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# Conversion Rate Optimization

Visual Neuro Programming Principles

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<p>The influence of the world wide web has already spread in every business. Consequently, it has become crucial to develop strong online presence and offer qualified user experience for website visitors. Website optimization undeniably has proved its importance in the recent decade.</p> <p>This research was conducted in order to study the practical application and structure of the stages of the CRO (Conversion Rate Optimization) framework that focuses on the most representative website metric – conversion rate. Additionally, the neuro web design principles are researched and described in the study in order to deeply understand underlying brain activity of users and hypothesize about changes more effectively. Concepts of subconscious perception and visual hierarchy are briefly explained.</p> <p>The experimental part of the research focuses on particular company a web store case. Using an online optimization tool, a number of A/B testing campaigns were conducted according to the best practices of the CRO framework. Application of several changes resulted in noticeable increase of conversion rate on the tested pages.</p> <p>The underlying layer of the human unconscious decision-making is not fully studied; thus, further studies would possibly make a sufficient contribution in neuro visual programming that could be used in order to provide better and smoother user experience and consequently higher conversion rate.</p>	
Keywords	conversion marketing, conversion rate optimization, persuasive web design, neuro web design, A/B test, subconscious perception, ecommerce, visual hierarchy, Gestalt principles

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## List of Abbreviations

<b>UI</b>	User Interface
<b>CRO</b>	Conversion Rate Optimization
<b>CTA</b>	Call-to-action
<b>VWO</b>	Visual Web Optimizer
<b>KPI</b>	Key Performance Indicator
<b>CMS</b>	Content Management System



## 1 Introduction

Over the past few decades of rapidly evolving technologies, the online commerce has taken a significant place in all business sectors. Having an online store or at least an informative landing page has become an ultimate must for companies in order to keep up with the progress. Online services gain more and more popularity due to their convenience, affordability for public, time and place independence. Consequently, strong online presence and multi-channel strategies have become a necessary part of any business. Especially in the branch of consumer retailing, the online traffic vastly influences a significant segment of companies' turnover. While all efforts of e-commerce have concentrated on increasing the traffic and attracting more and more new visitors, the conversion rate figure has stayed in the shadow. Relatively recently e-business realized the actual importance of the conversion rate. Currently, it is one of the most representative metrics of the internet-resource efficiency and, as a matter of fact, vastly proportional to the online sales rate.

The conversion optimization just started to gain popularity among other online marketing tools and has already dramatically increased the return of investments for the online promotion costs for an ample number of businesses that have decided to implement the conversion optimization framework (Heathman 2013). However, the topic is still experiencing a lack of statistically proven techniques that are structured and explained from the user behavioral and engineering perspectives. The purpose of this study is to examine and statistically analyze the efficiency of applying neuro web design principles into UI (User Interface) manipulations in order to increase the conversion rate of a web store. Therefore, precise research on the conversion rate optimization framework would help to test and analyze the structured principles based underlying brain activity.

Under the optimization framework, extensive A/B and usability tests were carried out in order to obtain representative statistics from Google Analytics or an alternative tracking tool to carry out the proper analysis of the applied tools and principles. This research is aimed to categorize and provide actual statistics upon the persuasive neuro web design in the conversion marketing that was implemented in the case of a Finnish design company web store.



## 2 Literature Review

### 2.1 Conversion Rate

The emergence of web optimization was a consequence of the constantly growing online presence and widespread influence of the Internet on businesses strategies. Since then, the subject of Internet marketing has gained popularity and has been widely researched. There are many strategies to improve performance and KPIs (Key Performance Indicators) of a website. Among numerous tactics and approaches, the conversion marketing is relatively unused as efficiently as it could be. Thus, this research precisely concentrates on the CRO (Conversion Rate Optimization) framework.

**CRO (Conversion Rate Optimization)** is an approach that focuses on hypothesizing about and performing testing changes on a website in order to achieve a higher conversion rate.

Conversion rate is a number expressed in percentage value that corresponds to the number of total website visitors divided into the number of visitors who have performed a goal action. For instance, if the total traffic on a certain web page that contains a “Subscribe” button is 1000 visitors, and only 20 users actually subscribe, in that case the conversion rate on that action equals 2%. The goal action is any action that a user is supposed to perform on a web site, for instance add to the basket, register, leave the contacts, or click some link. Even though the conversion marketing has been visible for already 10 years, still around 30% of web-stores’ owners do not possess information about their conversion rate. For a long time the traffic amount was the most valuable number in e-business. However, leading traffic to the not well-optimized website is the same as trying to fill a bucket with a hole with a large amount of water. (Eisenberg 2005.)

Detailed studies of several authors I have reviewed in this research show that the conversion rate is a very powerful tool of assessing usability and efficiency of a web site. For example, sufficient traffic in combination with a low conversion rate could tell that



either the website could not satisfy visitors' needs, or online promotions were poorly targeted and as a consequence attract wrong audience (Eisenberg 2005). Further I have reviewed several studies of the CRO and neuro web design in order to apply subconsciously persuasive design techniques into the CRO framework.

The implementation of the conversion rate optimization framework has to be tailored to the particular company. Especially deep understanding of the target audience is required. Nevertheless, all the users anyway suit the "human beings" division and their behavioral patterns could be more or less forecasted. Of course, in that case the target audience of the customers should be examined from every possible angle. The scientific approach of persuasive, neuro web design, studies the visual neuro programming that could be utilized in web design. Neuro web design applies the knowledge that has been studied by behavioral psychologists and neuro biologists in the web design in order to improve user experience and engagement. The famous behavioral psychologist Susan Weinschenk has described human decision-making in the following way:

"Humans will always ascribe a rational, conscious-brain reason to our decision, but it is never the whole reason why users take an action, and often the rational reason is not even part of the decision." (Weinschenk 2009).

In this study the neuro web design practices, which are aimed to the attention of the subconscious mind, are applied into the conversion optimization framework that is illustrated in figure 1. The CRO framework is a cycle of continuous improvement that is implemented in order to provide best user experience for the visitors.



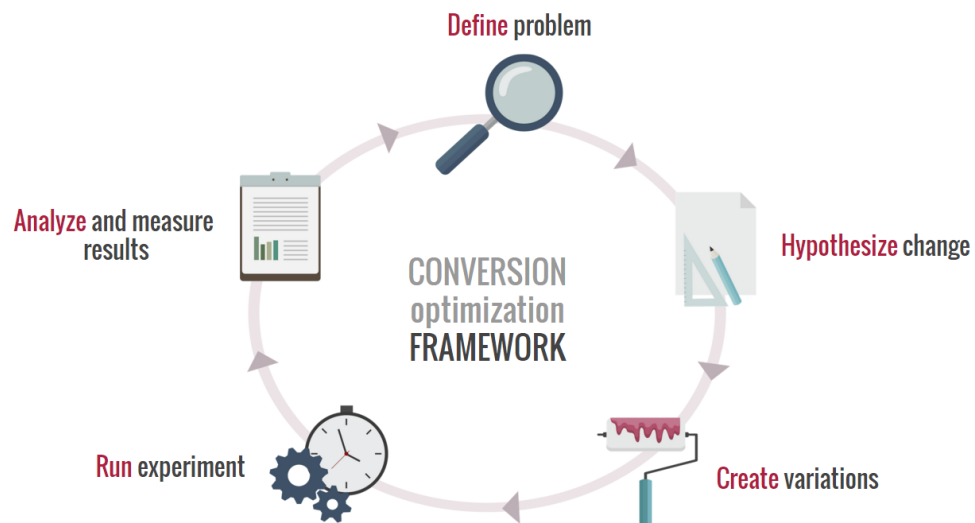


Figure 1. CRO framework. Data gathered from Heathman (2013).

