

NHH



Sources of Creativity in Consumer Ideation

Effects of Providing Information on Company Vision and
Market Research

Jim Olaisen

Supervisor: Magne Supphellen

Master Thesis, Master of Science in Economics and Business
Administration, Strategy and Management

NORWEGIAN SCHOOL OF ECONOMICS

This thesis was written as a part of the Master of Science in Economics and Business Administration at NHH. Please note that neither the institution nor the examiners are responsible – through the approval of this thesis – for the theories and methods used, or results and conclusions drawn in this work.

Abstract

We study the effects on creativity of providing information on (1) company vision, (2) reactive market research, and (3) proactive market research in consumer ideation of new services. We measure creativity by four variables (a) overall creativity, (b) number of ideas, (c) novelty, and (d) appropriateness. We collect data through a lab experiment conducted with students at the Norwegian School of Economics. We asked participants to generate as many ideas as possible on Near Field Communication Technologies, which is the case we used in the experiment. We treated participants with information on either company vision, reactive market research, or proactive market research. The control group received no additional information. Our findings suggest that (2) reactive market research have a positive effect on (c) novelty of ideas generated in consumer ideation. None of the other findings was statistically significant.

Contents

ABSTRACT.....	2
CONTENTS	3
1. INTRODUCTION	6
1.1 RESEARCH PROBLEM	8
1.2 REPORT STRUCTURE	9
2. THEORY.....	10
2.1 INNOVATION	10
2.2 CREATIVITY	12
2.2.1 <i>Operational Creativity Definition</i>	13
2.2.2 <i>Conceptual Creativity Definition</i>	13
2.2.3 <i>Creativity; Why, Where and How</i>	14
2.3 CONSUMER IDEATION	16
2.3.1 <i>Connecting With Customers</i>	17
2.3.2 <i>Origin of Ideas</i>	18
2.4 SOURCES OF CREATIVITY IN CONSUMER IDEATION	19
2.4.1 <i>Market Research</i>	19
2.4.2 <i>Company Vision</i>	23
3. MODEL AND HYPOTHESES	27
3.1 MODEL.....	27
3.2 HYPOTHESES	28
4. RESEARCH DESIGN AND METHOD	33
4.1 DATA COLLECTION	34
4.2 EXPERIMENT	34
4.2.1 <i>Sample</i>	35

4.2.2	<i>Conducting the Experiment</i>	36
4.2.3	<i>Case</i>	37
4.2.4	<i>Instructions</i>	39
4.2.5	<i>Treatment Information</i>	40
4.3	MEASURES	44
4.3.1	<i>Survey</i>	44
4.3.2	<i>Creativity</i>	48
5.	ANALYSIS AND RESULTS	50
5.1	DATA ANALYSIS	50
5.1.1	<i>Descriptive Statistics: Raw Data</i>	50
5.1.2	<i>Variables</i>	52
5.2	RESULTS	55
5.2.1	<i>Descriptive Statistics: Final Data</i>	56
5.2.2	<i>Test of Hypotheses</i>	57
5.2.3	<i>Test of Differences in Dependent Variables across Groups</i>	61
5.2.4	<i>Test of Potential Moderators</i>	65
5.2.5	<i>Test of Differences in Extreme Values across Groups</i>	67
6.	DISCUSSION	70
6.1	FINDINGS	70
6.2	THEORETICAL IMPLICATIONS	71
6.3	PRACTICAL IMPLICATIONS	72
6.4	VALIDITY AND RELIABILITY	73
6.4.1	<i>Validity</i>	73
6.4.2	<i>Reliability</i>	75

6.5	ETHICS	76
6.6	LIMITATIONS AND FURTHER RESEARCH	78
7.	CONCLUSION	81
8.	REFERENCES	82
9.	APPENDIX	87
9.1	EXPERIMENT	87
9.1.1	<i>Information on NFC Technology</i>	<i>87</i>
9.1.2	<i>Task</i>	<i>89</i>
9.1.3	<i>Treatment Reports</i>	<i>92</i>
9.1.4	<i>Survey to Participants</i>	<i>99</i>
9.2	CREATIVITY MEASURE	100
9.2.1	<i>Survey to Experts</i>	<i>100</i>

1. Introduction

Yahoo! has a number of troubles. Based on user feedback they have done too much, over-innovated, trying to be everything for everyone. Yahoo! has listened too much. What they lack is a clear vision (Skibsted & Hansen, 2014b). Two successful innovators are Apple and IKEA. Rather than listening to customer feedback, they have a clear vision that guides their innovation. Through their vision, they are able to differentiate themselves. They do so by launching user-friendly products customers did not realize they needed (Skibsted & Hansen, 2014a).

Customers do not know what they want before they get it. Accordingly, customers cannot predict future demands any better than companies can. In addition, customers dislike change, especially radical change. If they are satisfied with a product or service, they do not want to change it. It is only when companies change the products that they supply that customers realize that it is an improvement (Skibsted & Hansen, 2014a).

Traditional innovation theory suggests no best practice for innovation. Instead, traditional innovation theory distinguish between two different models. The technology push model and the market pull model (Johannessen, 2012, p. 22). In the technology push model, the process of innovation begins internally with scientists or entrepreneurs making unexpected discoveries or inventions. On the opposite, the market pull model begins externally, suggesting that the role of the customer is critical for successful innovation. Firms discover ideas from interactions with customers, and innovate based on customer's needs (Johannessen, 2012, p. s22). These two models for innovation show that there is no correct answer as to how to innovate. Consequently, we do not know how to interpret the discussion above. Should companies follow their vision or listen to customers? We do not know.

What we do know, is that in today's economy, disruptive innovations challenge existing business models. Accordingly, firms put more resources into research and development, striving to maintain high rates of innovation (Elerud-Tryde & Hooge, 2014). All innovation starts with an idea, so in order to maintain high rates of innovation, firms need a continuous flow of new ideas (Elerud-Tryde & Hooge, 2014). Despite this fact, there has been paid little attention in the literature about the phase of idea generation (Dahl and Moreau, 2002).

In practice, firms are increasingly involving customers in the phase of idea generation, a concept we will refer to as consumer ideation (Schweitzer, Gassmann & Rau, 2014). This is resulting in large IT platforms where users can provide companies with ideas through idea contests, toolkits, and other ideation systems (Elerud-Tryde & Hooge, 2014). For instance, LEGO realized that users designed many popular toys. To benefit from users designs, LEGO created a platform where users can create and vote on ideas (Elerud-Tryde & Hooge, 2014). Previous research suggests that the involvement of users can potentially lead to more innovative ideas (Elerud-Tryde & Hooge, 2014). Thereby, firms striving to keep a high rate of innovation could benefit from consumer ideation.

The central idea behind involving users in consumer ideation is to use their knowledge to generate more and better innovations (Schweitzer et al. 2014). The literature on consumer ideation has paid attention to which users firms should include in consumer ideation, based on users given knowledge. That is, whether they are ordinary users, lead user, inhabit technological knowledge etcetera ((Kristensson, Gustafsson & Archer, 2004), (Magnusson, 2009), (Schweitzer et al. 2014)). That being the case, we can still increase consumers' knowledge, or inspire their creativity. What will happen if we provide users participating in consumer ideation with knowledge? We do not know. What kind of information would we want to provide to them? Based on the discussion about Yahoo!, a reasonable suggestion would be to provide users with information on either user feedback or company vision.

Firms usually gather information on user feedback through market research. Market research is mainly concerned with what the customer would like to buy, and why (Witell, Kristensson, Gustafsson & Löfgren, 2011). Common techniques to collect such data is surveys, interviews, focus groups, and co-creation with customers. On the other side, a company's vision is a picture of the future. It gives an understanding of why people will be better off and how the firms will create value. An effective vision tells the company where they are going and why. Thus, the vision directs and motivates employee's actions towards some opportunity or specific goals (Johannessen, 2012).

The purpose of this research is to find answers to the questions we have asked during this introduction. By providing users in consumer ideation with knowledge about market research and company vision, we mainly wish accomplish the following two achievements. Firstly, we want to contribute with more insight to the literature on consumer ideation and the phase of ideation. Our findings will not take users knowledge as granted, but say

something about the effects of providing users with additional knowledge. In practice, we hope that these findings will have an impact on firms' management of consumer ideation. Secondly, we want to provide input to the discussion about whether market research or company vision is the preferred perspective of innovation. That, we hope will contribute to how we think of traditional innovation theory and to how managers think about their strategies for innovation.

1.1 Research Problem

Innovation is a process that involves two qualitatively different stages, the generation of creative ideas, and the implementation of the generated ideas (Miao & Wang, 2015, p. 2375). As we see, creativity is an important part of innovation. Accordingly, based on the questions asked above during the introduction, we can study innovation through creativity. Creativity is the ability to produce work that is both novel and appropriate (Sternberg, 1999, p. 3).

Focusing on creativity generated through consumer ideation, we can provide users with information on either market research or company vision. Then we can test how creativity differs based on the sources of creativity. For the internal perspective focusing on company vision, we will use information about company vision and strategy. For the external perspective focusing on market research, we will use market research reports. We differentiate between two kinds of market research. Reactive market research reports, focusing on consumers expressed needs, and proactive market research reports focusing on the abstract or unspoken needs of consumers.

Based on the debate and concepts discussed during this introduction, we will be testing the following research problem:

What is the effect on creativity of providing information on (1) company vision, (2) reactive market research, and (3) proactive market research in consumer ideation of new services?

1.2 Report Structure

In order to answer the chosen research problem, we begin section 2 by reviewing existing literature. First, we review relevant literature on innovation. Then we review the concept of creativity. We continue by discussing consumer ideation. Finally, we review existing literature on the sources of information that we will provide to users. Reactive and proactive market research and company vision. Based on the reviewed literature we present our research model and hypotheses in section 3.

In section 4, we explain the research design and methodology that we will use in order to answer our research problem. We begin by explaining how we will collect data through a lab experiment. We continue by providing information of which sample we use and how we conduct the experiment. Then we explain which information, instructions, treatments and surveys we provided to the participants. Finally, we explain the measure of creativity.

In section 5, we present our data and results. We begin by explaining how we measure the variables and indexes that we will use in our analysis. Then, we conduct our analyses and present our results. We continue with a discussion in section 6. First, we summarize the results on our hypotheses. Then we discuss both theoretical and practical implications of our findings. Furthermore, we evaluate the validity, reliability and ethics of our research. Finally, we discuss limitations and recommendations for further research.

We briefly conclude on our research problem in section 7. We provide a list of all references used during our research in section 8. At last, we add an appendix in section 9, including all information given to participants in our experiment, and surveys used to measure creativity.

2. Theory

2.1 Innovation

In the introduction, we mentioned that we were mainly concerned about innovation. However, we also mentioned that we would study innovation through creativity as those two concepts are closely related. Thus, we begin the literature section explaining theory on innovation before we define the concept of creativity.

Innovation is a very broad concept. Innovation is not a single action but a process of interrelated sub processes involving both the generation and implementation of creative ideas. Thus, an appropriate definition is that innovation is the introduction and application, of ideas, processes, technologies, or products that are new and useful (Miao & Wang, 2015, p. 2375). When defining innovation as a process, we can distinguish innovation from an invention. While innovation is concerned with the commercial and practical application of ideas into the economy, inventions is the conception of the idea. This means that an invention is only the starting point for innovation. The complete process of idea generation, technology development, manufacturing and marketing represents innovation (Johannessen, 2012, p.14). Based on this, researchers agree that innovation as a process involves two different stages consisting of idea generation and idea implementation (Miao & Wang, 2015, p. 2375).

Traditionally, textbooks has described the innovation process as a linear model consisting of a given sequence of separable stages or activities (Johannessen, 2012, p. 22). Because of the simplicity of the linear model, it has taken a firm grip on people's view of how innovation occurs. Consequently, the linear innovation model is still today a common understanding of how the innovation process works. Furthermore, there are two versions of the linear innovation model, the technology push model and the market pull model (Johannessen, 2012, p. 22).

The technology push model assumes that the process of innovation begins with scientists or entrepreneurs making unexpected discoveries, inventions or ideas. Firms develop these ideas into products or prototypes for testing. If the ideas work in practice, firms manufacture and distribute them to the market. Thus, in the technology push model, customers is a passive recipient for the results of firms' research and development (Johannessen, 2012, p. 22).

The market pull model turns the linear sequence around, implying that the role of the customer is of greater importance in the innovation process. The market pull model suggests that firms generate ideas based on customer needs. For firms to discover customer needs, they have to interact closely with customers. When needs are discovered and ideas generated, they are handed to the research and development department for design and engineering. The next step is manufacturing, and in the end sales and marketing until bought by customers (Johannessen, 2012, p. 22).

A more common view of the innovation process today is that innovation occurs not as a linear process, but through interaction of all the activities in the innovation process such as scientists, entrepreneurs, customers and production. Successful innovation occurs through the linkages between these factors and activities. However, there is still disagreement among researchers about precisely which activities affect innovation, and how. For instance, some argues that interaction with customers is most important for innovation, while others argue that creativity and R&D is more important (Johannessen, 2012, p. 22).

The managing director of McCain Foods takes the first view, arguing that information about customer needs is crucial for successful innovation. He says that only by understanding what the customer wants can we identify the innovative opportunities (Johannessen, 2012, p. 22). On the opposite, Professor Clayton Christensen suggests that firms faced with technological change may be required to focus on innovations that current customers do not demand. The reason for this argument is that listening to your current customers' needs might narrow your scientists' creativity and focus. Thus, resulting in a negative effect on technological innovation and reducing long-term business success (Johannessen, 2012, p. 9).

If we distinguish between radical and incremental innovations, both arguments above might be valid. Incremental innovations are innovations that provide improvements to established products, appealing to existing customers. Radical innovations are innovations that provide improvements greater than those that current customers demand, generating new markets. Consequently, uncovering and satisfying the needs of customers is important if one wants incremental innovations (Johannessen, 2012, p. 9). However, if the goal is radical innovations to disrupt the entire market the creative individual is a more important factor for success in the innovation process. Thus, factors which gives room for creativity is of more importance, such as to give space and time to let scientists think, experiment, discuss and being creative (Johannessen, 2012, p. 86).

To sum up the section about innovation, we have made it clear that innovation is not a singular event, but an entire process of activities. The process of innovation can include many activities. Nevertheless, for it to be an innovation process, it must consist of both idea generation and implementation of the idea. As to how innovation occurs, we can conclude that an innovation can be both a response to a customer need or a result from a creative effort (Johannessen, 2012, p. 24). Having a better understanding of innovation, we move on to explain perhaps the most important concept in our research, creativity.

2.2 Creativity

Innovation is a process that involves two qualitatively different stages, the generation of creative ideas, and the implementation of the generated ideas. Thus, creativity is an important part of innovation (Miao & Wang, 2015, p. 2375). Additionally, creativity is one of our main variables from our research problem. Accordingly, we need a clear understanding of creativity in order to understand and measure it. Therefore, we will now present a definition of creativity, and further explain the concept to enhance our understanding of creativity.

In the literature, there are many different definitions of creativity. The most explicit definitions use the creative product to distinguish creativity, and includes characteristics of novelty and appropriateness (Amabile, 1996, p. 20). From all the definitions of creativity that we have read, these two characteristics are recognized. Two similar definitions are the following; creativity is the production of novel and useful ideas in any domain (Amabile, Conti, Coon, Herron & Lazenby, 1996, p. 1156) and, creativity is the ability to produce work that is both novel and appropriate (Sternberg, 1999, p. 3). A somewhat different definition says that, if one should consider an idea as creative, the idea must be new and unique compared to competitive ideas available, and have the potential to create additional value (Miao & Wang, 2015, p. 2375). Thus, we can say that if we are going to judge something as creative, it must fulfill two criteria, being both novel and appropriate. This means that it is not enough that an idea is original; the idea must also have some additional value compared to already available ideas (Kaufmann, 2006).

In creativity research, formal definitions have proven to be most useful. However, as creativity is such an important variable for our research, we will be using two complementary definitions of creativity, an operational and a conceptual definition.

2.2.1 Operational Creativity Definition

Creative products is anything that produces an effective surprise in the observer, and a shock of recognition that the product or response is both novel and appropriate (Amabile, 1996). Based on this, the operational definition of creativity says that a product or response is creative to the extent that appropriate observers independently agree it is creative. Appropriate observers are those familiar with the domain in which the product was created or the response articulated (Amabile, 1996, p. 22). This understanding of creativity will be important for us when deciding on how to measure creativity.

Several assumptions are necessary for the operational definition to hold. Firstly, creativity must be something that people can recognize, even without a guiding definition. At the same time, there must exist some degrees of creativity that observers can agree upon to some extent. That way, they can decide whether some products or responses are more or less creative than others are. In addition, observers must respond to one basic form of creativity or quality when referring to something as “creative”. Finally, one must assume that products or responses are the hallmark of creativity. Meaning that it is not possible to specify which objective features of new products or responses that will be considered as creative (Amabile, 1996, p. 34).

2.2.2 Conceptual Creativity Definition

With an operational definition of creativity in place, we will now present our conceptual definition of creativity. This is necessary as an operational definition, which relies on subjective criteria is not sufficient when identifying creative products or responses as a variable. Thus, we need a conceptual definition, which defines some specific criteria that we can use to identify to which degree a product or response is creative or not. The conceptual definition we will be using goes as following; a product or response will be creative to the extent that it is both novel and appropriate, useful, correct and a valuable response to the task

and the task is heuristic rather than algorithmic. As can be seen, the definition is very similar to the definitions of creativity mentioned earlier with focus on the two characteristics of novelty and appropriateness. In addition to these two characteristics, it also specifies that the task must be heuristic rather than algorithmic. To clarify this, an algorithmic task is a task where the path to the solution is clear and straightforward. Heuristic tasks on the other hand, are tasks that does not have a clear and readily identifiable path to the solution, and the task does not necessarily have a clearly identified goal (Amabile, 1996, p. 35).

2.2.3 Creativity; Why, Where and How

Knowing what creativity is and how it defines, we continue by explaining why we need creativity, where creativity comes from, and how creativity is affected. We have already made it clear that creativity is necessary for innovation. Consequently, creativity is essential to solving a wide range of problems, problems faced by either the society, organizations, individuals or others. Examples of problems that might demand creative solutions are finding cures for deadly diseases, global concerns such as hunger, poverty, violence and global warming which is problems faced by the society. Organizations require creativity to deliver novel and valuable products and services to remain competitive. As individuals, the problems might not be as grand a scale as social problems, but they too can benefit from creative thinking (Ward, Finke & Smith, 1995, p. 3).

So what is creative thinking? Creative thinking is the process of generating creative ideas. Characteristics of creative thinking is that the thinking process usually starts in reverse, beginning with a solution that demands a problem or area of use. This is in contrast to the more straightforward thinking where one starts with a problem that requires a solution. In addition, in creative thinking, ideas often comes uncontrolled and suddenly. Furthermore, creative ideas tend to appear when viewing problems or solutions from new angles, taking different views to the problem or solution, looking at them from a new perspective (Kaufmann, 2006).

Creative thinking is not the only source of creative ideas. Creativity does not appear only from an individual's thinking, but also from other sources such as personality, motivation and irrational things. Additionally, one cannot only focus on single individuals. Also social environments, organizations, society and culture affect creativity. From this, we can

represent creativity through a circle with several layers (Kaufmann, 2006). The inner layer in the circle is the individual; we then get the social environment, organizations, society, and finally culture in the outer layer, which all affect creativity to some degree. Consequently, creativity is a complex phenomenon consisting of both micro and macro elements that all depend on each other (Kaufmann, 2006).

In our research, we will study creativity at an individual level. Accordingly, a good understanding of how creativity works at the individual level is important. There have been conducted much research on how concrete factors affects creativity. A known theory is the flow zone. It shows how the combination of an individual's skills and the degree of challenge in the task affect creativity. It finds that there are a perfect match between an individual's skills for the task, and the difficulty of the task. In this perfect match, the individuals will find themselves in a flow zone, increasing creativity and solving the task. On the extreme, if the task is too difficult compared to the individuals skills, the task cannot be solved. Opposite, if the task is too easy compared to the individuals skills, the individual will be bored with the task, and creativity will not increase (Kaufmann & Kaufmann, 2009, p. 257).

Girotra, Terwiesch and Ulrich (2008) studied whether working in groups, or individually prior to group work, generated the most creative ideas. They conducted an experiment where in one of the processes participants worked in groups. In the other process, participants worked first individually, then in groups. The results showed that in the process where participants first worked individually and then worked in groups, generated both more ideas and better ideas. This implies that creativity techniques such as brainstorming where one build on each other's ideas in a group setting might not be a good approach for generating many and good ideas.

Scopelliti, Cillo, Busacca and Mazursky (2014) studied how financial constraints affect creativity, also in an experimental setting. They find that limited financial resources results in more creative ideas. Others have found similar effects of time constraints on creativity. These findings suggests that individuals are more creative when they have less, rather than more alternative options to solve a creative problem. Being more creative when facing constraints, as you then have to seek other more creative options, and viewing the problem from different perspectives.

2.3 Consumer Ideation

Having explained our dependent variable creativity, and how it relates back to innovation, we continue with the phase of generating creative ideas. As mentioned in the introduction, we will study the creativity of ideas generated from consumer ideation. Accordingly, we will need a better understanding of consumer ideation, which is the topic of this section.

Consumer ideation is simply techniques where customers or users generate ideas (Lilien, Morrison, Searls, Sonnack & Hippel, 2002). The role of consumer or user are all individuals who may benefit from a new product or service by using or consuming it (Schweitzer et al. 2014). The purpose of consumer ideation is mainly to collect input and information from customers about needs or solutions (Lilien et al, 2002). Firms use input from customers' knowledge, skills and perspectives to generate innovations that are more successful, rather than relying only on firms internal R&D (Schweitzer et al, 2014).

The use of consumer ideation as part of firms' innovation process is in the innovation literature viewed as user-driven innovation. User-driven innovation primarily focuses on how firms can understand customer needs. Further, it focuses on how firms can meet customer needs through development of new products or services. The user-driven literature on innovation identifies users as an important driving force of innovation. Accordingly, users and their knowledge is important for firms to be able to develop new concepts, products and services that meet market demands (Rocheska, Kostoska, Angeleski, & Mancheski, 2014). In user-driven innovation, firms develop ideas from consumer ideation into possible solutions. Then they consider implementing the possible solutions to the market (Rocheska et al. 2014).

Research on involvement of users in the innovation process suggests that consumer ideation potentially can produce more innovative ideas (Elerud-Tryde & Hooge, 2014). Generating innovative and creative ideas is critical for a successful start of the innovation process. This, due to research that indicate that most innovation projects fail at the beginning, rather than at the end. Accordingly, if firms want to develop successful innovations at lower costs, consumer ideation can be a great source of input of creative ideas (Kristensson et al. 2004). Generated ideas can also feed subsequent development processes that also plays an important role for innovation (Girotra et al. 2008). Another key benefit by including users

through consumer ideation is that companies are able to get useful knowledge from consumers (Rocheska et al. 2014).

