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DIGITAL DECISIONS

How Digital Signage Networks generate profit



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DIGITAL DECISIONS: HOW DIGITAL SIGNAGE NETWORKS GENERATE PROFIT

The main objective of this study is to provide insight on how digital signage can create benefit and what can be done with the content to ensure its efficiency. Digital signage is a relatively new form of digital communication. Digital signage networks consists of displays, a content storage devices (media player), and some mechanism to manage and upload the content that appears on displays.

The study is assigned by a Finnish digital signage solution developer and provider company First Technology Ltd. The company strives to alleviate the uncertainty of potential customers that are yet uncertain of the benefits of deploying a digital signage system by providing solid, fact-based answers, and by creating guidelines for efficient use of the network.

Digital signage ROI is studied and measured by defining the profits of selling advertising space with a desk study. The effect of digital content to buying behavior is researched by an action research promotion study conducted in April 2012 with TOK Wine & Deli coffee shop and Sokos Wiklund displays. Some international studies have been made of digital signage effect on sales (such as Walmart SMART or Neo's Copp Pronto TV results), which will be taken into consideration to answer the questions of how to create better ROI for a digital signage system. The criteria behind effective digital signage content is studied with a content analysis executed with a web-based 3M Visual Attention Service software to analyze the effect of still images that are used on digital displays within selected FirstView customers.

There are no similar studies made of usage and benefits of digital signage within the Finnish markets and within Finnish companies. The lack of studies is a disadvantage itself, but it also effects on the companies willingness to deploy and engage digital signage solutions as a part of their communication strategies.

The study is limited to converse only on content production, digital signage ROI, and the effect of digital signage to buying behavior. The study does not take a stance on the actual hardware used, the amount, size, or type of the displays, or how and where the system is physically installed or who manages the content, which form of content is used, or which products are promoted on screens.

As more institutions and companies come to realize the potential of digital signage network, their use will proliferate resulting that good and even great quality content will evidently get better. This study amongst others within the industry and topic of DS profitability and content efficiency verify the advantages of investing in a digital signage network and using its full capabilities in order to gain profits.

KEYWORDS:

digital signage, marketing communication, technology, digital advertising, ROI, buying behavior

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DIGITAALISIA RATKAISUJA: MITEN DIGITAL SIGNAGE-VERKOSTOT TUOTTAVAT VOITTOA

Tutkimuksen päätavoitteena on muodostaa käsitys siitä mitä hyötyä digital signage-ratkaisuista on ja miten tehokkuus voidaan varmistaa sisällöntuotannon avulla. Digital signage on suhteellisen uusi digitaalisen viestinnän muoto. Digital signage-verkostot muodostuvat näyttölaitteista, sisällöntallennusvälineistä (mediatoistimet), sekä jostakin tavasta hallita ja päivittää sisältöä näytöille.

Tutkimus on toimeksianto suomalaiselta digital signage-ratkaisujen kehittäjältä ja toimittajalta, First Technology Oy:lta. Yritys pyrkii lievittämään potentiaalisten asiakkaiden epävarmuutta heidän pohtiessaan digital signage-ratkaisun käyttöönottoa tarjoamalla yhtenäisiä, faktaan perustuvia vastauksia ja luomalla ohjeistuksia verkoston tehokkaalle käyttämiselle.

Digital signagen takaisinmaksuaikaa tutkitaan ja mitataan määrittämällä mainosajan myynnistä saatavia voittoja. Sisällön tehokkuutta ja vaikutusta ostokäyttäytymiseen mitataan promootiotutkimuksella, joka toteutettiin Turun Osuuskaupan W wine & delin ja Sokos Wiklundin näytöillä huhtikuussa 2012. Joitakin kansainvälisiä tutkimuksia digital signagen vaikutuksesta myyntiin, kuten Walmartin SMART- tai Neo Coop Pronto TV-ratkaisujen tulokset, otetaan huomioon paremman takaisinmaksuajan määrittämisessä. Kriteereitä tehokkaan sisällön tuottamiseksi tutkitaan selainpohjaisella 3M VAS-työkalulla, joka analysoi FirstView-asiakkaiden käyttämien esimerkkikuvien tehokkuutta.

Samankaltaisia digital signagen käyttöön ja hyötyyn keskittyviä tutkimuksia Suomen markkinoihin ja yrityksiin keskittyen ei ole tehty. Tutkimusten puute on haitta jo itsessään, mutta myös vaikuttaa yritysten halukkuuteen ottaa käyttöön digital signage-ratkaisut osana markkinointiviestinnän strategiaa.

Tutkimus on rajattu käsittämään vain sisällöntuotantoa, takaisinmaksu-aikaa, ja ostokäyttäytymiseen vaikuttavia tekijöitä. Tutkimus ei ota kantaa siihen, mitä laitteistoa yrityksen käyttävät, miten paljon, minkälaisia tai minkä kokoisia näyttöjä käytetään, tai mihin ja miten järjestelmä on fyysisesti asennettu, kuka niitä käyttää ja mitä materiaalia esitetään.

Yhä useammat instituutiot ja yritykset ovat huomanneet digital signage-verkostojen potentiaalin. Niiden käyttö lisääntyy nopeasti synnyttäen yhä parempaa ja laadukkaampaa sisältöä. Tämä tutkimus muiden alalla ja aiheesta tehtyjen tutkimusten kanssa, jotka käsittelevät digital signagen tuottoisuutta ja sisällön tehokkuutta varmistavat digital signage-verkoston investoimisen aikaansaamia hyötyjä ja kokonaisvaltaista käyttöä vielä suurempien voittojen saavuttamiseksi.

ASIASANAT:

digital signage, markkinointiviestintä, digitaalinen mainonta, takaisinmaksu-aika, ostokäyttäytyminen, sisällöntuotanto

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LIST OF ABBREVIATIONS

DS	Digital Signage
FT	First Technology Ltd
POS	Point-of-Sale
SaaS	Software as a Service

1 INTRODUCTION

The customer has changed. The world markets have changed. Both are affected by the continuously growing amount of advertisements. All the time there are even more products, and new channels that advertise those products. The new era of mobile and digital equipment forces companies and departments dealing with advertising, marketing, and communication to change too. New, quicker and more cost-efficient ways to communicate with customers are demanded to stay competitive. The mass marketing techniques of television or print advertising are much less effective than they were in the past. The practice of micromarketing is growing, reflecting changes in how consumers interact with media today. We exist in an over communicated world and have learned to filter out messages that don't apply to us. (Collard 2009.)

Digital signage (DS) is one form of relatively new digital communication. It's a new kind of communication medium, and better yet; an experience medium, as described by Keith Kelsen in *Unleashing the Power of Digital Signage: Content Strategies for the 5th Screen* (2010). Dynamic digital screens have been used for marketing and communication purposes for the past two decades, but never in today's scales.

