our brain, therefore produce a 3D map. This is typically done traditionally by satellites or aircrafts.

Aranica, uses drones as the intermediary, with cameras installed and taking photos, to acquire information without making physical contact with the object.

2.3 Development Status

Aranica currently has finished developing its technology for serving its clients, however, the technology is constantly under development in order to fulfill more needs.

2.4 Competing Technologies and Technical Functions

By identify the innovation type of Aranica, it is important to understand the technology more and look at the technologies it can replace. The following chart Figure 5 illustrates advantages and disadvantages compared of the competing technologies of Aranica.

Technologies	Advantages	Disadvantages	Functions
Satellite	<p>Already in the market</p> <p>Mature technology</p> <p>Safe for humans</p>	<p>Expensive</p> <p>Problems with accuracy</p> <p>Limitation on the distance</p>	<p>1. Monitoring: for example, track animal migration, locate mineral deposits, watch agricultural crops for weather damage, or see how fast the forests are being cut down.</p> <p>2. Mapping: for example, take photographs and observe areas all</p>

			over the globe
Air plane	Already in the market Mature technology	Human resource cause Limitation on monitoring condition because of human operation	Mapping, monitoring, inspection
On site boat oil monitoring	Already in the market Mature technology	Human resource cause Limitation on monitoring condition because of human operation	Monitoring
On site geographic measuring	Already in the market Mature technology	Human resource cause Limitation on monitoring condition because of human operation Low accuracy	Mapping
Aranica	More accuracy Lower cost More flexibility	New technology Not in market	Mapping, monitoring, inspection

Figure 5

We are using Blue Ocean Strategy’s Strategy Canvas below in Figure 6 to value innovation and analyze what the current values of Aranica offered to customers. There are two benefits of the Strategy Canvas. The first is that the canvas describes what the key values are offered to customers the competing companies are currently challenging each other. Secondly, it helps companies to find the gap where they can take action in order to perform in a non-competitive area therefore they can move on to a blue ocean market. The competition level and investment of companies are identified on the horizontal axis of the framework. The

various offerings that customers receive on a specific product by considering competing factors are identified on the vertical axis. (Islam & Ozcan, 2012)

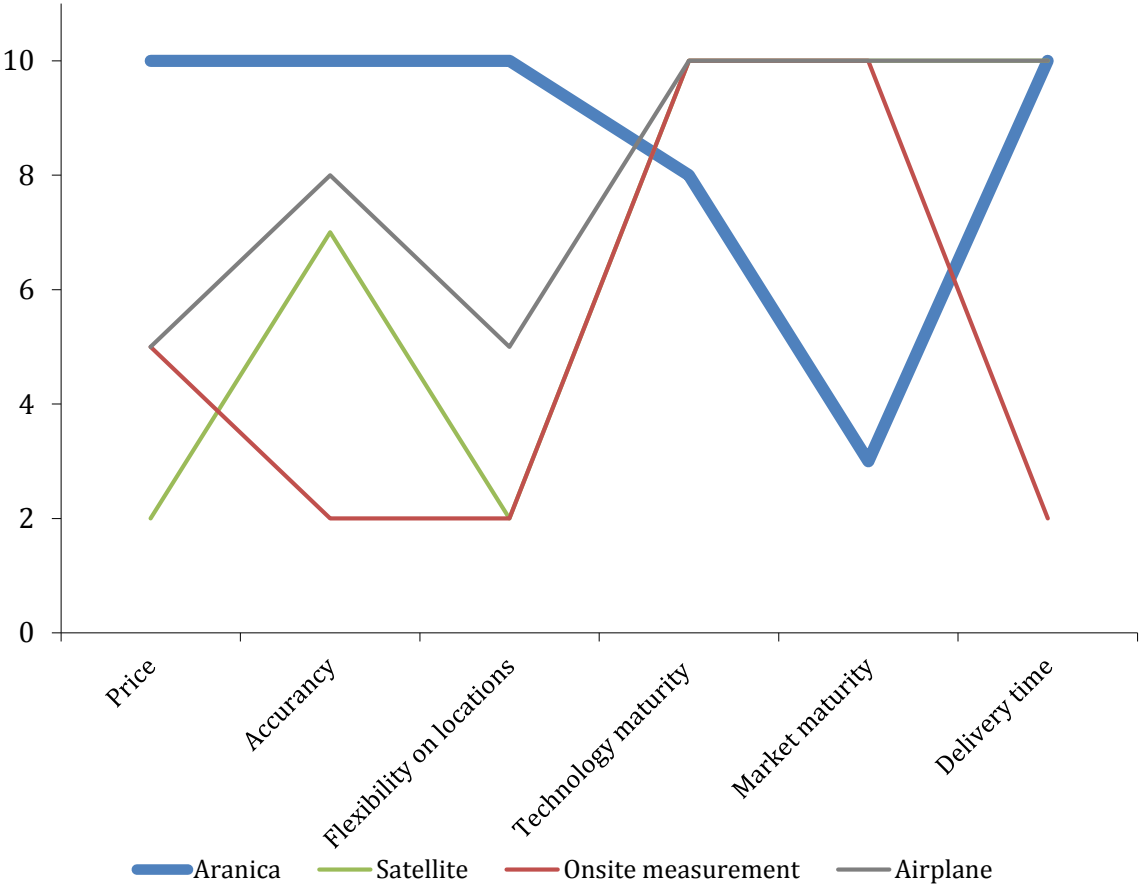


Figure 6

Figure 6 shows where Aranica is outperforming from competing technologies and how it is differentiated by various offerings. In the above strategy canvas, it can identified Aranica is differentiated from its competing technologies by various factors. It can also be said Aranica offers high quality in terms of the basic characteristics of mapping and inspection service its competing technologies offer, but it is also differentiated from its competing technologies by offering characteristics the competing technologies cannot offer. The closest competing technology of Aranica is airplanes. There are also other technologies that Aranica is competing with, such as satellite and onsite measurement.

It is clear Aranica offers a competitive price, better accuracy and higher flexibility on locations in comparison with existing competing technologies. When it comes to technology maturity and market maturity, Aranica comes lower than its competing technologies.

However, Aranica outperforms in terms of delivery time in comparison with competing technologies.

2.5 Customer Utilities

The customer utilities correspond to the technical functions Aranica has. The monitoring function enables oil companies to detect oil spill and manufacturing companies to detect hazard gas evacuation, it also enables governmental agencies to monitor stream changes for weather and natural disasters. The inspecting function enables wind power companies to inspect wind turbines and power lines, and also forest and farm owners to inspect trees and crops. The mapping function enables governmental agencies to produce updated maps, road construction companies to obtain maps before projects and shipping companies to obtain updated maps to avoid icebergs.

Therefore there are different services that can be provided by Aranica: 1) high voltage transmission line inspection, proximity to vegetation; 2) high precision georeferenced orthophoto, mapping and DEM; 3) volumetric mapping; 4) thermography; 5) aerial photography; 6) aerial SAR assistance; 7) wind turbine blade inspection; 8) detection of Vehicle Tracks and Vegetation Damages; 9) stream flow / monitoring; 10) oil spill detection and monitoring; 11) estimating wildlife population; 12) forest and farm inspection; 13) natural disaster monitoring.

To further exam Aranica’s utility propositions, we are using the BEC/BUM framework. The Buyer Utility Map is a unique utility for a new product or service, it can be used for re-innovating existing products or services to differentiate them from competing ones. This analysis covers the six stages of the buyer experience (purchase, delivery, use, supplements, maintenance, disposal) by combing six different utility levels (customer productivity, simplicity, convenience, risk, fun & image, environmental friendliness). Below Figure 7 shows Aranica’s current offerings in 36 different areas. By using this tool, it is possible to locate the existing product or service, analyse the market and locate or position the new product. (Islam & Ozcan, 2012)

BEC/BUM	Purchase	Delivery	Use	Supplements	Maintenance	Disposal
---------	----------	----------	-----	-------------	-------------	----------

Customer productivity	✓	✓	✓
Simplicity		✓	
Convenience		✓	
Risk	✓		
Fun & Image	✓		
Environmental friendliness		✓	

Figure 7

Customer Productivity

In the customer productivity part, Aranica covers purchase, use and supplements. With a B2B business model, Aranica is approaching their clients and one on one customer service. Once the service is purchased, the results will be delivered to the customers in required formats, therefore it is easy to integrate them into company's current system.

By looking at Aranica's suppliers, the drones are purchased in components in China assembled by themselves, one side it can save Aranica's costs, but also enables its drones to perform for different purposes. Another resource for Aranica is it can outsource its project to NORUT, the northern research institute in Norway, the unique technological support gives Aranica advantage to offer customers stronger services.

Simplicity

For simplicity, Aranica covers the use part, as the results are totally adapted to customer companies' current system, the use of the result would be as simple as it could be.

Convenience

It is important for a new product and service to consist of an offering that the work performs in an easier and more convenient way (Islam & Ozcan, 2012). Aranica offers a service for mapping and inspection, how easy the service can be obtained and the results to be used later decides the convenience level of Aranica. For obtaining Aranica's service, customers need to make preparations and give specific requirements, in this aspect, Aranica is not as convenient as existing technologies as Aranica has never dealt with the customers before and is unaware of customer requirements due to previous knowledge. However, for using the results from

Aranica, Aranica offers different formats for maps and possibilities of analysed data therefore increasing the convenience level of using Aranica's service.

Risk

Aranica provides confidence when customers purchase its service, however, the risk level in the buying process of Aranica is high. There are possibilities for a new technology to deliver the task and an established company to adapt to a new technology with its old system.

Aranica offers test runs and direct communication between the technicians to eliminate this risk therefore offering the customers confidence in purchasing this service.

Fun & Image

The fun and image factor is one of the key characteristics in the design of a product or a service. The image of drones is attempting around the globe, operating drones can be a fun work as well, to understand the product before purchase would be fun for the customers.