2.3.1 Connecting With Customers

Since firms recognize users as an important source of ideas, firms striving to maintain high rates of innovation are introducing new and creative ways to promote consumer ideation. Large firms are establishing IT platforms designed for idea generation, and encourages customers to participate in innovation contests on the platforms. Additionally, firms are using other web applications, such as blogs or other online communities to get in touch with consumers and their ideas (Elerud-Tryde & Hooge, 2014). For instance, LEGO have an online platform where consumers can generate ideas. Users on the platform are then able to discuss ideas, or vote on ideas they prefer. In addition to LEGO, firms such as Dell, Starbucks, Motorola, Fujitsu and Siemens have involved users in consumer ideation on online platforms (Elerud-Tryde & Hooge, 2014).

The easiest way for large companies to connect with users is through the internet. The internet allows large groups of users to participate in idea generation. Additionally, the internet makes it easier for users to access information that used to be limited to the company. This motivates consumers to generate ideas for how to solve problems with the existing solutions. To exploit this opportunity on IT platforms, toolkits for idea competitions are commonly used (Piller & Walcher, 2006). By using toolkits to generate ideas in a competitive setting, the competitive setting in itself work as a factor that encourages users, and inspires their creativity. Thus, it increases the value of generated ideas. In practice, firms ask users who wish to participate in the contests to submit solutions to a given task within a given timeframe. When the contest has ended, experts evaluate the generated ideas or solutions. Usually, the firms reward the users with the best ideas in exchange for the right to exploit their idea (Piller & Walcher, 2006).

The benefit of toolkits is that it in a cost efficient way shifts the task of idea generation from the manufacturer to the consumer (Piller & Walcher, 2006). Even so, not all ideas generated in consumer ideation are valuable or leading to successful innovation. Therefore, consumer ideation is not replacing internal innovation processes. Rather, it works as a supplement to internal processes (Piller & Walcher, 2006).

2.3.2 Origin of Ideas

Accepting that firms have good solutions for users to generate ideas, and that users are able to generate ideas valuable to innovation, the question of how these ideas originate arise. In accordance with creativity research as reviewed in the section on creativity, creative thinking consists of combining principles and elements of knowledge and insights that one have not previously connected (Kristensson et al. 2004). Consequently, ideas from consumer ideation does not originate in a vacuum, but through combination and reorganization of information and knowledge. For users to make such new connections, it is necessary for users to receive new and unknown information (Kristensson et al, 2004). The larger set of skills, information and knowledge the user inhabits, the larger the possibilities in consumer ideation (Kristensson et al, 2004). Accordingly, as in our study, it can be beneficial to provide users in consumer ideation with information, such as market research or company vision as we intend to do.

That user's knowledge is a source to successful consumer ideation is in accordance with existing literature on consumer ideation. Research suggest that the success of consumer ideation depends on the type of consumer used for ideation, and that their knowledge explain the difference. Kristensson et al (2004) compare different user groups in consumer ideation and find that ordinary users create more original and valuable ideas than professional developers and advanced users. Magnusson (2009) focus on the management of the consumer ideation, finding that firms have mainly used lead users in consumer ideation, as they are likely to inhabit a greater amount of technological experience, superior knowledge and user experience. Including other user groups in his study, he finds that user's knowledge of the underlying technology has an effect on their contribution. Guided users tend to generate more incremental ideas, while pioneering users generate ideas that are more radical (Magnusson, 2009).

A recent study from Schweitzer et al. (2014) compares four types of users in consumer ideation. They find that users with high technical skills or trend awareness generate ideas with greater originality than other groups. They also state that the reason for including users in consumer ideation has its roots in knowledge theory. To which degree users generate solutions or original and valuable ideas depends on the amount of knowledge that they hold of a specific domain and its quality (Schweitzer et al. 2014). If we conclude that knowledge of the problem or case is important for the success of consumer ideation. Our research

problem becomes even more interesting. We are supplying users with additional information on the case and technology through either market research or company vision. Accordingly, we should expect that to increase the success of the ideation task. In addition, the fact mentioned above that it can generate new combinations of information in users' minds, may lead to higher creativity. Knowing how ideas originate through consumer ideation, we continue by explaining the theory behind the sources of creativity we will supply to users.

2.4 Sources of Creativity in Consumer Ideation

As displayed in our research problem, we will provide users in consumer ideation with three different sources of information to inspire their creativity. Two of the sources of information focus on user feedback, and we will refer to them as market research (MR). As in our research problem, we distinguish between proactive market research and reactive market research as sources of information. We will explain both these kinds of market research below. In addition to market research, we will also provide users with information on company vision. Therefore, we also have to explain literature of what company vision is and how it works. Accordingly, market research and company vision is the topic of this section.

2.4.1 Market Research

Innovation models have taught us that innovation may either occur from new discoveries in the technology push perspective, or from market needs in the market pull perspective. Viewing innovation from the market pull perspective, three actions are important in determining innovation. Firstly, perceiving the needs, tastes and requirements of customers and building them into appropriate innovative solutions. Secondly, establishing interactions with users and value co-creation. Finally, implementing ideas generated by users. As we can see, in all of the three actions that determine innovation, information about the customer is important (Rocheska et al. 2014). This is mainly what differentiates information on market research from information on company vision. While market research take an external approach, information on company vision is internal.

To collect information about the customer, market research is used. Market research is mainly concerned with what the customer would like to buy, and why (Witell et al. 2011). Common techniques to collect such data is surveys, interviews, focus groups, and co-creation with customers. It may also vary whether the customer is a passive or a more active participant in the market research. Depending on the goal and content of the market research, it divides into two distinct orientations. One reactive market orientation and one proactive market orientation. The reactive market orientation is mainly looking backwards, focusing on the customers' experiences and expressed needs. Thus, resulting in market research on concrete attributes of products or services. The proactive market orientation on the other side is looking more forward. It takes a proactively approach in including customers to better understand the problems they are trying to solve when buying a given product or service. In doing so, researchers get more information about the customers' problems and value in use. Thus, resulting in market research on more abstract benefits (Clayton, 2012). Accordingly, this is the main difference between the two market orientations in relation to their effect on creativity.

In reactive market research, the customer is typically a passive participant. While in proactive market research, the customer is typically a more important resource of information, being a more active participant. Even if the two market research orientations differ, there is no need for firms to use only one approach to market research. Actually, research find that firms focus on both proactive and reactive market research, but might use it for different causes. Consequently, firms need both reactive and proactive market research to enhance innovation performance (Pedrosa, 2012). Thus, we continue by looking more into the details of a reactive versus a proactive market orientation.

Reactive

Reactive market orientation is a market research approach that attempts to understand and satisfy customers' expressed needs. We define customers' expressed needs as the needs the customer is aware of, and which the customer can express (Narver, Slater & MacLachlan, 2004). Thus, the reactive market orientation approach views customers as passive participants in the process of value creation through innovation. Consequently, traditional reactive market research techniques collects data on customers' expressed needs. Reactive market research techniques are supposed to capture customers' previous experiences with a

product or stimuli. Thus, they are reactive or backward looking. To gather reactive customer data, traditional market research tools such as interviews, surveys, focus groups and similar techniques are most commonly used. This gives little opportunity for researchers to get insight into factors outside of the questions given in the surveys. Consequently, they only get information about experiences using the product or service, and not the problem itself (Witell et al, 2011).

Relating reactive market research to innovation, researchers find that using reactive market research has less chance for success than proactive market research techniques. In addition, if the goal is to increase innovation, customers should not be a passive resource of information, but be included as an active source of co-creation (Witell et al, 2011). That is, if a business want to create and to sustain new-product success, a reactive market orientation is not sufficient (Narver et al, 2004). The reason why the opportunities for innovation using reactive market research is limited can be explained by the fact that qualitative reactive market research focuses on what customers say. Reactive market research focuses on users' experiences, but does not look into their latent needs or the job that needs to be solved (Kaplan, 2014). As people seem to think about concepts in a very concrete way, we are categorizing objects at a basic level, simply because it is easier for us to do so. When answering customer surveys, we do not typically change our way of thinking, which results in market research focusing on concrete attributes. Consequently, when researchers are trying to develop new ideas, they will also be focusing at a basic level, and are stuck with the concrete attributes that limits creativity (Ward et al. 1995, p. 39).

Even if the reactive market orientation has several drawbacks in the view of innovation and creativity, traditional consumer research focusing on satisfying customers' expressed rather than latent needs is still the norm in the majority of companies. However, when reactive market research is used, it is typically not to increase innovation or creativity, but to validate internally generated concepts (Kaplan, 2014).

Proactive

In contrast to a reactive market orientation as explained above, a proactive market orientation is a market research approach that seeks to understand and satisfy customers' latent needs. Customers' latent needs is opportunities for customer value that the customers

are unaware. Even if customers are not aware of their latent needs, it does not mean they are any less real than expressed needs. Both are real and actual needs, the difference is that latent needs is not in the consciousness of the customer. Consequently, it can be more difficult to discover latent needs than expressed needs. To discover latent needs one cannot simply ask customers about their experiences or needs. Instead, one have to proactively lead customers rather than just respond to them (Narver et al, 2004).

Proactive market research have a greater focus on the benefits the product gives, and which problems it actually solves rather than customers experiences using the product. As with reactive market research, there are many techniques to gather data. Common techniques in the proactive approach is to use methods to co-create with the customers (Witell et al, 2011). Customer co-creation is an innovation process where the firm and its customers interact jointly for the purpose of innovation (Gemser & Perks, 2015). By working participatory with customers, the firm can enhance the value customers get when buying and using products. Further, it makes it easier to understand and respond to deeper and more valuable customer needs (Maklan, Knox & Ryals, 2008). By co-creating with the customer, firms get the opportunity to collect a broader range of information in the form of both spoken and unspoken needs (Witell et al, 2011). The need for customer co-creation can be important in the innovation process, as there exists information asymmetry between the firms and customers. That is, that the customer best know what they need, while the firm best know how to produce the wanted product to satisfy the customers' needs. To understand these needs, it is important to meet the customers (Ohern & Rindfleisch, 2015).

Research on the use of proactive market research finds that firms that involve customers have a greater chance to get successful innovations than firms that do not involve customers. In addition, research suggest that the innovations from proactive market research are more innovative than innovations from reactive market research. Thus, the customer can be an important source in the innovation process. Accordingly, firms should use customers as an active rather than a passive source of information and knowledge (Witell et al, 2011). Consequently, we can state that those that question the effect of market research on innovation have not considered the proactive form of market research. Proactive market research is likely to differ significantly from reactive market research on its effect on innovation and creativity (Narver et al, 2004).

We can use the concept of abstraction to explain the reason why proactive market research differs and is more successful than reactive market research. As we have mentioned, reactive market research aimed at discovering customers expressed needs, while proactive market research aimed at discovering the unconscious latent customer needs. Expressed needs exists at our basic concrete level of thinking, the level we usually think at, but we are not bound to that level. To discover latent needs one have to go beyond the limits of concrete images to view needs from a more general abstract level. The more abstract level we can think at, the more room we get for imagination, which is more likely to increase our creativity. Studies confirm this statement, and finds that abstraction have a positive effect on innovation. Thus, it seems that bringing specific ideas to mind, such as ideas on concrete attributes will lock us to the details, making it difficult to think about original new ideas. On the other side, if we pull up ideas at a general abstract level, it leaves room for more pointed and original innovation. Consequently, the fact that proactive market research operates at a more abstract level than reactive market research is vital to creativity and innovation (Ward et al. 1995, p. 40-43).

2.4.2 Company Vision

Having explained market research that has an external focus to innovation, we now continue by explaining company vision that has an internal focus to innovation. We say that market research is externally as it focuses on what external stakeholders such as customers' wants and needs. On the opposite, vision is internal as it focuses on what the firm wants. Accordingly, market research and company vision is two different sources of information, and is therefore likely to differ in its effect on creativity. This assumption is in accordance with research suggesting that different kinds of knowledge has different effects on creativity in consumer ideation (Schweitzer et al, 2014). We begin by explaining the concept of vision. Then we continue by explaining two other related concepts, mission and strategy.

Vision

Companies usually exists for a reason. The reason can differ, but it often relates to creating value by making people better off. The company's vision is a picture of the future, which gives an understanding of why people will be better off and how firms create value

(Johannessen, 2012, p. 379). Thus, we can say that a vision is a picture of the new world the company wish to create, existing in the tension between what is and what might be (Johannessen, 2012, p. 379). For firms or entrepreneurs to be successful with their innovations, it is important that they believe in their visions (Vlaskovits, 2011). Accordingly, vision is important for innovation, and as innovation relates to creativity, vision is likely to affect creativity.

An effective vision tells the company where they are going and why. Directing and motivating employee's action towards some opportunity or specific goals. For the vision to be effective to employees, communication of the vision should be appropriate. That way, employees will understand and think through the vision. Then, the vision works as a very powerful mental image that the company's employees carries around in their head (Johannessen, 2012, p. 379).

If the company uses the vision as a management tool, it may generate several benefits. For instance, a clear and common vision motivates employees by giving them direction to reach the end of the tunnel. Thus, it helps the company and employees to define goals and objectives. The vision can work as a guide for the company's strategy. Further, it can apply as a source of information about the company to other stakeholders, and attracting new stakeholders (Johannessen, 2012, p. 379).

Even if there are several benefits of the vision, the success is to some degree dependent on two factors. Firstly, the managers and employees must be motivated to make the company's vision into reality. Secondly, the company must inhabit some kind of strategic foresight about how the world will be in the future. As the vision is a picture of the future, foresight in the company's decision-making is important to be able to create value and making people better off, generating future success. If the vision is a result of foresight, it will definitely be an important source of competitive advantage. It will allow the company to anticipate and exploit future opportunities, being superior to competitors that does not have the same vision. Due to the use of foresight, possibilities create visions. While certainties do not create visions. Thus, a vision specifies a given destination rather than the path to the destination (Johannessen, 2012, p. 379).

Mission

A mission provides the company with a possibility to codify the vision, making it even clearer what the company is going to achieve. It does so by shedding light on how the company aims to achieve its goals. Thus, we can define a mission as a formal statement of the purpose of the company, and what the company aims to achieve (Johannessen, 2012, p. 392). Furthermore, a mission statement consists of two components, the strategic component, and the philosophical component. The strategic component may define what the business aims to achieve, and what it does to achieve their vision. The philosophical component on the other side, focuses on the values the company will uphold while achieving its goals, relating to why the company's employees and other stakeholders should be proud of the company's achievements (Johannessen, 2012, p. 392).

As a vision, a mission statement can also be applied as a powerful management tool when communicated appropriately, generating value through several benefits. The mission can make the vision better understood, both by internal and external stakeholders. It can guide internal decision-making, and encourage analysis of the company. In addition, it can apply as a constant anchoring point or reference point during organizational change. Furthermore, a mission statement is qualitative, making it a good starting point for defining quantitative objectives (Johannessen, 2012, p. 392).

More importantly, the success of a business often does not depend on taking the most or biggest opportunities, but taking the correct opportunities. Firms should keep a narrow focus, avoiding spreading its effort too widely. The mission statement definitely assists decision-making when choosing among opportunities by defining the scope of the business, keeping the opportunities defined properly and precisely. Thus, the mission gives guidance on which opportunities one should ignore, and which opportunities one should exploit and dedicate resources. Furthermore, the mission provides a starting point for developing strategic options and it defines what the venture aims to achieve (Johannessen, 2012, p. 392). As we see, factors involved in company vision has a straight internal focus, rather than external such as market research.

Strategy

Previously we said that a vision specifies a given destination for the company in the future. The strategy specifies the actions that firms must take on the path to reach the destination. Thus, we define strategy as the actions an organization takes to pursue its business objectives (Johannessen, 2012). The strategy elaborates on both what the company actually does, the strategic content, and how the company decides what it is going to do, the strategic process. It is important that the company keep control of both its strategic content and strategic process. Firms achieve this by monitoring how the organization identifies options for its future. How these options are communicated, and which options are chosen. Further, one must keep control over resource investments aimed at achieving the desired outcomes, and how rewards are offered for delivering the outcomes. Consequently, if the company manages to maintain control over its strategy, they will also be able to control the organizational scope and focus on the opportunities that lies ahead (Johannessen, 2012, p. 406). If opportunities of innovation or creativity lies ahead, strategy will aid in keeping focus on those opportunities.

We can view the benefits of a business strategy in relation to the vision and mission. We have made it clear that firms develop a strategy in response to the vision, representing how the company will achieve its vision. Thus, the achievement of the vision will depend on the possibility of both creating, and acting in regards to the strategy. This tight relationship between the strategy and the vision can be beneficial to the company, as the strategy process is iterative. This means that as the firm act upon the strategy, feedback returns on the vision, reinforcing the visions strong parts and making it easier to readdress its weaknesses, clarifying the possibilities of the company. Like the mission, the strategy also aids in providing organizational focus, guiding decision-making, and functions as guidelines for setting quantitative objectives (Johannessen, 2012, p. 406).

3. Model and Hypoteses

3.1 Model

Based on our research problem, we now present our research model that displays the relationships we are studying. Figure 1 below displays our research model.

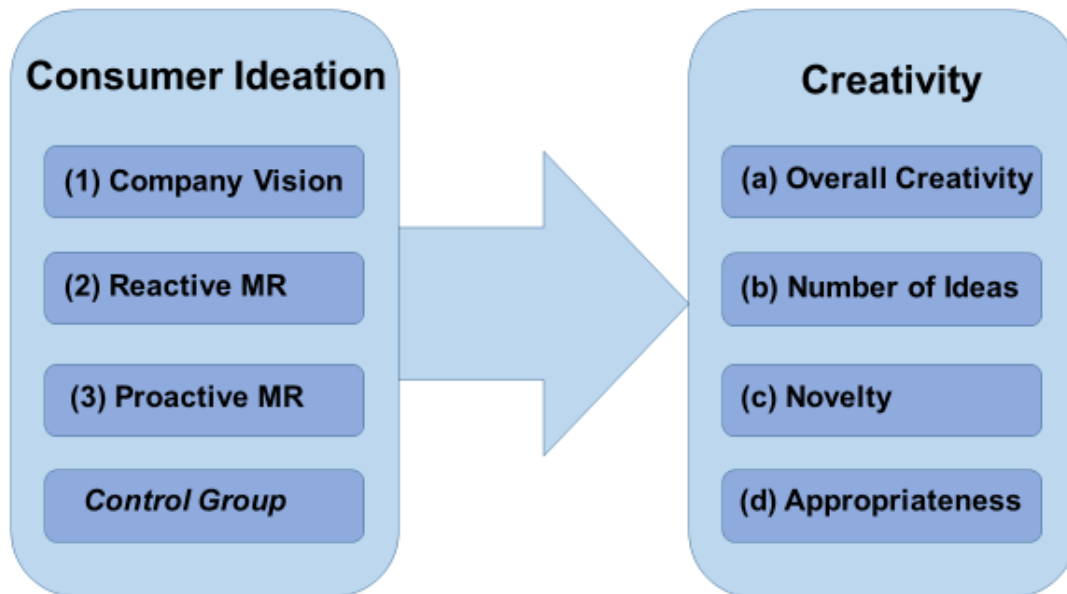


Figure 1: Research Model

In accordance with our research problem, the research model above display that we are studying the effects that information in consumer ideation has on creativity. For consumer ideation, we are studying the effects of three different sources of information, (1) company vision, (2) reactive market research, and (3) proactive market research. All the three sources of information we compare to each other and with a control group. Creativity we measure by four different variables, an overall creativity measure (a), the number of ideas generated (b), novelty of ideas (c), and appropriateness of ideas generated (d). Based on our research model and existing literature, we will now set our hypotheses.

3.2 Hypotheses

In the 1970s, innovation research suggested that customers in the marketplace could be an important factor in the innovation process. This suggestion led to the market pull model that we explained in the theory section. As we remember, in the market pull model, the innovation process begins with the customers' needs. Thus, it is important to listen to customers by conducting market research to enhance innovation performance. The managing director of McCain Foods emphasized this view. He argued that only by understanding our customers could we identify innovative opportunities (Johannessen, 2012, p. 22). Consequently, from the market pull model we could expect market research to have a positive effect on innovation. As innovation relates to creativity, we would also expect market research to have a positive effect on creativity. This expectation is in accordance with recent findings. For instance, Moon (2014) finds that external sources of information is important for innovation. Findings from Gemser & Perks (2015) takes it even further, suggesting that cooperation with customers gives both more variation in the product specter, and increases customer acceptance. From these findings, we would expect that market research is likely to increase both the number of ideas generated, the value of the ideas, and the innovativeness or originality of the ideas. If we consider reactive and proactive market research, Narver et al (2004) expects that both forms of market research will have a positive effect on innovation. Therefore, we state our first two hypotheses as the following:

Hypothesis 1: Providing information on (2) reactive market research in consumer ideation has a positive effect on (a) creativity, (b) number of ideas generated, (c) novelty of ideas generated, and (d) appropriateness of ideas generated.

Hypothesis 2: Providing information on (3) proactive market research in consumer ideation has a positive effect on (a) creativity, (b) number of ideas generated, (c) novelty of ideas generated, and (d) appropriateness of ideas generated.

Even if we suggest that both proactive market research and reactive market research will have a positive effect on creativity, Narver et al (2004) expects proactive market research to have the greatest effect on creativity. This expectation is in accordance with Witell et al (2011) which finds that proactive market research results in more innovative ideas than

reactive market research. Based on previous research, there is mainly two reasons why we expect proactive market research to be better for creativity than reactive market research.

The first is the abstract focus on unspoken needs in proactive market research compared to reactive market research. Studies has confirmed that the more abstract we can think the greater is creativity. Thus, abstraction have a positive effect on creativity (Ward et al. 1995, p. 40-43). In relation to reactive market research, which focuses more on concrete attributes and spoken needs. Researchers find that such a focus can lock us into details, making it difficult to think about creative ideas compared to the abstract level of thinking. Thus, abstraction is an argument that proactive market research will give both more ideas and with a higher level of originality than reactive market research (Ward et al. 1995, p. 40-43).

The second reason is the fact that one works closer with customers in proactive compared to reactive market research. Several studies find that working closer with customers enhance innovation performance. Accordingly, we expect that creativity also increase by working closer with customers. Witell et al (2011) finds that having active rather than passive customers in market research gives more valuable products, which increases success. Additionally, they find that proactive market research gives more innovative ideas. As above, Gemser & Perks (2015) found that working with customers increases product variation and customer acceptance. Others goes even further and finds that the tighter the interactions with customers, the better for innovation ((Nagati & Rebolledo, 2013) and (Battor & Battor, 2010)).