One of the first examples of a digital signage application occurred in 1970s and 1980s when fashion houses started to videotape runway models and hand deliver the tape to be played with VCRs in outlet stores. In the late 1990s the development and implementation of digital media along with smaller, lighter and thinner display screens laid a foundation for the digital signage known today. Fujitsu's alliance with U.S. PixelWorks in 1997 to offer U.S. buyers the first

plasma display device was a critical early catalyst. Flat-panels began to replace posters and signs. The change was led by industry pioneers such as 3M, Scala, Marketforward, and Broadsign. The first center of digital signage in retail, restaurant, and convenience store use was Las Vegas. (Schaeffler 2008: 40-42).

The development of technology and decrease in prices of displays, media players, software, and network connections have enabled more and more companies to consider taking digital signage as a part of their marketing communication strategies. But even the best and most innovative communications technologies will fail if there is little or no substantive value to the audience. During the past two years the digital signage markets, both global and Finnish, have grown rapidly. Globally the impact of DS, its ROI, and effect on customers' buying behavior and experience have been studied –not widely, not thoroughly, but studied nonetheless.

Then again there are no published studies of usage of digital signage in the Finnish markets and within Finnish companies. The lack of studies is a disadvantage itself, but it also effects on the companies willingness to deploy and engage digital signage solutions as a part of their communication strategies. Companies are uncertain of the benefits of digital signage, and also lack knowledge on how to make the content matter so that it would generate results. Digital content itself is not a new phenomenon; TV advertising and even Internet marketing have already been in use for quite some time. Still, one should bear in mind that digital signage is NOT television, nor web based marketing even though the content management on screens is most often done via Internet. When it comes to digital signage as a medium there is a great lack of knowledge for example on the effectiveness of content and of this continuously growing industry altogether.

The main objectives of the thesis are to determine

- how digital signage can generate ROI for the deploying company
- what is the criteria behind effective content on screens.

The thesis is assigned by a Finnish digital signage technology and service developer and distributor, First Technology Ltd. The author of the study has been working in the company for the past four years (2008-2012).

1.1 Case introduction

First Technology Ltd is a research and development oriented IT-company that develops and distributes digital signage solution FirstView. The core business of the company lies in digital signage software, hardware, and service development. As the competition accelerates the innovative company strives to keep its image and position as the market leader and known expert in Finnish digital signage industry. As a part of this positioning process and building of a stronger image First Technology Ltd conducts this study to answer the still undefined questions regarding digital signage ROI and content impact. Also the company can and will use the results of the thesis as a part of their sales and marketing strategy by ensuring potential customer companies to purchase a digital signage solution, which in this case is the FirstView DS system.

The thesis converses on what digital signage is about, and how digital displays can altogether benefit companies. The study gives fact-based answers to the companies still wondering whether to take digital signage into use or not, where lies the earning logic, and what's the ROI of digital signage solutions.

The study methods vary depending on the concentration of the question at hand. Digital signage ROI is studied and measured by defining the profits of selling advertising space. The effect of digital content to buying behavior is researched by a promotion study conducted with TOK Wine & Deli coffee shop and Sokos Wiklund displays. Some international studies have been made of digital signage impact on sales (such as Walmart SMART or Coop Pronto TV Network results). These studies will be taken into consideration to answer the questions of how to create better ROI for a digital signage system. The criteria behind effective digital signage content is studied with a web-based 3M Visual Attention Service software to analyze the effectiveness of sample still images used as a content on digital displays within selected FirstView customers.

Previous studies that concentrate solely on digital signage effects and especially digital content effectiveness have not been done in Finland. Since the thesis is a first study of its kind, it might be difficult to substantiate some of the claims. Since First Technology Ltd has no written company history or profile and due to the fact that the writer of the thesis currently works in the company, the study will include content that lacks written (published) sources and relies heavily on the experiences and knowledge of the company representative i.e. the author.

2 BACKGROUND OF THE STUDY

By the time this study was conducted the author had been working within the digital signage industry for four years. During that time the adoption of digital signage technologies had developed greatly. When starting to work at First Technology Ltd in 2008 the Finnish DS markets were still in the early adopter stage of diffusion of innovations. Diffusion of innovations is a theory that explains how new ideas and technologies spread through cultures, in this case the Finnish companies deploying digital signage solutions. Early adopters of DS systems in Finland were one or two display piloting projects that companies commenced in order to determine whether the system functioned properly and was worth expanding. A little later companies started to deploy small networks within a certain store of brand. Many early digital signage adopters tried to build in-store or corporate TV channels targeting large, non-specific audiences. They did not consider (or realize) that digital signage is able provide true narrowcasting. It can deliver a specific message to the audience in front of a screen at a given moment, based on real information, whether the audience is one or 100 people. Whilst the size of orders made to First Technology grow bigger all the time, FT along with its competitors are sure to notice that between 2008-2012 the market has reached the early majority. Companies are now starting to make comprehensive, organization level decisions to take DS as a part of their communication strategy. In 2012 in Finland digital signage as a technology innovation is somewhere between early and late majority, with the market share getting more saturated and with most businesses wanting to

deploy digital signage solutions. Many companies and organizations seem not to be sure of how the investment will benefit them, and how they can use the system to generate results. (Rogers 1962: 282-283; Collard 2009.)

The competition within Finnish DS companies has tightened and a continuously growing number of companies from different but slightly related fields, such as advertising or network operators, have started to provide DS solutions. Most of these companies lack knowledge, expertise, and experience of DS, but due to efficient and bold marketing strategies they still seem to gain interest from potential customers. This makes the market more scattered, making it more difficult for the customer to be sure of what they're purchasing. As First Technology Ltd has recognized this uncertainty the company wants to help alleviate it by providing solid, fact-based answers for the Finnish customers.

Digital signage does not consist only of technology and hardware, but is strongly related to services provider with the physical equipment. In his book *Selling the invisible: a field guide to modern marketing* the author Harry Beckwith cleverly states that within service businesses it is the industry that defines quality, not the customer (1997: 7). The customer can't be blamed for lack of knowledge if the industry does not provide them with solid, qualified answers. Beckwith also answers to the additional questions why this study should be made; First Technology Ltd aims to constantly improve its service quality, to find ways to serve their customers better, to stay in contact with customers, to learn from mistakes, to flag problem areas, and to know what the DS business is really about and what they are REALLY providing for the Finnish companies (1997: 25).

2.1 Literature review

Digital signage is a relatively new field of industry. Lately it has become more and more interesting due to the results that have already been seen for the companies deploying digital signage, and the good word of mouth and experiences of DS installation spreading along industries. Thus the industry has also become more and more investigated. Still at the moment there are limited

number of journals and literature that solely concentrate on and discuss digital signage, all few of which in English. Two of these literary publications are used as main sources in this study, whereas the third book, *Digital Signage Broadcasting: Broadcasting, Content Management, and Distribution Techniques* by Lars-Ingemar Lundstrom could not be used due to delivery issues of Booky.fi and Amazon.com e-shops, and the lack of the publication in Finnish libraries. The publications used are *Unleashing the power of digital signage: content strategies for the 5th screen* by Keith Kelsen 2010, and *Digital Signage Software, Networks, Advertising, and Displays: a Primer for understanding the Business* by Jimmy Schaeffler in 2008.