Environmental friendliness

The normal weight of UAVs is no more than 2.5kg, lifting such small vehicles into the sky costs much less energy than an airplane or helicopters. Using Aranica's services in one way costs much less energy for the same task that has been done by traditional methods before, therefore it is more environmentally friendly to use Aranica.

2.6 Values

As Aranica is offering services that already exist, there are several values that it can provide aside offering its services.

1) Better accuracy and efficiency

As drones can fly to more places with less limitations, it can often perform better than other methods to collect data. For example, in road construction industry of Northern Norway, it is always very difficult to get an accurate map. Traditionally, the data is collected by humans manually at the site, the new method by drones is more accurate and faster.

2) Lower cost

As other methods often need human resources, due to Aranica's specific location in Norway where human resources cost the most in the world, it can also be cheaper to use Aranica. Also when it is compared with satellite, using drones costs much less.

2.7 What type of innovation (findings)

“There are many kinds of innovation. Classification may vary according to the object of innovation, for example innovation of socio-cultural systems, of ecosystems, of business models, of products, of services, of processes, of organizations, of institutional arrangements, etc., to the drivers of innovation (technologies, markets, design, users, etc.), or to the intensity of innovation. With a focus on the product or service, we divide innovation into two categories: incremental and radical. 1. Incremental innovation: Improvements within a given frame of solutions (“doing better what we already do”); 2. Radical innovation: A change of frame (“doing what we did not do before”).” (Norman & Verganti, 2012)

As Aranica is offering remote sensing service with drones, such service already exist with other traditional methods, but using drones for collecting data improved the process of the work and the performance, therefore, with Aranica’s higher accuracy and lower cost, the technology still counts “doing better what we already do”, we think it is still an incremental innovation.

As a start-up firm, there is a big difference between Aranica and established firms, as a new comer of the industry, it is often difficult to succeed with continuous innovation as they are competing with mature firms for the same market with the same products (Crooker, Baldwin & Chalasani, 2009). This also puts Aranica in a disadvantage situation while competing with established firms especially it shares the same market with other businesses. Since conditions to make firms successful with continuous innovation do not emerge every day in every firm, it is essential to have discontinuous innovation (Crooker, Baldwin & Chalasani, 2009).

With Christensen’s theory on discontinuous innovation, we strongly suggest Aranica to innovate in the market side, to become disruptive innovation therefore achieving discontinuity in the innovation.

“A disruptive technology or disruptive innovation is a technological innovation that improves a product or service in ways that the market does not expect. A disruptive technology often leads to either lower-priced products or products designed for a different set of consumers.” (Crooker, Baldwin & Chalasani, 2009)

2.8 IP

Aranica AS was established in July 2014 and is owned by Norinnova AS – the technology transfer office for UiT-The Arctic University of Norway. Its technology contains two processes. First, it's the way they assemble the drones and collecting data, second, it's the way they process the data into a form that can be used. With regards to intellectual properties, both technologies are not patented.

However, with regards to the way Aranica assemble the drones for collecting data is a know-how and kept within the company, its operator is the COO – André. Both the know-how technology and processing technology are free for the company to use. We also performed a trademark search, however, the company doesn't own any other intellectual properties.

2.9 Conclusion

The innovation study of Aranica has learnt that Aranica, with its under covered features in comparison to competing technologies, has a potential to develop a blue ocean in the market. Further examined with BEC/BUM framework, we see an outline of Aranica's current offerings and room for improving the company's utility proposition. Aranica is also an instrumental innovation. It is important for Aranica to disrupt the market to obtain its discontinuity therefore increasing its chance to succeed as a start-up company. There are simply two ways to disrupt the market – aiming at lower end market or finding new market, therefore it gives an indication for the following marketing study.

3 MARKET STUDY

After the innovation study of Aranica, it is important to conduct a marketing evaluation in order to proceed the commercialization process. This chapter will conduct marketing analysis and find a marketing strategy for Aranica.

This chapter starts with marketing analysis which includes PEST analysis, market possibilities analysis and competitor analysis. PEST analysis will discuss how Aranica is influenced by the external factors which are political, economic, social, technological, environmental and legal factors. It is important for Aranica to know how the situations are by identifying these factors and make market strategy by considering the analysis results. Next is the analysis of market possibilities which includes market size, future growth and understanding the customers and their needs. Afterwards there will be a competitor analysis to identify the players in the current market and what advantage Aranica brings in comparison with their competitors.

The next step is to find a marketing strategy based on the market analysis, this includes a market entry strategy and a long-term strategy. The strategy also helps with setting Aranica's vision and business objective. First, we will start identifying target markets and market segments. Then we will analyse the internal and external environment with strengths, weakness, opportunities and threats of Aranica, a SWOT analysis will be performed, therefore the market entry strategy and long-term marketing strategy will be formed.

3.1 Market analysis

3.1.1 PEST analysis

Political

There are different political factors that are relevant to Aranica, the first and the most important one is that there is restrictions for flying UAVs, especially for flying out of sight. Moreover, Norwegian government is encouraging local firms to find local suppliers, this thus brings advantage to Aranica as a Norwegian company. There is also a growing tension on use of drones around the world, therefore it might cause difficulties no matter from the supplier chain side but also customers' side. Also, the Norwegian government is looking for new methods to prevent oil spill during new oil drilling projects in Northern

Norway, this could benefit Aranica when using drones for oil spill prevention is mandatory for oil companies.

Economic

The oil price drop recently has caused Norway's downside of economy, especially in the oil industry, this would push firms to think of ways to downsize costs and give Aranica advantage in the competition as it costs less, but however would also give Aranica disadvantage as it often costs more for firms to find out new solutions for their companies. Also the drop of Norwegian kroners also make it cost less to get suppliers from Norwegian suppliers, this would favor Aranica's position. However, with the current market getting more and more competitive, it is important for companies to stay upfront with innovative technologies and use them for the companies in order to out race other competitors, therefore, this factor favors Aranica.

Social

There is simply a trend against drones in the society for its wide use in wars. The concern over personal privacy as it is easy to be taken photos by the phones would also unfavor the drone solution. For the solutions Aranica is replacing, Aranica offers safty as there is no man on board while finishing assignment, human lives are cared and the society doesn't want humans to perform dangerous tasks, so this factor favors Aranica. Using drones as a method to collect data for mapping and inspection services, compared to traditional methods such as satellite and helicopters, is more sustainable since it saves more energy, with the global concern over future shortage of energy, Aranica becomes a favorable solution.

Technological

The technologies include operation of the choppers and small unmanned aircrafts, the process of interpreting the data into maps. The operating technology is unique within Aranica, and together with processing technology, they are supported by NORUT, the northern research center. Aranica technologies are know-how. Globally there is a trend to develop sustainable technologies. And Aranica is able to design a solution upon their technology for different industries upon requests.

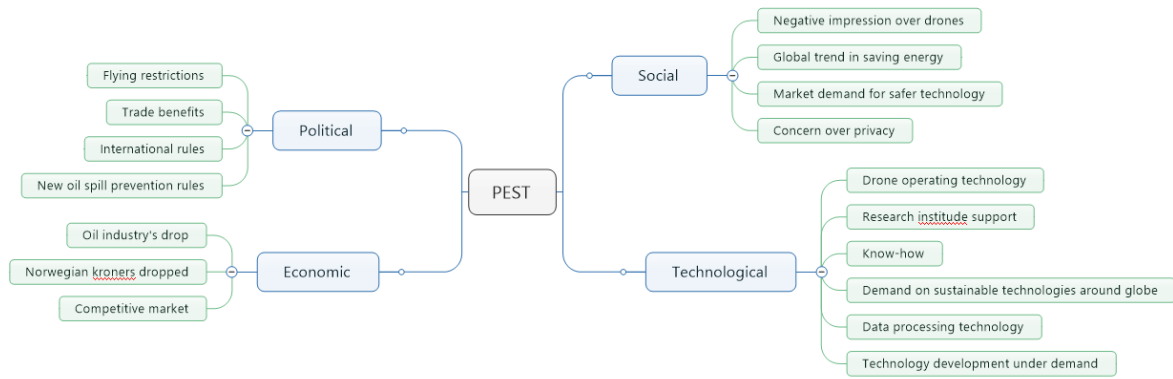


Figure 8

3.1.2 Industry Analysis

The global drone market industry is a fast growing industry. A growing amount of drone software and hardware vendors are already catering to a long list of clients in agriculture, land management, energy, and construction. Many of the vendors are small private companies and start-ups — although large defence-focused companies and industrial conglomerates are beginning to invest in drone technology, too. [8]

[8] The drones report: market forecasts, regulatory barriers, top vendors, and leading commercial applications. Business Insider. Website: <http://www.businessinsider.com/uav-or-commercial-drone-market-forecast-2015-2>. Published May 27 2015. Date: 27.05.15.