Due to these findings, we state our third hypothesis as the following:

Hypothesis 3: Providing information on (3) proactive market research in consumer ideation has a greater effect than providing information on (2) reactive market research in consumer ideation on (a) creativity, (b) number of ideas generated, (c) novelty of ideas generated, and (d) appropriateness of ideas generated

Having looked into the two different kinds of market research, we continue by studying how information on company vision affect creativity. Instead of taking the market pull perspective to innovation, we can view innovation from the technology push perspective. Innovation does not begin with the customer in the technology push model, but inside the firm (Johannessen, 2012, p. 22). Thus, there are reasons to believe that a firm's vision and

strategy have a positive effect on innovation and creativity. Even if there is limited research on this topic, there are strong arguments for visions to have a positive effect on creativity. For instance, Vlaskovits (2011) states that it is essential for entrepreneurs to follow their visions and believe in their products to create true innovation. Customers may not see the same potential in a product as the entrepreneur does. Thus, it makes sense that many startup companies would not have continued with their ideas if they listened to customers.

Two known companies that do believe that vision triumphs market research is Apple and IKEA. In accordance with Skibsted and Hansen (2014a), the best brands has a clear vision that guides them. They use the vision to guide their customers, not the other way around, where customer guides the companies by providing them with input. Another example is LEGO, which produced too many varieties and ineffective products when they lost focus on their vision. Consequently, they believe that a clear vision is important for innovation and creativity in their organization. (Elmansy, 2014).

In accordance with the arguments above, we expect the following hypothesis to hold:

Hypothesis 4: Providing information on (1) company vision in consumer ideation has a positive effect on (a) creativity, (b) number of ideas generated, (c) novelty of ideas generated, and (d) appropriateness of ideas generated

The companies mentioned above, Apple, IKEA and LEGO does not only believe that their vision is important for creativity. They also go as far as to say that one should not listen to customers to succeed with innovation. This, they explain by stating that the user cannot predict future demands any better than the companies themselves can (Skibsted & Hansen, 2014a). Additionally, customers does not know what they want before they get it. In relation to market research, they say that customers does not want to change a product they are satisfied with, as customers dislike change, especially radical changes. Thus, customers in market research will not aid companies in making radical changes. Consequently, companies will not be able to differentiate and generate innovations by listening to customers (Skibsted & Hansen, 2014a). Many of the same arguments applies to explain why Yahoo! has not reached their true potential. Yahoo! have been open and bought different companies because they have listened to their customers. What Yahoo! lack is a clear direction or vision as to where they are going and where they want to be in the future (Skibsted & Hansen, 2014b).

In addition to the arguments based on companies above, there are studies that support the arguments that vision might be better for creativity than traditional reactive market research. Fern (1982) finds that individual interviews as a market research technique generates more ideas than focus groups because one tend to spin on each other ideas in groups, while individually one does not. The same thinking may apply to reactive market research, where one by focusing on market research get hung up on the focus of the market report and thus generates fewer ideas than one would do if the focus were the company vision. Other studies find that limited resources such as time or financial resources increases creativity, and that people are more creative when they have less rather than more alternatives (Scopelliti et al, 2014). Viewing a market research report as a resource or alternative, we could suggest that the report will have a negative effect on creativity. Clayton Christensen also takes this standpoint, finding that listening to customers may limit innovation in some industries. He suggests that firms may require pursuing innovations that current customers do not demand now (Johannessen, 2012, p. 9).

Based on the arguments and studies above which focuses on the different benefits of following companies vision versus focusing on traditional market research, we will be testing the following hypothesis:

Hypothesis 5: Providing information on (1) company vision in consumer ideation has a greater effect than providing information on (2) reactive market research in consumer ideation on (a) creativity, (b) number of ideas generated, (c) novelty of ideas generated, and (d) appropriateness of ideas generated

We have now suggested that both proactive market research and focus on company vision will have a greater effect than reactive market research on creativity. That leaves us to the last major question of our study. Which effect on creativity will be largest, the effect from company vision or proactive market research. As we have seen above, there are good arguments for company vision to be better than market research, but there is also good arguments for proactive market research to be better than vision. The debate of which is better is still relevant, and therefore it exists little research about the benefits of company vision versus proactive market research. Thus, we do not know what to expect. Consequently, we state our last hypothesis as the following:

Hypothesis 6: Providing information on (1) company vision ((3) *proactive market research*) in consumer ideation has a greater effect than providing information on (3) proactive market research ((1) *company vision*) in consumer ideation on (a) creativity, (b) number of ideas generated, (c) novelty of ideas generated, and (d) appropriateness of ideas generated.

4. Research Design and Method

In this section, we describe the research design and research method. The research design is simply a plan for how to answer the chosen research problem in the best possible way (Ghauri & Grønhaug, 2010, p. 54). The plan should contain which kind of research methods is required to solve the problem, which data is required, and how we will analyze the data. Research methodology is the techniques used to collect data (Ghauri & Grønhaug, 2010, p. 54).

Based on the definition above, we have to see the research design and the research problem in relation to each other. Our problem seeks to study whether different sources of information in consumer ideation has different effects on creativity. Thus, we are seeking causal connections. It means that we want to know if the different sources of information affect creativity differently in relation to each other. Compared with an unstructured problem, which seeks to discover something new, a structured problem uses hypotheses to test a clearly defined problem. That way we know which causalities we want to test and which variables must be included (Ghauri & Grønhaug, 2010, p. 56). As becomes clear, our research problem is a structured problem.

Based on the purpose and structure of our research problem, we select a causal research design. The purpose of a causal research design is to isolate causes to explain how and how much the cause's results in effects (Ghauri & Grønhaug, 2010, p. 57). Furthermore, one can choose between deductive or inductive research orientations. A deductive orientation implies promoting of hypotheses based on existing theory where one collects quantitatively data to test the chosen hypotheses (Ghauri & Grønhaug, 2010, p. 15). On the opposite, an inductive orientation seeks to explore new discoveries or theories through observations or qualitative data. Then, existing literature explain the findings (Ghauri & Grønhaug, 2010, p. 15). A causal design implies a deductive rather than an inductive research orientation. Accordingly, we select deduction as our research orientation, and will be using quantitative data, which we analyze using statistical methods.

4.1 Data Collection

To our knowledge, we are the first to test the hypotheses as stated in section 3. Hence, we need to collect primary data. With a causal design, it is most appropriate to collect data through an experimental setting to be able to test for causalities. Commonly, research differentiates between two kind of experiments, lab experiments and field experiments. We have chosen to perform a lab experiment for several reasons. Firstly, in a lab it is easier to keep all other factors but manipulation constant. Thus, we can easier isolate effects of potential causes in lab settings. As it is easier to keep factors constant, it is also easier to manipulate what we wish to manipulate, without the risk of generating other effects that we do not want to measure. In field experiments on the other side, it is more likely that other factors may affect the manipulation. Additionally, it can be more difficult to recruit a randomized sample in the field. Making our results less generalizable. Finally, the conducting of field experiments tend to be done over a longer time period, as one often conduct an experiment before and after a given happening. In the lab, we can do the manipulation instantly. Thus, it requires less time to conduct a lab experiment (Ghauri & Grønhaug, 2010, p. 63). This is naturally an important factor for us, as we have limited time to conduct our research. Since it is a master thesis, we only have five months from start to finish, making the time factor a constraint for not choosing field experiment. We will now describe our chosen method for data collection, the lab experiment, in more detail.

4.2 Experiment

As our hypotheses are testing for three different treatments, we needed four groups for our experiment. One control group for comparison, and three treatment groups consisting of a reactive market research group, a proactive market research group, and a company vision group. In theory, the only difference between the four groups is supposed to be the treatment. The control group gets no treatment. The reactive market research group reads a reactive market research report focusing on concrete attributes as treatment. The proactive market research group reads a proactive market research report focusing on abstract benefits as treatment. Finally, the company vision group reads about a company's vision, mission and strategy as treatment.

The task given to the participants is to generate as many ideas as possible on the topic of the experiment. Two experts on the topic are then measuring the creativity of ideas generated in the experiment. This provides us with a measurement of creativity in the four groups. This data we will then use to test our hypotheses.

We will now begin by explaining our chosen sample and how we recruited the sample of participants. Then, we explain how we conducted the experiment in practice. We continue by explaining the case chosen for the experiment, the instructions and task given to participants and the treatment effects. Finally, we describe our measures. They were collected through one survey answered by participants in the experiment, and one survey answered by two experts on the topic of the case in the experiment.

4.2.1 Sample

In order to get sufficient data to conduct our statistical analysis with a desired level of precision, we would need about 30 participants in each group (Ghauri & Grønhaug, 2010, p. 145). With four groups, we would have to recruit 120 participants. As we are conducting a lab experiment, and needed to recruit a rather large sample in a limited amount of time, we chose students at the Norwegian School of Economics as our population. We recruited students by sending an invitation to all the people registered as students at the school. Thus, our population was about 3000 students. As incentive, students who chose to participate received 50 NOK. To gather a sufficient amount of participants, we had to conduct the experiment at four different times. We conducted the experiments in auditoriums at the school straight after lectures. To boost participation, we also recruited students directly from the lectures prior to our experiment.

Even if we got enough participants, our approach made it difficult to secure randomization. Firstly, our population are students who have chosen to study economics, not a sample of different kind of people with different educational preferences. Secondly, we could not force random students to participate in our experiment. Therefore, we needed to give them incentives. By providing incentives, we risk that people who either like the incentives or are curious of economic experiments are the ones who chooses to participate, rather than a random sample. Finally, as mentioned, we also recruited students directly from lectures. This also reduces the randomization of our sample as students who takes the same courses are

likely to have the same preferences for courses, and are therefore not a randomized population.

4.2.2 Conducting the Experiment

Prior to conducting the experiment with the recruited sample, we conducted a test-experiment on four participants. This was necessary in order to secure that participants correctly understood the case and instructions in the experiment. In addition, it was necessary to check that the participants was able to get creative in the case, being able to generate ideas on the topic of the case in the experiment. Viewing the results of the test-experiment, it seemed like the experiment was well understood, and all of the test-participants were able to generate several ideas. Thus, we continued by conducting the experiment with our recruited sample.

Even if our sample was a selected population of business students, we took concrete actions to secure randomization within our sample. Firstly, we mixed our four different experiment sheets prior to handout. This secures that we get about equally many participants in each of the four groups at all of the four times we conducted the experiment. Additionally, we avoid that participants sitting next to each other would get the same experiments. Thus, we would not get a biased sample from group of friends sitting next to each other and participating in the same treatment group. The same argument applies for the experiments at the different points in time. Secondly, the participants was asked to make space between themselves and the person they sat next to, to avoid the risk of participants looking at each other's answers or instructions.

Before we handed out the experiment, participants received some brief instructions. The instructions consisted firstly of information about the case. Secondly, we told participants to read all the information in the case carefully. Finally, we instructed them to use about 10 minutes to read the case, and exactly 10 minutes to answer the questions. All of the information we also described in writing in the handouts to the participants for them to read. We will now continue by explaining all of the information given to participants. That is, the case chosen for the experiment, the instructions for the different treatments, and the treatment effects.

4.2.3 Case

For the experiment, we created a case from the mobile industry. For the complete case, see section 9.1.1 in the appendix. The case was based on near field communication technologies (NFC). NFC is a short-range, low power, wireless technology that enables mobile devices to connect, exchange information, and make transactions with just a touch (NFC Forum, 2015). Furthermore, we based the case on an actual company, which we anonymized in the case. The case focused on the company's goals with NFC. Thus, we informed the participants that the mobile industry is in the midst of transformation, traversing through times of digital disruption. Consequently, mobile operators are confronted with the question of what type of company they should become. Additionally, we told participants that the company in the case has an ambition to create growth through monetizing data usage. This they should achieve through 1) enabling use, 2) stimulating usage, and 3) monetizing data usage. More specific, the company aimed at increasing data usage by increasing the number of devices/machines/chips connected to the internet, and stimulate usage through NFC (Telenor Group, 2015).

Participants was then told that as part of the company's innovation process, the company needed help to generate new or improved ways on how to utilize NFC technologies. This would be the participants' task in the experiment. We chose this task and case because we believed that participants would be able to relate to the task and case, being creative, and therefore generate several ideas. In addition, other researchers has conducted similar experiments with cases from the mobile industry with satisfying results ((Kristensson, Magnusson & Matthing, 2002) and (Telenor Group, 2013)). Thus, we believed we would be able to get some variation in both number of ideas generated and the creativity of the ideas. Our test-experiment confirmed this prediction. Before the participants was presented with the full instructions of the task, they were provided with additional information on NFC technologies. That way, it would be more clear to them what NFC really is, and how it may be developed and used.

We first defined the concept of NFC technologies to the participants as mentioned above. Then, both in written and with a figure, three ways to use NFC were presented. The three ways are; 1) Tag reader/writer mode which allows NFC devices to read information stored on NFC tags embedded in smart posters and displays; examples include reading timetables, tapping for special offers, and updating frequent flyer points. 2) Peer-to-peer mode that

enables two NFC devices to communicate with each other to exchange information and share files; so that users of NFC-enabled devices quickly can share contact information and other files with a touch. For example, users can share Bluetooth or Wi-Fi link set-up parameters or exchange data such as virtual business cards or digital photos. 3) Card emulation mode that enables NFC devices to act like smart cards, allowing users to make retail purchases, board transit systems, and gain secure access to electronically keyed buildings. Adding NFC to a contactless infrastructure enables two-way communications. For the air transport industry, this could mean updating seat information while boarding, or adding frequent flyer points when making a payment (NFC Forum, 2015).

Having read about what NFC is and how it works, we presented participants with a research project on NFC technologies, based on an actual research project from the mobile company in the case (Telenor Group, 2013). About the research project, we told participants that researchers are testing business models of mobile contactless services in the NFC City project. NFC City is an open innovation project with the objective to promote development and use of services for information exchange, access, ticketing and payment through new applications of NFC technologies. In an on-going trial, students in the NFC City project can replace their bus tickets, house keys and pocket money with their mobile phone. By using NFC tags, they get location specific information about the arrival time of the next bus, today's menu at the canteen or tonight's events at the campus. There is also the NFC Fitness Guide that provides them with videos, textual and oral training instructions when they place their mobile device against a tag reader attached on the training equipment. Some tags can provide context sensitive information on an individual level. An example is a tag placed outside an auditorium, which enables only the enrolled students to get information or download materials for the lecture. With the NFC City project, innovative NFC services beyond the payment function is being studied (Telenor Group, 2013).

After information, both about what NFC is, how it is used, and about the NFC City project, we believed that participants would have a clear understanding of NFC. Thus, they should be capable and ready to start the task of generating ideas. To do that, they would first have to read the full instructions.

4.2.4 Instructions

With four different groups in our experiment, the instructions in each group are slightly different due to the upcoming treatment report. See section 9.1.2 in the appendix for the complete instructions.

We told the control group that researchers believe that NFC technologies can simplify customers' everyday tasks and offer increased convenience in access to services. In addition, the use of NFC technologies is increasing data usage. Data usage is one of the most important sources of income for mobile companies. Consequently, our company intends to take a leading role in supporting the NFC value system. As mentioned above, they need help to generate new or improved ways on how to utilize the NFC technologies. Consequently, this is the task given to you; describe new or improved uses briefly. Generate as many new or improved ways to use the NFC technologies as possible. You have 10 minutes to generate ideas.

As we see from the task, we asked participants to generate both new and improved ways to use NFC. The reason for this is that we did not want to limit their creativity or idea generating by stating that they should either generate new ideas or improve existing ideas. Thus, we were hoping to get a greater spread in their creativity. Some participants might focus on existing solutions failing to see new ways to use NFC, while others might be more creative and focus on new ways to use NFC.

We also asked participants to generate as many ideas as possible. The reason for this was that we wanted variation in number of ideas generated, and therefore should not limit their possibilities. Variation in number of ideas generated was important because this is one of the measurements for testing our hypotheses.

In order to get the treatment effect of the other three groups, we made some changes to their instructions. Even so, we tried to limit the changes, so that the instructions should be as similar as possible. Thus, we would only realize the effect from the actual treatment, and not from different information in the instructions. In addition to the instruction above, we told participants in our company vision treatment that to inspire and guide your ideas, the company has provided you with a short one-page summary of their vision and strategy. Their vision and strategy will give you useful information necessary for generating ideas useful for

the company. Read the attached report below before you begin the process of idea generating.

The treatment for reactive market research was similar. We told participants that they was provided with a short three-page summary of a market report on NFC technologies, focusing on customer perceptions of concrete attributes by using NFC technologies. The treatment for proactive marker research was also similar to those above. It stated that we had provided the participant with a short two-page summary of a market report on NFC technologies, focusing on abstract benefits of NFC technologies reported from consumers.

As we see, we stated the number of pages of the reports to the participants. Even if the three reports differs in number of pages, they were about equal in number of words. The difference in pages is due to graphs and figures. We wanted reports with equal amounts of words so that they would take approximately equal time to read. Furthermore, to motivate the participants to read the reports, we told all participants in the treatment groups that the reports did contain important information. Additionally, we asked them to read the whole report prior to idea generating. We referred to the reports as short, again to motive the participant to read the whole report. It was important to motivate participants to read the reports, as it is a key factor for our experiment to generate reliable results. In addition, we have limited methods to check whether they actually read the report or not. We now continue by explaining the three different reports provided to the three treatment groups.

4.2.5 Treatment Information

For the experiment, we created three different treatment reports as mentioned above. For the complete reports, view section 9.1.3 in the appendix. One report for the vision treatment containing information about company vision. One for the reactive market research treatment, containing market information on concrete attributes of using NFC. One for the proactive market research treatment, containing market information on abstract benefits of using NFC. We will now explain the content and purposes of these three reports.

Information on Company Vision

As mentioned in the instructions for the vision treatment, participants were supposed to generate ideas based on the company's vision. Thus, we will be able to check for differences in creativity in the ideas generated based on the company's vision compared to the control group and other treatment groups. For participants to base their ideas on the company's vision, the report given to the participants in the vision treatment had to contain information about the company's vision. Accordingly, we created a report that first stated the importance and purpose of the company's vision, mission and values. Then the report presented their vision, mission and values. The vision being; Empower societies. We provide the power of digital communication, enabling everyone to improve their lives, build societies and secure a better future for all. Our vision to empower societies is a clear call to action. We bring vital infrastructure, new services and products that stimulate progress, change and improvement. The mission focused on helping customers, while the values was; be respectful, keep promises, make it easy and be inspiring. The participants also got some additional information about the stated values (Telenor Group, 2016a).

Finally, participants got information on the company's strategy and ambitions. The strategy and ambitions were the following: We will retain the focus on growth and value creation. The growth will come from both our telecom business, current digital verticals, and in new digital verticals. To deliver on the ambitions of growth and value creation we will take the position as our customers' favourite partner in digital life. We will be delivering a broad range of relevant, personalized and engaging digital services. These include connectivity and communications services, select internet services within for example storage and communication, and select stand-alone digital verticals. Furthermore, the report briefly defined four strategic ambitions to the participant. The ambitions being; loved by customers, engaging digital products, winning team, and most efficient operator (Telenor Group, 2016b).

Information on Reactive Market Research

For the reactive market research treatment, we wanted participants to focus on, and base their ideas on a reactive market research report. Thus, the report would be focusing on concrete attributes with NFC technologies. Doing this, we believed participants would get

affected by the report when generating ideas, using the report as inspiration. Achieving this, we can compare the creativity of their ideas with the creativity of the ideas generated in the control group and other treatment groups.

We based the reactive market research on an actual market report (NFC Forum, 2015). Accordingly, it focuses mainly on uses of NFC technologies in in-store situations. It begins with a short introduction of the current and future availability of NFC technologies. Then, it gives some brief information about what this availability means for consumers. For consumers it means easy connections, faster transactions, and simple data sharing. Additionally, NFC tags on store shelves and even integrated into individual products and packaging will allow consumers to access personalized product information and coupons, as well as add products to their “basket” when tapping NFC tags. For retailers and brand owners, nonpayment applications of NFC technologies can lead to significant increases in shopper engagement and streamlined, intuitive connections between retailers’ instore assets and their extended digital presence (NFC Forum, 2015).

The report goes on to focus on concrete attributes in three retail scenarios. The first situation was about accessing store deals, store Wi-Fi, and rewards accounts. It gave information about the usefulness, ease, and speed of touching NFC-enabled smartphones to an icon or poster at the store’s entrance in order to access store deals, store Wi-Fi, and rewards accounts. Then, the report reported the results of the market research in this situation. The second retail situation was about accessing more product information and store inventory. The efficiency and effectiveness of using NFC-enabled smartphones to tap a product in order to get additional information about the product and store inventory was the focus, and results reported. In the third retail situation, the report evaluates the usefulness, ease, and speed of using a digital shopping cart experience with their NFC-enabled smartphones and reported results (NFC Forum, 2015).

Finally, the reactive market research report concluded at a general level. Stating that participants indicated a strong interest in using NFC technologies in both retail and post-retail scenarios, and a stronger preference for NFC technology over competing technologies. Across all scenarios in the market research report, NFC technologies was preferred by the majority of customers over competing technologies, including QR codes, Bluetooth Beacon, and mobile web browsers. The reason being that NFC technology provides a unique and desired mix of convenience, speed, and control. This mix enables the more relevant,

efficient, digitally enhanced instore shopping experience that consumers prefer (NFC Forum, 2015).

Information on Proactive Market Research

Because market research can differ in both purpose and content, we wanted to do an additional treatment for proactive market research. We did this because we wanted to see whether the different forms of market research would affect creativity differently, as our discussed theory suggests. In contrast to the reactive market research report that focused on concrete attributes, the proactive market research report focuses on abstract benefits of NFC technologies. To make sure that we only measure the effect of the abstract benefit versus concrete attributes, we only change the content focusing on concrete attributes in the reactive report to focus on abstract benefits in the proactive report. Consequently, the introduction and conclusion as explained above was the same both for the reactive and proactive market research reports. In the proactive market report, we replaced the content about concrete attributes in the three retail situations with three significant abstract benefits of NFC technology.

The purpose of the three benefits was to make participants think more abstract about the innovation problem. The three benefits used was speed, convenience and control. Speed was important to customers because during the path to purchase, busy mobile shoppers demand ease of use and speed when it comes to in-store technology engagement. Participants in the research report indicated that NFC provides the optimal shopping experience because it offers quick access to contextual information when they want it. To be able to get information by simply tapping a tag rather than having to launch an app or wait for a camera lens to focus, users perceived as a significant benefit to the consumer experience (NFC Forum, 2015).

For the second benefit, convenience, 70% of consumers said, “NFC technology addresses real-world problems and inconveniences” that they have. They liked that they could use NFC regardless of what other function they were performing on their phones at that moment. One participant stated that simply tapping with NFC is easier to do when she has her child with her, because “with a QR code I have to take time to find the app and then scan the barcode” (NFC Forum, 2015).