A similar study concerning both the benefits and ROI of a DS systems and the efficiency criteria of content could not be found by the time this study was conducted. Hannele Välipakka from Jyväskylä University of Applied Sciences has made a thesis “Capturing customers’ attention with digital signage” in 2008, a work that considers what kind of material on displays is effective and how the physical displays should be installed in a customer’s premises. This thesis was commissioned by a Slovenian digital signage provider Nevron d.o.o, a company that hasn’t yet emerged in the Finnish DS markets. For the similarity of the subject the source material for the graphics Välipakka has used when describing effective content production for displays will also be considered in this study.

Globally there are a growing number of articles and studies made especially within retail and advertising. These studies are mostly done by DS solution providers, advertising and media houses, or big chain companies implementing DS solutions. Most articles and studies focus on implementations that consist of hundreds or even thousands of stores with multiple displays, and are not therefore straightforward applicable to Finnish markets. In Finland even the biggest separate chain wide implementations of DS systems doesn’t exceed 1000 displays, let alone separate stores or brands of a chain. Some examples of the international studies and articles such as Walmart’s results for their SMART Network usage of 18 months and POPAI (the Global Association for Marketing at Retail) and Neo Advertising Coop Pronto TV sales uplift articles

used as a reflective material in this study. The complete list of source material used is listed in References.

2.2 Why studying the benefits of digital signage is relevant?

Digital signage is a new technology to the business world. It shouldn't be seen as just a part of a traditional communication and marketing strategy, but an experience medium to create human connection with current and prospective customers (Kelsen 2010: foreword). As more companies are either already implementing digital signage solutions or at least are planning to do so the metrics of what digital signage can do become more important. Already companies are questioning whether the investment is worthwhile, and want to know what digital signage system can do for their business. Those companies that have already implemented a DS system and taken it as a part of their communication tools want to know how they could most benefit from the system.

Kelsen nominates digital signage as the "5th Screen" (2010: foreword). The first four screens in their appearance order are movie theaters, television, personal computer, and mobile phones and PDAs. Rapid advances in technology have altered the human communication during the past 120 years. The 1st Screen, motion picture, came in about 1890 and became a source of novelty, entertainment, and later on news information, and even propaganda. Approximately 50 years later the 2nd Screen, television, came and brought a more intimate setting and delivered messages that viewers perceived in their living rooms. Another 40 years passed before the 3rd Screen, personal computer, came into being bringing later on the Internet and the communication that it carries. When personal computers met cellular technology the 4th Screen, mobile phone, enabled people to access and gather information wherever they were. The 5th screen, digital signage, has once again its own characteristics, its own content methodology, and its own strategy to ensure success. People have learned the visual language of movies and television, and also interaction with the Internet and mobile devices. We can expect those habits to transfer to the

usage of the 5th screen (also known as DOOH, digital out of home). It needs to be considered that the where and how viewers encounter the screen since it is relatively different from the other mediums. Studying the 5th screen and how it provides unique values to viewers will teach us how it can provide value to the implementing companies. As Kelsen states: “data about viewer selections-- can be very valuable for marketers who are fine tuning messages and products to be more appealing to customers.”(2010: 1-6.)

Justifying the acquisition of a DS system seems to be easy for those companies that have already implemented it. Reasons for the purchase vary from claims such as “need to cross-market in real-time” to “because the company next door has the system too”. Still the system alone won’t do anything. Kelsen states that the technology itself is a proven delivery mechanism but the content often fails because marketers don’t modify their content to adapt this particular medium (2010: 11). Especially in Finland companies tend to implement a DS solution, invest money in the best looking displays in the market, and then hope to gain results with just copying the material they’ve already been using in Power Points or in their web marketing to the displays. This lack of knowledge in content production to the 5th screen can’t be blamed on the marketers alone, but also the providers of digital signage systems. At this time there’s no (Finnish language) material provided for marketers to provide them with the knowledge needed to produce efficient material for DS screens.

Studying digital signage with the concentration especially on content and keeping the focus in the yet unstudied Finnish DS markets will in the long run benefit not only the marketers and companies deploying DS systems, but also the viewer by providing them with relevant and useful content that also they can benefit from.

Lynn Mattson describes in *See it, hear it, experience it, buy it: increase sales with digital signage, ambiance marketing, and electronic merchandising* published in 2009 yet another reason behind this study; customer engagement. Mattson states that “the more engaged customers are with your products, services, or place of business, the longer they will stay, more likely they will be to buy and more money they’ll spend” (2009: 3). All this can be done with digital

signage display(s). First we need to make the customer see WHY they should take DS into use, and then provide them with information on HOW they can make content that is efficient and interesting enough to reach their customers.

The whole concept of digital signage is relatively new especially in Finland, but also worldwide. The digital media technologies allow marketers to reach their customers effectively, quickly and precisely. Digital signage is changing the world of marketing but as a new medium it still has some basic problems; digital signage solutions lack appropriate standards, and it's difficult to measure digital sign's effectiveness and evaluate its ROI. The industry of digital signage in Finland is emerging and somewhat fragmented. In a few years the industry will most probably reach a maturity stage. First Technology Ltd has worked as a pioneer in the Finnish digital signage industry due to its own (domestic) R&D of digital signage products and the early entry to the markets.

In the future First Technology Ltd wants to be able to provide a "whole-package" concept to its customers and make the FirstView solution more understandable and simple to comprehend. Studying the benefits of digital signage allow the company to provide better and more profitable products and services to its customers.

2.3 First Technology Ltd company description (FT)

First Technology Ltd was founded in 2004 in Turku with the help of Turku Science Park incubators. It started as an innovative research and development company that sold software engineering projects to customers such as Tunturi Ltd (fitness equipment software development). Quite early on the owners (employees) of the company started to develop a web browser based software that controls displays via a server. The main emphasis at that time lied in conference and guidance needs of especially hotels. FT's sophisticated and automated conference and guidance functions are still something that competitors don't provide. During the last five years First Technology Ltd has concentrated on developing the FirstView digital signage system as a whole.

The company provides digital signage solutions for customers in many different fields; hotels, restaurants, public spaces, schools, conference centers, ships, theaters, shops, markets, transportation, and so forth. First Technology's domestic customers are for example S-group, Terveystalo, Tallink Silja, Viking Line, Technip, Radisson BLU, and KONE Industrial. The company has several resellers in Finland. Some resellers provide FirstView services and products to their customers (e.g. advertising agency Huima), while some have taken FirstView technology to use as a part of their own product line (e.g. Anvia Ruutu or Cygate Viestintäkanava). FirstView info display system is spread over Europe and middle-East via a Norwegian co-operation company Otrum ASA. First Technology also has a distribution agreement with S-group by which FirstView is the recommended digital signage system for the whole S-group.