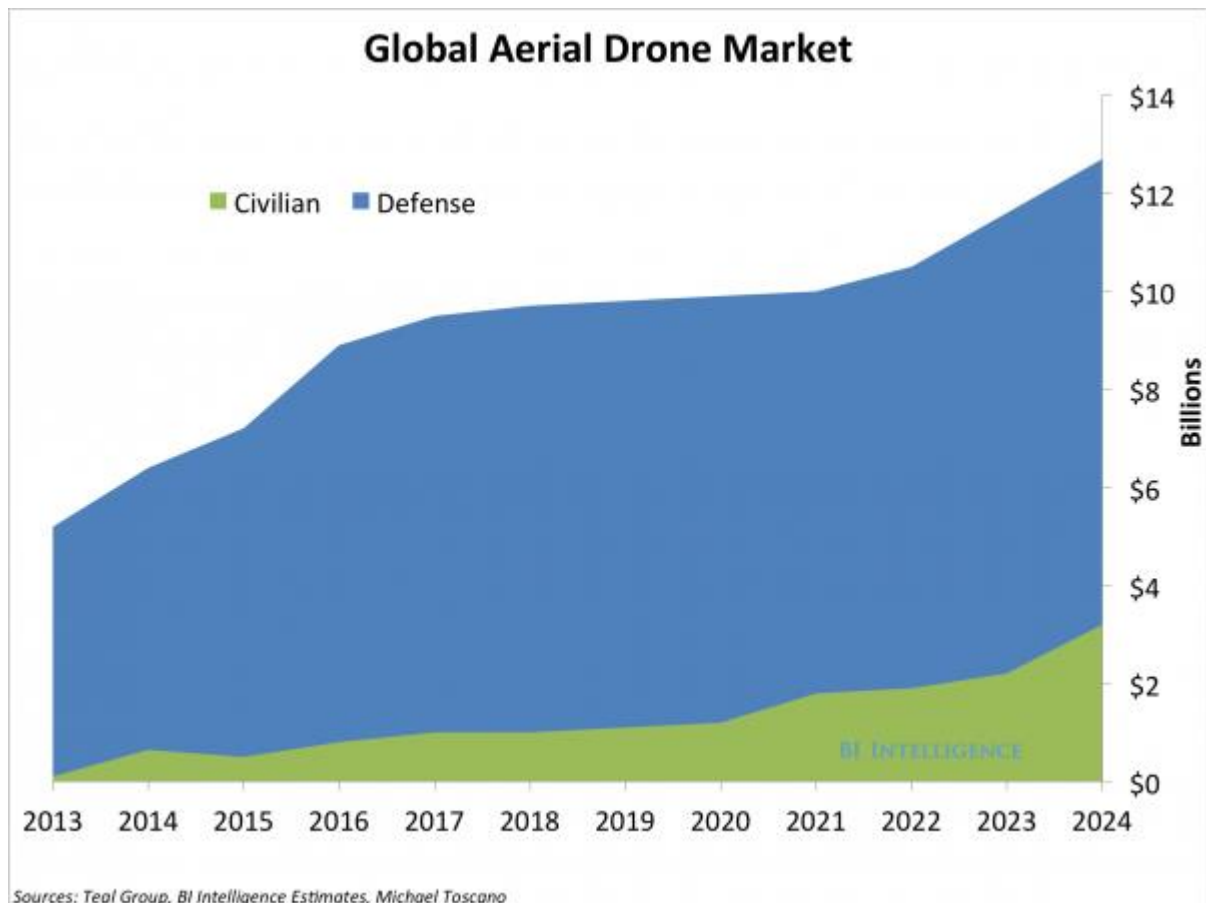


Figure 9

Figure 9 is a chart showing the growth of global civilian drone market and defense drone market from 2013 to now and also a prediction of the future growth of both civilian and defense drone markets till 2024. The size of global civilian drone market, which Aranica lies in, is expected to reach more than USD 3 billion in 2024. According to a UK research project backed by the government and top aerospace companies, the civilian drone market alone is possibly worth more than USD 400 billion [9].

However, the Norwegian civilian drone market only takes a small share of the global market, the exact percentage is unknown. Applications of civilian drone in Norway mostly are on filming for TV and commercial use, inspections for remote or dangerous areas and mapping. Further analysis will be taken on after market segmentation.

[9] Drones buzzing towards a \$400 billion market. Robohub. Website: <http://robohub.org/drones-buzzing-towards-a-400-billion-market/>. Published Jan 21 2014. Date: 26.05.15.

3.1.3 Market segment

Segmenting a market allows the market or sales program to focus on the prospects that are most likely to purchase the products or services on offer. If market segmentation has been done properly, it could enable all the marketing expenses to have the best return. There are also definite differences and these depend on whether you are selling to individual consumers or to business customers. [10]

In order to focus on customers within Aranica's capacity, segmenting the market is the first essential step. Segmentation is dividing the market into homogenous groups. (Goyat, 2011).

We are using geographic divisions and industry divisions as our segmenting criteria. By geographical divisions, the market could be segmented by regions, due to limitation of traveling capacity with drones, we choose to only focus on the Norwegian market as this is the only possible market to deliver our services with a low cost. Furthermore, the Norwegian market can be divided by regions, such as Northern Norway, Middle Norway, Western Norway and Southern Norway.

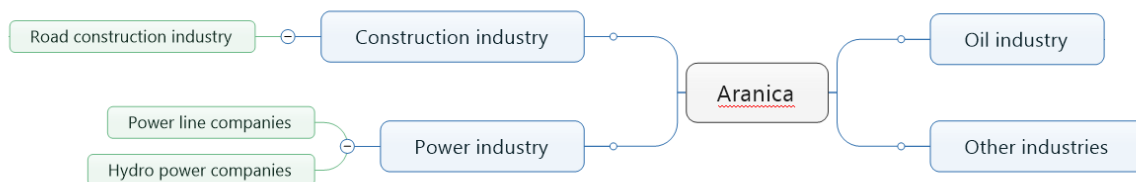


Figure 10

Segmenting by industries following geographic locations, we divide the market into power industry, construction industry, oil industry and etc. (There could be farming, forestry and other industries, however, due to the special environment in Northern Norway, listed industries are only existing industries in the region.) Figure 10 gives an overview of market segments of Aranica and further segments such as the power industry includes power line companies and hydro power companies. After market segmentation, an analysis of different

[10] Purpose of market segmentation. StartRunGrow. Website:

<http://www.startrungrow.com/information/business/1,2373,purpose-of-market-segmentation.htm>. Date: 03.05.15.

market segments including market size and potential will be performed in order for picking preferred segments for Aranica.

3.1.4 Market size

Due to our current interaction with potential customers and the result of market segmentation, we first choose the Norwegian power industry (including power line companies and hydro power companies) and the Norwegian oil industry to analyze. Secondly, we will analyze these two industries in Northern Norway as this is the region Aranica is located at, also the best target region,

For power line inspection alone, the estimated length of entire Norwegian high tension power-line grid system is 95 000 km (Bevanger, 1995), high voltage lines need to be inspected regularly, at least once a year (Fischer et al). As power lines are often located far from roads and in rugged terrain, inspection capacity is 24/30 km of line per hour, depending on the terrain, weather conditions and customer requirements, High voltage lines need to be inspected regularly, at least once a year. This leaves more than 4000 hours of work, 5 million NOK annually for power line inspection only for the whole Norwegian high voltage power line grid system.

For hydro power companies, there are 500 water plants and 2000 water dams in Norway [11], each of them is expected to be examined after the winter season when everything is defrosted. Estimated working hours for examining the water plants and dams is unknown, however this leaves the water plant examination in Norway section more than 2000-3000 hours of work, 3.75 million NOK annually.

For oil spill prevention, Norway is the largest oil producer and exporter in Western Europe, below is a chart of Norway's petroleum and other liquids production and consumption from 1992 to 2013, as shown, each day, the production is averagely over 2 million barrels. This leaves the oil spill prevention sector a huge market in the future. [12]

[11] VideoRay in hydro power plants, dams and water tunnels. VideoRay. Website:

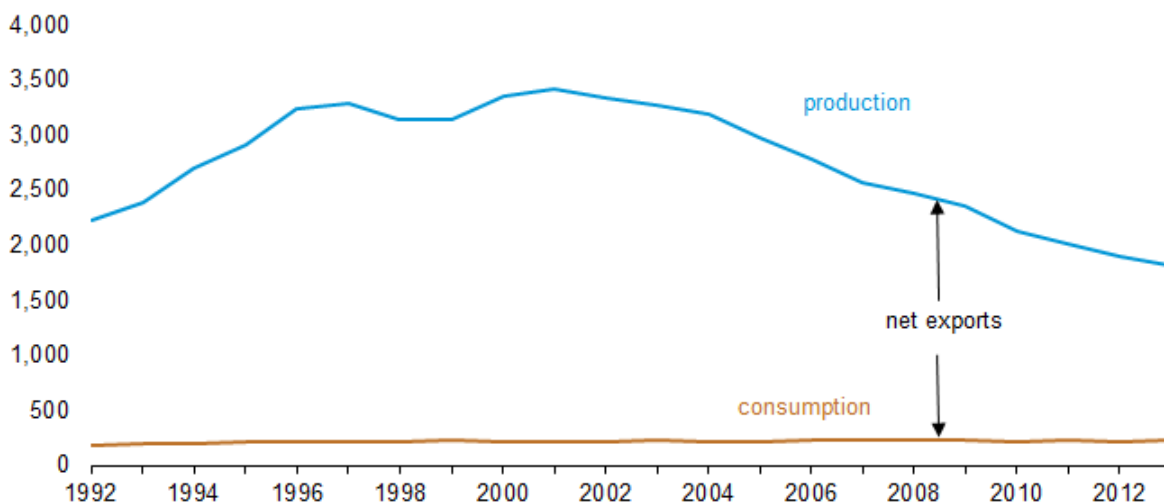
<http://www.videoray.com/VIPS/VIPS%202007%20Presentations/ROV%20Inspections%20of%20Hydro-Power%20Plants,%20Dams%20&%20Tunnels%20in%20Norway.pdf>. Date: 07.05.15.

[12] Total petroleum and other liquids production-2014. eia. Website:

<http://www.eia.gov/beta/international/?fips=no>. Date: 07.05.15.

Norway petroleum and other liquids production and consumption, 1992-2013

thousand barrels per day



Source: U.S. Energy Information Administration, *Short-Term Energy Outlook*

Note: Data for 2013 are estimates.

Figure 11

As the current interaction with power companies in Northern Norway, and the implementation period for regulations in oil industry is uncertain, we look into the power industry in Northern Norway further.

Below is a full list of power companies in Northern Norway.

Bodø Energi

Bodø Energi is a municipal owned power company that serves Bodø, Norway. It operates the power grid with 24,000 customers in Bodø, as well as Heggmoen power station.