The experiments are implemented on the littala web store case and follow the framework that summarized theory from Heathman (2013) and Dooley (2011) about the conversion rate. First of all, current analytics data of the littala website is reviewed in order to define properly the range of pages that are most suitable to run the experiments on. For instance, those are pages with the highest bounce rate, exit rate, product cards, check out process and so far. In other words, pages that have been studied play a crucial role in the main conversion funnel.

After receiving analytics data, the hypotheses based on studied research about persuasive design principles were designed for the chosen pages. Numerous A/B tests have been implemented in order to obtain representative statistics of experiments' results. Results ought to be monitored using the Google Analytics application. More information about A/B testing is given in the method section.



## 2.2 CRO Framework

### Problem definition

Deep assessment of the current situation is a preliminary part of the CRO framework. Before hypothesizing future changes, it is significant to analyze problematic areas that need improvement. CRO is not based on guesses or principles that would work in any case. Firstly, it is necessary to acquire information about the company in question, website analytics and, what is most important, data about the target audience.

General information about website performance can be found in Google Analytics Reports. At this stage of the framework, it is crucial to clearly understand which macro goals need to be achieved. When the macro goals (for example “Add to Basket” or “Subscribe”) for conversion are defined, the next step is to visualize the conversion funnel (see figure 2). The conversion funnel consists of several micro conversion goals that represent steps users have to pass in order to complete the macro goal of, for example, buying the product. Mostly all valuable changes have to be done inside the funnel. (Eisenberg 2005.)



Figure 2. Conversion funnel example. Data gathered from Eisenberg (2005)



During the funnel assessment, problematic pages with the highest drop-off rate should be defined. Clearly steps on these pages impede users from performing the goal action. At this point it is essential to analyze why users have left the page. What could confuse them? Is it easy to find the next step for adding an item into a basket? These questions are answered in the hypothesizing changes section.

### Hypothesizing changes

A particular part of the framework concentrates on hypothesizing changes based on the research made upon the problematic areas and audience assessment. The A/B testing requires noticeable change of one page element per experiment. The major factors that affect vastly the conversion rate are described below. These factors summarized from the Heathman's (2013) study should be applied while hypothesizing changes for experiments.

1. **Value proposition** – This aspect represents overall benefits that a customer will receive after taking certain action. For CTA (call-to-action) buttons, the value proposition should be clear to users. For example, it ought to be obvious that after clicking “Subscribe”, the customer will receive valuable information, a discount or free samples. The increase of value proposition will encourage visitors to take certain action.
2. **Relevance** – It is essential that visitors will find on the website exactly what they were looking for. Unnecessary content only confuses and distracts from the main purpose of the page. Search engines should lead to exact pages users have searched for.
3. **Clarity** – The main message on the webpage has to be clear. The copy of CTA and value propositions ought to be transparent and obviously beneficial.
4. **Distraction** – What is the first thing a user sees on the page? Does it help or hurt the main purpose? What does the page offer that is conflicting or off-target? Humans get distracted easily. Big contrast elements firstly attract the attention of viewers. At this point it is necessary to analyze what the first



things are that a user sees within a brief look at the page. One of the techniques to assess this factor is the blur test, which is described in the case and methods section.

5. **Urgency** – This represents the factor of an immediate need to take a goal action. Thus, a hint that the product could become unavailable increases its scarcity (Weinschenk 2009, 43-46). The content of value proposition and buttons ought to clearly send a message about why the user needs to take this action right now. Time restrictions work well for that purpose.

Considering the listed factors, the analysis of a problematic page has to be performed. What exact element should be tested? There is no strict rule about what to change for experiments; however, the fastest and the most significant feedback can be seen after modifying the following elements based on Eisenbergs' (2005) and McFarland's (2012) studies about conversion rate optimization:

1. **Call-to-actions** – Usually CTAs are the most important elements on the page that create leads. Therefore CTAs ought to be visible from first brief sight. Message on the CTA should have verbs in active form. Contrast is a powerful tool to grab attention of the unconscious mind. Color, shape and size that are different from other elements on the page can create stronger power for an element in the visual hierarchy. More precisely the visual hierarchy is described in chapter 2.3.1 about Gestalt principles.

2. **Copy** – The taglines and headers should provide a clear picture about which problems a visitor can solve using certain service. Marketing text and item description should correspond to the main value proposition of a product or service provided. Product description should not concentrate only on the technical characteristics. Marketing text should provide a clear emotional image of the benefits a customer would get. It is essential to test several variations of the headlines and marketing text on the landing page.



3. **Forms** – As described in the “Neuro web design” study (Weinschenk 2009) people do get distracted very easily. Reducing the amount of form fields could help to increase the conversion. Studies show that many people could just instantly leave when they see more than five fields in the form. If some fields are essential, then it is better to chunk fields into several groups, so it would be unconsciously perceived by the brain as several small steps instead of one big step. Also a powerful tool is to give an explanation next to each field why this information is needed and provide a statement that personal information will be kept secure.

4. **Product pricing** – This is another important thing to test. Variations for experiments could be based on several aspects as price visibility – size, color differentiation, positioning, and emphasizing the value proposition by placing on the product card a badge that indicates the benefit from the price reduction, for example “-20% off”.

5. **Amount of content** – Alongside of experiments with the actual copy and content, it could also be tested how reduction of some particular elements would affect the conversion. Such aspects as page length, content rearrangement and unnecessary elements that distract from the conversion action should be taken into account.

Moreover, it is common for split testing to hypothesize about several change options for the same element or copy. Therefore, the experiments’ results would show which option works better and convert more users. The multivariate experimentation is another tool that intends combining changes of several elements at the same time.



## 2.3 Neuro Web Design

This chapter covers the principles of neuro web design. What should be considered while designing the actual changes after the problematic areas have been defined and hypotheses have been made? Looking through some persuasive web design research and studying human behavioral patterns with the help of the study on human perception (Weinschenk 2011), I decided to research how applying the principles of neuro web design into the CRO framework would affect the results of the A/B tests.

All good designs for the human eye have an underlying layer of understanding the nature of human perception. The human brain has been forming and developing through ages to serve survival purposes for the human kind. For thousands and thousands of years humans learned to watch around in order not to be eaten and to have an opportunity to reproduce and pass further the DNA.

Briefly, the human brain structure could be simplistically divided into three different parts, as figure 3 represents. The old brain is responsible for all autonomous physical body activities like breathing, temperature control and all innate reflexes; the mid brain, also known as the mammal brain, accounts for creating emotions; and the new brain (also called cerebrum or cortex) that is the youngest brain is associated with higher brain functions. It produces consciousness and logic and operates the old and the middle brains as well. (Swaab 2014.) All three brains continuously communicate with each other.