FirstView info display system consists of three main parts; display(s), FirstView media player, and a connection to the Internet that connects the system to a cloud server. The user can update the content on screens with FirstView Manager content management system from anywhere where is an Internet connection. All data traffic is SSL secured (same as network banks) to avoid breaches. With FirstView info display system the customer can broadcast and schedule image, video, and Flash presentations and web sites (HTML) on screens, use ready-made templates for price lists, text, pictures, RSS feeds, or animations, and create guidance screens, conference timetables, and meeting reservations.

Most FirstView customers use the system as SaaS (Software As a Service) service which means that the server is provided by FT. Own server equipment demand fairly big investments and require some maintenance and separate updating, and therefore those are rarely used, wanted, or needed within FirstView customers (exception are closed installations, such as government agencies). FirstView customers can either buy or lease the equipment (displays and media players). Customers use the FirstView cloud server for a monthly fee per media player, including server maintenance, software updates, and free technical support. The content on screen is managed remotely by the customer with the web-based FirstView Manager content management system.

2.4 Digital Signage industry description

Digital signage as a concept is relatively new and relatively strange. One challenge within the industry is the inconsistent use of names given to describe the technology. All these following terms relate to digital signage:

- Captive Audience Network
- Digital Advertising
- Digital Point-of-Purchase (POP)
Considering advertising made in places where viewers are likely to buy.

- Digital Signage Broadcasting
- Digital Signage Network
- Digital Signs
- Dynamic Digital Signage
- Electronic Signage
Considering electronic systems that are usually wide spread in multiple locations, connected via servers, links, or networks.

- In-Store TV
- Kiosk System
- Narrowcasting Network
- Out-of-Home Advertising
- Place-Based Media
- Retail Digital Media
- Retail Media
- Retail Media Networks
Considering screen installations that call to action with targeted groups in targeted locations.

(Matson 2009: 69.)

- Also: Info TV, Digital Out of Home (DOOH), media channel, info display

By a generally accepted description digital signage includes digital hardware displaying digital content in the form of both on-screen systems and software control systems, featured on screen that come in many sizes, offering constantly changing and refreshed content, often showing on many regions of a single screen, capable of delivery instantaneously via networks, from a server or PC, intended to be relevant and helpful to consumers aimed largely at out-of-home audiences who are frequently moving from place to place (Schaeffler 2008: 39).

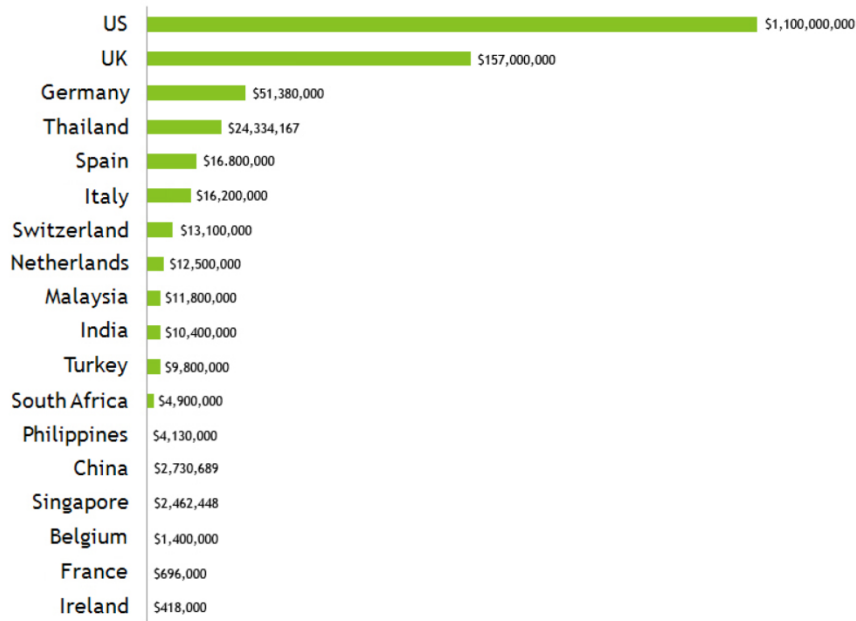
First Technology has a fairly good knowledge when it comes to the Finnish digital signage markets. Biggest competitors who provide professional DS solutions in Finnish markets are Scala, Onelan, Seasam, ZetaDisplay, MarketMedia, and also Elisa (Videra), Towermedia, iDiD, Trendchannel, and InfoSign. JC Decaux is an outdoor advertising company that can be seen as threat or a possibility for First Technology, especially now that they've also taken DS into their product line. In Finland JC Decaux displays are found for example in Helsinki subways and trams. JC Decaux is also the supplier of TescoTV in the United Kingdom (Schaeffler 2008: 33). The competitive environment in Finland goes hand in hand with the definition of the whole digital signage market; it is quite fragmented, non-standardized, and complex for the customer. Some competitors have functions and features in their products and additional services that others lack of, and vice versa. The main problem throughout the whole industry is the lack of knowledge especially when it comes to defining what customers want and need, and what they *think* they want and need when searching for digital signage system (provider).

The world's biggest digital signage provider Scala conducted a research in 2007 by business research and consulting company Frost & Sullivan that defines the digital signage competition worldwide. Based on the research there are five types of digital signage companies (DS systems): MPEG only networks, Browser-based Flash players, Hosted only solutions, Big companies with small DS groups, and Small DS start-ups. Scala is defined as a digital signage provider that combines the best and most significant qualities from each

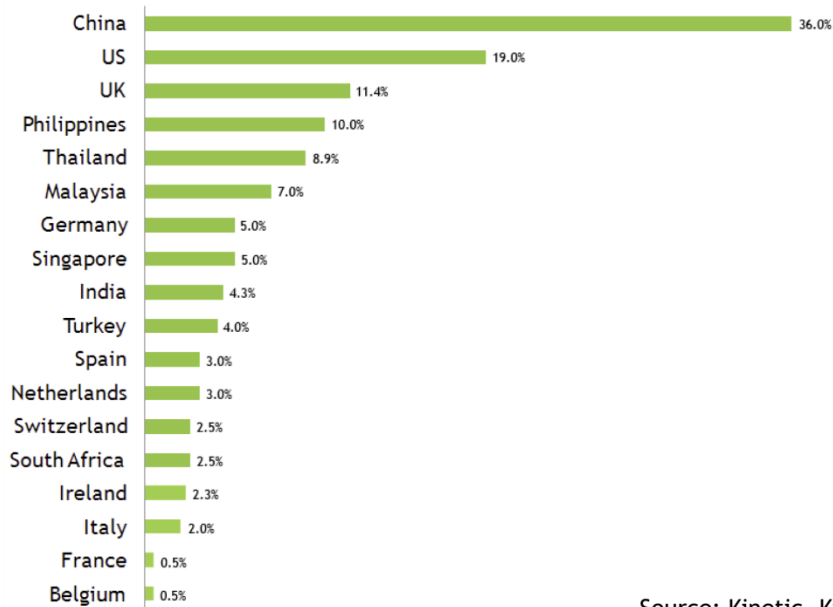
category. (Scala 2010.) Based on this research First Technology Ltd can be categorized to be at the same level with Scala when it comes to the functions and features of the digital signage system, and the service model provided.