Finally, the last benefit was control because participants preferred NFC's user-initiated "pull" approach to retrieving information compared to the "push" approach from Bluetooth Beacons. They felt the pull-approach allowed greater control over what information they received and greater accuracy of that information. Consumers value credible information, especially for purchases on the go. Qualitative feedback during this study suggests that participants perceive that the user-initiated NFC is more trustworthy than an unprompted message from a Beacon (NFC Forum, 2015).

With information about these three benefits at an abstract level, our purpose was that the information would affect our participants in the experiment, resulting in different ideas and a difference in creativity compared to the other treatments.

4.3 Measures

In this section, we explain how we collected data for our measures with two different surveys to two different groups. First, we explain the survey given to participants in the experiment. Then, we explain the survey given to two experts on NFC technology for the rating of creativity.

4.3.1 Survey

After participants in the experiment had finished the ideation task, they had to answer a short survey for the statistics. See appendix section 9.1.4 for the complete survey. The survey asked questions about their age and gender, about the participants' self-reported creativity and self-reported interest in NFC technologies. The survey also asked whether they read a report or not. If they said that they did read a report, they had to answer some follow up questions about the content of the report. Accordingly, we did only expect participants in the three treatment groups to say that they read a report.

The survey asked participants about their age and gender so that we could check for randomization across age and gender between the different experiment groups. For additional analysis, checking for potential moderating effects, we also asked participants'

questions about their creativity and interest in the topic of the experiment. They had to answer seven questions on a five point Likert scale ranging from (1) “strongly disagree” to (5) “strongly agree”. The questions was “1. Being creative is an important part of who I am”, “2. I have confidence in my ability to solve problems creatively”, “3. Being creative in my work is an important part of who I am”, “4. I take an interest in innovation on communication technologies”, “5. I am interested in the topic of innovation in communication technologies”, “6. The creative task was fun to work with” and “7. I enjoyed working on new ideas for the use of NFC technologies” ((Tierney & Farmer, 2002) and (Tierney & Farmer, 2011)).

Finally, we asked participants’ whether they read a report before they started the task of generating ideas. We asked the question so that we could check whether they actually read the treatment report or not, as this was essential for us to be able to analyze the effects of the different treatments. If they answered yes, the participants’ had to answer additional six questions about the content in the report. That way we could check whether they did not only read the report, but also understood it and remembered the content. First, they had to answer three questions on a five point Likert scale ranging from (1) “not at all” to (5) “to a large extent”. The questions being; “1. To which extent did the report contain information about the company’s vision and strategy?”, “2. To which extent did the report concentrate on concrete customer perceptions using NFC technologies?” and “3. To which extent did the report concentrate on the abstract benefits of using NFC technologies?”. Then, they had to answer the last three questions on a five point Likert scale ranging from (1) “strongly disagree” to (5) “strongly agree”. The questions being; “1. The company’s mission focuses on helping customers”, “2. I read about consumer preferences for NFC technologies in various scenarios” and “3. I read about the importance of speed, convenience and control for customers when using NFC technologies”. These questions would generate data that would make us able, at least to some extent, to check whether participants’ actually read and obtained the information in the attached treatment reports. Thus, we could see whether our manipulation in the different treatments actually worked on the participants. We will now continue by first checking for randomization across age and gender. Then we analyze the findings from the manipulation check, to make sure that the treatment reports generated different knowledge across the treatment groups.

Randomization

Even though we faced problems with the randomization of our recruited sample of the chosen population, we believe to have achieved a greater randomization within our sample. As respondents reported their age and gender, we could statistically check whether our treatment samples were randomized across age and gender within our sample. The survey generated the following descriptive statistics for Age and Gender across the four groups:

Table 1: Descriptive Statistics, Age and Gender

	Control					Proactive MR					Reactive MR					Vision				
	N	Min	Max	Mean	St.d	N	Min	Max	Mean	St.d	N	Min	Max	Mean	St.d	N	Min	Max	Mean	St.d
Age	30	19	27	22.63	2.17	30	19	27	22.8	2.28	29	19	27	23.3	2.34	28	20	26	22.7	2.27
Gender	30	0	1	0.57	0.5	30	0	1	0.47	0.51	29	0	1	0.55	0.51	28	0	1	0.46	0.51

We tested both Age and Gender with a one way ANOVA. The results proved that age with a p-value of 0.626 did not significantly differ across treatment groups. Neither did gender with a p-value of 0.8. Thus, we could conclude that we achieved within group randomization across age and gender. Randomization is important to secure the validity of our data, which we will explain further later in this report.

Manipulation Effects

The answers from the questions in the survey that we asked to check for manipulation effects, that is, if participants read and understood the attached report, generated the following data for the three treatments:

Table 2: Descriptive statistics variables testing for manipulation

	Proactive Market Research					Reactive Market Research					Vision				
	N	Min	Max	Mean	St.d	N	Min	Max	Mean	St.d	N	Min	Max	Mean	St.d
Report	30	0	1	0.93	0.25	29	0	1	0.93	0.26	28	0	1	0.96	0.19
1:Vision	28	1	5	2.57	0.92	27	1	4	2.15	0.82	27	1	5	3.7	1.1
1:ReMR	28	1	4	2.43	0.92	27	3	5	3.81	0.79	27	1	4	2	0.88
1:ProMR	28	2	5	3.96	1	27	1	5	2.44	0.97	27	1	4	1.96	0.81
2:Vision	28	1	5	2.64	0.91	27	1	4	2.26	0.76	27	2	5	3.96	1.09

2:ReMR	28	1	5	2.75	1.07	27	3	5	4.22	0.85	27	1	4	2.04	0.98
2:ProMR	28	2	5	4.07	1.05	27	1	5	2.44	1.12	27	1	4	2.04	0.98

As we see from the binary “Report” variable in the descriptive statistics, which takes a value of “1” if they read a report and “0” otherwise, almost all participants read a report. Therefore, we continue by analyzing whether they remembered and understood the content of the reports. To get an idea of what to expect we first graph the data from the six questions for each treatment group. For the graph, see figure 2 below:

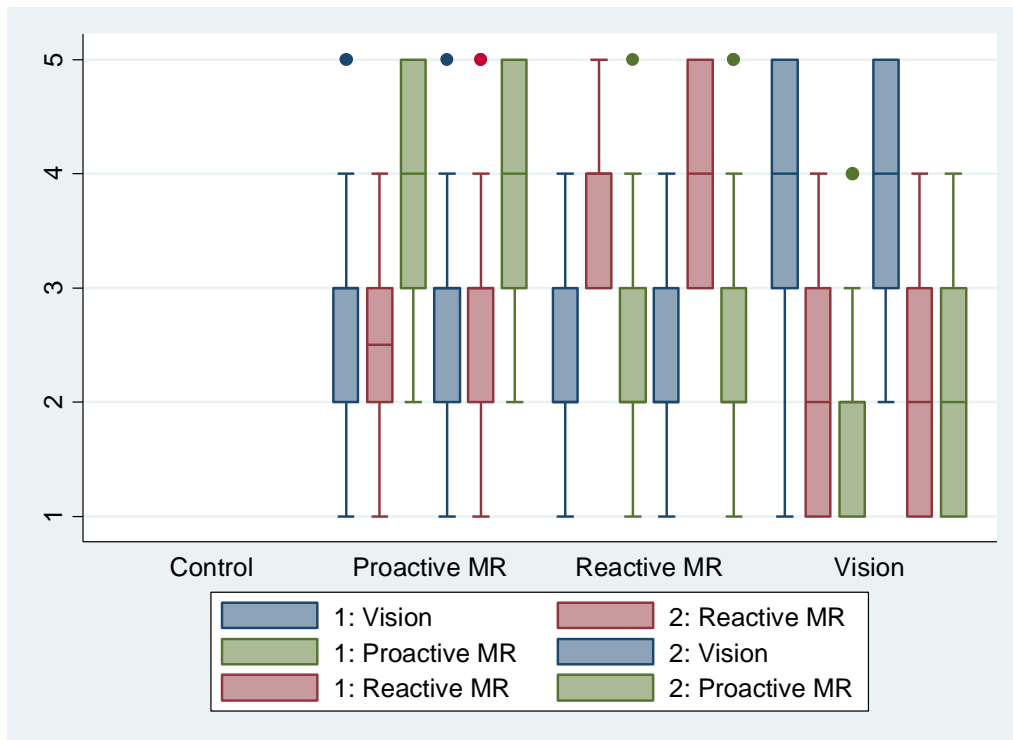


Figure 2: Box plot of variables testing for manipulation effects

As we see, the proactive market research treatment group scored the two questions about proactive report and content high. The reactive market research treatment group scored the two questions about reactive report and content high. Finally, the vision treatment scored the two questions about vision report and content high. Thus, as the treatment rated the questions about the report they read higher than the questions about the report they did not read, it seems like the treatment groups understood the attached report.

To be sure, we conducted a one way ANOVA on the data shown in the figure above. Our findings proved that both the two vision questions differed significantly from the other

treatments with a p-value close to 0.000. Additionally, they was rated largest in the vision treatment, as also seems to be the case in the figure. The two reactive questions also differed significantly across groups with a p-value close to 0.000. The reactive questions participants rated largest in the reactive market research treatment. For the two proactive questions, we got similar results, as expected. They differed significantly across groups with a p-value close to 0.000, and was significantly highest in the proactive market research treatment.

Based on these findings we have strong reasons to believe that the participants understood the attached reports and the information that they contained. These findings is critical for the experiment to provide valid results. However, we do not know whether they actually used the information to generate ideas.

4.3.2 Creativity

After conducting the experiment, we had a dataset containing about 450 generated ideas on how to use NFC technologies, or a little more than 100 unique ideas. See appendix section 9.2.1 for the complete list of unique ideas. In order to analyze the creativity of these ideas, we needed a way to measure the creativity of all the ideas generated. In the theory section when defining creativity, we said that there is mainly two critical components in the assessment of creativity, novelty and appropriateness (Moreau & Dahl, 2005). Consequently, we needed to create a survey that asks about the novelty and appropriateness of the generated ideas. In previous research on creativity there is commonly used a seven point Likert scale to measure the creativity of ideas ((Andrews & Smith, 1996) and (Dahl, Chattopadhyay & Gorn, 1999)). Accordingly, we use one scale to measure the novelty of ideas, and one scale to measure the appropriateness of ideas. Goldenberg, Mazursky and Solomon (1999) uses a scale measuring novelty that asks to which degree the idea is (1) “Not original at all” to (7) “Very original”. The second scale they use which measure the appropriateness of the idea, asks to which degree one would recommend investment in implementing the idea on a scale ranging from (1) “Not recommend at all” to (7) “Highly recommend”. The last scale does not directly ask about the value, but we still believe the scale reflect the appropriateness of ideas as a company will only invest in implementing ideas which they think are valuable, and which they also think have potential in the market. Thus, the scale for appropriateness will measure both the value for the firm and the value in

the marketplace. Accordingly, it does measure the entire appropriateness of the generated ideas.

In creativity research, people who are experts on the field of the chosen case in the experiment usually determine the creativity of ideas (Amabile, 1996). Accordingly, we got in touch with two employees from the research department of a large mobile company in Norway. Their job would be to reply to the survey so that we get data about the creativity of ideas generated in the experiment.

In research from Goldenberg et al (1999), they made the judges blind to the identity of the participants, to one another, and to the purpose of the experiment. This is also in accordance with previous creativity research. Thus, we try to make the same assumptions. Our experts were colleagues, so they knew each other. However, they were blind to the identity of the participants. We also tried to limit their knowledge of the purpose of the experiment, only giving them the instructions they needed to respond to the survey. We told them that the ideas in the survey was ideas on how to use NFC-technologies, and we then gave them a definition of NFC-technologies. As the experts knew the technology, they did not get any further information about NFC technology. Furthermore, we briefly explained the two questions that they had to score. The questions being: “1. to which degree would you say that the idea is original” on a scale ranging from (1) “Not original at all” to (7) “Very original”, and “2. To which degree would you recommend investment in implementing the idea” on a scale ranging from (1) “Not recommend at all” to (7) “Highly recommend”. We explained the scale that they had to answer. They had to use their own subjective understanding of the concept of creativity (Amabile, 1996). Additionally, we told them that they should rank the ideas relatively to each other on the 7-point scale (Amabile, 1996). Finally, we asked them to reply to the survey individually to limit the effects of the fact that they are not blind to each other’s identity. For the full survey, see appendix section 9.2.1.

5. Analysis and Results

5.1 Data Analysis

In this section, we will present our data. First, we present our raw data. Then, we explain how we sort and index our raw data into variables for our final data, which we will use in our analysis.

5.1.1 Descriptive Statistics: Raw Data

Table 3 below contains descriptive statistics on the data gathered from the experts that rated novelty and appropriateness of ideas. They rated 108 unique ideas, of which we present minimum and maximum values, mean and standard deviation. Table 3 also show the indexes for novelty and appropriateness, which is the average from the two judges' rankings.

Table 3: Creativity scores from experts and indexes

Novelty and Appropriateness measured by two experts

	N	Min	Max	Mean	St.dev
Novelty Expert(1)	108	1	7	4.33	1.41
Novelty Expert (2)	108	1	5	2.71	0.93
Novelty Index	108	1.5	5.5	3.52	0.96
Appropriateness Expert(1)	108	1	6	3.31	1.58
Appropriateness Expert(2)	108	2	7	4.9	1.47
Appropriateness Index	108	1.5	6.5	4.11	1.27

Table 4 below, shows number of observations, minimum and maximum values, mean and standard deviation for our raw data for each of our four groups. Variable N1-N7 is the novelty assigned to each idea on an individual level. A1-A7 is the appropriateness assigned to each idea on an individual level. SC1-SC3 represents the three questions that asked participants about self-creativity. Finally, I1-I4 is the variables representing the four questions that asked about participants' interest in the topic of the case.

Table 4: Descriptive Statistics of raw data

	Control					Proactive MR					Reactive MR					Vision				
	N	Min	Max	Mean	St.d	N	Min	Max	Mean	St.d	N	Min	Max	Mean	St.d	N	Min	Max	Mean	St.d
N1	27	1.5	5.5	3.28	1.1	28	1.5	5.5	3.45	0.87	27	2	5	3.74	0.75	27	1.5	5.5	3.35	1.06
N2	21	1.5	5	3.33	1.2	24	1.5	5	3.33	0.88	20	2	5	3.75	0.97	22	1.5	5	3.6	0.99
N3	19	1.5	5	3.37	1.02	19	2	5	3.63	0.8	17	2	5	3.44	0.91	18	1.5	5	3.8	0.91
N4	17	1.5	5	3.15	1.07	12	2	4.5	3.54	0.78	11	1.5	5	3.73	0.98	13	2	5.5	3.54	0.94
N5	8	1.5	5	3.25	1.22	8	2	4.5	3.5	0.76	8	5.5	5	4	1.13	8	2	4	2.94	0.73
N6	6	1.5	4.5	3.5	1.05	4	3	5	4	0.91	4	1.5	4	3.12	1.18	6	3.5	5	3.92	0.66
N7	2	2	3	2.5	0.71	1	4	4	4		0					2	4	4.5	4.25	0.35
A1	27	2	6	3.89	1.07	28	2	6	4.11	1.42	27	1.5	6.5	4.22	1.51	27	2	6.5	4.07	1.31
A2	21	1.5	5.5	3.76	1.17	24	1.5	6	4.06	1.18	20	2	6	4.35	1.48	22	1.5	6	4.14	1.15
A3	19	1.5	5.5	3.95	1.22	19	1.5	6	4.05	1.27	17	2	5.5	3.94	1.24	18	2	6	4.33	1.2
A4	17	2	6.5	3.79	1.3	12	2	6	4.25	1.31	11	1.5	6	4	1.26	13	1.5	5.5	3.88	1.43
A5	8	2.5	5.5	4.31	1.22	8	2	5.5	3.56	1.18	8	2	6	3.56	1.26	8	1.5	4.5	3.31	1.07
A6	6	4	5.5	4.92	0.58	4	2.5	6	3.62	1.65	4	2.5	3.5	3.12	0.48	6	3	5.5	4.17	0.93
A7	2	2	5.5	3.75	2.47	1	4	4	4		0					2	4.5	5	4.75	0.35
SC1	30	2	5	3.63	1.07	30	2	5	3.4	1.07	29	2	5	3.38	1.18	28	2	5	3.61	1.1
SC2	30	2	5	3.63	0.96	30	2	5	3.43	0.97	29	2	5	3.55	0.98	28	3	5	3.57	0.74
SC3	30	2	5	5.53	1	30	2	5	3.53	1.11	29	2	5	3.52	1.02	28	2	5	3.54	0.96

11	30	1	5	2.73	1.11	30	1	5	3.1	1.06	29	1	5	3.27	1	28	1	5	3.21	1.13
12	30	1	5	2.5	1.11	30	1	5	3	1.1	29	2	5	3.21	1.01	28	1	5	2.96	1.23
13	30	1	5	3.07	1.14	30	1	5	3.33	1.09	29	1	5	3.32	1.29	28	2	5	3.29	1.12
14	30	1	5	3.13	1.07	30	1	5	3.27	1.23	29	1	5	3.21	1.29	28	1	5	3.18	1.09

5.1.2 Variables

Creativity, Novelty, Appropriateness and Number of Ideas

To be able to analyze effects on creativity, we first need a measure for creativity. As previously mentioned, two experts ranked the novelty and appropriateness of the ideas generated. We start by checking to which degree the two experts agreed on the level of creativity of the ideas. This we do by checking if the scores from the two experts are significantly correlated ((Kristensson et al, 2002), (Moreau & Dahl, 2005) and (Scopelliti et al, 2014)).

Table 5: Correlations of expert's ratings on novelty and appropriateness

Correlations	Novelty Expert(1)	Appropriateness Expert(1)
Novelty Expert(2)	0.324*	
Appropriateness Expert(2)		0.393*

*Significant at the 1% level of significance

The correlation of the novelty scores from the two experts correlated significantly with a correlation of 0.32 and a p-value of 0.001. Even so, the Cronbach's alpha for Novelty was only 0.46, which indicates a poor correlation. The score for appropriateness were also statistically significant with a correlation of 0.39 and a p-value close to 0.000. The Cronbach's alpha reported were 0.56, which also indicates a rather poor correlation. In accordance with previous research, statistically significant correlations indicates that the experts agreed on the creativity of ideas at a satisfactory level ((Kristensson et al, 2002), (Moreau & Dahl, 2005) and (Scopelliti et al, 2014)).

We continue by averaging the two experts' scores into two indexes. One for novelty of ideas, and one for the appropriateness of ideas. Having an index for novelty and appropriateness for all ideas generated at an idea-level, we continued by indexing the values across ideas for each individual. That way, we get a measurement for novelty and appropriateness at the individual level.

We also averaged the two indexes of novelty and appropriateness into an overall measure of creativity. The overall measure of creativity assumes that overall creativity is a simple linear combination of novelty and appropriateness. This means that the effect of situational and individual factors are similar on overall creativity (Moreau & Dahl, 2005). This is a weakness, and we will therefore not be putting too much weight on this measurement in further analysis. We will mainly be analyzing the overall creativity to check whether there are any differences in overall creativity in our data, so that we can get an overview of the data, and see what we may expect from further analysis. Consequently, to be able to test our chosen hypotheses, and for both practical and theoretical reasons, we will be using the novelty and appropriateness indexes separately in our analyses in addition to the overall creativity measurement ((Kristensson et al, 2002), (Moreau & Dahl, 2005) and (Scopelliti et al, 2014)).

As our hypotheses states, we will be using four variables for creativity, overall creativity, novelty, appropriateness, and number of ideas. An index for number of ideas generated we simply get by summing the number of ideas generated for each individual.

Extreme Values of Creativity

In addition to the four indexes on creativity as described above, we also created eight binary variables for the extreme values of the creativity indexes. We created two binary variables for each measure of creativity. The first would take the value 1 if the value of either overall creativity, novelty, appropriateness or number of ideas had a value equal to or larger than "4" and "0" otherwise. That is, we got four binary variables for values equal to or larger than "4", one for each measure of creativity. The other binary variable would take the value 1 if the value of either creativity, novelty, appropriateness or number of ideas had a value equal to or larger than "5" and "0" otherwise. Again, we got four binary variables for values equal to or larger than "5", one for each measure of creativity.

We created the binary variables for the extreme values so that we in addition to check for mean differences across groups, also could check if there were any differences across groups for extreme values. That is, the binary variables makes us able to check whether any of the groups generated significantly more “very creative”, “very novel”, “very appropriate”, or “very many” ideas than any of the other groups.

Self Creativity

We asked all participants three questions about their creativity. Thus, we got three values for self-reported creativity. As for the values of novelty and appropriateness, we wanted to create an index measuring self-creativity in one variable at the individual level. Accordingly, we check whether the three scores for the questions on self-reported creativity correlates.

Table 6: Correlations of self-reported creativity measures

Correlations	SC(1)	SC(2)	SC(3)
SC(1)	1	0.789*	0.875*
SC(2)	0.789*	1	0.829*
SC(3)	0.875*	0.829*	1

*Significant at the 1% level of significance

The three questions correlates significantly with p-values close to 0.000, and correlation coefficients of 0.789, 0.875 and 0.829. The Cronbach’s alpha in this case is 0.934, indicating an excellent correlation. Consequently, we average the three scores into an overall index for self-creativity. The index we can use in our analysis to check for potential moderating effects on the relationship between the different sources of information in the different groups and the creativity of ideas generated.

Interest

As explained in our methodology section, we also asked all participants four questions about their interest in the topic of NFC technologies. For the same reasons as with self-creativity,

we also wanted to create an index measuring participants' interest on the topic for the idea-generating task. We check the correlation for the data from the four questions.

Table 7: Correlations of self-reported interest in the case of the experiment

Correlations	I(1)	I(2)	I(3)	I(4)
I(1)	1	0.914*	0.191**	0.241*
I(2)	0.914*	1	0.237**	0.317*
I(3)	0.191**	0.237**	1	0.934*
I(4)	0.241*	0.317*	0.934*	1

*Significant at the 1% level of significance, **Significant at the 5% level of significance

As we see from table 7, they correlates significantly at a 5% level of significance. The Cronbach's alpha is 0.782, which indicates a very acceptable correlation. As we have done with the previous indexes, we average the data from the four questions into an index that measures interest in NFC technologies at the individual level.

5.2 Results

In this section, we will explain our results. We begin by presenting descriptive statistics of the variables explained in section 5.1.2 above, which we will use in our analysis. Then, we test each of our six main hypotheses. We continue by testing for differences in the four dependent variables, overall creativity, novelty, appropriateness and number of ideas, across the four groups, vision, reactive market research, proactive market research, and the control group. By conducting a one-way ANOVA we test if any of the measurements significantly differ across the four groups ((Kristensson et al, 2002), (Scopelliti et al, 2014), (Girotra et al, 2008) and (Chen & Althuizen, 2013)). For each of the four dependent variables, we continue by testing for possible moderating effects, conducting ANCOVA including the variables of self-creativity and interest. That way, we can check whether the results from the first ANOVA changes when taking self-creativity and interest into account. Finally, we analyze the extreme values for each of our four dependent variables using ANOVA.