Lofotkraft

Lofotkraft is a power company that operates the power grid in Lofoten, Norway as well as ten hydroelectric power plants through the subsidiary Lofotkraft Produksjon.

Narvik Energi

Narvik Energi is a power company that serves Narvik in Norway. It operates seven hydroelectric power stations and Nygårdsfjellet wind farm.

Troms Kraft

Troms Kraft is a power company that operates twelve hydroelectric power plants and the

power grid in fifteen municipalities in Troms, Norway. The company operates a fiberoptic broadband service in Tromsø. The company is also planning to construct Fakken windfarm.

Fauske Lysverk

Fauske Lysverk is a private power company that operates the power grid in Fauske, Norway with 6,000 customers and 440 kilometers of grid. The company does not have any of its own power production.

HelgelandsKraft

HelgelandsKraft is a power company that serves Helgeland in Norway. It owns eight hydro electric Power Plants with average annual production of 678 GWh as well as the power grid in the fourteen municipalities of Helgeland, that also own the company. It also operates district heating in Mo i Rana and a private equity company.

Kings Bay

Kings Bay AS is a government enterprise owned by the Norwegian Ministry of Trade and Industry that operates the entire settlement of Ny-Ålesund on Svalbard. The settlement, the most northerly in the world serves research staff. The company provides the necessary infrastructure, such as transport (including the airport Ny-Ålesund Airport, Hamnerabben), real estate, power and water supply, catering and other facilities.

Varanger Kraft

Varanger Kraft is a municipal owned power company that operates four hydroelectric power stations producing 420 GWh per year through the subsidiary Pasvik Kraft, operates the power grid in the seven owner municipalities in Eastern Finnmark with 3,200 km lines and 16,000 customers, as well as retails power through Barents Energi.

Salten Kraftsamband

Salten Kraftsamband or SKS is a Norwegian power company that operates eight hydroelectric power stations with annual production of 1,770 GWh. Since 1997 the company has also sold power to end-users. Head offices are located in Fauske.

As we have been informed by Troms Kraft that their expected budget for inspection in the following year is 10M NOK, however, numbers of other companies are unknown, therefore we list the revenues of the companies in Figure 12 to estimate their budget in comparison to Troms Kraft.

Power companies	Revenue in 2013	Estimated budget for inspection
Bodø Energi	51 312' NOK	5M NOK
Lofotkraft	219 927' NOK	20M NOK
Narvik Energi	115 672' NOK	10M NOK
Troms Kraft	105 985' NOK	10M NOK
Fauske Lysverk	70 096' NOK	5M NOK
HelgelandsKraft	1 315 407' NOK	100M NOK
Kings Bay	60 089' NOK	5M NOK
Varanger Kraft	29 722' NOK	2M NOK
Salten Kraftsamband	23 929' NOK	2M NOK
Total		159M NOK

Source: www.proff.no

Figure 12

Figure 12 indicated there is a market of 159M NOK each year in the inspection market for power companies in Northern Norway. As a first mover of the market, Aranica is confident to take half of the market which leads possibilities to profit about 80M NOK each year.

3.1.5 Competitor analysis

Porter's Analysis



Figure 13

1 Threat of new entrants

As the technology is based on unmanned aircrafts, which has been developed for years, it takes long time for new entrant to establish the technology, special knowledge is required and it has high criteria, the cost of new entrants would stay the same, however the technology is free to use, though the barrier to enter is high. Therefore we think the threat of new entrants is medium.

2. Threat of having substitutes

There are currently many methods in the market now that are already established, however, there is no new and more advanced technology, after Aranica is established in businesses, it would have a very low chance to have new substitutes as it has to be another breakthrough technology, the cost for customers to change to new technology would be high as most aimed

customers are established enterprises, it is costly for enterprises to change suppliers. Therefore we think the threat of having substitutes is low.

3. Bargaining power of buyers

The expected customers (power companies and oil companies) of Aranica are majorly established businesses with medium price sensitivity, and Aranica is a new business. The buyers normally place large orders and the cost for them to change suppliers is high. Currently Aranica, in comparison to its competitors, has a technological advantage, however, it is possible for other people to develop the same technology, therefore we think the bargaining power of buyers is high.

4. Bargaining power of suppliers

There are different suppliers for Aranica, one is the supplier for the hardware – components of drones, there are many producers around the global for drone components, it is not unique and can be substituted easily, the cost of changing suppliers would be very low the bargaining power of this supplier is low as there are many producers around the global for drone components, it is not unique and can be substituted easily, the cost of changing suppliers would be very low. Another supplier is NORUT, which provides the technological support and human resource for projects, the bargaining power of NORUT is high, the service they offer is unique and irreplaceable, however, the threat is low as Aranica is a spinoff company.

5. Internal or external rivalry

There are 3 major competitors, however Aranica technology in comparison to their traditional technologies are cheaper, more accurate and more sustainable. Aranica in one way is not offering the exact same service as competitors do. There is high customer loyalty in companies needing the services, and also high switching cost for customers to change suppliers.

Competitors

Midnorsk Helikopterservice (www.mnhs.no)

Located in Verdal, Nord-Trøndelag, Midnorsk Helikopterservice offers services in photography/filming, transportation, sightseeing, line inspection and advertising. Founded in 2006, with 3 employees, the company has reached 895K NOK profit in 2013.

Helitrans (www.helitrans.no)

Headquartered in Trondheim, Helitrans is Norway's largest civilian helicopter company. They have helicopters and pilots stationed throughout Norway. Helitrans offers services for businesses and private individuals. It also offers a range of services (line construction and maintenance, visual inspection, thermography, noise measurement, line cutting with saws, top control and line tracker) for power companies and is the only helicopter company in Norway that has an approved security agreement with the Norwegian Water Resources and Electricity Authority. Founded from 1998, Helitrans currently has 39 employees and its profit has reached over 2 million NOK in 2013.

Heli-Team (heliteam.no)

Based in Harstad, Heli-Team is the leading inland helicopter company in Northern Norway. Founded in 1988, Heli-Team has been flying for more than 40k hours. Heli-Team is experienced in operating in the Arctic environment, they have also been delivering all the power line missions in Norway's three northernmost counties (Finnmark, Troms, Nordland) in the last 25 years. Their operations include building and erecting steel mast constructions. Concrete Moulding, String Power Line cables. Helicopter transport pax (personnel) and transport of external load /sling operations, General survey missions and Power Line inspection with helicopter, including thermal photography of power lines, Tailor-made helicopter transport service (VIP Travel), Events sightseeing, Transportation of building materials to difficult accessible construction site. With 11 employees on board, their profit has reached about 6.5 million NOK in 2013.

Cinecopter (www.cinecopter.no)

Based in Oslo, Cinecopter is a Norwegian company specializing in unmanned aerial cinematography using high capacity unmanned VTOL drones. The drones of Cinecopter can lift any camera or sensor payload up to 10 Kg using their state of the art gyrostabilized camera platforms. They are currently offering filming services with drones and their clients are Yellow Bird Norge (Okkupert Tv Serie) kommer 2015, Friendly Films, Pang Produksjoner, Kongeparken Stavanger Landstreff 2013, ITV Barnehospitalet, Toxic for TV2. The company also covers services such as line inspections, mapping, emergency uses and other industrial appliances.

Droneservice (www.droneservice.no)

Located in western Norway – Stryn, Droneservice is a Norwegian company specializing in high quality inspection service using remote piloted aerial systems to catch information from places where it is difficult or not safe to reach. The company offers flare stack inspections onshore and offshore and power line inspections. The company also has experiences as power supply technicians and is also a qualified supplier in Achilles JQS (Achilles JQS is a cost effective system where suppliers in an easy and standardised way can advice details on their company and products and services to potential customers in a fair, open and transparent way.).

Dronepilotene (www.dronepilotene.com)

Based in Porsgrunn, Dronepilotene operates remote-controlled multi-rotor drones with camera for photo and video capture from the air in HD quality, and are among the region’s first companies specializing in professional photographic and video documentation from the air. They have divided their customers into three groups such as private customers, business, industry & media, public authorities and agencies and their services lie in three sectors - documentation, inspection and advertising.

Hålogaland Kraft (company name unknown)

A spin off company from Hålogaland Kraft, inspecting power lines with drones.

SWOT

Internal analysis (strong and weak sides)

The table below list some of our strong and weak sides.

Strong sides	Weak sides
Management team is skilled in UAV assembling and operation	The company is new and small
Strong technological support from NORUT	The technology is still being tested
Direct ownership from Technology Transfer Office with commercialization support	
Unique product in Northern Norway	Lack of employees
Access to inexpensive professionals	
High organizational flexibility	

External analysis (opportunities and threats)

The table below list some of our opportunities and some threats.

Opportunities	Threats
A wide spectrum of market	Long waiting period while getting deals done
Chance to cooperate with competitor to broaden service range	Unexpected technologic incompatibility
	Long waiting period for getting flying permission

3.2 Market strategy

3.2.1 Vision and mission

The vision is the dream. It is the ideal conditions for the community; it is how things would look if the important issues were completely, perfectly addressed. It might be a world without war, or a community in which all people are treated as equals, regardless of gender or racial background. [13]

Aranica, as the first mover of commercial drone mapping and surveillance service provider in Northern Norway, expects to be the market leader in the region it offers its services, therefore Aranica’s vision is:

- Aranica will be the market leader providing commercial drone mapping and surveillance services in Northern Norway.

The next step is to ground Aranica’s vision in practical terms. A mission statement helps to outline the actions in order to achieve the vision. An organization's mission statement describes what the group is going to do and why it's going to do that. Mission statements are similar to vision statements, in that they, too, look at the big picture. However, they're more

[13] Proclaiming your dream: developing vision and mission statements. Community Tool Box. Website: <http://ctb.ku.edu/en/table-of-contents/structure/strategic-planning/vision-mission-statements/main>. Date: 07.05.15.

concrete, and they are definitely more "action-oriented" than vision statements. The vision statement should inspire people to dream; whereas the mission statement inspire people to action. Therefore we developed the following mission for Aranica:

Aranica's mission is to develop and offer drone inspection and mapping service as a sustainable solution to customers.