As in many facets of modern day telecom development Asia is a strong base for the development of the industry. Slightly surprisingly Europe is often ranked ahead of North America when it comes to overall digital signage deployment of networks and infrastructures. Type samplings of digital signage projects in Europe are for example Audi, Aras (a German gas station operator), Dutch Railways, Poland's Pharmacy Advertising Channel, Shell Retail in Norway, and IKEA in the United Kingdom. Digital signage is already spread worldwide, having its legs as far as Africa and Latin America. (Schaeffler 2008: 185-204.) The *Global Digital Out Of Home Handbook* published by Kinetic provides information that defines the global DS industry by revenues and percentage of out of home advertising as a whole (Kinetic 2011). This information is provided in the form of a chart (picture 1) that illustrates the Digital-Out-Of-Home generated revenues by country, and the proportion of Digital Out-Of-Home advertising from overall Out-Of-Home advertising. By this chart U.S. is the best when utilizing DOOH advertising to gain revenue, followed by UK, Germany, and a bit surprisingly Thailand. These countries seem to understand the earning logics behind DOOH advertising, and therefore are able to get revenue from them. China is the clear leader when DOOH usage is defined by percentage of overall out of home advertising, suggesting that the usage of the DOOH technology is strong but the efficiency of the system is not utilized fully since the revenues are minimal when compared to countries that have a much lower level usage of digital out of home from all out of home advertising. This again implies the fact that the technological equipment (digital signage system) alone does not generate revenues, but needs to be understood, utilized correctly, and content-driven.

Global digital OOH revenues (USD)



Digital OOH percentage of OOH



Source: Kinetic, Kinetic Markets Only

PICTURE 1: the revenues gained from DOOH within different countries, and the amount of digital-out-of-home from all out-of-home advertising (Kinetic 2011).

2.5 Definitions and limitations of the study

This study is conducted by a set of sub-studies that provide data or help determining the underlying problem (the effect and benefits of DS). The sub-studies are all conducted by the author who also works as a marketing director in the commissioning company First Technology Ltd. The sub-studies have been executed during April-November 2012.

The study is limited to converse only on content production, digital signage ROI, and the effect of digital signage to buying behavior. The study does not take a stance on the actual hardware used, the amount, size, or type of the displays, or how and where the system is physically installed. Neither does the study include the basics of advertising, or consider what products, services, or information should one deliver within particular destinations (environment of the displays), companies, or industries. In the study it is assumed that the companies deploying digital signage systems already know what kind of messages they want and need to deliver within their business. This study focuses solely on how and in what way this material should be taken to screens to create actual effect on viewers.

This study disregards home installations (e.g. PC attached to a display), text led signs, and posters on lit panels. Only professional digital signage systems are considered. Professional in this case implies network based, multiple display solutions that enable remote content distribution. Professional digital signage systems are expected to be able to present basic (dynamic) materials such as images and videos on displays. Additional features, such as using templates or presenting web content, RSS feeds, or Flash vary greatly between different DS system providers in Finland. These features are mostly not taken into consideration within the effective content designing in order to keep the focus solely on the key features that are similar between solution providers and most used by the customers. Neither are the different types of hardware and software provided by different suppliers analyzed in this study. The focus and main objective of this study is to determine where lies the benefits of deploying any kind of professional digital signage system, and how to produce effective content in order to create more results and benefits with the DS system.

3 STUDY OBJECTIVES

Every project and research should have a clearly defined and explicit objective which states *why* the research is being carried out. Badly thought-out objectives usually lead to poor or less than optimum results. (Hague 1999: 44.)

The main objective of the study is to provide companies insight on to how digital signage can create benefit and what can be done with the content to ensure efficiency. In addition to the main objective there are some company-driven indicators to conduct this study.

3.1 Defining the benefits of a digital signage network

Digital signage is one form of relatively new digital communication. It's a new kind of communication medium, and better yet -an experience medium, as described by Keith Kelsen in *Unleashing the Power of Digital Signage: Content Strategies for the 5th Screen* (2010: foreword). Digital screens have been used for marketing and communication purposes already for the past two decades, but never in today's scales. The development of technology and price levels of displays, media players, software, and network connections have enabled more and more companies to consider taking digital signage as a part of their marketing communication strategies.

The growing interest in deploying digital signage systems within corporate or chain level brings with it the need for fact based information on how the system will benefit the deploying company. Finnish organizations are now asking how the investment will benefit their business in order to make the decision to install a (sometimes even nationwide) digital signage system. This study aims to answer that question by defining the return on investment (ROI) of a digital signage system when it is used not only for proprietary marketing purposes, but also for selling advertising time from the screens. Professional digital signage system is a medium that enables its users to schedule content beforehand and

sell out campaigns in advance. Advertising sales can make the ROI bigger and faster. Another factor in better ROI is the uplift in sales and effect on customer buying behavior, both of which are also included and reflected in the study.

3.2 Defining the criteria for efficient digital signage content

The investment made for digital signage system is usually seen solely as the purchased hardware i.e. displays and media players, and the installation and maintenance of the technology. Content management is seen mainly as something that someone in the company will manage amongst other tasks. But even the best and most innovative communications technologies will fail if there is little or no substantive value to the audience. Technology itself is a delivery mechanism, but the content might still fail due to marketers not adapting their thinking to producing relevant DS content.

One main objective of this study is to give insight for (Finnish) marketers on what is the criteria behind effective content for digital signage screens, and how the content can influence its viewers. The study will also create a basis for a written content guide that First Technology will provide for its customers. The objective is to provide information for marketers that allow them to make more efficient content with less time and effort, and by doing so generate even better results for the deploying company.

3.3 Company-driven study objectives

3.3.1 Positioning First Technology within DS markets in Finland

A position, or a position statement, explains how a company is perceived in the minds of prospects. Then again, a *positioning* statement describes how a company wishes to be perceived. It answers to questions

- who is the company
- what business is the company in

- what people does the company serve
- what are the special needs of those people
- with who or with what is the competition
- what differentiates the company from the competitors
- what's the benefit for the customer

(Beckwith 1997: 113.)

First technology Ltd as a company wants to be renowned as the solution provider that is able and willing to conduct studies and gain expertise that assist both them and their customers in the initialization process of digital signage systems within different industries and companies.

The company is concentrated in developing the FirstView software and hardware, producing reliable equipment for digital signage deployments, and seen as the technology or tool and service provider within the digital signage market in Finland. Harry Beckwith describes in *Selling the invisible: a field guide to modern marketing* (1997) that people in the fast-food business formerly thought that they are selling food. Then McDonald's came, and figured out that people weren't buying hamburgers but buying *experiences*. (1997: 41.)

Using this study to produce a new, content consultation service and the reinforce the image of the digital signage expert First Technology Ltd aims to be seen not only as the technology provider, but as the digital signage solution provider, that help its customers to initially create better end-user experiences for the viewers.