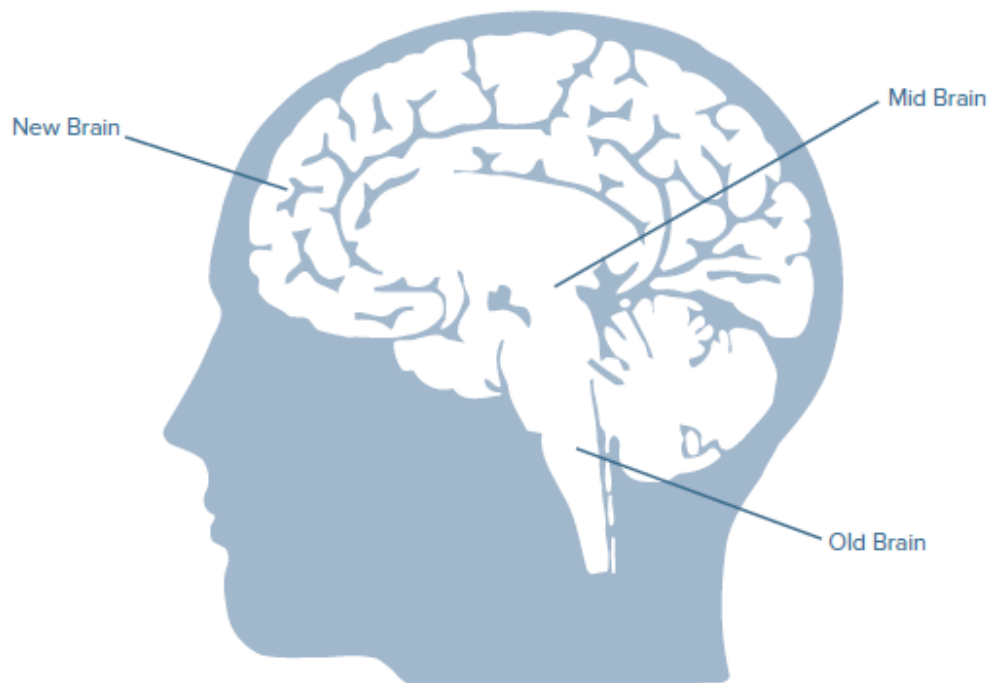


Figure 3. Brain structure. Copied from Weinschenk (2009,3).

The advantage of utilizing this knowledge in web design is knowing that the human subconscious often creates a decision without a logical basis and transfers it to the logical brain. Suddenly a person just feels like doing something as Susan Wienschenk has pointed out:

“Web site we pick, what we decide to do while there, and whether we buy or not are decisions and actions that we make in a largely unconscious way. Many of our decisions, reactions, and behaviors are governed by mental processes of which we are not even aware.” (Weinschenk 2009,1).

Further, several principles of the human visual perception are explained. They can be perceived directly by the old brain and influence the activity of the logical cortex. Proper application of these principles can play a role in visual neuro programming.

## The Gestalt principles

The human brain tends to fill in the gaps of missing information. The Gestalt principles are theories that study the ways in which the human sight is functioning. These principles explain how people perceive the meaning and relations of objects regarding their size, shape and arrangement in space and color (Cao 2015, 10-14). The principles also describe how these factors could alter perception. Efficiently applied, the Gestalt principles help to structure the visual hierarchy of a website and create immediate meaning relations between objects.

### Reification

In order to easily comprehend vague objects the human brain tends to fill in gaps with information that is missing. Looking at the example of reification that figure 4 illustrates, humans instantly see a white triangle and a rectangle even though they are not really there.

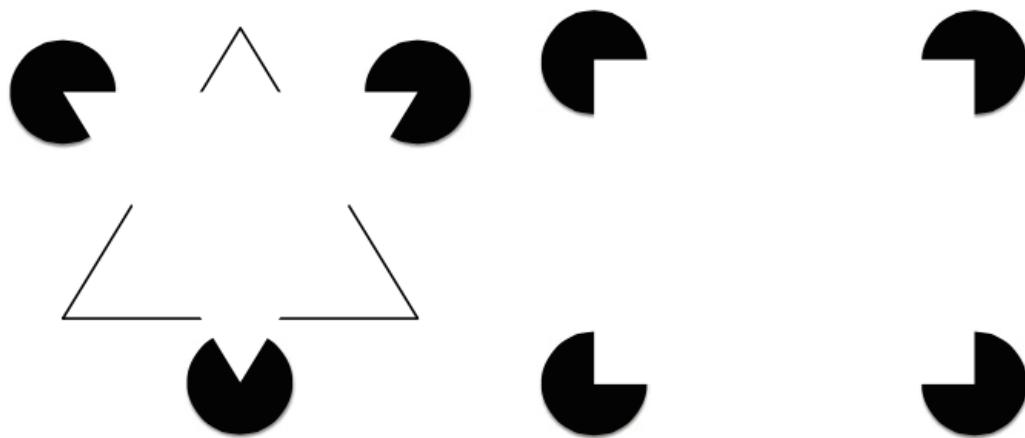


Figure 4. Reification example. Copied from Weinschenk (2011, 2).

This principle could be applied in the efficient usage of the white space on the website. Considering reification, white space could be used as a powerful tool to create associations and meaning of objects.

## Emergence

In order to rapidly identify an object the brain preliminarily interprets a shape as a whole and matches it with outlines that are already stored in the memory. When taking a brief look at figure 5, people mostly see a leopard as a whole. The brain is able to understand that this is a leopard without noticing separately details such as head, ears and tail.



Figure 5. Emergence. Copied from Brockmans (2015)

In the work *Design for the Human Eye*, Cao (2015) describes the practical application of emergence in web design in the following way:

“It doesn’t matter how fascinating a clickable button looks if your users don’t know it’s a button.”(Cao 2015)

In other words, users would preliminarily concentrate on shapes and outlines rather than details. The shape of an element should be well thought of and clearly reflect the purpose.



## Similarity

Objects that look similar are perceived related. One of the easiest tools to build a visual hierarchy of a design is utilizing the similarity principle. The relations could be built based on shape, color, or size. However, these characteristics do not possess equal power over establishing relations. (Rutledge 2009; Cao 2015, 45-47.)

The first characteristic human beings unconsciously perceive as a sign of relation is color. Color is the most dominant characteristic. As figure 6 represents, objects are perceived as groups of red, blue and yellow shapes regarding the difference in size and shape itself.