3.2.2 Target market

Aranica's target market will be power industry (this includes power line companies and hydro power companies) and oil industry.

3.2.3 Marketing Entry Strategy

The geographical limitation of Aranica that it cannot deliver its services to a further distance than the maximum flying distance of drones without a high transportation cost. Aranica will not focus on the international market unless the border countries of Northern Norway. The market entry strategy here in Aranica's case only refers to its strategy to go from non-existing in the market to taking a share of the market, and further in the future to come true its vision, to become the market leader in Northern Norway.

With current company profile, Aranica is aiming at to enter the market with power industry. As previous cases indicated potential success in this industry and relationship with power companies offers an advantage for entering this sector.

Aranica is also at the same time doing test runs for other market segments for future expansion. For example, doing test run for oil spill prevention exercise to prepare policy change in Norway therefore the use of drone monitoring is enforced within the oil industry.

3.2.4 Relationship marketing strategy

Relationship marketing is a facet of customer relationship management that focuses on customer loyalty and long-term customer engagement rather than shorter-term goals like customer acquisition and individual sales. The goal of relationship marketing (or customer relationship marketing) is to create strong, even emotional, customer connections to a brand

that can lead to ongoing business, free word-of-mouth promotion and information from customers that can generate leads. [14]

As Aranica's survival will be fully dependent on the customers, maintaining relationship with customers will be important. Relying on industry referral would also be the best way for Aranica to get new clients.

Relationship marketing activities should mainly be social and structural rather than purely focused on financial outcomes. Social activities appear to generate the highest returns. Increasing communication – the amount, the frequency, and the quality – are especially effective in the beginning of the lifecycle, because communication is a strong driver of relationship quality and future relationship growth (Palmatier, 2008). To have a better relationship with the customers, it is usually important to better understand the customer's perspective. The customer's need and desire for a relationship decides the quality of relationship. If a customer has a low need, relationship marketing investments will not only generate poor returns but can actually damage the exchange by increasing customer perceptions of hassles and exchange inefficiencies (Palmatier et al. 2008). Alternatively, a customer who wants and needs a close relationship is the very best target for relationship marketing. To manage limited resources for relationship marketing, the company needs to time to give communication when the customer's need is at its peak, and that is when relationship market can turn out the best value (Palmatier et al. 2008). Each of the potential customers of Aranica will need its service at different periods of the year for different reasons, for example, hydro power companies need inspection before the snow melts in order to ensure a smooth production when the snow melts. Some companies also make their financial plan in certain month of the year, it is important for the departments in charge of purchase to decide what services and products they need to get for the company before this time. This gives a hint that Aranica should observe customer purchase cycle in order to invest time for relationship market when best needed.

[14] Relationship marketing definition. TechTarget. Website:

<http://searchcrm.techtarget.com/definition/relationship-marketing>. Date: 07.05.15.

3.3 Marketing plan

3.3.1 Pricing Strategy

The price of Aranica's service will depend on different projects. Since the current service mainly require for time and specialist to work, the price will be based on man hours needed for projects. The initial price of an hour of work is 1250NOK per person, working hours will be evaluated before starting the project.

Figure 13 is an example of the price scheme. The total cost has also included transportation and accommodation as well.

Budsjett øvelse Finnmark uke 17, 2015	Dager	Timer	Per time	Kostnad	Dir.kostnad	Sum
Forberedelser						
Søknad Luftfartstilsynet/Avinor		25	1250	31250		31250
Til reise befaring, flybillett og leiebil					6000	6000
Befaring øvelsesområdet		10	1250	12500		12500
Pakking og klargjøring		16	1250	16800		16800
Sum forberedelser						66550
Tilkjøring og mobilisering 20. april						
Tilkjøring med bil, 15 t, 2 personer		30	1000	30000		30000
Flyreise T/R Tromsø 1 stk						6000
Bil + drivstoff reise Tromsø - Mehamn					8550	8550
1 overnattinger + per diem 2 pers					4400	4400
Sum tilkjøring og mobilisering						48950
Operasjon 21. april						
				Per dag		
Mannskap 3 stk		24	1250	30000		30000
Flyleie (drift, vedlikehold og risiko)					40000	40000
Overnatting + per diem 3 pers					6600	6600
Bil kost per dag					3000	3000
Sum dag 1						79600
Operasjon 22. april						
				Per dag		
Mannskap 3 stk		24	1250	30000		30000
Flyleie (drift, vedlikehold og risiko)					40000	40000
Databehandling, overføring etc.					10000	10000
Overnatting + per diem 3 pers					6600	6600
Bil kost per dag					3000	3000
Sum dag 2						89600
Tilbakekjøring 23. april						
Hjemkjøring med bil, 15 t, 2 personer		30	1000	30000		30000
Per diem 2 pers					4400	4400
Sum hjemkjøring						34400
Sum totalt eks MVA						319100

Figure 13

However, Aranica is looking into developing its technology and make the drones fly autonomously, by then, each project will have a fixed value.

3.3.2 Promotion

Promotion is one of the key elements of the marketing mix, and deals with any one or two-way communication that takes place with the consumer. [15] After market segmentation and choosing target market (power companies and oil companies), we decide to choose industry papers and scientific journals as our major media channels. Combined with market communication with the customers, we hope to position ourselves as a high tech company delivering sustainable solutions for mapping and inspection.

The content of the promotion will be mainly about the technical functions of the service and its possibility for changing future with sustainability.

3.4 Conclusion

The market study started with marketing analysis which includes PEST analysis, market possibilities analysis and competitor analysis. The result of PEST analysis reveals the importance of political factors for regulations on flying permission, social factors for sustainability. The analysis for market size reveals the possibilities in power industry in Northern Norway. At the same time, a list of potential customers are also identified.

The competitor analysis to identify the players in the current market and what advantage Aranica brings in comparison with their competitors. It gives indication the aspects Aranica could improve.

A marketing strategy based on the market analysis, this includes a market entry strategy and a long-term strategy has been formed. The strategy also helped with setting Aranica's vision and business objective. First, we identified power companies and oil companies in Northern Norway as target markets. Then we analyzed the internal and external environment with strengths, weakness, opportunities and threats of Aranica, a SWOT analysis is performed,

[15] Promotion & advertising strategy. Marketing Made Simple. Website: http://www.marketing-made-simple.com/articles/promotional-strategy.htm#VWuRO8_tmkq. Date: 07.05.15.

therefore the market entry strategy and long-term marketing strategy are also identified.
Pricing for Aranica will start from man hour counts to fixed cost per project in the future.

4 BUSINESS PLAN

4.1 Executive Summary

Industry overview: Power industries nowadays are struggling to find efficient ways to inspect power lines when there is no need for repair. Moreover, 99% of power used in Norway is from hydro power, there are thousands of water dams waiting to be examined after the winter season has passed and things start to defrost. Aranica offers solutions not only to these power companies, but to other industries, inspection and mapping services with using drones to collect the data.

Vision: Aranica will be the market leader providing commercial drone mapping and surveillance services in Northern Norway.

Business objectives: Aranica aims at to become a profitable and primary supplier for drone mapping and surveillance services in Northern Norway.

Market Strategy: Aranica is aiming to establish its service in power industry for power line inspection and water dams 3D mapping first and looking into expanding its technology into helping oil spill prevention. Meanwhile, Aranica is also open to other possibilities to serve other industries with its technology, primarily, now there are construction, area planning, and forestry companies under consideration.

Business Model: Aranica will make its income mainly through delivering monitoring and mapping projects to businesses with a need of those. We will use our own staff and outsourced human resource for delivering the projects.

Market Potential: The market potential for Aranica is huge as its services can be used in different industries. With our market strategy, there are about 10-20 power companies in Northern Norway with 2000-3000 water dams to be examined.

Management and key resources: Aranica currently has two staff with technology support from Northern Research Institute NORUT. COO André is a certified UAV operator, the adviser as well as expected CEO Trond Båtnes also has extensive marketing experience in power industry.

4.2 The Idea

On January 20, 2014, a helicopter being used to inspect power lines in rural Colorado in the US hooked one of the wires and crashed on Monday, killing all three people on board. [16]

Sad incidents like this has not only happened once. In August 2014, two men were killed in a helicopter crash in northern Tuscaloosa County in the US during a line inspection assignment, the pilot was 51-year-old Matthew Wallace, the passenger 63-year-old David Carson. Carson was a senior line specialist for Alabama Power, and Wallace worked as a pilot of Rotor-Works, the company that owned the helicopter. [17]

The entire Norwegian high tension power-line grid system is about 95 000 km (Bevanger, 1995), High voltage *lines need to be inspected* regularly, at least once a year (*Fischer et al*).

Aranica, a company that has elaborated drone technology with remote sensing functions (gathering data on an object or area from a considerable distance) in Norway, offers services to inspect power lines and water dams. What Aranica can observe, is not only power lines, but also forest, oil spill and etc. Aranica is also able to produce accurate 3D maps for purposes like construction, municipal management and etc.

Aranica offers:

- Onsite and offsite observation with unmanned aircrafts.
- Processed data collected by the observation in the form of 3D maps or other equivalents.

Business objective

Aranica aims to become one of the largest commercial surveillance and mapping service provider in Norway.

There is a wide spectrum of market for Aranica. For example, the geographers, who look for changes on the Earth's surface that need to be mapped; the foresters, who need information

[16] Helicopter crashes during Colorado power line inspection, three dead. Reuters. Website:

<http://www.reuters.com/article/2014/01/27/us-usa-helicopter-crash-idUSBREA0Q1OP20140127>. Published January 27 2014. Date: 02.02.15.