3.3.2 Strengthening the image of expertise

The capability of a company refers to the company's expertise in delivering product and service offerings, such as effective innovation and high service quality. Social responsibility refers to how a company manages social issues. The image and brand of a company impacts a customer's evaluation of service quality, satisfaction and loyalty. (Kim & Lee 2010.) Brand-name businesses are able to spend less time and money to increase sales. This gives them greater profits, with what the company can ultimately be made even more productive by

reinvesting in branding. Companies that understand making the invisible visible will ensure their potential customers to buy, instead of being insecure and hesitant with the purchase decision. Prospects look for evidence, or clues, about a service and when those cannot be found, they'll thrive to find a service that does. (Beckwith 1997: 156, 186-187) One objective of this study is to ensure the prospects searching for a DS solution provider (potential FirstView customers) that First Technology is the expert within the industry that provides not only quality products and services, but continuous knowledge and help to its customers in forms such as comprehensive research and studies like this one.

3.3.3 New service: DS Content Consultation

A common mistake made by many companies that have taken digital signage system into use is to forget the importance of content. The technology itself, however good looking screens or high-tech video walls, is not going to captivate an audience.

Most digital signage is usually deployed to be an additive component to existing marketing and advertising campaigns and materials. The look and feel of a raw material for a campaign can, and should, be used for digital displays also. Creating content from scratch is often more expensive. (Kelsen 2010: 91.)

Still, even the raw material, let alone completely new material should be created considering their ultimate purpose on *digital* screens. Many Finnish marketers start using digital signage without the knowledge of what should be considered and done with digital signage material what works, what doesn't, which formats to use, and what can be done to make the content provide even better results. This study along with other materials will provide information for First Technology Ltd to provide their customers with a new service, DS content consultation. This service will be provided as a form of a written content guide (for example '*Tips and guidelines for creating DS content*') that will be handed out for the participants of educational seminars for DS content production arranged in spring 2013, for FirstView reseller companies, material producers, and key contact persons within FirstView customers.

4 FRAME OF THEORETICAL REFERENCE

The following will define the main concepts and terms related to this study, to constitute a theoretical foundation. These concepts enlighten what the study consists of and describe the main factors and concepts related to the main objectives of the study (defining the benefits of digital signage and efficient content production).

4.1 What is digital signage broadcasting?

Digital signage technology involve at least the following three concepts

- 1) communicating general (promotional) information to customers
- 2) putting customers in the buying mood (experience media)
- 3) merchandising a specific product, category of products, or services

(Matson 2009: 70.)

Digital signage simply consists of a display, a content storage device of some kind (media player), and some mechanism to manage and upload the content that appears on the display. Digital picture frames that have a USB memory stick attached can be seen as digital signage equipment. Professional, sophisticated network-based digital signage solutions can involve 10 flat-screens blanketing the walls of a retail store that are connected to a media player and linked to headquarters where all content for the 2000 retail stored with 10 displays is managed (Matson 2009: 70). This study focuses on the latter, the network-based DS solutions.

Digital signage broadcasting is usually seen as a form of advertising in which content and messages are presented on a digital surface, an electronic screen, and can be changed without physically modifying the screen. Usually the goal is to deliver targeted messages to specific locations at specific times. Digital signage broadcasting can be used to deliver content of usually the next primary distinct forms:

- commercial

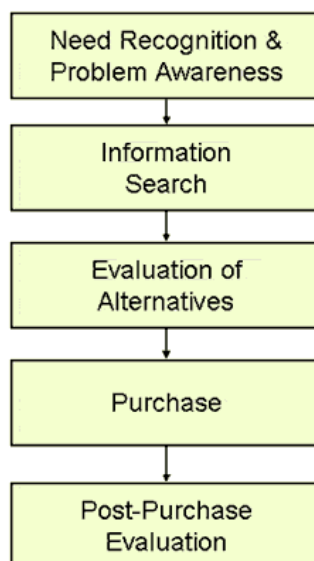
- informational
- experiential
- behavioral

Distribution of the content is done by three key methods: traditional wireline (Internet), terrestrial wireless distribution (cell phones), and delivery via satellite stations. Similar to all distribution methods is that the ability to send content simultaneously to one or tens of thousands of locations and screens. (Schaeffler 2008: 1-24.)

The power of digital signage is the difference between it and traditional mediums that does not necessarily approach the customer at the point of sale (POS). Digital signage is able to deliver creative, compelling content that's relevant to viewers and their out-of-home experiences in ways that no other mediums can. (Kelsen 2010: 12.)

4.2 What is buying behavior?

Buying behavior can be seen as a five stage process that involves decision making. An article *Buyer behavior - The decision making process* by Jim Riley in 2012 summarizes buying behavior with the following diagram:



Need recognition starts the purchasing process. The process starts when the buyer notes a problem or desire such as hunger, headache, or new sport equipment, or responds to a marketing stimulus such as passing by Starbucks or, considering this study an effective and engaging digital display. Then the customer starts to estimate how much (if any) information is needed to make the purchase decision. The information can be gathered from multiple different sources; recommendations from friends, advertisements on magazines, search engines, and so on. After gaining enough information, the amount depending on how low- or high is the involvement with the purchase (low being a hamburger, high being a house), the evaluation process begins. Evaluation process means the comparison between brands, products, and service providers. When a customer feels “involved” in the product the choice is perceived as more relevant and personally important, and therefore is likely to be purchased. (Riley 2012.)

Buying behavior and digital signage mainly relate to how the viewer perceives the given message and in which point of the decision making process. Buyers see the cost of a purchase as a negative. Then again, the perception of attractiveness or reliability of the product or service is positive. Affecting the buyers’ behavior at the evaluation stage demands knowledge of the audience. To accommodate the buying behavior the content on displays can emphasize the positives, justify the negative (cost), and ultimately result in a purchase. The more personal the attitude and knowledge of an audience is, the more predictable the behavior, and therefore the outcome of a particular message delivery. (Kelsen 2010: 47-48.)

Not all shoppers that walk into sales premises buy something, even if they were meaning to. The concept of conversion rate implies that the shoppers need to be “converted” into buyers for a purchase to happen. A person is a shopper when walking into a store, but becomes a consumer only when walking out with a purchased product or user service. The conversion rate varies greatly depending on the store, product, and field. For example in a supermarket the conversion rate comes near to a 100% with people buying toilet paper, milk, or

such. In an art gallery or jewelry store the conversion rate can come as low as 1%, one consumer of a hundred shoppers that walked in. Conversion rate is all about what happens within the four walls of the store, not considering the reason why a shopper walked in (the reason could be anything from advertisement to a real-life problem). (Underhill 2009: 28-35) Digital signage displays are more than often installed inside the sales premises, and therefore offer an excellent channel to enhance the conversion rate with targeted messaging.

4.3 What is point-of-sale (POS) marketing?

Point of sale (POS, also known as point of purchase POP) marketing is tailored towards the shopper and implemented in the places where buying decisions are made such as corridors of a market or on a shelf in a shoe store. POS marketing is meant to affect the buying behavior of a consumer that is already predisposed to shopping and in the ideal mindset for making a purchase. POS content, whether it's on print ads, sample tastings, delivered by a sales person, touch screen, or a digital ad display can drive the customer to make a purchase through presentation of a value proposition. Usually the content is accompanied with a call to action to accelerate the decision process. (Kelsen 2010: 20-27.)