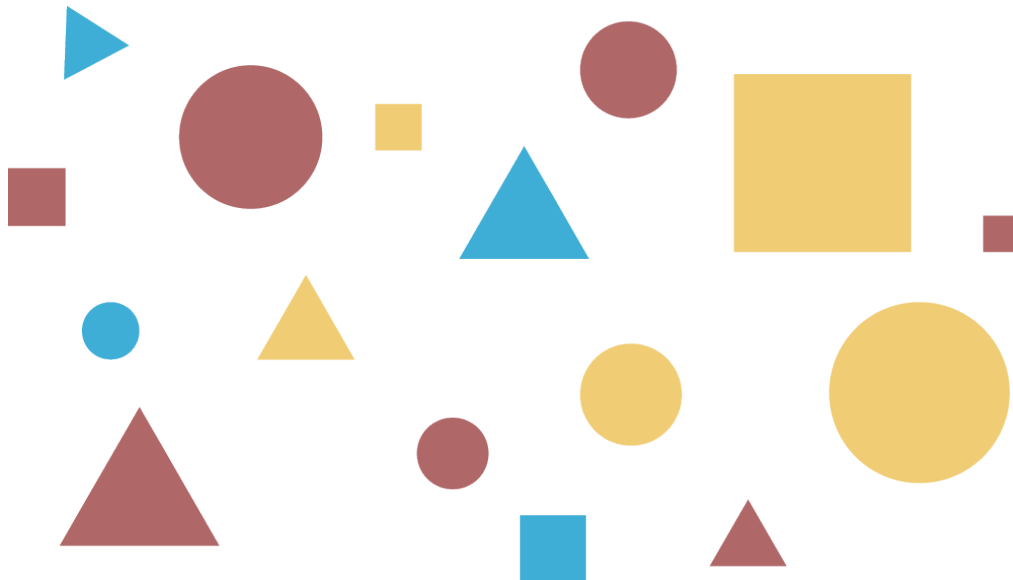


Figure 6. Similarity in color. The Illustration is based on the information collected from Rutledge (2009).

In the same way similarity in shape dominates over similarity in size as shown at the figure 7. Obviously a viewer determines the objects as a group of circles and a group of rectangles.

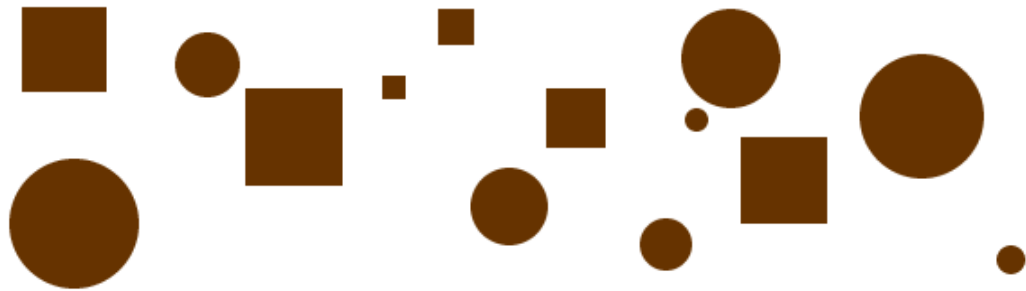


Figure 7. Similarity in shape. Copied from Rutledge (2009).

Finally, grouping by size also would build the visual hierarchy in design. The example illustrated by figure 8 shows that bigger squares relate together and dominate over the smaller ones.



Figure 8. Figure 8. Similarity in size. Copied from Rutledge (2009).

Appropriately utilizing these principles would help to create a visual hierarchy in web design organization for smoother user experience and navigation. Similarity works efficiently with buttons, hyperlinks and menu elements. (Rutledge 2009; Cao 2015, 45-47.)

## Golden Ratio

Human beings mostly differentiate surrounded subjects by their shapes. The initial interest to a certain shape could be a result of a vital necessity dictated by evolution. Concrete shapes, which are based on the combination of symmetry and golden ratio proportions, create stronger visual perception. Pythagoras and the ancient Greeks discovered a long time ago the proportion of golden ratio, which is represented in figure 9. (Walter 2011.)

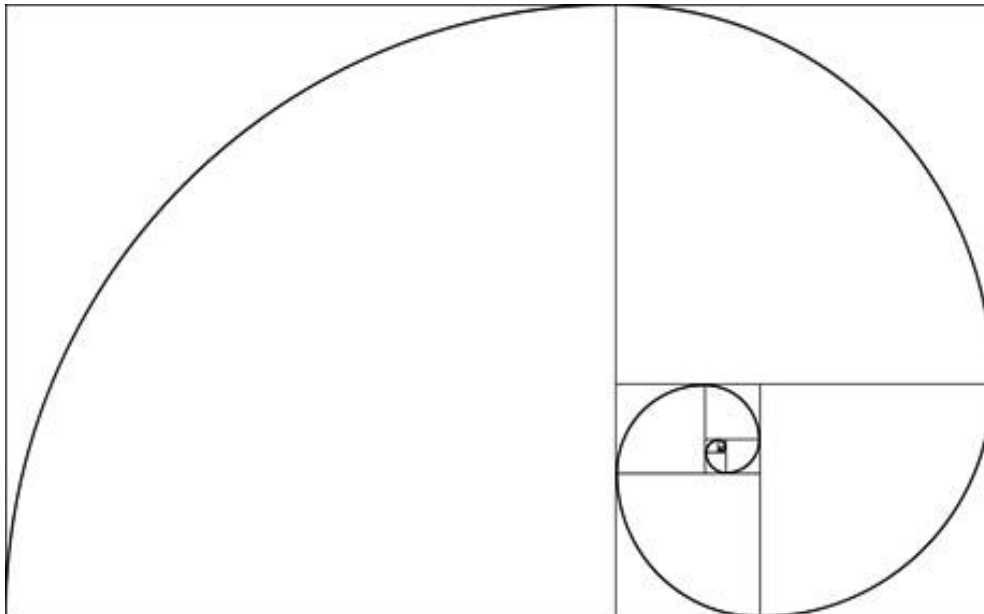


Figure 9. Golden ratio proportions. Copied from Walter (2011).

This unique mathematical ratio can be repeatedly found in art, architecture, nature and even the human body. Designs that are based on golden ratio proportions are commonly perceived as divine and beautiful. Such mighty monuments of the past as Parthenon, The Great Pyramid and Taj Mahal reveal golden proportions in their structure. (Livio 2008.)

Nowadays, knowledge about golden ratio occasionally been applied in web and graphic design as well. For instance Twitter designers obviously have heard about the golden proportions. Figures 10 and 11 represent the application of the golden ratio into the modern logo and web design. (Walter 2011, 20-21.)