5.2.1 Descriptive Statistics: Final Data

In table 8 below, we present our final data that we use in our further analysis. The variables are as described above, overall creativity, novelty, appropriateness, number of ideas, self-creativity, interest, and binary variables measuring the extreme values of each of our four main variables.

Table 8: Descriptive Statistics of final data for our main analyzes

	Control					Proactive MR					Reactive MR					Vision				
	N	Min	Max	Mean	St.d	N	Min	Max	Mean	St.d	N	Min	Max	Mean	St.d	N	Min	Max	Mean	St.d
Creativity	27	2.5	4.6	3.56	0.6	28	2.5	4.6	3.66	0.61	27	2.4	5.3	3.89	0.67	27	3	5.3	3.82	0.56
Novelty	27	1.5	4.6	3.2	0.72	28	2.5	4.5	3.45	0.53	27	2.8	4.8	3.65	0.47	27	2.6	5	3.54	0.53
Appropriateness	27	2	5.5	3.92	0.76	28	2	5.5	3.7	0.9	27	2	6	4.13	1.06	27	3	5.5	4.1	0.75
Number of Ideas	30	0	7	3.33	2.15	30	0	7	3.2	1.86	27	0	6	3	1.93	28	0	7	3.43	2
Self-Creativity	30	2	5	3.6	0.96	30	2	5	3.45	1	29	2	5	3.48	1.02	28	2.3	5	3.57	0.85
Interest	30	1	5	2.86	0.91	30	1.5	5	3.17	0.82	29	2	5	3.26	0.85	28	1.5	5	3.16	0.93
Novelty>=4	30	0	1	0.23	0.43	30	0	1	0.2	0.4	29	0	1	0.31	0.47	28	0	1	0.14	0.36
Novelty>=5	30	0	1	0.1	0.3	30	0	1	0.07	0.25	29	0	1	0.07	0.26	28	0	1	0.07	0.26
Appropriateness>=4	30	0	1	0.57	0.5	30	0	1	0.53	0.5	29	0	1	0.62	0.49	28	0	1	0.53	0.51
Appropriateness>=5	30	0	1	0.17	0.38	30	0	1	0.17	0.38	29	0	1	0.31	0.47	28	0	1	0.18	0.39
Creativity>=4	30	0	1	0.37	0.49	30	0	1	0.4	0.5	29	0	1	0.52	0.51	28	0	1	0.39	0.5
Creativity>=5	30	0	1	0.1	0.3	30	0	1	0.07	0.25	29	0	1	0.14	0.35	28	0	1	0.07	0.26
Number of Ideas>=4	30	0	1	0.57	0.5	30	0	1	0.4	0.5	29	0	1	0.38	0.49	28	0	1	0.46	0.51
Number of Ideas>=5	30	0	1	0.27	0.45	30	0	1	0.27	0.45	29	0	1	0.28	0.45	28	0	1	0.28	0.46

5.2.2 Test of Hypotheses

In this section, we will test our six hypotheses as chosen in section 3. For each hypothesis, we repeat the hypothesis, and then describe the analysis conducted and the results provided.

Hypothesis 1

Providing information on (2) reactive market research in consumer ideation has a positive effect on (a) creativity, (b) number of ideas generated, (c) novelty of ideas generated, and (d) appropriateness of ideas generated.

First, we conducted ANOVA, testing if our dependent variables differ in at least one of the four groups. This we test against the null, that there are no differences in our dependent variables across the four group. Output from ANOVA revealed that (a) creativity ($F(3, 105)=1.64, p=0.185$), (b) number of ideas ($F(3, 113)=0.25, p=0.861$), and (d) appropriateness ($F(3, 105)=0.59, p=0.625$) did not significantly differ across groups. Accordingly, we do not have enough evidence to say that reactive market research has a positive on (a) overall creativity, (b) number of ideas or (d) appropriateness, compared to the control group. The follow-up Tukey's test confirm this. It reveals that none of the effects on (a) overall creativity (Mean $_{\text{Reactive}}=3.89$, Mean $_{\text{Control}}=3.56$, $p=0.195$), (b) number of ideas (Mean $_{\text{Reactive}}=3$, Mean $_{\text{Control}}=3.33$, $p=0.92$) and (d) appropriateness (Mean $_{\text{Reactive}}=4.13$, Mean $_{\text{Control}}=3.92$, $p=0.82$) is significantly larger in the reactive market research group than in the control group.

However, from the ANOVA we did find that novelty significantly differed across groups at a 3% level of significance ($F(3, 105)=3.15, p=0.028$). Tukey's test confirm that (c) novelty of ideas in the reactive market research group is statistically larger than in the control group (Mean $_{\text{Reactive}}=3.65$, Mean $_{\text{Control}}=3.2$, $p=0.02$), even at a 2% level of significance. Thus, reactive market research has a positive effect on novelty of ideas generated. We conclude on hypothesis 1 by rejecting the null hypothesis for (c) novelty. For the other variables (a) overall creativity, (b) number of ideas, and (d) appropriateness, we do not reject the null hypothesis.

Hypothesis 2

Providing information on (3) proactive market research in consumer ideation has a positive effect on (a) creativity, (b) number of ideas generated, (c) novelty of ideas generated, and (d) appropriateness of ideas generated.

With the same procedure as for hypothesis 1, we test whether proactive market research has a positive effect on our four dependent variables. Output from ANOVA revealed that neither (a) creativity ($F(3, 105)=1.64, p=0.185$), (b) number of ideas ($F(3, 113)=0.25, p=0.861$), nor (d) appropriateness ($F(3, 105)=0.59, p=0.625$) differs significantly across groups. As before, (c) novelty ($F(3, 105)=3.15, p=0.028$) differs significantly across groups, even at a 3% level of significance.

However, computing the Tukey's test based on the ANOVA reveals that none of our four variables is significantly larger in the proactive group compared to the control group. Output from Tukey's tests provides (a) creativity (Mean_{Proactive}=3.66, Mean_{Control}=3.56, $p=0.93$), (b) number of ideas generated (Mean_{Proactive}=3.2, Mean_{Control}=3.33, $p=0.99$), (c) novelty (Mean_{Proactive}=3.45, Mean_{Control}=3.2, $p=0.35$) and (d) appropriateness (Mean_{Proactive}=3.7, Mean_{Control}=3.92, $p=0.99$). Accordingly, proactive market research does not have statistically significant positive or greater effects on any of the four dependent variables compared to the control group. Consequently, we reject hypothesis 2 in favor of its null hypothesis for (a) creativity, (b) number of ideas, (c) novelty, and (d) appropriateness.

Hypothesis 3

Providing information on (3) proactive market research in consumer ideation has a greater effect than providing information on (2) reactive market research in consumer ideation on (a) creativity, (b) number of ideas generated, (c) novelty of ideas generated, and (d) appropriateness of ideas generated.

For hypothesis 3, we compare the group receiving proactive market research with the group receiving reactive market research. Again, we begin by repeating ANOVA output which revealed that (a) creativity ($F(3, 105)=1.64, p=0.185$), (b) number of ideas ($F(3, 113)=0.25, p=0.861$), and (d) appropriateness ($F(3, 105)=0.59, p=0.625$) did not significantly differ across groups, while (c) novelty ($F(3, 105)=3.15, p=0.028$) did differ across groups.

Based on the ANOVA, we compute the Tukey's statistics comparing the mean difference in the proactive group with the reactive group. Tukey's output provide (a) creativity (Mean_{Proactive}=3.66, Mean_{Reactive}=3.89, $p=0.5$), (b) number of ideas generated (Mean_{Proactive}=3.2,

Mean_{Reactive}=3, $p=0.98$), (c) novelty (Mean_{Proactive}=3.45, Mean_{Reactive}=3.65, $p=0.55$) and (d) appropriateness (Mean_{Proactive}=3.7, Mean_{Reactive}=4.13, $p=0.69$). As we can see from the reported p -values for each of our dependent variables, none is statistically significant. Accordingly, proactive market research does not have a statistically significant greater effect on any of the four variables compared to the group that received reactive market research. Consequently, we reject hypothesis 3 in favor of its null hypothesis that there are no differences between proactive and reactive market research for (a) creativity, (b) number of ideas, (c) novelty and (d) appropriateness.

Hypothesis 4

Providing information on (1) company vision in consumer ideation has a positive effect on (a) creativity, (b) number of ideas generated, (c) novelty of ideas generated, and (d) appropriateness of ideas generated.

We use the same procedure as for hypothesis 1 and 2 when we now test hypothesis 4 as stated above. That is, we compare the group receiving information on company vision with the control group. Repeating ANOVA output, it revealed that (a) creativity ($F(3, 105)=1.64$, $p=0.185$), (b) number of ideas ($F(3, 113)=0.25$, $p=0.861$), and (d) appropriateness ($F(3, 105)=0.59$, $p=0.625$) did not significantly differ across groups, while (c) novelty ($F(3, 105)=3.15$, $p=0.028$) significantly differs across groups.

Based on the ANOVA, we compute Tukey's test on the four dependent variables. Tukey's test provides output for (a) creativity (Mean_{Vision}=3.82, Mean_{Control}=3.56, $p=0.41$), (b) number of ideas generated (Mean_{Vision}=3.43, Mean_{Control}=3.33, $p=0.99$), (c) novelty (Mean_{Vision}=3.54, Mean_{Control}=3.2, $p=0.13$) and (d) appropriateness (Mean_{Vision}=4.1, Mean_{Control}=3.92, $p=0.88$). As we see from the reported p -values, none of the dependent variables is statistically significant. Accordingly, information on company vision does not have statistically significant positive or greater effects on any of the four dependent variables compared to the control group. Consequently, we reject hypothesis 4 in favor of its null hypothesis for (a) creativity, (b) number of ideas, (c) novelty, and (d) appropriateness.

Hypothesis 5

Providing information on (1) company vision in consumer ideation has a greater effect than providing information on (2) reactive market research in consumer ideation on (a) creativity, (b) number of ideas generated, (c) novelty of ideas generated, and (d) appropriateness of ideas generated.

For hypothesis 5, we compare the group receiving information on company vision with the group receiving reactive market research. Again, we mention that the output from ANOVA revealed that (a) creativity ($F(3, 105)=1.64, p=0.185$), (b) number of ideas ($F(3, 113)=0.25, p=0.861$), and (d) appropriateness ($F(3, 105)=0.59, p=0.625$) did not significantly differ across groups, while (c) novelty ($F(3, 105)=3.15, p=0.028$) significantly differs across groups.

Based on the ANOVA, we compute the Tukey's statistics comparing the vision group with the reactive group for our four dependent variables. We get output on (a) creativity (Mean_{Vision}=3.82, Mean_{Reactive}=3.89, $p=0.97$), (b) number of ideas generated (Mean_{Vision}=3.43, Mean_{Reactive}=3, $p=0.85$), (c) novelty (Mean_{Vision}=3.54, Mean_{Reactive}=3.65, $p=0.87$) and (d) appropriateness (Mean_{Vision}=4.1, Mean_{Reactive}=4.13, $p=0.99$). From the reported p-values, none of the four variables does statistically differ between the two groups. Accordingly, information on company vision does not have a statistically significant greater effect on any of the four dependent variables compared to the group that received reactive market research. Consequently, we reject hypothesis 5 in favor of its null hypothesis that there are no differences between receiving information on company vision or reactive market research for (a) overall creativity, (b) number of ideas, (c) novelty, and (d) appropriateness.

Hypothesis 6

Providing information on (1) company vision ((3) *proactive market research*) in consumer ideation has a greater effect than providing information on (3) proactive market research ((1) *company vision*) in consumer ideation on (a) creativity, (b) number of ideas generated, (c) novelty of ideas generated, and (d) appropriateness of ideas generated.

Finally, we compare the group receiving information on company vision with the group receiving proactive market research. We repeat the output from the ANOVA which revealed that (a) creativity ($F(3, 105)=1.64, p=0.185$), (b) number of ideas ($F(3, 113)=0.25, p=0.861$), and (d) appropriateness ($F(3, 105)=0.59, p=0.625$) did not significantly differ across groups, while (c) novelty ($F(3, 105)=3.15, p=0.028$) did differ across groups.

Based on the ANOVA, we compute the Tukey's statistics comparing the vision group with the proactive group. We find that neither (a) creativity (Mean_{Vision}=3.82, Mean_{Proactive}=3.66, p=0.78), (b) number of ideas generated (Mean_{Vision}=3.43, Mean_{Proactive}=3.2, p=0.97), (c) novelty (Mean_{Vision}=3.54, Mean_{Proactive}=3.45, p=0.95) nor (d) appropriateness (Mean_{Vision}=4.1, Mean_{Proactive}=3.7, p=0.77) is statistically significant. Accordingly, information on company vision does not have a statistically significant greater effect on any of the four dependent variables compared to the group that received proactive market research. The same holds for the opposite, that information on proactive market research does not have a statistically significant greater effect on any of the four dependent variables compared to the group that received information on company vision. Consequently, we reject hypothesis 6 in favor of its null hypothesis that there are no differences between receiving information on company vision or proactive market research for (a) creativity, (b) number of ideas, (c) novelty, and (d) appropriateness.

5.2.3 Test of Differences in Dependent Variables across Groups

In this section, we will test for differences in our four dependent variables across groups. We will do so by conducting ANOVA. We have already mentioned the ANOVA results for our dependent variables above when testing our hypothesis. However, now we will present the ANOVA output in more detail. We do so in order to test for potential moderating effects in the next section below, section 5.2.4.

Creativity ANOVA

We begin by testing whether there are any differences in overall creativity between the four groups. To get an indication of what to expect, we first illustrate the overall creativity data with a box plot as displayed in figure 3 below.

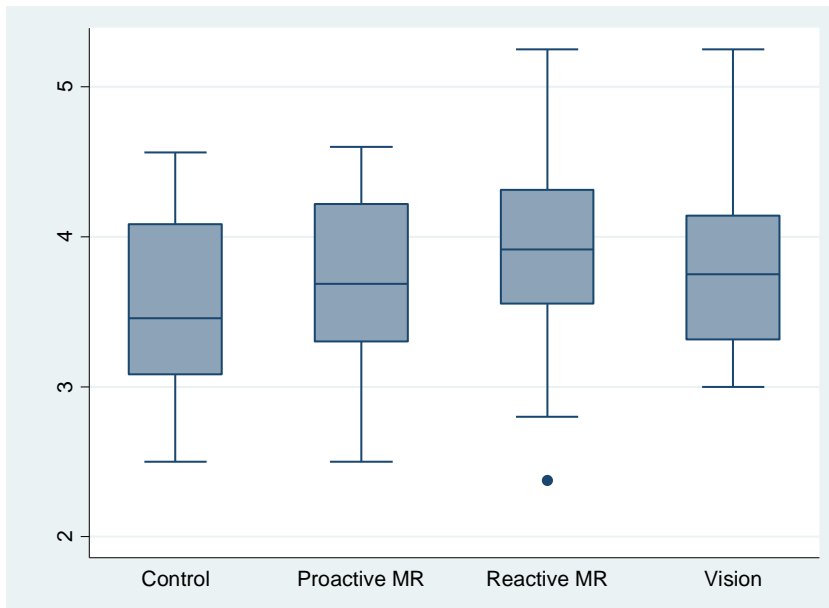


Figure 3: Creativity box plot

As we see from figure 3, overall creativity seems to be rather equal across groups, perhaps a little higher in the group receiving reactive market research. To verify, we test the alternative hypothesis that overall creativity in at least one of the four groups differs from the other groups. We test this against the null that there is no differences in overall creativity between groups. The output from the one-way ANOVA ($F(3, 105)=1.64, p=0.185$) tells us that we do not have enough evidence to reject the null hypothesis, not even at a 10% level of significance. However, as mentioned previously, the overall creativity variable is a rather weak measurement as it is simply a linear combination of the novelty and appropriateness. Consequently, a non-significant result on overall creativity does not necessary mean that the other dependent variables also will be insignificant.

Novelty ANOVA

With the same procedure as above, we now conduct ANOVA for our Novelty measure. To get an indication of what to expect, we first illustrate the novelty data with a box plot as displayed in figure 4 below. It seems like novelty might be a little higher in the group receiving reactive market research. Even so, in total, our novelty data seems to be rather equal across groups.

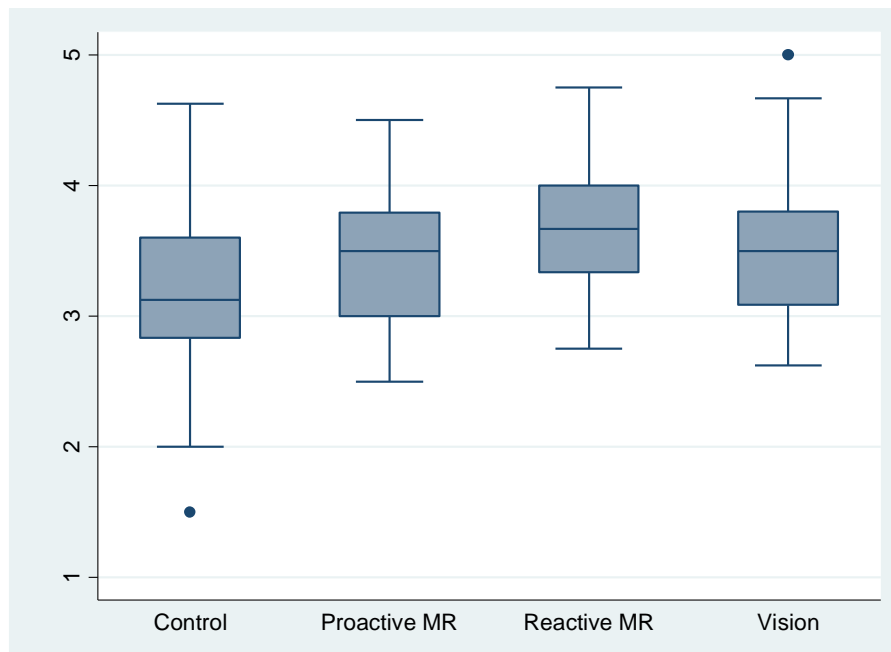


Figure 4: Novelty box plot

To verify our indications from figure 4, we conduct ANOVA to test whether there are any differences in novelty between groups. The alternative hypothesis that novelty of ideas differs in at least one of the groups, we test against the null that there is no differences in novelty between groups. The output from one-way ANOVA ($F(3, 105)=3.15, p=0.028$) let us reject the null hypothesis at a 3% level of significance. Accordingly, there are in fact differences in novelty of ideas between the four groups.

Looking at the follow-up Tukey's test from the ANOVA, we found that novelty only differed significantly from the control group with output of ($\text{Mean}_{\text{Reactive}}=3.65, \text{Mean}_{\text{Control}}=3.2, p=0.02$). Accordingly, novelty differs in at least one of the groups, in our case, the reactive market research group. It has a positive effect on novelty, as its values is significantly greater than in the control group. There is no significant difference in novelty between the remaining treatment groups.

Appropriateness ANOVA

With the same procedure as above, we conduct ANOVA for our appropriateness measure. To get an indication of what to expect we first illustrate the appropriateness data with a box plot as displayed in figure 5. Again, our measures seems to be rather equal spread across groups.

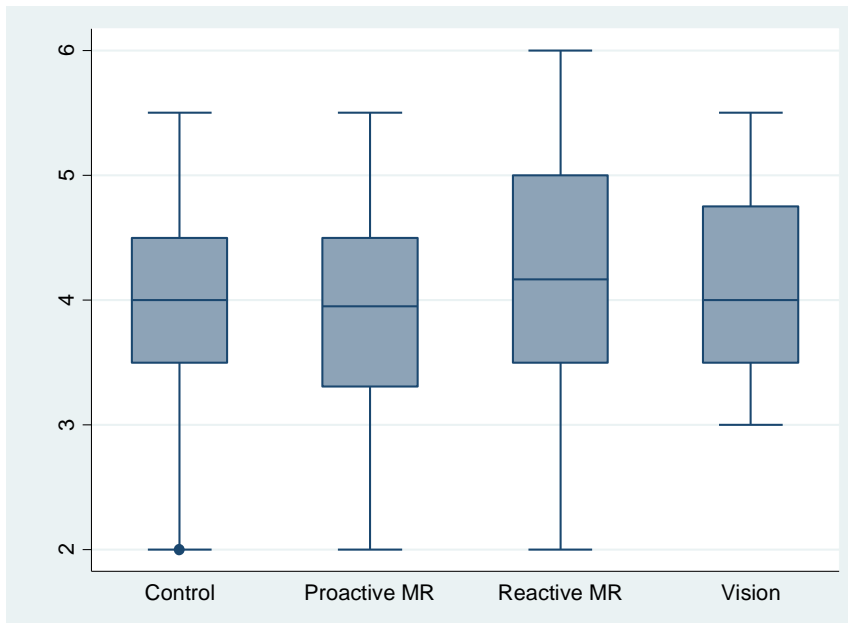


Figure 5: Appropriateness box plot

To verify, we conduct ANOVA to test whether there are any differences in appropriateness of ideas between groups. The alternative hypothesis that appropriateness differs in at least one of the groups, we test against the null that there is no differences in appropriateness between groups. Based on the output from the one-way ANOVA ($F(3, 105)=0.59, p=0.625$) we do not have enough evidence to reject the null hypothesis. Accordingly, we cannot say that appropriateness differs across groups based on our data.

Number of Ideas ANOVA

Finally, we test whether there are any differences in number of ideas generated between groups. To get an indication of what to expect we first illustrate number of ideas with a box plot as displayed in figure 6. As the figure shows, number of ideas generated seems to be rather equal across the four groups.