POS marketing fundamentally aims to sell additional items to a customer than he or she originally planned (impulsive purchases). POS marketing is mainly done by different types of displays –not only digital, but also prints, coupons, or banners. Prime locations for point of sale marketing are the checkouts and cash registers. POS marketing generates product awareness and trial than ultimately can lead to a purchase. Samples, offers, and discounts near the point of decision may result in shoppers even changing familiar brands. Different types of messages in different POS places can resonate with the target audience and motivate impulsive purchases. According to a global shopper study conducted by OgilvyAction in 2008, 30% of people wait until they're in the store to decide the brand that they will purchase. (Slabaugh 2012.)

4.4 What is (digital signage) content?

Hardware, maintenance, distribution, and measurement are important when taking digital signage (or any other digital marketing) solution into use. The driver behind results is still the content brought to the end-user via the technology. Consumers don't care about *how* they receive different kinds of content (images, video, audio, animations, and other forms of data displayed), they mainly care about *what* content they receive. Digital signage content should always contain relevant, local content. Another noteworthy comment is that digital signage content should consist of the right digital content mix, with the right volume of content. (Schaeffler 2008: 113-118.)

Jeff Porter, the president of SignChannel business unit of the world's biggest digital signage company Scala, has cleverly remarked that many people new to digital signage concentrate first and foremost on the technology (screens) but forget or dismiss "feeding the monster" with qualified and efficient content that with digital displays can be dynamic instead of static. (Schaeffler 2008: 118-125.)

The types of content used in digital signage are mostly one of the five following:

- still images (PowerPoint slides, photos, ads, JPEG, PNG, GIF..)
- animation (Flash or other forms of animation)
- video (MPEG-2, MPEG-4, H.264..)
- data (such as weather feeds, news, timetables, price lists..)
- text (information, guidance, logos, briefings..)

Additional content used with digital signage is audio, which demands more than often the answer on whether to use it at all, and if so, how. Mixing the types of content provide the element of surprise and help engaging customers. New kind of content relate specifically to the audience and environment. (Schaeffler 2008: 128-133.)

Future content might not reach to high-tech of individual eyeball detectors seen in the movie *Minority Report*, but doesn't stay far. Motion detectors, eye movement tracking, and identification devices such as RFID sensors will enable delivering pinpointed, instant material targeted to a certain group (eg. young

women, families, men). Digital signage technology is also not far from becoming mobile, when specific digital signage devices will permit consumers to transfer content onto their smart phones. Touch screens and other interactive solutions are more and more popular already, with 3D following closely. (Schaeffler 2008: 134-135.)

The content that the viewer sees is just the outcome of a variety of technical and visual specifications that the producer of the content and ultimately the provider of the digital signage solution have created. Screen sizes, ratios, and resolutions vary greatly between different providers, installations, and purposes. The format of the digital content will finally be determined by a combination of factors from whether the content has motion or not, to the capabilities of the used DS solution system, and for example media player limitations. (Kelsen 2010: 111-136.)

4.5 Importance of content and design

Deploying the best possible digital signage system, with the best-looking big flats-screens and the most agile software for content management will not guarantee that a company will succeed with its digital signage communication. Technology itself is a delivery mechanism, but the content might still fail due to marketers not adapting their thinking to producing relevant DS content. Digital signage utilizes for example HD video and Flash content, that has already made familiar to the public by television and the Internet. As digital signage content can be dynamic it brings the advantage for capturing the attention of time-constrained individuals in an increasingly message-cluttered environment. Digital signage content can be directed to a particular audience making it personal. Refreshing content from TV and Internet to suit the DS screen is not a small task, but when utilizing creative assets with slightly modified content, those assets will keep the messages fresh in the mind of a consumer. For example dwell time and visit frequency effect on how and how often the content should be refreshed. Digital signage content meets viewers in an environment with a possibility to send the right message at the right time to result in for

example impulse purchases or brand changes. With content relevancy is the key. (Kelsen 2010: 11-12.)

Relevancy comes as given, when the content is designed with a context. Jeff Collard point out in an Omnivex white paper *Digital signage: creating content with context* that “content can be entertaining, clever and attention holding without necessarily imparting any useful information to the recipient”. The purpose of a message is to inform, educate, build awareness, create relationships, and/or facilitate a decision. For this to happen, the content must resonate with individual viewers. Content is applicable with a viewer when it’s properly timed and focused. Clear value is lost when content is ultimately designed for a broad range of viewers, with the hope that a sufficient segment of the passing traffic at that location will have an interest in the message. Digital signage technology can be used better than for just delivering general, misdirected messages. Content producers should start with determining what is the data that they want, need, or should deliver with their screens. After that the best way to display it (images, animations, video, design) can be determined. (Collard 2009.)

Based on the experiences of the author the most common problems with the material used displays seem to be (especially with Finnish customers):

- using the same marketing material as in web, television, or brochures without modification
- using the PowerPoint slides that the company already has without modification
- too small font on screen
- too much information/elements on one content (especially still images)
- badly structured layouts
- not utilizing the tools provided with a DS system (scheduling, targeting, templates, different forms of content)
- ineffective and poor choice of colors (background, text, images)
- showing content that is not relevant for the viewer in order to have any content on the screens

ClearChannel, of the world leaders in Out-Of-Home advertising, has created guidelines and specifications for creating effective DOOH material. The guide suggests that simplicity is the key to reach the ultimate purpose of functionality. Digital signage content should always be readable even from a distance. These are ClearChannels recommendations for effective DOOH material:

USE LARGE TEXT

DOOH designs should be simple, clear and easy to read. Digital Bulletins (especially those installed outdoors) should be legible from 500 feet away.

USE BOLD, NON-SERIF FONTS

Always use large, legible typefaces. Thin lines optically fade or break up. Avoid decorative, italic, or serif fonts. As a general rule, upper and lower case fonts provide the best readability.

STICK TO ONE MESSAGE OR IDEA PER CONTENT

Simplify everything. Don't present a complex message or numerous images. Have one thing that you want your audience to do or to recognize.

BE SHORT

Use no more than ten words total on the entire billboard, including the logo/product tagline. Seven words or less is recommended for the headline. Keep the words short for faster comprehension.

COLOR

Use only RGB color files for digital displays. Design colors as you would for a website, TV or computer monitor.

AVOID WHITE BACKGROUNDS

To achieve white, a combination of all three display colors must be turned on to their maximum brightness. Consequently, white backgrounds will wash out and compete with the remainder of your creative.

USE BRIGHT COLORS

Use fully saturated web-safe hues. Complimentary colors, such as red and green, are not legible together because they have similar value. Contrasting color combinations work best for viewing outdoor designs (especially at far distances).