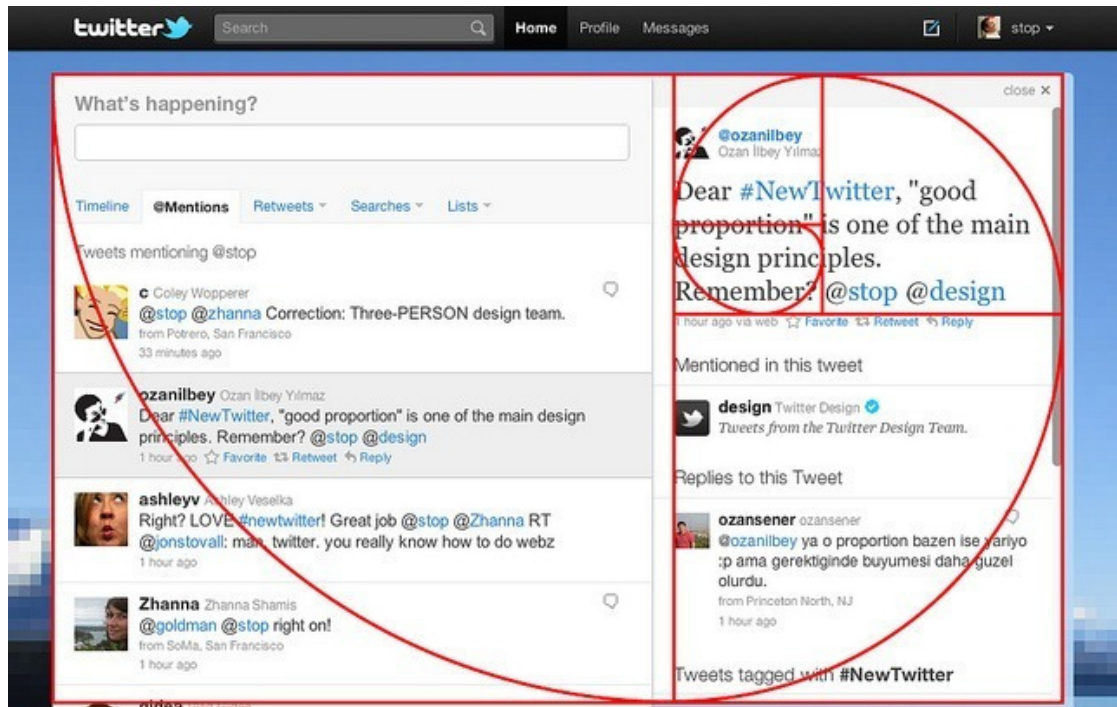


Figure 10. Applience of golden proportion in web design by Twitter. Copied from Walter (2011, 21).

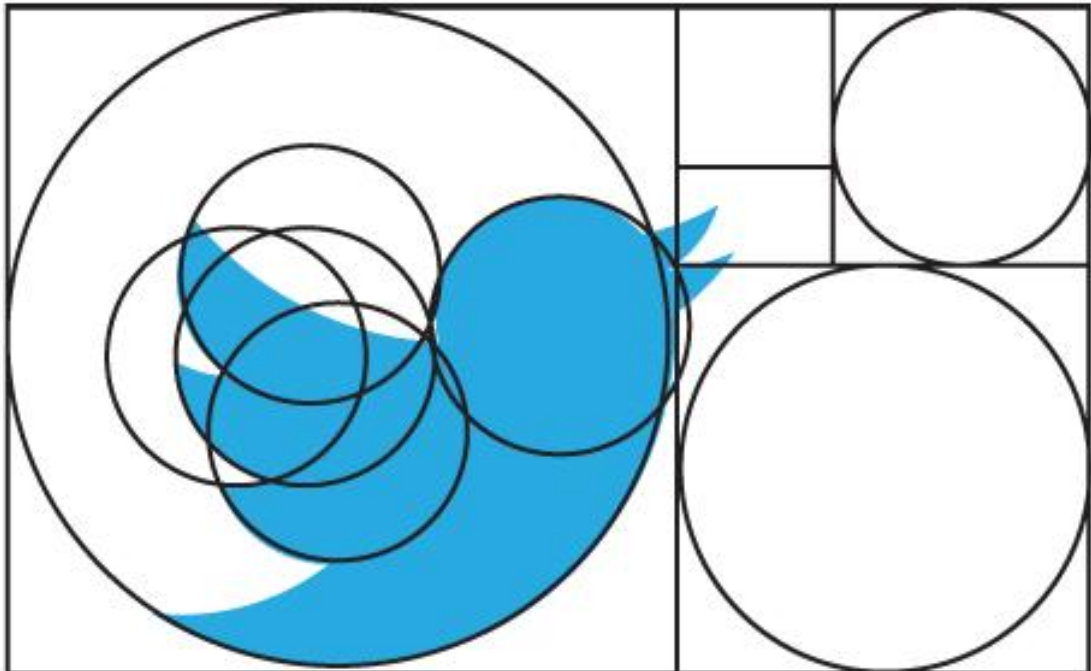


Figure 11. Appliace of golden proportion in logo design by Twitter. Copied from Johnson (2012).

The golden proportion can be used as a reference for creating web page layout, product cards and even choosing the font sizes for captions and body text. As a result, users' eyes would instantly interpret a website as more balanced and attractive.

### 3 Methods and Implementation

#### 3.1 Case study

In order to apply the studied techniques it was significant to choose a suitable company case. After conducting research upon Finnish online retailing market it was decided that the littala web store is the most suitable for carrying out the experimentation. littala is one of the biggest well-known Finnish brands. The company specializes in design objects, tableware and cookware. Their web store presents quite high performance in monthly traffic range that was a crucial criterion in order to be able to conduct research in a very limited amount of time.

Summarizing the studied material, it was decided that a certain number of A/B tests with appliance of CRO best practices would be conducted. In order to present reliable

reasoning for the changes, all hypotheses ought to be made with logical reference to the neuro web design concepts. It was agreed between parties that carrying out these A/B tests would be mutually beneficial for the littala company, which is referred to as a “client” from now on, and academic purposes.

### 3.2 Method

A/B Test (a.k.a. Split test) is a comparison of variations of one or more elements on a page in order to find the best variation that converts more users into customers. Generally, the total page traffic is divided into proportions 50/50; thus, an equal amount of users operate with control and variation pages. That gives an opportunity to draw conclusions on how certain changes affect the conversion rate based on undeniable user behavior data. In chapter 2.2 Hypothesizing changes section, it was described what elements should be tested in the first place according to the best practices of the CRO framework. However, the A/B testing areas ought to be chosen individually for each company considering the main customer group and their needs. (Heathman 2013.)

According to the research plan, hypotheses were presented and discussed with the client. Initially, the experimentations were meant to cover various areas of the web store. However, after the client meeting it was decided that the A/B testing that was going to be implemented would cover generally the product card pages.

Meanwhile the method was decided, the issue of choosing a performing tool emerged. littala happened to have quite a modest CMS (Content Management System) implemented on the web store, which did not allow making changes on separate items but the whole pattern only. Since the A/B testing requires creating an alter page with a different code implemented, the planned approach via Google Analytics tool Experiments was not suitable anymore for the littala web store case. However, a couple of modern web-based conversion optimization tools exist nowadays. After researching existing applications, it was agreed to use application called VWO – Visual Web Optimizer. This is an online-based tool that allows to create various testing campaigns in order to optimize conversion and get familiar with target web site audience. All information concerning VWO features is gathered from VWO official website – [vwo.com](http://vwo.com).



The Visual Web Optimizer provides several tools for the conversion optimization. First of all, the application makes it possible to create an unlimited amount of A/B tests on any web page, which has hardcoded a certain snippet into the head section. The VWO creates a “mirror” page by acquiring scripts and data from the initial page, and allows altering elements as needed for tests. The service also allows creating multivariate tests – experiments with a combination of different changes. The undeniable advantage of this service is that it has a visual user interface a.k.a Point-and-Click-Editor. Thus, editing and creating of variations requires no coding skills. littala stated out that it is sufficient to pick applications that they could continue using themselves in the future without any particular trainings. For the assessment of data acquired from campaigns, VWO provides analytics and reporting features. Furthermore, this application provides a tool to conduct research on user behavior using embedded forms, heatmaps and click trackers. All experiments can be precisely targeted for certain groups of visitors, depending on traffic source, geographical or demographical criteria.

### 3.3 Implementation and Results

During one month about ten various A/B tests and multivariate campaigns were implemented on the live site of the client. However the research faced the low traffic issue that somewhat prevented from acquiring statistically representative data in many campaigns. Nevertheless, several campaigns still received valuable results that proved the efficiency of the made changes. These circumstances were a consequence of different product popularity levels. Even though littala provided a list of the most popular products, the products performed with a steep difference. As figure 12 shows a few products generated traffic over 1000 visitors in two weeks, whilst other products could not attract than 100 visitors.