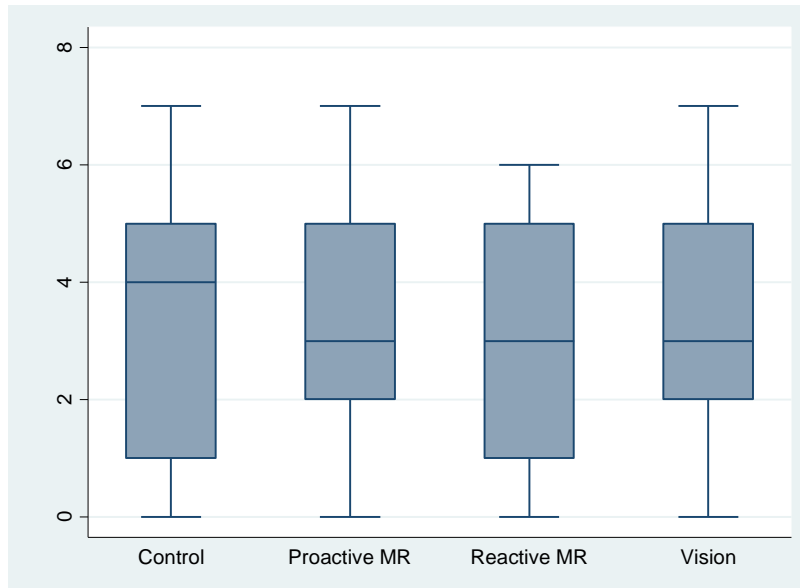


Figure 6: Number of Ideas box plot

To verify, we conduct ANOVA, testing the alternative hypothesis that number of ideas generated differs in at least one of the groups. This we test against the null that there is no differences in number of ideas generated between groups. Based on the output from the one-way ANOVA ($F(3, 113)=0.25, p=0.861$) we do not have enough evidence to reject the null hypothesis. Accordingly, based on our data, we cannot say that any of the groups generated more or less ideas than any of the other groups.

5.2.4 Test of Potential Moderators

Having conducted ANOVA on our main models, we continue by follow up analysis to test for potential moderators. We do so by conducting ANCOVA, including our measures for self-creativity and interest in our ANOVA models above.

Creativity ANCOVA

We first run the ANCOVA with overall creativity and self-creativity to check whether self-creativity affects overall creativity in itself, or whether it affects the relationship that the sources of information on consumer ideation has on overall creativity. ANCOVA output

provide that the correct model is still not significant ($F(df=3)=1.33$, $p=0.263$). Neither is self-creativity with output of ($F(df=1)=0.445$, $p=0.506$). Consequently, self-creativity does not affect the relationships from the correct model.

We repeat using interest instead of self-creativity. Again, the correct model is not significant provided the output of ($F(df=4)=1.231$, $p=0.302$). Neither is interest with output of ($F(df=1)=0.058$, $p=0.81$). Consequently, interest does not affect the relationship from the correct model.

Novelty ANCOVA

We continue by testing for potential moderating effects in our model for novelty. First, we run the ANCOVA with novelty and self-creativity to check whether self-creativity affects novelty in itself, or whether it affects the relationship that the sources of information in consumer ideation has on novelty. The correct model is now only significant at a 6% level of significance, provided the output of ($F(df=4)=2.406$, $p=0.054$). Self-creativity is not significant with ($F(df=1)=0.249$, $p=0.619$). Consequently, self-creativity does not affect the relationships from the correct model.

We repeat using interest instead of self-creativity. This time, the correct model is only significant at a 9% level of significance, given ANCOVA output of ($F(df=4)=2.41$, $p=0.085$). Interest is not significant provided output of ($F(df=1)=0.267$, $p=0.607$). Consequently, interest does not affect the relationship from the correct model.

Appropriateness ANCOVA

For our measure of appropriateness, we first run the ANCOVA with appropriateness and self-creativity to check whether self-creativity affects appropriateness in itself, or whether it affects the relationship that the sources of information in consumer ideation has on appropriateness. The correct model is still not significant given output of ($F(df=4)=0.843$, $p=0.501$). Neither is self-creativity with output of ($F(df=1)=1.601$, $p=0.209$). Consequently, self-creativity does not affect the relationships from the correct model.

We repeat using interest instead of self-creativity. Again, the correct model is not significant with $(F(df=4)=0.436, p=0.782)$. Neither is interest with $(F(df=1)=0.00, p=0.999)$. Consequently, interest does not affect the relationship from the correct model.

Number of Ideas ANCOVA

Finally, we run the ANCOVA with number of ideas and self-creativity to check whether self-creativity affects number of ideas generated in itself, or whether it affects the relationship that the sources of information on consumer ideation has on number of ideas. The correct model is still not significant provided ANCOVA output of $(F(df=4)=1.739, p=0.146)$. However, for self-creativity we get $(F(df=1)=6.17, p=0.014)$. Accordingly, self-creativity has a positive effect on number of ideas generated. However, for our purpose, it is still not interesting, as it does not statistically affect the relationship between the sources of information and number of ideas generated in the different groups.

We repeat using interest instead of self-creativity. This time, the correct model is significant with $(F(df=4)=5.069, p=0.001)$. Interest is also significant in explaining number of ideas generated with $(F(df=1)=19.406, p=0.00)$.

5.2.5 Test of Differences in Extreme Values across Groups

In this section, we test whether our binary measures of extreme values for the four dependent variables differ across groups. We do so by conducting ANOVA. That way, we will be able to test whether any of the four groups generate ideas that are «very more creative» than in the other groups.

Creativity Extreme Values

We begin by conducting ANOVA on the binary variables measuring extreme values of overall creativity. First, we test whether there are any difference between groups for ideas rated equal to or higher than 4. We test against the null of no differences between groups. The ANOVA provides us output of $(F(3, 105)=0.673, p=0.57)$. Thus, we do not reject the

null hypothesis. Accordingly, we do not have enough evidence to say that there are any differences between groups for ideas rated equal to or higher than 4.

We repeat with the same procedure as above, this time using a variable for ideas rated equal to or higher than 5. We use ANOVA to test whether there are any differences across groups. We test against the null of no differences across groups. The ANOVA provides us $(F(3, 105)=1.276, p=0.287)$. Again, we do not have enough evidence to reject the null hypothesis, leading us to believe that there is no difference in extreme overall creativity scores across the four groups.

Novelty Extreme Values

With the same procedure as for extreme values for overall creativity, we now conduct ANOVA for extreme values of novelty. First, we test whether there are any difference in novelty between groups for ideas rated equal to or higher than 4. The ANOVA provides us output of $(F(3, 105)=0.809, p=0.491)$. Thus, we do not reject the null hypothesis. Accordingly, we do not have enough evidence to say that there are any differences in novelty of ideas between groups that are rated equal to or higher than 4.

We repeat the same test as above, testing if there is any difference in novelty across groups for ideas rated equal to or higher than 5. The ANOVA provides us output of $(F(3, 105)=1.013, p=0.39)$. Again, we do not have enough evidence to reject the null hypothesis, leading us to believe that there is no difference in extreme novelty across the four groups.

Appropriateness Extreme Values

We continue by conducting ANOVA with the binary variables for extreme values of the appropriateness variables. We begin by testing whether there are any difference in appropriateness between groups for ideas rated equal to or higher than 4. The ANOVA provides us with output of $(F(3, 105)=0.178, p=0.911)$. Thus, we do not reject the null hypothesis. Accordingly, we do not have enough evidence to say that there are any differences in appropriateness of ideas between groups that are rated equal to or higher than 4.

We repeat the same test as above, with the other binary variable for appropriateness. That is, we test whether there are any differences in appropriateness across groups for ideas rated equal to or higher than 5. The ANOVA provides us ($F(3, 105)=1.409, p=0.244$). Again, we do not have enough evidence to reject the null hypothesis, leading us to believe that there is no difference in extreme appropriateness across the four groups.

Number of Ideas Extreme Values

Finally, we conduct ANOVA with the binary variables for extreme values of the number of ideas. We begin by testing whether there are any difference between groups for number of ideas generated being equal to or higher than 4 ideas. The ANOVA provides us with output of ($F(3, 105)=1.082, p=0.36$). Thus, we do not reject the null hypothesis. Accordingly, we do not have enough evidence to say that there are any differences in number of ideas generated between groups, for number of ideas being equal to or higher than 4 ideas.

We repeat the same test as above, with the other binary variable for number of ideas generated. That is, we test whether there are any differences across groups for number of ideas generated being equal to or larger than 5 ideas. The ANOVA provides us with output of ($F(3, 105)=0.004, p=1$). Again, we do not have enough evidence to reject the null hypothesis, leading us to believe that there is no difference in number of ideas generated between groups, for number of ideas being equal to or larger than 5.

6. Discussion

In this section, we will discuss our results. In order to do so, we begin by summarizing all our findings for our main hypotheses in section 6.1. Based on our findings, we discuss theoretical implications in section 6.2, and practical implications in section 6.3. In section 6.4, we will discuss the quality of our research. In section 6.5, we discuss to which degree we have maintained our ethical responsibilities as researchers. As noticed, most of our findings turned out insignificant. In section 6.6, we will discuss limitations of our research in order to explain potential reasons for why our results turned out to be insignificant. Finally, we will make suggestions for further research based on the limitations of our research.

6.1 Findings

Table 9: Summary of hypotheses with results

Hypothesis	P-Value
Hypothesis 1: Providing information on (2) reactive market research in consumer ideation has a positive effect on (a) creativity, (b) number of ideas generated, (c) novelty of ideas generated, and (d) appropriateness of ideas generated.	(a) 0.195
	(b) 0.92
	(c) 0.02*
	(d) 0.82
Hypothesis 2: Providing information on (3) proactive market research in consumer ideation has a positive effect on (a) creativity, (b) number of ideas generated, (c) novelty of ideas generated, and (d) appropriateness of ideas generated.	(a) 0.93
	(b) 0.99
	(c) 0.35
	(d) 0.99
Hypothesis 3: Providing information on (3) proactive market research in consumer ideation has a greater effect than providing information on (2) reactive market research in consumer ideation on (a) creativity, (b) number of ideas generated, (c) novelty of ideas generated, and (d) appropriateness of ideas generated	(a) 0.5
	(b) 0.98
	(c) 0.55
	(d) 0.69
Hypothesis 4: Providing information on (1) company vision in consumer ideation has a positive effect on (a) creativity, (b) number of ideas generated, (c) novelty of ideas generated, and (d) appropriateness of ideas generated	(a) 0.41
	(b) 0.99
	(c) 0.13
	(d) 0.88
Hypothesis 5: Providing information on (1) company vision in consumer ideation has a greater effect than providing information on (2) reactive market research in consumer ideation on (a) creativity, (b) number of ideas generated, (c) novelty of ideas generated, and (d) appropriateness of ideas generated	(a) 0.97
	(b) 0.85
	(c) 0.87
	(d) 0.99

Hypothesis 6: Providing information on (1) company vision ((3) <i>proactive market research</i>) in consumer ideation has a greater effect than providing information on (3) proactive market research ((1) <i>company vision</i>) in consumer ideation on (a) creativity, (b) number of ideas generated, (c) novelty of ideas generated, and (d) appropriateness of ideas generated	(a) 0.78
	(b) 0.97
	(c) 0.95
	(d) 0.77

(*Significant at the 5% level of significance)

6.2 Theoretical Implications

In this section, we will discuss theoretical implications based on our findings as reported in section 6.1. That is, we will discuss whether we have learnt something new, contributed to existing theory, or challenged existing assumptions in the literature. In the introduction of this research report, we stated two purposes with our research. In regards to contributions to the literature, we firstly wanted to contribute with more insight on consumer ideation and the phase of idea generation. The other purpose was to shed light to the discussion in the innovation literature as to what is the preferred perspective of innovation. Is an internal focus on company vision best, or is an external focus on market research the most beneficial approach to innovation.

Based on our findings, we can now discuss to which degree we have fulfilled the purposes of our research. While previous research took users knowledge for granted, we did not, as we provided users with additional information. Accordingly, we have contributed with more insight to the phase of idea generation and consumer ideation. Our contribution is that if the goal is to generate novel ideas, users should receive reactive market research prior to idea generation. However, if the goal is to generate ideas that are more creative in general, or a higher number of ideas generated, we do not find any evidence in favor of providing users with additional knowledge.

In our case, knowledge was information on either market research or company vision. Therefore, it seems like it does not matter if we provide users with such knowledge or not in consumer ideation. Consequently, rather than providing users with knowledge, we should do as existing literature suggests and focus on users given knowledge. Even so, we have only tested for providing users with knowledge on market research and company vision. Therefore, we do not know what to expect if we were to provide users with other kind of

knowledge. For instance, we could have provided users with technological knowledge on the case of ideation.

In regards of what is the preferred perspective of innovation we have perhaps shed light on the discussion, but not made any breakthroughs. Overall, we found that neither company vision nor market research is more or less beneficial than the other is. However, as already mentioned, if the goal is novel innovations, a focus on reactive market research might be beneficial. Accordingly, we have shed light on the discussion, but do not have enough evidence to prove that focus on one of the perspectives is better than the other is. Therefore, we still need more research on this topic in order to be able to change the perceptions we hold about traditional theory on innovation.

6.3 Practical Implications

In this section, we will discuss practical implications based on our findings as reported in section 6.1. That is, we will discuss how our findings can be beneficial in practice, or change the way managers and firms think about innovation. In the introduction, we stated that we hoped our research would contribute on two areas in regards of practical implications. Firstly, we hoped our findings would change the way firms manage consumer ideation. Secondly, we wanted to affect the way managers think about their strategies for innovation by shedding light on the discussion of whether market research or company vision is the preferred perspective of innovation.

What regards consumer ideation and the phase of idea generation, managers now know that if they aim to generate novel ideas, they should gather reactive market research. Then they must provide the users in consumer ideation with the reactive market research. Managers also know that if the goal is creativity in general, or just to generate many ideas. It does not really matter whether managers provide users with market research or information about company vision. Instead, they should rely on existing literature, which suggests which kind of users managers should recruit to consumer ideation based on the aim of the ideation task.

Our research is probably not significant enough to affect the way managers and firms think about their innovation strategies. Even so, we have shed light on the discussion of innovation

perspectives by conducting research on the topic. Therefore, we hope that firms and managers continue to think carefully about how they organize for innovation. That is, whether they focus on user feedback through market research, or let a set vision guide them in order to generate innovations that customers do not realize they need. At least, we hope our findings will motivate both researchers and managers to investigate our research problem further.

6.4 Validity and Reliability

The quality of our research depends mainly on two factors, validity and reliability (Ghauri & Grønhaug, 2010). In this section, we will discuss how we have designed our research to be able to obtain both valid and reliable results.

6.4.1 Validity

Validity refers to whether our results are “true”. Thus, if our results are valid they are true and can be trusted. If they are not valid, they are not “true”, and our results should be questioned, and perhaps not be trusted. Consequently, researchers want to obtain valid data and results (Ghauri & Grønhaug, 2010). In research methods, there are several different forms of validity. However, we will only focus on two forms of validity, external validity and internal validity. External validity refers to whether the results are true in external settings, that is, whether we can generalize our findings beyond the study (Ghauri & Grønhaug, 2010). Internal validity refers to whether the results are true within the study, that is, that our findings can be trusted and acted upon given the setting we obtained them from (Ghauri & Grønhaug, 2010). We continue by explaining how we view the external and internal validity of our research.

External Validity

To be able to generalize results, it is important to obtain observations both in a realistic setting and from a representative and randomized population. The challenge with lab

experiments is that they do per definition not represent a realistic setting. The reason is that researchers conduct lab experiments in a lab in order to be able to control for all factors. Thus, lab experiments usually have a low degree of external validity (Ghauri & Grønhaug, 2010). As we have conducted a lab experiment rather than a field experiment in our research, we are facing challenges with external validity. However, even if we might not be able to generalize our results to other settings, lab experiments are useful in situations as ours where we study a case that have not been studied before. In those situations, a lab experiment can be a good starting point for further research.

Previously we mentioned that we had some challenges regarding recruitment of a representative and randomized population. As our population are business students at the Norwegian School of Economics, we cannot assume our findings to generalize to other populations such as engineers or more mixed populations. In addition, we faced problems with selection bias, as we could not pick our sample at random from the chosen population. Instead, we had to give the students incentives to self-select into the experiment. This may result in a sample with an overweight of people who liked either the incentives, or likes economic experiments. The same applies to the fact that we recruited students from given lectures, which may results in an overweight of students that like the subjects of courses which we recruited from.

Based on our lab experiment as our chosen design for data collection, our limited population, and risks of a sample that is biased through self-selection, it becomes clear that our research is faced with a low degree of external validity.

Internal Validity

Internal validity is mainly concerned with to which degree we manage to control the internal settings of data collection. We do so by securing both randomization and anonymity within our sample, and keep respondents error to a minimum (Ghauri & Grønhaug, 2010). When it comes to internal validity, lab experiments is more advantageous than field experiments, as it is easier to maintain control over the internal factors in a lab setting. In a lab, it is easy to hold all factors but the treatment effects constant, as there is less external factors that might affect respondents. Additionally, we conducted the experiment over a limited period, thus other events are less likely to affect the participants.

To minimize respondent error we asked participants to keep some space between themselves and the participant next to them so that they could not look at each other's tasks or answers. In addition, we secured their anonymity by stating that their answers were anonymous. Consequently, they did not provide any personal information and we destroyed all their answers after being transcript to digital data. By securing anonymity, participants are less likely to feel observed, affecting their responds. From the manipulation check as described in the methodology section, we also found that respondents both read, and remembered the contents of the attached treatment reports. This means that we to some extent have been able to differ the treatment effects.

We took actions to keep control of the internal settings in the experiment, and secured both internal randomization and anonymity. Additionally, participants understood the treatment effects, reducing respondents' error. Accordingly, we believe our research to have generated a satisfactory level of internal validity.

6.4.2 Reliability

The reliability of our research refers to the stability of our measures. In different words, whether our chosen techniques for collecting and analyzing data would have produced consistent findings if repeated in a different occasion by another researcher (Ghauri & Grønhaug, 2010). Accordingly, a strong internal validity is important to generate reliable results. As we argued above, we believed our methods of research to inhabit a strong internal validity, which is positive for the reliability of our data and results. However, there are still other threats to the reliability of our measures, which we can control for to a lesser degree.

Firstly, we fear for the reliability of the measurement of novelty and appropriateness as rated by two experts. Even if this is in accordance with previous creativity research, there could have been factors that may have resulted in errors when rating creativity. For instance, the two experts could have had different perceptions of the rating scale, even if we explained the use of the scale to them. In addition, the experts could have been in different moods, or having a tight schedule, measuring creativity under time pressure, which might have affected the measurements. There is also the risk of checking off the wrong number, choosing a

different number on the 7-point scale instead of the intended number. These errors are difficult to control for, even if we tried to minimize such threats to the reliability by giving the experts clear instructions.

Secondly, many of the same factors as mentioned above in relation to the experts could have affected the participants in the experiment. However, we believe there is less risk of a weaker reliability in the ideas generated in the experiment. The reason for this is that the participants were responding in a controlled lab setting with a given time window of 10 minutes, while the experts did not. Thus, the participants did not have any time pressure. Accordingly, they did not have any incentives to finish earlier. Furthermore, their main task was not to reply to a survey but to write down their own generated ideas. Thus, reducing the effects of viewing rating scales differently and checking off the wrong boxes.

Finally, errors may not only occur from the participants or experts, but also from researchers. Thus, one threat to the reliability of our measurements is research error. As all data generated from the experiment were transcript into digital data manually, there is a risk that errors might occur. Even if the data were transcript carefully and with precision, we cannot be sure if we have done any lesser errors. Especially since the data only were transcript by one researcher, myself, and not double-checked by another researcher, it is difficult to check whether research error occurred.

6.5 Ethics

Ethics are moral principles and values, and applies to all situations and activities in which there can be actual or potential harm of any kind to anybody (Ghauri & Grønhaug, 2010). Consequently, ethics influence the way a researcher conduct research. Researchers should explain and find answers to their questions honestly and accurately. Accordingly, both the strengths and weaknesses of methods, models and results should be explained (Ghauri & Grønhaug, 2010). By discussing the validity and reliability of our research above, we have already come a long way in covering what is required from an ethical standpoint. However, to fulfill our moral and ethical responsibilities we continue by mentioning a few other factors focusing on how we treated both our data and participants.

Participation in the experiment was voluntarily, as we recruited participants through self-selection by providing incentives. Accordingly, students were not forced to participate, but did it out of their own choice. An important factor in regards of ethics is to which degree we maintained participants' anonymity. We took the task of maintaining anonymity seriously. We never asked participants to specify any personal information, or other information that we may use to track the participant. The collected data were transcript into digital data, and coded such that we cannot use it to track the participant. After we digitalized the data, all the sheets from the experiments were shredded. Thus, they were not stored longer than necessary.

Data were only collected using physical sheets. We did not at any point use other methods for data collection such as video recording, voice recording or similar. By avoiding such methods of data collection, we minimize the mental stress we exposed participants to, in addition to maintaining anonymity.

A challenge with experiments in regards of ethics is how much information we should give to participants (Ghauri & Grønhaug, 2010). On one side, you do not want to reveal too much of what you are studying when conducting experiments, as participants may be affected from knowing what effects we are trying to get, influencing their responds. On the other hand, viewed from a more ethical standpoint, participants should get information about what they are contributing to by participating. To avoid the risk of getting biased results, we only told respondents that it was an experiment to study innovation in NFC-technologies, and the instructions for how to respond to the experiment. We did not tell them that we studied creativity, and that we had different treatment groups. The same applies to the experts judging creativity of the ideas generated. We only told them how to measure creativity.

Using hindsight, we should have debriefed the participants after the experiment, so that they eventually got all the information about the experiment, and got to know which effects we really tried to measure. Again, we should also have debriefed the experts, as neither the participants nor the experts was informed about which effect we were trying to measure due to the risk of getting biased results. Since we did not debrief the participants, they will have to wait until we publish the research report to read about the study.

Furthermore, we did not ask the participant to provide us with any information that we would not use in our data analysis to test either our hypotheses or the validity of our data. Thus, participants only responded to questions directly linked to the research questions.

6.6 Limitations and Further Research

As the headline suggests, we will be discussing limitations and further research in this section. We begin by discussing limitations of our research, and then we make suggestions for further research based on our limitations. In regards of limitations, we should first question the results of our hypotheses as presented in section 6.1. All of our hypotheses except for one, turned out as insignificant. If we have done everything correctly and made the right assumptions when setting our hypotheses, our results indicates that there are in fact no differences on creativity by providing users with information on either market research or company vision in consumer ideation. However, we do not know whether this is the case, or if our results are misleading due to limitations with our research. Therefore, we will now point to several factors that might have affected our results, leading to insignificant findings.

Firstly, there is the possibility that we are wrong theoretically. That is, that we have based our hypotheses on the wrong literature, or failed to include important findings on our topic of research. If this is the case, we might have set our hypotheses wrong, and therefore should have formulated our hypotheses differently in order to get significant results. For instance, it might not actually be such a great difference in innovation by using market research or company vision as the existing theory we have used suggests. Another possibility is that the effects of market research and company vision on creativity is in fact equal, but that other factors affect whether one should choose to conduct market research or follow the company vision. If that is the case, one should study other factors firms chooses among when determining their approach to innovation.

Secondly, there is a possibility that our research design and methods for data collection was not sufficient to get data that would yield significant results. We conducted a lab experiment on business students, and the experiment took only 20 minutes. Perhaps a different design would be more beneficial in order to get significant results. For instance, another possibility would be to conduct the experiment on people who are more suited to work with innovative

tasks. Additionally, one could have trained participants to work creatively with tasks prior to the experiment.