[17] 63-year-old killed in Tuscaloosa County helicopter crash worked with Alabama Power since he was 19.

Alabama. Website: http://www.al.com/news/tuscaloosa/index.ssf/2014/08/63-year-old_tuscaloosa_man_kil.html. Published August 19 2014. Date: 02.05.15.

about what type of trees are growing and if they have been affected by disease, fire or pollution; the environmentalists, who want to detect, identify and follow the movement of pollutants such as oil slicks on the ocean; the geologists, who is interested in finding valuable minerals; the farmers, who wants to keep an eye on how his crops are growing and if they've been affected by drought, floods, disease or pests; the ship captains, who needs to find the best route through the northern ice packs; the firefighters, who sends out his crews based on information about the size and movement of a forest fire; the mountain road builders, who builds railroads or roads according to the size and shape of the mountain; the electricians, who fix and maintain power lines according results of onsite observations. There are many industries needing monitoring and mapping services, especially when drone technology appeared. Due to geographic limitation and market size, currently there are 4 primary products Aranica is offering, each product aims at a different market.

- Power line inspection

This product offers offsite inspection for power lines for power grid companies. In comparison with the traditional method –helicopter, Aranica costs much less, however, Aranica is only offering inspection, there will be no onsite maintenance.

- 3D mapping

This product offers comprehensive 3D maps for Hydropower companies, construction companies and etc. In comparison with the traditional method – human onsite measuring, Aranica is much more efficient and accurate.

- Oil spill monitoring

This product offers oil companies a higher level of preparation to prevent oil spill. This method is now being tested by NOFO (norsk Oljevernforening for Operatørselskap) and expected to be introduced to oil companies nationally.

- Area planning mapping

This product offers municipals maps for area planning. Currently, this service is offered by satellite companies to big municipals.

The above four products have prioritized power line, Hydropower, construction, oil, area planning these 5 segments for Aranica. With further testing and local market analysis, Aranica is prioritizing its power line inspection and 3D mapping these two products in particular for power companies.

The primary markets Aranica is aiming at are power line inspection, water plants and dams examination and oil spill prevention. Details to be illustrated in the following Market chapter.

Business protection

The advanced technology of Aranica is a know-how technology developed by NORUT, a research center in Northern Norway. It is not an idea that is easy to copy since the development of service has high entry requirement.

Business model

In order to obtain legitimacy, we are reaching different markets such as power industry, oil industry, construction industry for first clients. We choose B2B model since no matter whether its farm owners or oil companies, the operation of the service is organizational scale. We charge service fees depending on projects and we are reaching our clients individually. Apart from 1.5 employees of the company, all technical support is outsourced from NORUT and cost will be paid per project.

4.3 Market

Market segments and size

Due to our current interaction with potential customers and the result of market segmentation, we first choose the Norwegian power industry (including power line companies and hydro power companies) and the Norwegian oil industry to analyze. Secondly, we will analyze these two industries in Northern Norway as this is the region Aranica is located at, also the best target region,

For power line inspection alone, the estimated length of entire Norwegian high tension power-line grid system is 95 000 km (Bevanger, 1995), high voltage lines need to be inspected regularly, at least once a year (Fischer et al). As power lines are often located far from roads and in rugged terrain, inspection capacity is 24/30 km of line per hour, depending on the terrain, weather conditions and customer requirements, High voltage lines need to be inspected regularly, at least once a year. This leaves more than 4000 hours of work, 5 million NOK annually for power line inspection only for the whole Norwegian high voltage power line grid system.

For hydro power companies, there are 500 water plants and 2000 water dams in Norway [18], each of them is expected to be examined after the winter season when everything is defrosted. Estimated working hours for examining the water plants and dams is unknown, however this leaves the water plant examination in Norway section more than 2000-3000 hours of work, 3.75 million NOK annually.

For oil spill prevention, Norway is the largest oil producer and exporter in Western Europe, below is a chart of Norway's petroleum and other liquids production and consumption from 1992 to 2013, as shown, each day, the production is averagely over 2 million barrels. This leaves the oil spill prevention sector a huge market in the future. [19]

[18] VideoRay in hydro power plants, dams and water tunnels. VideoRay. Website:

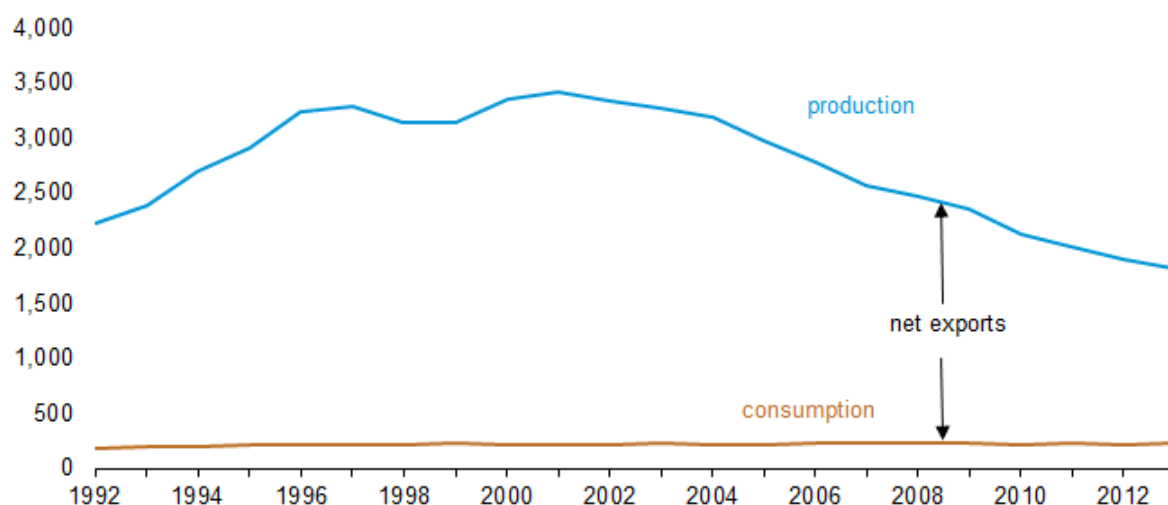
<http://www.videoray.com/VIPS/VIPS%202007%20Presentations/ROV%20Inspections%20of%20Hydro-Power%20Plants,%20Dams%20&%20Tunnels%20in%20Norway.pdf>. Date: 07.05.15.

[19] Total petroleum and other liquids production-2014. eia. Website:

<http://www.eia.gov/beta/international/?fips=no>. Date: 07.05.15.

Norway petroleum and other liquids production and consumption, 1992-2013

thousand barrels per day



Source: U.S. Energy Information Administration, *Short-Term Energy Outlook*
 Note: Data for 2013 are estimates.

Figure 11

For Aranica, there will be more potential as its functions could not only be used in mentioned sectors but more sectors in other industries and regions.

As the current interaction with power companies in Northern Norway, and the implementation period for regulations in the oil industry is uncertain, we look into the power industry in Northern Norway further.

As we have been informed by Troms Kraft that they expected a budget for inspection in the following year of 10M NOK, however, the revenues of other companies are unknown, therefore we list the revenues of the companies in Figure 12 to estimate their budget in comparison to Troms Kraft.

Power companies	Revenue in 2013	Estimated budget for inspection
Bodø Energi	51 312' NOK	5M NOK
Lofotkraft	219 927' NOK	20M NOK
Narvik Energi	115 672' NOK	10M NOK
Troms Kraft	105 985' NOK	10M NOK

Fauske Lysverk	70 096' NOK	5M NOK
HelgelandsKraft	1 315 407' NOK	100M NOK
Kings Bay	60 089' NOK	5M NOK
Varanger Kraft	29 722' NOK	2M NOK
Salten Kraftsamband	23 929' NOK	2M NOK
Total		159M NOK

Source: www.proff.no

Figure 12

Figure 12 indicated there is a market of 159M NOK each year in the inspection market for power companies in Northern Norway. As a first mover of the market, Aranica is confident to take half of the market which leads possibilities to profit about 80M NOK each year.

Today's and future's competitors in the market

For each sector Aranica is aiming at, Aranica faces different competing technologies and competitors, the competing technologies are satellite, onsite measurement, airplane and helicopters and more. Below is a chart to compare Aranica with its competing technologies under different variables.

	Aranica	Satellite	Onsite measurement	Airplanes and helicopters	Other drone services
Price advantage	✓				
Accurate	✓			✓	
Location flexibility	✓				✓

Is the technology mature?	✓	✓	✓	✓	✓
Is the technology accepted by the market?		✓	✓	✓	
Prompt delivery time	✓				✓

However, there are also companies in the Norwegian market using similar technology (drones) to target the same markets Aranica is targeting at.

Below is a list of the competitors:

Midnorsk Helikopterservice (www.mnhs.no)

Located in Verdal, Nord-Trøndelag, Midnorsk Helikopterservice offers services in photography/filming, transportation, sightseeing, line inspection and advertising. Founded in 2006, with 3 employees, the company has reached 895K NOK profit in 2013.

Helitrans (www.helitrans.no)

Headquartered in Trondheim, Helitrans is Norway's largest civilian helicopter company. They have helicopters and pilots stationed throughout Norway. Helitrans offers services for businesses and private individuals. It also offers a range of services (line construction and maintenance, visual inspection, thermography, noise measurement, line cutting with saws, top control and line tracker) for power companies and is the only helicopter company in Norway that has an approved security agreement with the Norwegian Water Resources and Electricity Authority. Founded from 1998, Helitrans currently has 39 employees and its profit has reached over 2 million NOK in 2013.