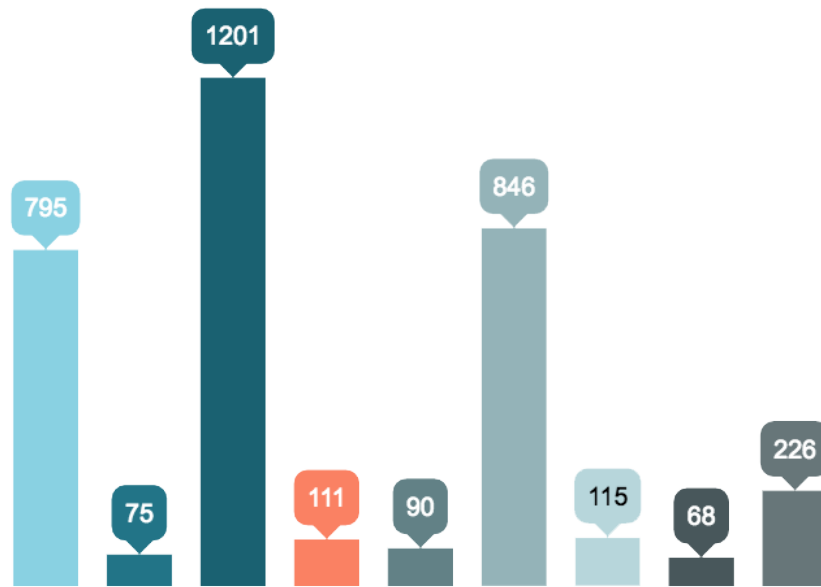


Figure 12. Traffic chart for campaigns

Analyzing the results of experiments, I supposed that campaigns with more traffic provide more statistically valuable results. This conclusion is supported by the data from dynamics charts, which are presented in campaigns' results descriptions, showing that the difference between control and variation conversion rate became bigger with the traffic increase. Three the most representative campaigns are described below. Two of them, which had the highest traffic, confirmed the hypothesized changes and the variation layout performed higher conversion. The third campaign showed that the initial layout was more favorable. Moreover, further will be described one of the hypothesis for the home page that did not have a chance to be tested on the live site, although it clearly represents the application of studied theory.

### **Campaign 1. Price-off badge.**

This campaign was designed in order to test how emphasizing value proposition would affect the conversion rate. Coincidentally, the client launched a marketing campaign with reduced pricing, which was a perfect option to test the hypothesis. The price-off badge that can be seen on the figure 13 was designed in order to clarify customer benefits. This change was based on the aspect that reduction of price would increase





the value of the product. The badge meant to spotlight the undeniable benefit and work as a trigger for visitor attention. Thus it had to be noticeable and have a clear message. Several products with the most beneficial discounts were picked. Figure 13 represents the altered variation page with pricing-off badge attached.

Myymälät / Asiakaspalvelu / Kirjautu / Rekisteröidy / [+](#) Verkkokauppa **FI**

**iittala**

Kattaminen Ruuanlaitto Sisustaminen Tuotesarjat liik! Uutuudet

Kotisivu / Ruuanlaitto / Functional Form Veitsiteline 5 veitsellä valkoinen

**FISKARS**

## Functional Form

Veitsiteline 5 veitsellä valkoinen

Sisältää veitsitukin ja seuraavat 5 veistä: leipäveitsi, iso kokinveitsi, aasialainen kokinveitsi, tomaattiveitsi ja vihannesveitsi. Materiaali valkoiseksi maalattua koivua. Veitsitelineen toisessa päädyssä vahva magneettipidike, jossa voi säilyttää esim. saksia. Kätevät säilytysaukot mahdollistavat veitsitukin säilyttämisen jopa keittiökaappien välitilassa. Mitat: 147x90x244,5 mm.

[Näytä Functional Form sarja](#) / [Näytä Fiskars tuotteet](#)  
[Maksuvaihtoehdot](#) / [Tilaus ja toimitus](#)

**50,00 €** sis. ALV

~~89,90 €~~

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Figure 13. The Variation with price-off badge. Print screen of iittala web store (www.iittala.com).

The results of this experiment that are represented in table 1 clearly show a net difference in conversion rate of 1.28% in comparison to the conversion rate of the control option. Even though it seems to be a very small difference, in the world of conversion rate this difference means a lot and leads to a sufficient increase in profit of the web store. Generally, for the overall conversion rate even change in decimals would be crucial.

Table 1. Results

	Visitors	Conversions	Conversion Rate
Control	608	23	3.88 %
Variation	593	30	5.16%

Therefore, this campaign statistically proved that the badge that represented a hypothetically saved amount of money increased the value of the product and created stronger will to commit the conversion action. Moreover, the badge was designed to be very contrastive with the rest of the page and to drag visitors' attention directly to the product picture. The graph showed in figure 14 represents the dynamics of the experiment.

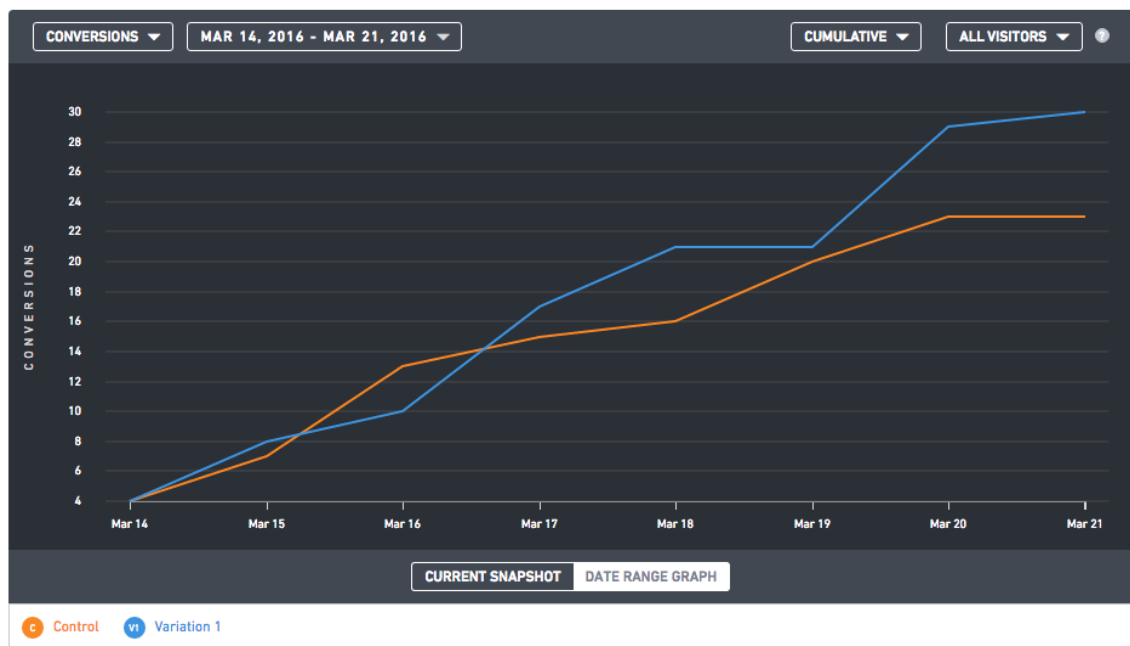


Figure 14. Graph of the campaign dynamics

Proportional increment in traffic after 17th of March makes it clear that a higher amount of visitors creates stronger differentiation in results. Obviously with the growth of visitors, the gap between the orange and blue line becomes larger. The main takeaway from the results of this campaign is the importance to highlight the offered benefits by creating visible clear value proposition triggers.