In regards of the implementation of the experiment, we also touch upon concepts such as validity and reliability as potential limitations to our research. These, we discussed in detail above. We were mainly concerned with the external validity of our research, limiting our possibilities to generalize our results. Therefore, even if most of our findings turned out significant, one should interpret them with caution outside our lab setting. We also questioned the reliability of our measures. Especially the rating of novelty and appropriateness, as only two experts measured them. Additionally, we had limited opportunities to control for external factors in their rating of creativity. Therefore, even if the ratings from the two experts correlated at a satisfactory level, we do not know to which degree the ratings are biased by other factors.

The measures of creativity, that is, the novelty and appropriateness, we could also have used differently in our analyses. As we have explained, we used average scores for all ideas generated at an individual level. A limitation by using averages is that we are more likely to get less variation in our data, making it more difficult to obtain significant results. However, in practice, firms will not consider or implement all ideas occurring from consumer ideation. What is more likely is that they choose a handful of the greatest ideas with the best potential. That is, the ideas who scored highest on novelty and appropriateness. A somewhat different, but perhaps more realistic approach to our analyses could therefore be to pick only the idea which scored highest for each individual. That is, if a user generated five ideas, we remove all ideas except for the best idea from our data. Then we could continue to test for differences in creativity for “best ideas” across groups. This would represent a more realistic setting. Additionally, we would perhaps be more likely to obtain significant results if there are differences between the four groups.

Another limitation with our research is that we could not test whether participants used the information we provided to them. We did ask them about the content in the reports with information, and tested that they did in fact read and understand the content of the reports. However, we do not know if they based their ideas upon the attached information, or some other source such as their own logic or creativity. Perhaps participants are using the attached information wrong, or not using it at all. If that is the case, it does not really matter which

treatment group they are in, as the attached information is the only factor that differs across groups. Consequently, we will get insignificant results.

Finally, we did not control for how participants should use the attached information. They received no training in how to use the information for generating ideas, they were simply just told to read the report before generating ideas, and that it contained important information necessary to generate ideas. Therefore, a potential cause for our insignificant results might be that the way users use the information is more important than the information itself. That is, while it might matter if the information is about company vision or market research, it might be more important how the information is interpreted and used by the participant. Consequently, a reason for our insignificant results might be that participants did not know how to use the information.

Even with insignificant results and several potential limitations, we still have faith in our research problem. Therefore, we should not put too much weight on the discussion of limitations above, but rather view our limitations as a possibility for further research. Accordingly, we believe that our research problem is still interesting, highly relevant, and therefore deserves more attention both in the literature and in practice. Based on the discussed limitations, further research should review the literature we have used, and consider rewording our hypotheses. Researcher can conduct the experiment differently, one could train participants about creative thinking or idea generating prior to the experiment. Additionally, participants should get training in how to use the information. Further research should also consider using different sources of information to increase users' knowledge prior to ideation. Furthermore, one could test for other measures of creativity. For instance using only the best ideas generated for each individual as we described above. By learning of our limitations, we hope that further research is able to collect enough evidence to either confirm or deny our findings.

7. Conclusion

We began this research by presenting our research problem. We wanted to study the effect on creativity of providing information on (1) company vision, (2) reactive market research, and (3) proactive market research in consumer ideation of new services. In the literature section, we presented theory on innovation and creativity, and found it reasonable to use four measurements of creativity, being (a) overall creativity, (b) number of ideas, (c) novelty, and (d) appropriateness. Furthermore, we presented existing theory on consumer ideation, market research and vision.

Choosing a causal research design, we collected data through a lab experiment with students at the Norwegian School of Economics. We asked participants to generate ideas on Near Field Communication Technologies, which is the case we used in the experiment. We treated participants with information on either company vision, reactive market research, or proactive market research. We compared the data from the treatment groups to each other, and with a control group that received no information.

Two experts at the field of NFC technologies rated the novelty and appropriateness of generated ideas. We analyzed the ratings both separately, and as an overall measure of creativity. In addition, we analyzed the number of ideas generated. Looking at the overall measure of creativity, we found no statistical significant differences between the four groups in our experiment. This led us to believe that the three chosen sources of information on consumer ideation has no different effect on creativity. However, as creativity is a complex concept, we continued by analyzing differences for (b) number of ideas, (c) novelty, and (d) appropriateness across groups.

For (b) number of ideas and (d) appropriateness, there were still no statistically significant differences between the four groups. Nevertheless, we did find (c) novelty to differ significantly across groups from our ANOVA. Further analysis revealed that providing consumer ideation with (2) reactive market research has a positive effect on (c) novelty compared to the control group. Accordingly, firms that uses consumer ideation to boost innovation should provide consumers with reactive market research if the goal is to generate novel ideas.

8. References

Amabile, T. M. (1996). *Creativity in Context*. Boulder: Westview Press.

Amabile, T. M., Conti, R., Coon, H., Herron, M., & Lazenby, J. (1996). Assessing the Work Environment for Creativity. *Academy of Management Journal*, Vol. 39, No. 5, 1154-1184.

Andrews, J. & Smith, D. C. (1996). In Search of the Marketing Imagination: Factors Affecting the Creativity of Marketing Programs for Mature Products. *Journal of Marketing Research*, 33(2), 174-187.

Battor, M., & Battor, M. (2010). The impact of customer relationship management capability on innovation and performance advantages: test a mediated model. *Journal of Marketing Management*, 26(9-10), 842-857.

Chen, B. & Althuizen, N. (2013). Consumer Creativity in Product Design: The Effects of Providing a Default Product on Idea Generation. *Advances in Consumer Research*, 41, 616-617.

Clayton, C. (2012, 13. June). Understanding the job. URL: <https://www.youtube.com/watch?v=f84LymEs67Y>

Dahl, D. W., Chattopadhyay, A., & Gorn, G. J. (1999). The Use of Visual Mental Imagery in New Product Design. *Journal of Marketing Research*, 36, 18-28.

Elerud-Tryde, A. & Hooge, S. (2014). Beyond the Generation of Ideas: Virtual Idea Campaigns to Spur Creativity and Innovation. *Creativity and Innovation Management*, 23(3), 290-302. DOI: 10.1111/caim.12066

Elmansy, R. (2014, 08. August). Learning More About Creativity and Innovation From LEGO. URL: <https://www.smashingmagazine.com/2014/08/learning-creativity-innovation-from-lego/>

Fern, E. F. (1982). The Use of Focus Groups for Idea Generation: The Effects of Group Size, Acquaintanceship, and Moderator on Reponse Quantity and Quality. *Journal of Marketing Research*, 19, 1-13.

-
- Gemser, G., & Perks, H. (2015). Co-Creation with Customers: An Evolving Innovation Research Field. *Journal of Product Innovation Management*, 32(5), 660-665. DOI: 10.1111/jpim.12279
- Ghauri, P., & Grønhaug, K. (2010). *Research Methods in Business Studies* (4. Edition). Great Britain: Prentice Hall.
- Girotra, K., Terwiesch, C., & Ulrich, K. T. (2008). *Idea Generation and the Quality of the Best Idea*. Working paper. INSEAD, Fontainebleau, France.
- Goldenberg, J., Mazursky, D., & Solomon, S. (1999). Toward Identifying the Inventive Templates of New Products: A Channeled Ideation Approach. *Journal of Marketing Research*, 36, 200-210.
- Johannessen, T. A. (2012). *Innovations Management and Entrepreneurship* (4. Edition). Dorchester: Pearson Custom Publishing.
- Kaplan, S. (2014, 23. October) Harnessing Consumer Inspiration for Innovation – Non-traditional techniques for working with consumers at the «fuzzy front end». URL: <http://www.innovation-point.com/consumerinspiration.htm>
- Kaufmann, G. (2006). *Hva er kreativitet*. Oslo: Universitetsforlaget.
- Kaufmann, G., & Kaufmann, A. (2009). *Psykologi i organisasjon og ledelse* (4. Edition). Bergen: Fagbokforlaget.
- Kristensson, P., Gustafsson, A., & Archer, T. (2004). Harnessing the Creative Potential among Users. *The Journal of product innovation management*, 21, 4-14.
- Kristensson, P., Magnusson, P. R., & Matthing, J. (2002). Users as a Hidden Resource for Creativity: Findings from an Experimental Study on User Involvement. *Creativity and Innovation Management*, 11(1), 55-61.
- Lilien, G. L., Morrison, P. D., Searls, K., Sonnack, M., & Hippel, E. (2002). Performance Assessment of the Lead User Idea-Generation Process for New Product Development. *Management Science*, 48(8), 1042-1059.

Magnusson, P. R. (2009). Exploring the Contributions of Involving Ordinary Users in Ideation of Technology-Based Services. *The Journal of product innovation management*, 26(5), 578-593. DOI: 10.1111/j.1540-5885.2009.00684.x

Maklan, S., Knox, S., & Ryals, L. (2008). New trends in innovation and customer relationship management. *International Journal of Market Research*, 50(2), 221-240.

Miao, C. F., Wang, G. (2015). Effects of sales force market orientation on creativity, innovation implementation, and sales performance. *Journal of Business Research*, 2015 (68), 2374-2382.

Moon, S. (2014). How Does the Use of External Knowledge Influence Innovative Performance of Service Firm? An Introductory Study of Openness and Service. *Seoul Journal of Business*, 20(1), 36-61.

Moreau, C. P., & Dahl, D. W. (2005). Designing the Solution: The Impact of Constraints on Consumers' Creativity. *Journal of Consumer Research*. 32, 13-22.

Nagati, H., & Rebolledo, C. (2013). Fostering Innovation through Customer Relationships. *Supply Chain Forum – An International Journal*, 14(3), 16-28

Narver, J. C., Slater, S. F., MacLachlan, D. L. (2004). Responsive and Proactive Market Orientation and New-Product Success. *Journal of Product Innovation Management*, 21, 334-347.

NFC Forum, (2015, 10. February). NFC Technology: How Changing Consumer Preferences Create New Opportunities for Retailers. URL: <http://nfc-forum.org/retail-study/>

OHern, M. S., & Rindfleisch, A. (2015). Customer Co-Creation. *Review of Marketing Research*, 84-106

Pedrosa, A. M. (2012). Customer Integration during Innovation Development: An Exploratory Study in the Logistics Service Industry. *Creativity and Innovation Management*, 21(3), 263-276. DOI: 10.1111/j.1467-8691.2012.00648.x

Piller, F. T., & Walcher, D. (2006). Toolkits for idea competitions: a novel method to integrate users in new product development. *R&D Management*, 36(3), 307-317.

Rocheska, S., Kostoska, O., Angeleski, M., & Mancheski, G. (2014). User-Driven Innovation: Towards a New Innovation Paradigm. *Journal of Economics and Business*, 12(1), 31-41.

Schweitzer, F., Gassmann, O., & Rau, C. (2014). Lessons from Ideation: Where does User involvement Lead Us? *Creativity and Innovation Management*, 23(2), 155-167. DOI: 10.1111/caim.12058.

Scopelliti, I., Cillo, P., Busacca, B., & Mazursky, D. (2014). How Do Financial Constraints Affect Creativity?. *Journal of Product Innovation Management*, 31(5), 880-893. DOI: 10.1111/jpim.12129

Skibsted, J. M., & Hansen, R. B. (2014a, 03. March). User-Led Innovation Can't Create Breakthroughs; Just Ask Apple and Ikea. URL: <http://www.fastcodesign.com/1663220/user-led-innovation-cant-create-breakthroughs-just-ask-apple-and-ikea>

Skibsted, J. M., & Hansen, R. B. (2014b, 03. March). Why Open Innovation Could Be Marissa Mayer's Downfall At Yahoo!. URL: <<http://www.fastcodesign.com/1670416/why-open-innovation-could-be-marissa-mayers-downfall-at-yahoo>>

Sternberg, R. J. (1999). *Handbook of creativity*. Cambridge: Cambridge University Press

Telenor Group, (2013, 7. February). Hva kan du gjøre med bare en mobiltelefon i lomma? URL:<http://www.telenor.com/no/media/artikler/hva-kan-du-gjore-med-bare-en-mobiltelefon-i-lomma/>

Telenor Group, (2015, 27. April). Report on Corporate Governance 2014. URL: <https://www.telenor.com/wp-content/uploads/2015/02/Telenor-Group-Corporate-Governance-Report-2014.pdf>

Telenor Group, (2016a). Vision, Mission and Values. URL: <https://www.telenor.com/about-us/vision-mission-and-values/>

Telenor Group, (2016b). Our Strategy. URL: <https://www.telenor.com/about-us/our-strategy/>

Tierney, P. & Farmer, S. M. (2002). Creative self-efficacy: Potential antecedents and relationship to creative performance. *Academy of Management Journal*, 45, 1137-1148. DOI: 10.2307/3069429.

Tierney, P., & Farmer, S. M. (2011). Creative Self-Efficacy Development and Creative Performance Over Time. *Journal of Applied Psychology*, 96(2), 277-293. DOI: 10.1037/a0020952.

Vlaskovits, P. (2011, 29. August). Henry Ford, Innovation, and That «Faster Horse» Quote. URL: <https://hbr.org/2011/08/henry-ford-never-said-the-fast>

Ward, T. B., Finke, R. A., & Smith, S. M. (1995). *Creativity and the Mind: Discovering the Genius Within*. New York: Plenum Press.

Witell, L., Kristensson, P., Gustafsson, A., & Löfgren, M. (2011). Idea Generation: customer co-creation versus traditional market research techniques. *Journal of Service Management*, 22(2), 140-159.

9. Appendix

9.1 Experiment

9.1.1 Information on NFC Technology

Information provided to all participants:

Innovation in the mobile industry: Near Field Communication Technology

The mobile industry is in the midst of transformation, traversing through times of digital disruption. Mobile operators are confronted with the question of what type of company they should become. One major player in the mobile industry has an ambition to create growth through monetizing data usage. This will be achieved through 1) enabling use, 2) stimulating usage, and 3) monetizing data usage. More specific, they aim to increase data usage by increasing the number of devices/machines/chips connected to the mobile internet, and stimulate usage through Near Field Communication (NFC) technology. As part of their innovation process, they need help to generate new or improved ways on how to utilize the NFC technologies.



1) Tag reader/writer mode allows NFC devices to read information stored on NFC tags embedded in smart posters and displays; examples include reading timetables, tapping

NFC Devices Operate in 3 Modes



for special offers, and updating frequent flyer points

2) Peer-to-peer mode enables two NFC devices to communicate with each other to exchange information and share files; so that users of NFC-enabled devices can quickly share contact information and other files with a touch. For example, users can share Bluetooth or WiFi link set-up parameters or exchange data such as virtual business cards or digital photos

3) Card emulation mode enables NFC devices to act like smart cards, allowing users to make retail purchases, board transit systems, and gain secure access to electronically keyed buildings. Adding NFC to a contactless infrastructure enables two-way communications. For the air transport industry, this could mean updating seat information while boarding, or adding frequent flyer points when making a payment.

Research:

Researchers are testing business models of mobile contactless services in the NFC City project. NFC City is an open innovation project with the objective to promote development and use of services for information exchange, access, ticketing and payment through new applications of mobile and near field communication (NFC) technologies.

In an on-going trial, students can replace their bus tickets, house keys and pocket money with their mobile phone. By using NFC tags, they get location specific information about the arrival time of the next bus, today's menu at the cantina or tonight's events at the campus. There is also the NFC Fitness Guide that provides them with videos, textual and oral training instructions when they place their mobile device against a tag reader attached on the training equipment. Some tags can provide context sensitive information on an individual level. An example is a tag placed outside an auditorium, which enables only the enrolled students to get information or download materials for the lecture. Much attention is given to NFC as a tool for mobile payment and transport ticketing. With the NFC City project, innovative NFC services beyond the payment function is being studied.

9.1.2 Task

Control Group

Task given to the control group:

Researchers believe that Near Field Communication (NFC) technologies can simplify customers' everyday tasks and offer increased convenience in access to services. In addition, the use of NFC technologies is increasing data usage. Data usage is one of the most important sources of income for mobile companies. Consequently, our company intends to take a leading role in supporting the NFC value system.

As mentioned above, they need help to generate new or improved ways on how to utilize the NFC technologies. Consequently, this is the task given to you; describe new or improved uses briefly. Generate as many new or improved ways to use the NFC technologies as possible. You have 10 minutes to generate ideas. You may answer in either Norwegian or English.

An example:

“A tag reader could be placed on every price tag on store shelves. When the tag reader is touched by a mobile phone/device, the customer get additional information about the product, such as inventory status or complementary products.”

Company Vision

Task given to the company vision group:

Researchers believe that Near Field Communication (NFC) technologies can simplify customers' everyday tasks and offer increased convenience in access to services. In addition, the use of NFC technologies is increasing data usage. Data usage is one of the most important sources of income for mobile companies. Our company intends to take a leading role in supporting the NFC value system.

As mentioned above, they need help to generate new or improved ways on how to utilize the NFC technologies. Consequently, this is the task given to you; describe new or improved uses briefly. Generate as many new or improved ways to use the NFC technologies as

possible. To inspire and guide your ideas, the company has provided you with a short one-page summary of their vision and strategy. Their vision and strategy will give you useful information necessary for generating ideas useful for the company. Read the attached report below before you begin the process of idea generating. After reading the report, you have 10 minutes to generate ideas. You may answer in either Norwegian or English.

An example:

“A tag reader could be placed on every price tag on store shelves. When the tag reader is touched by a mobile phone/device, the customer get additional information about the product, such as inventory status or complementary products.”

Reactive Market Research

Task given to the reactive market research group:

Researchers believe that Near Field Communication (NFC) technologies can simplify customers' everyday tasks and offer increased convenience in access to services. In addition, the use of NFC technologies is increasing data usage. Data usage is one of the most important sources of income for mobile companies. Our company intends to take a leading role in supporting the NFC value system.

As mentioned above, they need help to generate new or improved ways on how to utilize the NFC technologies. Consequently, this is the task given to you; describe new or improved uses briefly. Generate as many new or improved ways to use the NFC technologies as possible. To inspire and guide your ideas, the company has provided you with a short three-page summary of a market report on NFC technologies, focusing on customer perceptions of concrete attributes by using NFC technologies. The market report will give you useful information necessary for idea generating. Read the attached market report before you begin the process of idea generating. After reading the report, you have 10 minutes to generate ideas. You may answer in either Norwegian or English.

An example:

“A tag reader could be placed on every price tag on store shelves. When the tag reader is touched by a mobile phone/device, the customer get additional information about the product, such as inventory status or complementary products.”

Proactive Market Research

Task given to the proactive market research group:

Researchers believe that Near Field Communication (NFC) technologies can simplify customers' everyday tasks and offer increased convenience in access to services. In addition, the use of NFC technologies is increasing data usage. Data usage is one of the most important sources of income for mobile companies. Our company intends to take a leading role in supporting the NFC value system.

As mentioned above, they need help to generate new or improved ways on how to utilize the NFC technologies. Consequently, this is the task given to you; describe new or improved uses briefly. Generate as many new or improved ways to use the NFC technologies as possible. To inspire and guide your ideas, the company has provided you with a short two-page summary of a market report on NFC technologies, focusing on the benefits of NFC technologies reported from consumers. The market report will give you useful information necessary for generating ideas. Read the attached market report before you begin the process of idea generating. After reading the report, you have 10 minutes to generate ideas. You may answer in either Norwegian or English.

An example:

“A tag reader could be placed on every price tag on store shelves. When the tag reader is touched by a mobile phone/device, the customer get additional information about the product, such as inventory status or complementary products.”

9.1.3 Treatment Reports

Company Vision

Vision, Mission, Values and Strategy

Our industry plays an increasingly important role in people's everyday lives. Our vision, mission and values express where we are going and the role we will play both in transforming people's lives and empowering societies to grow and progress.

Our vision: Empower societies. We provide the power of digital communication, enabling everyone to improve their lives, build societies and secure a better future for all. Our vision to empower societies is a clear call to action. We bring vital infrastructure, new services and products that stimulate progress, change and improvement.

Our mission: We are here to help our customers. We exist to help our customers get the full benefit of being connected. Our success is measure by how passionately they promote us.

Our values: Our values serve as a guide for our everyday work. They describe how we should serve our customers and work together as colleagues.

Be respectful: We acknowledge and respect local cultures and want to be a part of local communities wherever we operate.

Keep promises: We are about delivery, not overpromising. We are about actions, not words.

Make it easy: We do not complicate things. Everything we produce should be easy to understand and use.

Be inspiring: Everything we produce should look good, modern and fresh. We find new ways to improve and create value – for people and society alike.

Our Strategy: We will retain the focus on growth and value creation. The growth will come from both our telco business, current digital verticals (IoT/M2M, Online Classifieds and Financial Services), and in new digital verticals.

Strategic ambitions: To deliver on the ambitions of growth and value creation we will take the position as our customers' favorite partner in digital life. We will be delivering a broad range of relevant, personalized and engaging digital services. These include connectivity and communications services, select internet services within for example storage and communication, and select stand-alone digital verticals. Four strategic ambitions are defined to reach this position:

Loved by Customers: Subscriber growth is reaching saturation in most of our markets. To achieve above industry growth going forward, we need to create a superior experience for our customers, and turn them into promoters of our services. We will provide the best network experience, personalized customer interactions, and digitized and automated customer journeys.

Engaging Digital Products: The time our customers are spending on our core services is leveling off or decreasing across all our markets. To stay relevant to our customers and to secure digital marketing channels we need strong end-user positions and our ambition is to create this within digital verticals (e.g. IoT/M2M).

Winning Team: The shift from a traditional telco to becoming the customers' favorite partner in digital life requires a significant change in culture and capabilities. We will become a more expertise driven company, and be an attractive employer for people with digital mindset and competence.

Most Efficient Operator: With diminishing growth in telco revenue and increased competition on services from internet players, Telenor needs to operate smarter and more efficiently. We will accelerate technology efficiency, pursue process simplification and deploy new operating models, to significantly reduce costs.

Reactive Market Research

Reactive market research report given to the reactive market research group.

In 2015, NFC is on track to be available in more than one billion smartphones, tablets, and other

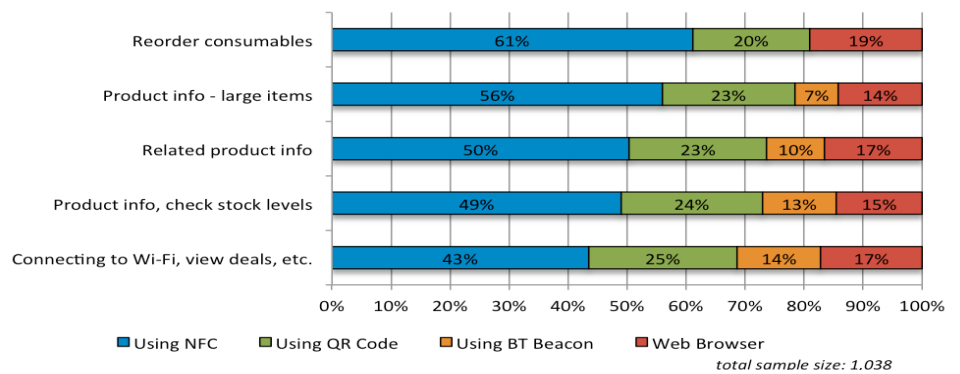


consumer electronics, including headphones, speakers, and wearable devices like smartwatches. This projected growth points to a tremendous opportunity for developers, system integrators, and businesses in general. Europe and America are the largest markets with Asia expected to catch up in the next years.