Heli-Team (heliteam.no)

Based in Harstad, Heli-Team is the leading inland helicopter company in Northern Norway. Founded in 1988, Heli-Team has been flying for more than 40k hours. Heli-Team is experienced in operating in the Arctic environment, they have also been delivering all the power line missions in Norway's three northernmost counties (Finnmark, Troms, Nordland) in the last 25 years. Their operations include building and erecting steel mast constructions. Concrete Moulding, String Power Line cables. Helicopter transport pax (personnel) and transport of external load /sling operations, General survey missions and Power Line inspection with helicopter, including thermal phtography of power lines, Tailor-made helicopter transport service (VIP Travel), Events sightseeing, Transportation of building materials to difficult accessible construction site. With 11 employees on board, their profit has reached about 6.5 million NOK in 2013.

Cinecopter (www.cinecopter.no)

Based in Oslo, Cinecopter is a Norwegian company specializing in unmanned aerial cinematography using high capacity unmanned VTOL drones. The drones of Cinecopter can lift any camera or sensor payload up to 10 Kg using their state of the art gyrostabilized camera platforms. They are currently offering filming services with drones and their clients are Yellow Bird Norge (Okkupert Tv Serie) kommer 2015, Friendly Films, Pang Produksjoner, Kongeparken Stavanger Landstreff 2013, ITV Barnehospitalet, Toxic for TV2. The company also covers services such as line inspections, mapping, emergency uses and other industrial appliances.

Droneservice (www.droneservice.no)

Located in western Norway – Stryn, Droneservice is a Norwegian company specializing in high quality inspection service using remote piloted aerial systems to catch information from places where it is difficult or not safe to reach. The company offers flare stack inspections onshore and offshore and power line inspections. The company also has experiences as power supply technicians and is also a qualified supplier in Achilles JQS (Achilles JQS is a cost effective system where suppliers in an easy and standardised way can advice details on their company and products and services to potential customers in a fair, open and transparent way.).

Dronepilotene (www.dronepilotene.com)

Based in Porsgrunn, Dronepilote operates remote-controlled multi-rotor drones with camera for photo and video capture from the air in HD quality, and are among the region's first companies specializing in professional photographic and video documentation from the air. They have divided their customers into three groups such as private customers, business, industry & media, public authorities and agencies and their services lie in three sectors - documentation, inspection and advertising.

Hålogaland Kraft (company name unknown)

A spin off company from Hålogaland Kraft, inspecting power lines with drones.

4.4 Management

Aranica is a spin-off company that is directly owned by the technology transfer office Norinnova at the University of Tromsø. The company is currently with two employees and supported by NORUT (a research center) on the technical side.

André Kjellstrup

Chief Operation Officer

André is educated in Computer Science and an approved UAS (Unmanned Aerial Vehicle Systems) operator. He has extensive knowledge in assembling and operating drones. He has been the CEO of FlyFoto-Nord.no and is also responsible for the IT system at Tromsø Kommune.

Kristian Bøckman

Chief Executive Officer

Kristian Bøckman is an experienced entrepreneur with track record success. Graduated from the University of Boston and Norwegian University of Life Science with a master's degree in Entrepreneurship, He has competences including within board, financing of technology-based business development, as well as evaluation and protection of patent rights (IPR).

Trond Båtnes

Mentor (CEO to be)

Trond has over 17 years of experience in marketing. Been the Marketing Director of Ishavskraft for 6 years, he also has experiences and extensive connections in power industry. He has also been the CEO of a software and consultancy company.

NORUT

NORUT is a multi-disciplinary research and innovation group, which provides services of high quality and practical applicability for public sector authorities and industry and business actors in Norway and abroad. UiT - The Arctic University of Norway is the majority shareholder in the NORUT Group.

4.5 SWOT Analysis

Internal analysis (strong and weak sides)

The table below list some of our strong and weak sides.

Strong sides	Weak sides
Management team is skilled in UAV assembling and operation	The company is new and small
Strong technological support from NORUT	The technology is still being tested
Direct ownership from Technology Transfer Office with commercialization support	
Unique product in Northern Norway	Lack of employees
Access to inexpensive professionals	
High organizational flexibility	

External analysis (opportunities and threats)

The table below list some of our opportunities and some threats.

Opportunities	Threats
A wide spectrum of market	Long waiting period while getting deals done
Chance to cooperate with competitor to broaden service range	Unexpected technologic incompatibility
	Long waiting period for getting flying permission

4.6 Strategy

Target Market

Aranica's target market will be power industry (this includes power line companies and hydro power companies) and oil industry.

Pricing

The cost of using Aranica's service is mainly calculated based on working hours. Aranica will evaluate the project and estimate expected working hours including hours for submitting documents to apply for fly permission, hours of preparation, days of operation, in order to give the full cost for finishing the project. The price of man hour is NOK 1250 per person per hour (cost is NOK 450 per person per hour for Aranica staff, NOK 900 per person per hour for NORUT staff) and this would be the major source for Aranica's profit.

With Aranica's current experience, each project could be priced at NOK 50K-350K.

Market Communication

Our customers will be primarily power companies in Northern Norway. There are currently 7-8 power companies in Northern Norway, with B2B model, our major market activities would be direct contact with them and references.

The further plan of marketing activities would be breaking through the geographical and industry frame with coverage of the technology by scientific publications.

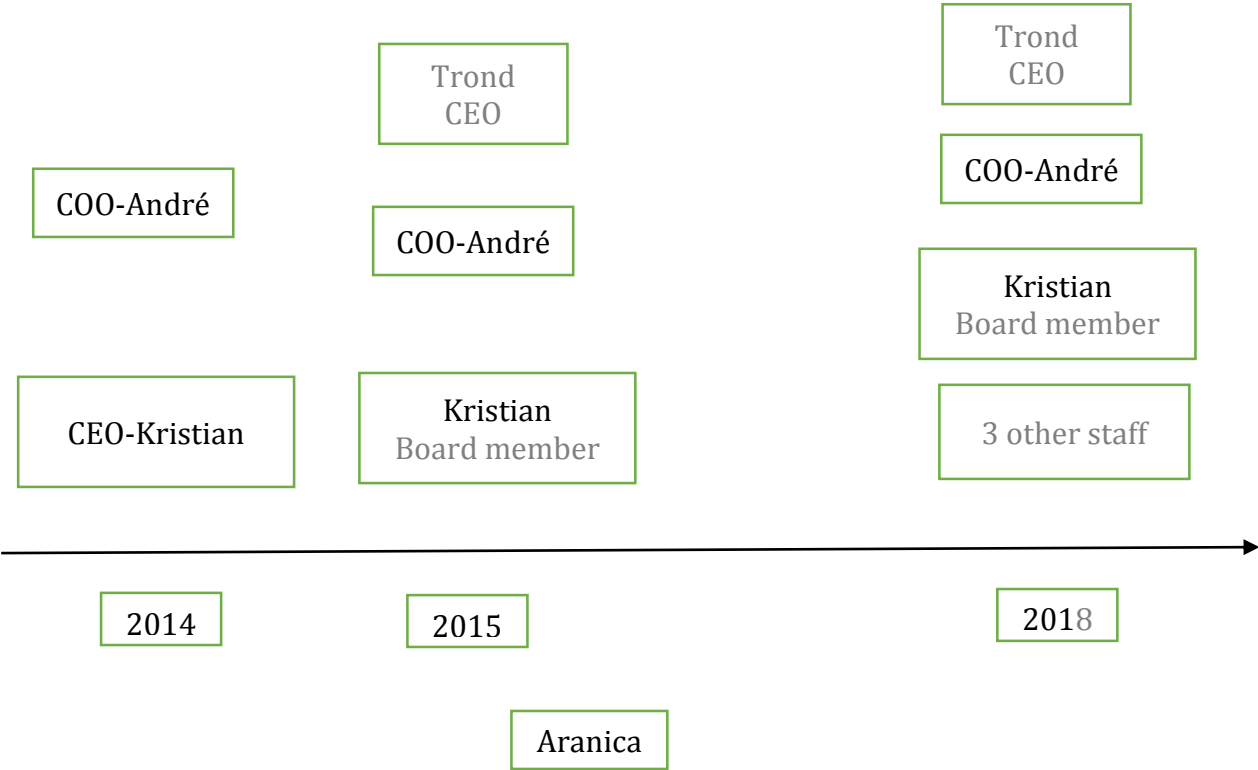
Organization

Currently Aranica has two employees, COO André is focused on the technology side and he ensures the operation for delivering services is smooth, CEO Kristian (half employed) is overseeing the sales and marketing aspect of the company. NORUT, the northern research institute, also interacts with André for technology development and support.

As the below figure shows, for the coming year, Aranica is planning to have a full time CEO Trond Båtnes, who has extensive marketing experience, in particular in power industry.

As a long term plan, Aranica is seeing themselves with 5 long term staff in 3-5 years' time.

Aranica will also look into to deliver its service automatically.



4.7 Financial Plan

Sales Forecast

Aranica currently has three projects, number one project for oil spill prevention exercise with NOFO is under operation in April 2015, the income of this project is 330K NOK, there are also two other contracts worth 50K NOK with YMBER which is for power line inspection and 150K NOK with university for sea mammal watching. Aranica is also having discussions with Troms Kraft for mapping hydropower plants.

With our current contact with hydro power companies, we expect COO André to use most of his working hours on delivering projects. Estimated André is working 3 full days each week, each month he will be working approximately 13 days on average. We also expect to outsource 20% of the project to NORUT. Therefore the monthly revenue is expected to be more than $1250 * 24 * 13 / 80\% = 488\text{K NOK}$.

If there are 11 working months, the expected revenue of 2015 from April would be 4.4 million NOK.

For 2016 and 2017, we assume there will be a 20% growth rate, so the revenues of 2016 and 2017 will be 6.45 M NOK and 7.74 M NOK.

Expenses Forecast

Apart from the cost of human resources, the other costs of Aranica are very low, as we assemble the UAVs by ourselves, each plane only costs around 10K NOK, we plan to get 2 more planes and 2 more copters in the coming months, which would cost about 40K NOK.

The cost of André's salary is 50K NOK per month.