## Campaign 2. Multivariate testing.

A multivariate testing campaign that combines the value proposition badge and mirror layout was carried out. The variation represented in figure 15 was altered from the initial page. This variation caused a noticeable increase in conversion rate results.



Figure 15. Variation page. Multivariate test print screen of Iittala web store (www.iittala.com).

Considering that this campaign was applied to the most popular product, the badge indicated that the product is going out of stock. Thus the urgency aspect was emphasized and the value of this product was increased. The product card had a mirrored layout, that was designed based on the golden ratio rule previously mentioned in chapter 2.3 called Neuro Web Design and described more precisely on example of the last campaign. The difference in conversion rate between the control and variation results can be seen from table 2. Variation with applied changes won with increase of 1.36%. The graph of the campaign dynamics in figure 16 shows how proportionally the difference in conversion rates becomes noticeable with traffic increase.

Table 2. Results from multivariate campaign

	Visitors	Conversions	Conversion Rate
Control	407	55	13.63 %
Variation	430	64	14.99 %

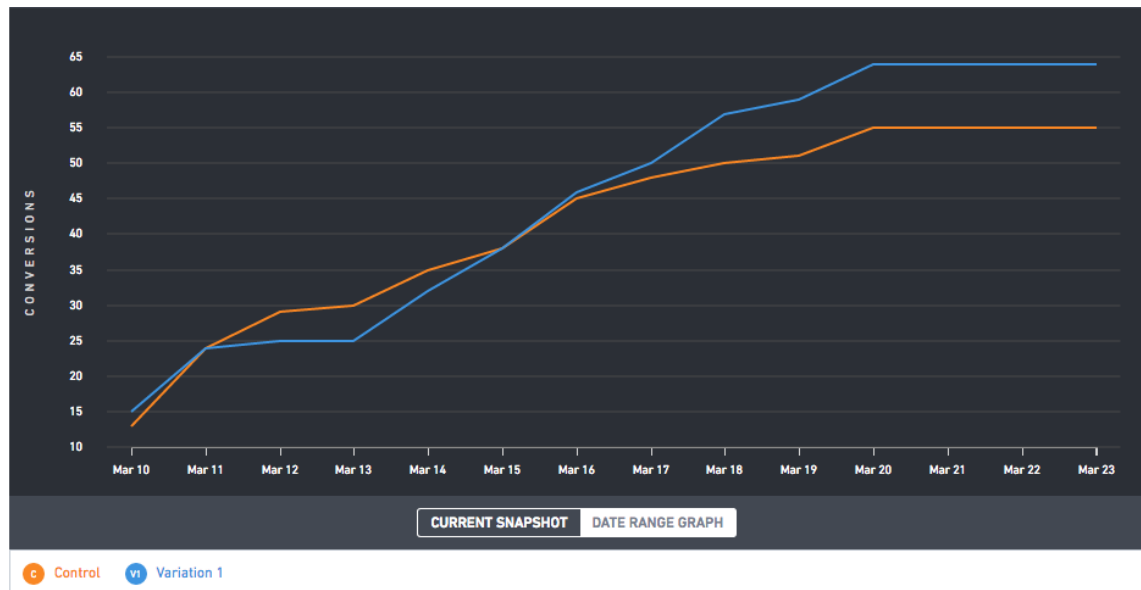


Figure 16. Graph of the campaign dynamics

More comprehensive layout in combination with an increased value proposition led to a sufficient increase in conversion rate. The multivariate test appeared to be the most successful also due to the fact that this product card was provided with most incoming traffic and higher user engagement, which allowed acquiring representative results.

### Campaign 3. Mirror page layout.

The human brain perceives and interprets proportions unconsciously. The first hypothesis considered in this study was based on using the golden ratio proportions in the product card layout. This change was aimed to create a more human eye friendly and native interface, and test how that would affect the conversion. In figure 17 below shows an example of a product card with an applied mirror layout. Comparing with the golden ratio proportions that were shown previously in figure 9, the altered card creat-



ed a natural path for the human eyes that goes through all valuable information from picture to the “Add to Cart” button on the lower right-hand side corner.



Figure 17. Product card with applied mirror layout

However, campaign 3 showed the lower conversion rate result in comprising to the altered variation. The results are presented in table 3.

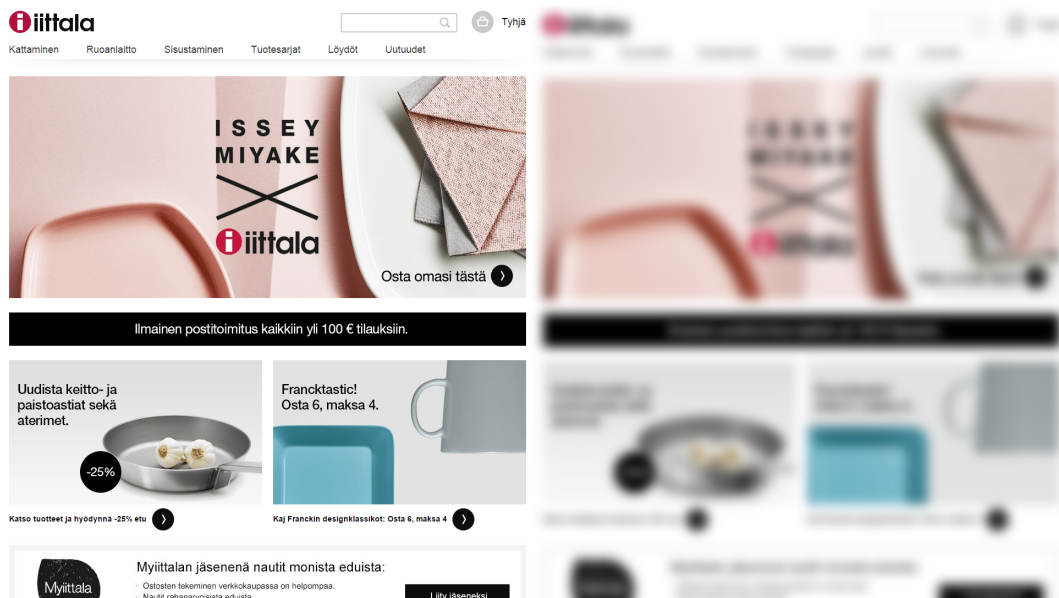
Table 3. Results from the campaign

	Visitors	Conversions	Conversion Rate
Control	55	18	33.14 %
Variation	56	15	27.33 %

Presumably, this could be explained by relatively low traffic. Comparing to the first two campaigns, campaign 3 had 87% less visitors. This fact leads to a decrease in statistical sufficiency. Thus, the result could not be perceived as right or proven, especially because the multivariate campaign, where one of the changes was a mirror layout, showed quite sufficient result in conversion increase.