For consumers this means easy connections, faster transactions, and simple data sharing. As this study shows, NFC tags on store shelves and even integrated into individual products and packaging will allow consumers to access personalized product information and coupons, as well as add products to their “basket” when tapping on NFC tags. For retailers and brand owners, nonpayment applications of NFC, which can be deployed independently of payment systems, can lead to significant increases in shopper engagement and streamlined, intuitive connections between retailers’ instore assets and their extended digital presence.

Consumer Preference for NFC in Various Scenarios:

In three out of the five retail scenarios, we have gathered additional information:



1) Accessing Store Deals, Wi-Fi, and Rewards Accounts

Participants were asked to evaluate the usefulness, ease, and speed of touching their NFC-enabled smartphones to an icon or poster at the store’s entrance in order to; 1) connect automatically to a store’s Wi-Fi network, 2) be logged in automatically to account/rewards accounts and loyalty programs, 3) download a brand or store’s mobile app, 4) view deals, coupons, and special offers, 5) access other services the store has to offer

Results:

In addition, 28% of respondents indicated this experience made their shopping



experience much more valuable. When asked which aspects of this opportunity were the most compelling to them, 85% of respondents said they are most interested in store deals, and 78% said they are most interested in using NFC to connect to the store's Wi-Fi network automatically.

2) Accessing More Product Information & Store Inventory

Participants were asked to assess the efficiency and effectiveness of using their NFC-enabled smartphones to tap a product – in this example, a pair of shoes – to learn more about the product, and to; 1) see other colors available, 2) check store inventory to see what colors and sizes were available to try on and/or purchase today, 3) have the shoes shipped to their home, 4) see social media photos and videos from celebrities or athletes using the shoes

Results:

Participants showed the greatest interest in getting more product information (e.g. shoe colors available, 82%), and checking stock



levels (81%) using NFC in this scenario. Out-of-stock issues are a leading cause of lost sales revenue. NFC technology has an advantage in driving consumers quickly and easily to information that can connect them with the intelligence they need to make a purchase either in-store or via a store website.

3) Accessing a Digital Shopping Cart

Participants evaluated the usefulness, ease, and speed of using a digital shopping cart experience with their NFC-enabled smartphones, an experience that included; 1) accessing more information about the product by touching their smartphone to the individual product, 2) an option to add the product to their “digital shopping cart” until they are ready to check out later (similar to the process of online shopping), 3) checking out at special NFC PayPoint registers that are faster than the standard manual checkout process, 4) applying all available coupons and rewards programs automatically, and storing digital receipts in the shopping app

Results:

Respondents showed the greatest interest in applying store or brand coupons and/or rewards to purchases

automatically using NFC in this type of scenario (83%).



Overall, participants indicated a strong interest in using NFC both in retail and post-retail scenarios, and a stronger preference for NFC technology over competing technologies. Across all scenarios in the study, NFC was preferred by the majority of participants over competing technologies, including QR codes, Bluetooth Beacon, and mobile web browsers, because NFC technology provides a unique and desired mix of convenience, speed, and choice/control. This mix enables the more relevant, efficient, digitally enhanced instore shopping experience that consumers prefer.

Proactive Market Research

Proactive market research report given to the proactive market research group.

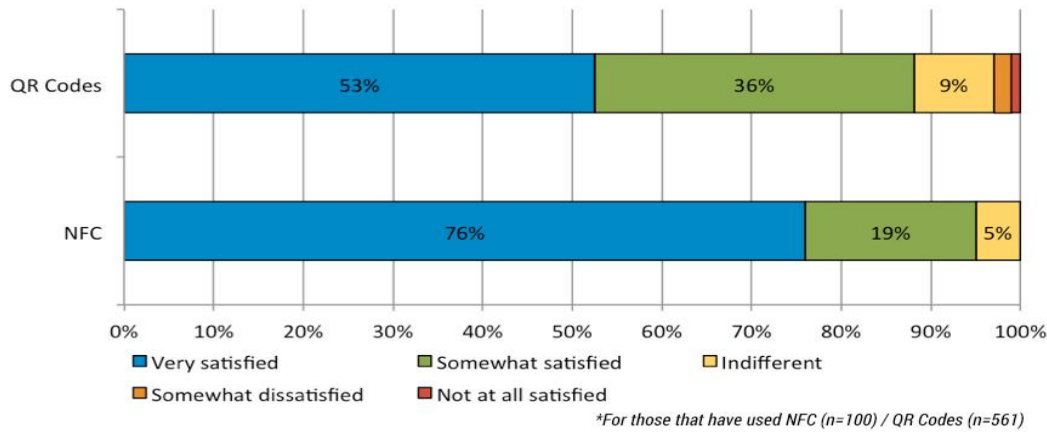
In 2015, NFC is on track to be available in more than one billion smartphones, tablets, and other consumer electronics, including headphones, speakers, and wearable devices like smartwatches. This projected growth points to a tremendous opportunity for developers, system integrators, and businesses in general. Europe and America are the largest markets with Asia expected to catch up in the next years.



For consumers this means easy connections, faster transactions, and simple data sharing. As this study shows, NFC tags on store shelves and even integrated into individual products and packaging will allow consumers to access personalized product information and coupons,

as well as add products to their “basket” when tapping on NFC tags. For retailers and brand owners, nonpayment applications of NFC, which can be deployed independently of payment systems, can lead to significant increases in shopper engagement and streamlined, intuitive connections between retailers’ instore assets and their extended digital presence.

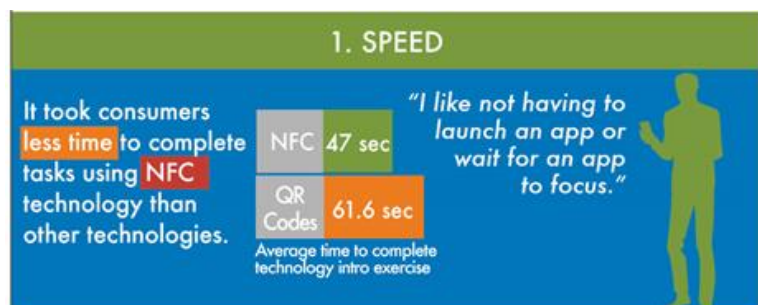
Participants Were Asked “How Satisfied Have You Been with Your Experience(s) Using NFC / QR Codes?”



Three significant benefits of NFC technology emerged, pushing it ahead of competing technologies in consumer preference.

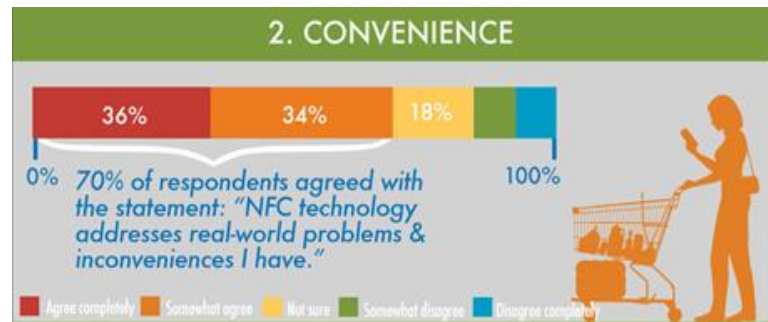
For busy shoppers, speed, convenience, and control are essential ingredients for securing their engagement

1. Speed: During the path to purchase, busy mobile shoppers demand ease of use and speed when it comes to in-



store technology engagement. Study participants indicated that NFC provides the optimal shopping experience because it offers quick access to contextual information when they want it. To be able to get information by simply tapping, rather than having to launch an app or wait for a camera lens to focus, was perceived as a significant benefit to the consumer experience.

2. Convenience: 70% of study participants said that “NFC technology addresses real-world problems and inconveniences” that they have. They liked that they could use NFC regardless



of what other function they were performing on their phones at that moment. One participant stated that simply tapping with NFC is easier to do when she has her child with her, because “with a QR code I have to take time to find the app and then scan the barcode.”

3. Control: Participants preferred NFC’s user-initiated “pull” approach to retrieving information compared to the “push” approach from Bluetooth Beacons. They felt



the pull allowed greater control over what information they received and greater accuracy of that information. Consumers value credible information, especially when researching purchases on the go. Qualitative feedback during this study suggests that participants perceive that the user-initiated NFC is more trustworthy than an unprompted message from a Beacon.

Overall, participants indicated a strong interest in using NFC both in retail and post-retail scenarios, and a stronger preference for NFC technology over competing technologies. Across all scenarios in the study, NFC was preferred by the majority of participants over competing technologies, including QR codes, Bluetooth Beacon, and mobile web browsers, because NFC technology provides a unique and desired mix of convenience, speed, and

choice/control. This mix enables the more relevant, efficient, digitally enhanced instore shopping experience that consumers prefer.

9.1.4 Survey to Participants

Survey given to all participants

For the statistics: Please answer the questions below:

Age: _____ Gender: Female / Male

Questions	Strongly Disagree				Strongly Agree
	1	2	3	4	5
Being creative is an important part of who I am					
I have confidence in my ability to solve problems creatively					
Being creative in my work is an important part of who I am					
I take an interest in innovation on communication technologies					
I am interested in the topic of innovation in communication technologies					
The creative task was fun to work with					
I enjoyed working on new ideas for the use of NFC technologies					

Additional survey given to participants in the three treatment groups

Question	YES	NO
Before I reported my ideas, I read a report		

IF YES: Please answer all of the following six questions

Questions	Not at all				To a large extent
	1	2	3	4	5
To which extent did the report contain information about the company's vision and strategy?					
To which extent did the report concentrate on concrete customer perceptions using NFC technologies?					
To which extent did the report concentrate on the abstract benefits of using NFC technologies?					

Questions	Strongly Disagree				Strongly Agree
	1	2	3	4	5
The company's mission focuses on helping customers.					
I read about consumer preferences for NFC technologies in various scenarios.					
I read about the importance of speed, convenience and control for customers when using NFC technologies.					

9.2 Creativity Measure

9.2.1 Survey to Experts

Instructions

Masteroppgaven handler om kreativitet, og for å studere kreativitet har vi benyttet Near Field Communication (NFC) Technologies som case.

NFC is a short-range, low-power, wireless technology that enables mobile devices to connect, exchange information (data), and make transactions with just a touch.

For mer informasjon om hvordan Telenor jobber med NFC se:

<http://www.telenor.com/media/articles/2012/nfc-event-in-telenor-expo/>

<http://www.telenor.com/media/articles/2013/what-can-you-do-with-only-a-mobile-phone-in-your-pocket/>

Det vi nå trenger hjelp til er å vurdere kreativiteten til ideer om hvordan NFC kan brukes i praksis. Vedlagt følger et Excel-ark med 108 ideer om hvordan NFC kan brukes. For hver idé må følgende to spørsmål besvares:

To which degree would you say that the idea is original on a scale ranging from (1) “Not original at all” to (7) “Very original”.

(med originalitet menes hvor uvanlig/vanlig ideene er i den gitte situasjonen, en lite vanlig idé er lite original, mens en uvanlig idé er mer original.)

To which degree would you recommend investment in implementing the idea on a scale ranging from (1) “Not recommend at all” to (7) “Highly recommend”.

Spørsmålene er gjengitt som kommentar i Excel-arket i ruten som beskriver skala for rangering. I flere av ideene vil begrepet «Tags» gå igjen, med det menes chip eller lignende som «leses» av brukerens mobiltelefon ved kontakt.

Spørsmålene besvares på en 7 punkt skala, hvor dere besvarer spørsmålet ved å skrive inn det tall (mellom 1 og 7) som best beskriver ideen.

Ideene rangeres relativt til hverandre. Det vil si at dersom en f.eks ikke vil anbefale investering i noen av ideene, gis likevel ikke alle 108 ideene score 1, da noen ideer alltid vil være litt mer foretrukket relativt til de andre ideene.

Spørsmålene besvares individuelt. Det betyr at dere besvarer hvert deres Excel-dokument, og returnerer to Excel-dokumenter til meg.

List of unique ideas to be rated by experts

Tags på IKEA-varer, når tag leses får kunden mer informasjon om hvordan varen settes sammen, f.eks via instruksjonsvideo.
Tags i varehus kan gi informasjon om hvor varer er lagret.
Tags på priser i butikk, leses under handlingen, gir raskere betaling i kassen da alle varer allerede er scannet i mobil.
Tags på prislapper i butikk kan gi informasjon om produsent
Tags på varer kan vise hvor mye miljøutslipp som blir forårsaket av varens produksjon.
Tags på bøker hos en bokforhandler kan gi informasjon om kundeomtaler/anmeldelser.
Tags på bøker hos en bokforhandler kan gi informasjon om den er anbefalt av andre.
Tags på varer i butikk kan gi informasjon om kundeomtaler/anmeldelser.
Tags på varer i butikk kan gi link til produsents hjemmeside med ytterligere produktinfo.
Tags på varer i butikk kan gi link til produktet i butikkens hjemmeside med ytterligere info.
Tags på klær i klesbutikker kan vise bilder av hvordan klesplagget kan matches med andre plagg.
Tags på klær i klesbutikk kan vise eksempler på hva andre kunder kjøpte i tillegg til det gitte produkt.
Tags på varer i butikker kan vise eksempler på hva andre kunder kjøpte i tillegg til det gitte produkt.
Tags på varer i butikk kan gi oversikt over andre komplementære/anbefalte produkter.
Tags på varer i butikk, når alle varene scannes får en kvittering tilsendt på mobil eller e-post etter betaling.
Tags på prislapper, pris omgjøres automatisk til foretrukket valuta.
Tags på varer i butikk, kobles automatisk til tjenester som "prisjakt" for å sammenligne prisene i butikk med priser andre steder.
Tags på varer i butikk, kobles automatisk til tjenester som "finn.no" for å sammenligne med priser i bruktmarkedet.
Tags på varer i butikk, lagrer alle kjøp som f.eks kjøp av klær, snus, alkohol osv, gir oversikt over hvor mye penger en bruker på "unødvendige ting".
Tags på varer i butikk, lagrer alle kjøp, gir oversikt over forbruk i forhold til valgte budsjett.
Tags ved kjøp av varer, registrerer lojalitetskjøp. (f.eks hver 5. kaffe gratis.)
Tags ved inngang til butikk, gir tilgang til et interaktivt kart over butikken, kan brukes til å guide kunden til de varer en søker.
Tags i butikk, når tag leses får butikkansatte beskjed om hvor i butikken tagen ble avlest, den ansatte kommer så for å tilby hjelp.
Tags på varer i butikk, gir ansatte informasjon om når det sist ble påfylt med varer.
Tags utenfor butikk, gir informasjon om tilbudsvarer/kampanjeverer.
Tags utenfor butikk, gir kunden tilgang til ukens tilbudsavis.
Tags på matvarer i butikk, gir ansatte informasjon om siste forbruksdato på varene.
Tags på matvarer i butikk, leses av kunden, kunden får varsel ved siste forbruksdato.
Tags på matvarer i butikk, gir forslag til oppskrifter matvaren kan brukes til.
Tags på matvarer i butikk, gir forslag til oppskrifter matvaren kan brukes til, og tar hensyn til kundens matpreferanser.
Tags på matvarer i butikk, gir informasjon om innhold.
Tags på matvarer i butikk, gir informasjon om matvaren inneholder ingredienser kunden er allergisk mot.
Tags på matvarer i butikk, gir informasjon om ingredienser en trenger for å lage matvaren, f.eks ved kjøp av Toro gryteretter el.

Tags på matvarer kan gi informasjon om næringsinnhold.
Tags på matvarer kan gi informasjon om næringsinnhold, linkes til app som teller calorer.
Tags på meny i restaurant, gir informasjon om ingredienser.
Tags på meny i restaurant, gir informasjon om hvor råvarene kommer fra.
Tags utenfor restaurant, gir informasjon om restaurant.
Tags på meny i restaurant, gir informasjon om næringsinnhold i matrettene.
Tags utenfor restaurant, gir informasjon om kundeomtale/anbefalinger.
Tags utenfor restaurant, gir tilgang til meny på mobil.
Tags på husdør, kan brukes til å åpne dør med mobil.
Tags i bil, kan brukes til å starte bil med mobil.
Tags ved inngang til treningssentre, bruker mobil som adgangsbrikke istedenfor kort, chip el.
Tags på dører i offentlige bygg, åpner dører en har tilgang til med mobil.
Tags på dører på arbeidsplass, åpner dører en har tilgang til med mobil.
Tags på dører på skole/universitet, åpner dører en har tilgang til med mobil.
Tags kan erstatte student ID, gi tilgang til lesesal m.m
Tags hos legevakt, gir informasjon om estimert ventetid.
Tags hos lege, gir lege tilgang til pasientinformasjon, blodtype, medisiner, behandlinger m.m
Tags i helsesektor, gir sykepleier informasjon om pasient/bruker.
Tags i helsesektor, gir sykepleier informasjon om når pasient/bruker sist fikk medisin.
Dele helseinfo mobil til mobil ved f.eks ulykke, gir personer på ulykkesstedet informasjon om skadede som kan brukes i samtale med ambulanse.
Tags utenfor auditorium, gir studentene tilgang til forelesningsmatriell/powerpoint-plansjer på mobil/nettbrett.
Tags i auditorium, gir studentene øyeblikkelig tilgang til notater skrevet på SmartBoard digitalt.
Tags på offentlige steder for å koble seg raskt til gratis WiFi.
Tags på flyplass for automatisk oppkobling til WiFi.
Tags på utesteder for tilgang til liste over musikken som spilles.
Tags på konserter/festivaler for tilgang til liste over musikken som spilles.
Tags på kontorpult for automatisk justering av høyde på bord m.m til brukerens preferanser.
Tags på jobb- og skole-PC for raskere innlogging.
Tags på TV-dekodere eller fjernkontroll for ytterligere informasjon om produkter det reklameres for i sanntid.
Tags på TV-dekodere eller fjernkontroll for ytterligere informasjon om produkter det reklameres for i sanntid.
Tags på TV-dekodere eller fjernkontroll for ytterligere informasjon om produkter det reklameres for i sanntid.
Tags på armlenet i kinosaler for ytterligere informasjon om filmer det vises trailere på.
Tags på treningsapparater i treningssentre for tilgang til instruksjonsvideoer.
Tags på møterom/kollokvierom for enkel booking ved ankomst.
Tags på møterom/kollokvierom for å registrere oppmøte.
Tags på boligvisning for å gi interessenter tilgang til digitalt prospekt.
Tags på boligvisning for å enklere melde seg opp på meglers interessentliste.
Tags på reklameplakter for ytterligere produktinformasjon.
Tags på steder som krever kontroll, f.eks møterom/toaletter for sjekking av når stedet sist ble rengjort.
NFC for deling av innhold mellom to telefoner.

NFC for bekrefting av gyldig jaktkort/fiskekort ved kontroll.
Tags utenfor utesteder for raskere bekrefting av gyldig alder/legitimasjon.
Tags hos vinmonopolet for raskere bekrefting av gyldig alder/legitimasjon.
Tags i Taxi, gir Taxiens GPS automatisk informasjon om kundens hjemstedsadresse.
NFC for deling av bilder mellom to telefoner.
NFC for deling av nettadresser mellom to telefoner.
NFC for å legge til venner på sosiale medier (facebook, instagram, linkedin) når mobilene holdes sammen.
Tags i bil, når tag leses av mobil justeres automatisk bilen (speil, sete m.m) til personens preferanser.
Tags utenfor auditorium, registrerer oppmøte.
Tags på arbeidsplass som leses ved ankomst og når en går for dagen, registrerer hvor lenge den ansatte var på kontoret/jobb.
Tags på turisthytter for å registrere bruk.
Tags på offentlige steder for å "sjekke inn på stedet", kan så deles på sosiale medier.
Tags på fjelltopper eller andre turmål for å registrere at en har vært der og når, kan deles på sosiale medier.
NFC lagrer rabattkuponger og lignende, leses så av enklere via tags i butikk.
NFC lagrer billetter, raskere registrering via tags på kino, konsert, teater el.
NFC for å sende penger til hverandre ved å holde mobilen sammen.
NFC for deling av kontoopplysninger når mobilene holdes sammen, kan brukes f.eks til å stille garanti for at personen har et gitt beløp på konto.
NFC for enklere betaling i butikk ved at en kobler opp mot bankkort.
NFC registrerer opp mot bonus og lojalitetskort ved kjøp, slik at en kan bruke mobil fremfor flere kort for å samle bonus på steder som tilbyr det.
Mobil kan erstatte NFC-lignende betalingskort som f.eks Cashless-kort.
NFC kan integreres i tjenester som Vipps og Mobilepay for enda enklere overføring.
Tags på turistattraksjoner for å gi bruker ytterligere informasjon om attraksjonen.
Tags kan erstatte skilt med turistinformasjon, istedenfor å lese skilt, avleses en tag, og bruker får all informasjon på mobil.
Tags kan plasseres langs turløyper, gir informasjon om hvor på et kart en befinner seg.
Tags kan plasseres langs turløyper, dersom en har avlest flere tags langs løypen kan en få informasjon om hvor langt en har gått, hvor fort, m.m.
Tags kan plasseres i starten og slutten av fjelltopper, f.eks Stoltzekleiven og Ulrikken, ved avlesing ved start og slutt får en informasjon om hvor lang tid en har brukt.
Tags på busstopp gir informasjon om når neste buss kommer.
Tags ved kjøp av buss- eller togbillett, kvittering sendes til mobil eller epost.
Tags på buss, validerer om billett er gyldig.
Tags på buss, registrerer antall på- og avstigninger, verktøy for busselskapet til å lage bedre busstilbud.
Tags på buss, gir oppdatering i sanntid om de neste busstoppene.
Tags på busstopp med informasjon om hvor de ulike bussrutene går.
Tags for innsjekking ved ombordstigning på fly.
Tags for å bekrefte reise i sikkerhetskontroll på flyplass.
Tags på transportmidler, gir oppdatering i sanntid om hvor en er, estimert tid til ankomst.
Tags på transportmidler, gir oppdatering i sanntid om noe uforutsett skjer, f.eks forsinkelser, informasjon om hvorfor det er forsinket.