Expected if we could hire Trond as our CEO from July, the cost of hiring him would be about 60K NOK per month.

We also expect to hire another person in beginning of 2017, the cost of this person's salary would be 45K NOK per month.

Other costs are relatively low in Aranica's case. We put 200 NOK per month as website fees. It is free to use the offices for Aranica, therefore such costs are 0. For detailed expenses forecast, please refer to Cash Flow Projection in Appendix.

Cash Flow Statement and Profit & Loss Projection

Aranica AS			
3-YEAR CASH FLOW PROJECTION			
	Year-1	Year-2	Year-3
TOTAL CASH IN	NOK 4 392 000	NOK 7 027 200	NOK 8 432 640
TOTAL CASH DISBURSEMENT	NOK 1 070 500	NOK 1 718 800	NOK 2 404 600
Closing Cash Balance (Cummulative)	NOK 3 321 500	NOK 8 629 900	NOK 14 657 940

Figure 13

Profit and Loss Projection (3 Years)

Aranica AS

	2015	2016	2017
Sales	NOK 4 392 000,00	NOK 7 027 200,00	NOK 8 432 640,00
Cost/ Goods Sold (COGS)	NOK 0,00	NOK 0,00	NOK 0,00
Gross Profit	<u>NOK 4 392 000,00</u>	<u>NOK 7 027 200,00</u>	<u>NOK 8 432 640,00</u>
Operating Expenses			
Salary (Office & Overhead)	NOK 1 028 700,00	NOK 1 676 400,00	NOK 2 362 200,00
Marketing	NOK 1 800,00	NOK 2 400,00	NOK 2 400,00
Internal resources	NOK 40 000,00	NOK 40 000,00	NOK 40 000,00
Other expense (specify)	NOK 0,00	NOK 0,00	NOK 0,00
Total Expenses	<u>NOK 1 070 500,00</u>	<u>NOK 1 718 800,00</u>	<u>NOK 2 404 600,00</u>
Net Profit Before Tax	NOK 3 321 500,00	NOK 5 308 400,00	NOK 6 028 040,00
Corporate Taxes	NOK 896 805,00	NOK 1 433 268,00	NOK 1 627 570,80
Net Profit After Tax	NOK 2 424 695,00	NOK 3 875 132,00	NOK 4 400 469,20
Owner Draw/ Dividends	NOK 0,00	NOK 0,00	NOK 0,00
Adj. to Retained Earnings	<u>NOK 2 424 695,00</u>	<u>NOK 3 875 132,00</u>	<u>NOK 4 400 469,20</u>

Figure 14

Figure 13 is a screenshot of the projected cash flow of Aranica in 3 years. For detailed cash flow every month, please see Cash Flow Projection in Appendix. Figure 14 is a screenshot of the projected Profit & Loss of Aranica in 3 years.

4.8 Risk

There are different risks for Aranica currently and in the future, below chart illustrates the different risks the company is facing.

Risk	Level	Effect	Precaution
Risk in the market			
We fail at introducing our technology to expected customers	High	Losing market shares	Looking into more industries, aiming at industries with previous successful cases, looking into investment for testing period
Competitions	High	Losing market shares	Act and enter market quickly
We fail at getting investment	Low	Bankruptcy	Support from Norinova and NORUT
We fail at delivering projects	Low	Losing market shares	Looking into expanding capacity, maintaining relationship with NORUT
Risk in the company			
We fail at getting employees we need	Medium	Low speed in development	Maintain good relationship with key persons and offering shares of company to key employees
We lose key persons	Low	Low speed in development	Key technology and knowledge should be shared within the company

The biggest risk for Aranica currently is its testing result with Troms Kraft and YMBER, whether the technology can fulfil the customer in different aspects and be acquired on a regular basis. If the result is positive, it will open a big door for the company, however, if the result is negative, the company would have look into other industries to find its own fit.

There is also a risk for competitors, currently, there is a spin-off company from Hålogaland Kraft developing similar technologies with Aranica for the power line inspection, and competitors could cut Aranica expected market shares therefore its income. Facing this situation, it is extremely important for Aranica to move fast and enter the market before them, as well as improving its services not only from the technology aspect but other aspects.

Currently, André is the key person in the company, with the knowledge of the technology as well as the ability to operate the projects. However, the possibility of André leaving is very low.

Aranica is also looking for a full time CEO, Trond Båtnes would be the ideal candidate, however, the company is struggling to offer enough pay for him, it is important to think other alternatives such as ownership to him in order to get better development in the company.

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APPENDIX

Cash Flow Projection

Materials	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Equipment	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Project Contract Resources	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Subcontractor 2: NAME SERVICE	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Subcontractor 1: NAME SERVICE	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Materials	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Facilities and Equipment	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Technical Support	NOK 0	NOK 40 000	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 40 000
Materials	NOK 0	NOK 40 000	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 40 000
Equipment	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Financial	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Acquisitions	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Loan Payments (P+I)	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Incidental Loan Repayments	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Short-Term Debt	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Aged Accounts Payable	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
R&D Expenses	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
In-Licensing of Intellectual Property	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Subscriptions and Technical Research	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Travel	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Selling Expenses (eg Commissions)	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Office Support	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Office Supplies	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Office Equipment	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Professional Fees	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Legal -- General	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Legal -- Patents	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Accounting	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Bookkeeping	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Advisor Fees	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Banking Charges	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Bank Fees	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Credit Card Charges and Interest	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Interest on Line of Credit	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Taxes	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Sales Tax	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Income Tax	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Miscellaneous	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Insurance	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Membership Fees	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Couriers, Mail and Postage	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
TOTAL CASH DISBURSEMENT	NOK 63 700	NOK 103 700	NOK 63 700	NOK 139 900	NOK 139 900	NOK 139 900	NOK 139 900	NOK 139 900	NOK 139 900	NOK 139 900	NOK 1 070 500
Net Cash	NOK 424 300	NOK 384 300	NOK 424 300	NOK 348 100	NOK 348 100	NOK 348 100	NOK 348 100	NOK 348 100	NOK 348 100	NOK 348 100	NOK 3 321 500
Closing Cash Balance (Cummulative)	NOK 424 300	NOK 808 600	NOK 1 232 900	NOK 1 581 000	NOK 1 929 100	NOK 2 277 200	NOK 2 625 300	NOK 2 973 400	NOK 3 321 500	NOK 3 321 500	NOK 3 321 500

Cash Flow Projection

Acquisitions	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Loan Payments (P+I)	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Incidental Loan Repayments	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Short-Term Debt	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Aged Accounts Payable	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
R&D Expenses	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
In-Licensing of Intellectual Property	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Subscriptions and Technical Research	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Travel	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Selling Expenses (eg Commissions)	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Office Support	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Office Supplies	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Office Equipment	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Professional Fees	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Legal -- General	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Legal -- Patents	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Accounting	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Bookkeeping	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Advisor Fees	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Banking Charges	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Bank Fees	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Credit Card Charges and Interest	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Interest on Line of Credit	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Taxes	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Sales Tax	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Income Tax	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Miscellaneous	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Insurance	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Membership Fees	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Couriers, Mail and Postage	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
TOTAL CASH DISBURSEMENT	NOK 179 900	NOK 139 900	NOK 139 900	NOK 139 900	NOK 139 900	NOK 139 900	NOK 139 900	NOK 139 900	NOK 139 900	NOK 139 900	NOK 139 900	NOK 139 900	NOK 139 900	NOK 1 718 800
Net Cash	NOK 405 700	NOK 445 700	NOK 445 700	NOK 445 700	NOK 445 700	NOK 445 700	NOK 445 700	NOK 445 700	NOK 445 700	NOK 445 700	NOK 445 700	NOK 445 700	NOK 445 700	NOK 5 308 400
Closing Cash Balance (Cummulative)	NOK 3 727 200	NOK 4 172 900	NOK 4 618 600	NOK 5 064 300	NOK 5 510 000	NOK 5 955 700	NOK 6 401 400	NOK 6 847 100	NOK 7 292 800	NOK 7 738 500	NOK 8 184 200	NOK 8 629 900	NOK 8 629 900	NOK 8 629 900

Cash Flow Projection

Loan Payments (P+I)	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Incidental Loan Repayments	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Short-Term Debt	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Aged Accounts Payable	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
R&D Expenses	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
In-Licensing of Intellectual Property	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Subscriptions and Technical Research	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Travel	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Selling Expenses (eg Commissions)	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Office Support	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Office Supplies	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Office Equipment	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Professional Fees	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Legal -- General	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Legal -- Patents	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Accounting	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Bookkeeping	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Advisor Fees	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Banking Charges	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Bank Fees	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Credit Card Charges and Interest	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Interest on Line of Credit	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Taxes	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Sales Tax	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Income Tax	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Miscellaneous	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Insurance	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Membership Fees	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
Couriers, Mail and Postage	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0	NOK 0
TOTAL CASH DISBURSEMENT	NOK 237 050	NOK 197 050	NOK 197 050	NOK 197 050	NOK 197 050	NOK 197 050	NOK 197 050	NOK 197 050	NOK 197 050	NOK 197 050	NOK 197 050	NOK 197 050	NOK 197 050	NOK 197 050	NOK 2 404 600
Net Cash	NOK 465 670	NOK 505 670	NOK 505 670	NOK 505 670	NOK 505 670	NOK 505 670	NOK 505 670	NOK 505 670	NOK 505 670	NOK 505 670	NOK 505 670	NOK 505 670	NOK 505 670	NOK 505 670	NOK 6 028 040
Closing Cash Balance (Cummulative)	NOK 9 095 570	NOK 9 601 240	NOK 10 106 910	NOK 10 612 580	NOK 11 118 250	NOK 11 623 920	NOK 12 129 590	NOK 12 635 260	NOK 13 140 930	NOK 13 646 600	NOK 14 152 270	NOK 14 657 940	NOK 14 657 940	NOK 14 657 940	NOK 14 657 940