## Landing Page Hypothesis

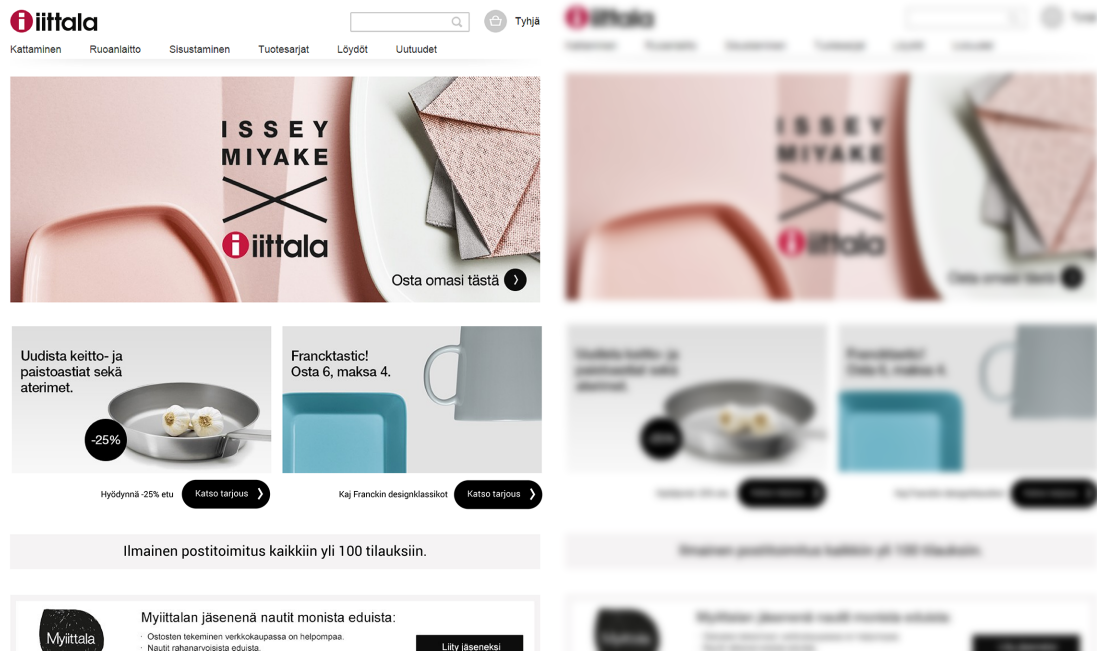
Despite the fact that Iittala asked to abstain from any experiments on the home page due to the current campaigns, I will describe one representative example of theory application for one possible experiment. Figure 18 shows the current layout of the Iittala home page. The blur test method was used in order to define which elements attract greater attention first and foremost (Cao 2015, 72-75). This method is utterly simple and effective for visual hierarchy assessment. In order to assist the layout the blur effect is simply added in Photoshop. Figure 19 illustrates a page with an applied blur effect.



Figures 18 and 19. Initial home page (left). Blur test applied (right).

Obviously the centered page wide black line (see figure 18) is the most noticeable element that draws foremost attention and this is perceived as most valuable. The message of the element has a value proposition “Free delivery for orders over 100 EUR”. Theoretically this line ought to represent the gift of free delivery, although it requires a condition fulfillment. Exceptionally, gift propositions that have a conditioning cannot be perceived as gifts and consequently will not work as reciprocity rule for subconscious (Weinschenk 2009, 29-33). Hence the importance that this particular element possesses in the visual hierarchy is unnecessary and distracting from main content, while main buttons, which lead to the marketing campaigns, instantly become less important and

barely recognizable circles on the background. Based on the results of the analysis, an alternative page layout was designed, which is represented in figures 20 and 21.



Figures 20 and 21. Altered page with changes applied.

The element with the value proposition of “Free delivery” was rearranged and the fill color was changed to gray in order to position it lower in the visual hierarchy. Moreover, the main buttons were made more visible. They also now contain a verbalized call-to-action, “Check Offer”.

### 3.4 Discussion

In total, the whole cycle of defining testing fields, hypothesizing changes, designing actual changes and the implementation period took about three months. The main issue this research faced was low incoming traffic. Even though the marketing campaign was carried out during the experimentation, the traffic for the product cards pages was not sufficient enough to obtain statistically sufficient analytics data for every running campaign. Even the client stated that the lack of visitors was unexpected.

As was requested by the client, the experiments were implemented on the product card pages. The elements that were tested on the product cards included changes to the call-to-action buttons, price and value proposition badges, and card structure itself. All hypotheses upon the changes were presented and confirmed with the client before starting the campaigns. Thus, the field for the experiments was slightly limited to the product cards. Initially the research was planned to be twice longer; however, some rescheduling and delays took place. Moreover, due to the low incoming traffic to product pages it took longer to acquire data than it was planned. Thus, the results are not vastly representative in terms of comparing variation. However, several campaigns that generated relatively high traffic provided enough data for conclusions to be made. For instance, the implementation of the value proposition badges presented sufficient increase in conversion rate in two campaigns. Moreover the combination of the badge and mirror layout showed steady overtakes in conversions as figure 15 represents.

After all, a discussion was held with the client in order to summarize the research take-aways and receive the feedback regarding the overall study and experiments. The client has determined this study as a valuable and useful experience, which clarified the importance of CRO and effectiveness of testing even small changes. Change of several percent in conversion rate might seem nominal; however, this change can cause a very substantial increase of revenue considering whole web store.

In general, the client stated that altered versions work better. Before this experiment, the client never had implemented split tests. Mostly only linear changes (measurement before change – change – measurement after change) were implemented with customer specific content. The client's reasoning was associated with the challenge of the modest CMS that does not allow creating A/B tests using Google Analytics. Therefore,





the VWO tool, as the client stated, was a very useful solution for the conversion optimization purpose. The client intends to continue using the tool in the future.

In order to acquire statistically higher results, the client is advised to continue execution of extensive A/B tests with proven changes applied to the layout. Recommendations concerning usability observations would be delivered to the client. Obviously, future experiments without a time limitation would provide more accurate data. The client has confirmed that the results acquired from the implemented campaigns were significantly valuable and the winning changes will be utilized on the littala's website.



## 4 Conclusion

For the past couple of decades the worldwide web has infiltrated every aspect of the modern life. Popularity of the Internet has influenced development of ecommerce importance and the ultimate need for businesses to be the best player online. Thus recently, website optimization took the leading position in a row of most demanded services and companies must-have.

This study was aimed to take a closer look at the metric that represents website efficiency the most – conversion rate. The best practices of website optimization are described in this study. Neuro design principles that are also discussed in this study can be implemented in experiments hypothesizing in order to provide the best version of a website for visitors, which would help them achieve their goals with minimal effort. The described approach was carried out with one of the biggest players on the Finnish online market – littala. Numerous split tests were implemented on the live littala website. Eventually, some of experiments provided sufficient results and emphasized the importance of CRO framework implementation.

Future research could be more oriented on studying and defining accurate principles based on visual neuro programming. Consumer online behavior is not fully explained scientifically. It is important to remember that persuasive web design is not a tool to manipulate visitors. It is a way to provide flawless user experience, which of course would lead to the increase in sales with actually no extra money spent on marketing.



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