DESIGN WITH HIGH CONTRAST

Strong contrast in both hue and value are essential for creating content on screens (picture 2, more samples found in the appendix).



PICTURE 2: High contrast in both hue and value result in more efficient content

PICK YOUR IMAGES WISELY

When deciding which images to use on screens, take a small object and make it large (like a watch) rather than making a large object small (like a building). Avoid using landscapes or complex scenes. It is recommended to use 3 visual elements or less in total. For example: 1 image, 1 logo and 1 headline.

FORGET ABOUT (WHITE) SPACE

White space does not apply in outdoor like in printed material. Increase your logo, font sizes and imagery.

TEST YOUR IDEA

A digital signage display is not a print ad. The average viewing time is less than 5 seconds. A good test is to show the design to someone (from a distance) for only 5 seconds and then ask them about it. Did they understand it? Who was the advertiser? What do they think the advertiser wants them to do?

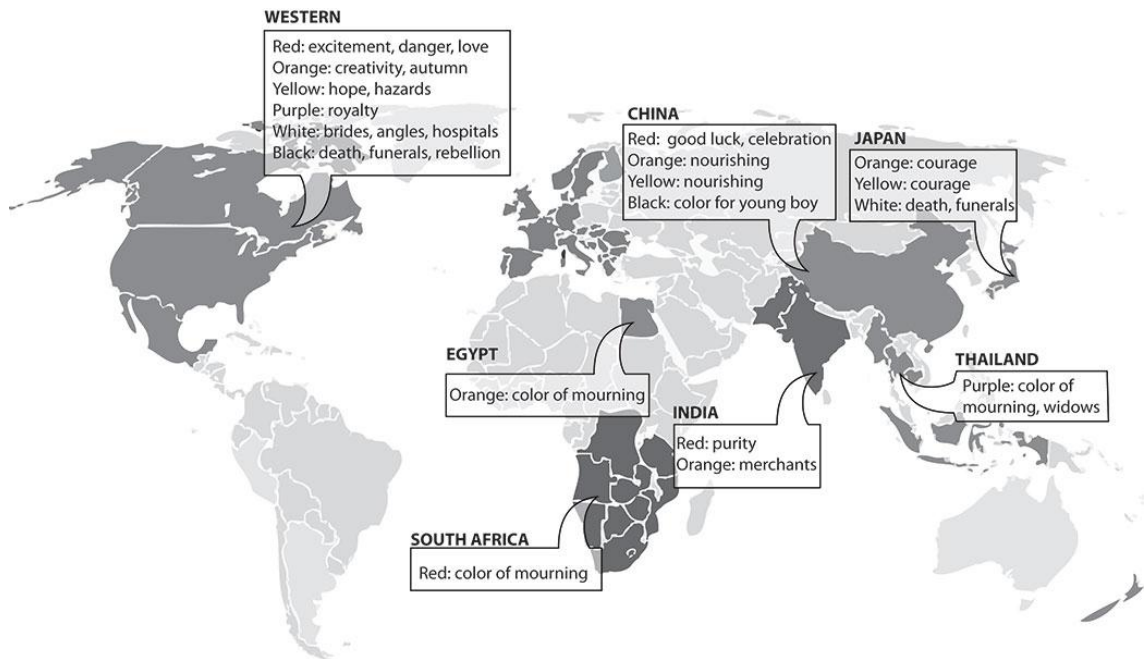
(Clearchannel 2012.)

Kelsen's *Unleashing the Power of Digital Signage* (2010) provides practical test material for digital signage content producers. The test material can be downloaded from <http://5thscreen.info>. Examples of the material are found in the appendix. The material allows the content producer to test e.g. the size of fonts on a particular display location and viewing distance, or the contrast of displays in use,

When producing digital signage material for displays, the colors that may work on print can be hard to read from screen, such as tertiary complementary color combinations (picture 3). For companies producing digital signage content used in different parts of the world, also cultural references should be considered when choosing colors (picture 4).



PICTURE 3: Tertiary complementary color combinations might work in print, but not as well on screen



PICTURE 4: Cultural references should be taken into consideration when producing DS content for displays installed in different parts of the world

(Kelsen 2010: 120-132.)

4.6 What is return on investment (ROI)?

Profitability is a measure of success. A company might spend thousands of dollars (euros) in the hardware, installation, implementation, content production, and maintenance. If the sales can be increased with double or even triple digit numbers, or the investment covered and generating cash flow with different means such as selling advertising space, the ultimate value of digital signage becomes quite evident. (Schaeffler 2008: 72)

Return on investment (ROI) is a means of measurement to show how long it will take for the investment to “pay itself back”. Also known as rate of return, ROI is one of the most commonly used methods of measuring the earning capacity of an investment, such as digital signage system.

Investopedia defines return on investment (ROI) as follows

“A performance measure used to evaluate the efficiency of an investment or to compare the efficiency of a number of different investments. To calculate ROI, the benefit (return) of an investment is divided by the cost of the investment; the result is expressed as a percentage or a ratio.

The return on investment formula:

$$\text{ROI} = \frac{\text{Gain from Investment} - \text{Cost of Investment}}{\text{Cost of Investment}}$$

--if an investment does not have a positive ROI, or if there are other opportunities with a higher ROI, then the investment should not be undertaken.” (Investopedia 2012.)

In *Digital Signage Software, networks, advertising, and displays: a primer for understanding the business* (2008) Jimmy Schaeffler insists that the ROI of digital signage should not be to just find the break-even, but to look for the balance between costs and returns that will tip decidedly in favor of a actual profit. Any (marketing) solution should be able to pay for itself faster than it depreciates to be more of an asset than a liability. Growth of use with any technology tends to lower the cost of the units, as larger volumes of hardware and other equipment are produced. This perfects the business models, making risks lower and creating greater overall returns. (2008: 169.)

5 METHODS OF THE STUDY

The methods of a research concern how the needed data will be collected. Effective planning creates an understanding of the alternatives of methods, and how and when each can be used. Fundamental choices in research methods are between desk research (secondary research) and fieldwork (primary research). (Hague 1999: 48.) This study uses both mechanisms. Desk research is initially used to gather already existing data that will provide deeper insight into the results of fieldwork.

Research methods within this study include qualitative and quantitative methods in order to be able to answer the main questions. Quantitative research concerns measurements such as the size of market segments, distribution levels, awareness of brands, and purchase frequencies. In consumer markets quantitative information is based on extrapolating from a sample to the general population. Qualitative information focuses more on 'understanding' rather than simple measurement. It seeks answers to questions such as how something is better than other, and why do things happen. Qualitative methods seek meanings that consumers attach to products, brands, or advertisements. (Hague 1999: 17.)

The data for the study is gathered with three different methods. The choices of the research methods are empirical field studies and experiment in field settings. Perspectives from which this study is viewed and the basis for the research methods used are

1. by the degree of formulation of the study is exploratory
2. by the topical scope the study is a case study
3. by the time dimension the study is both one-time and longitudinal
4. by the mode of data collected the study is both observational and survey
5. by the manipulation of the variables the study is experimental
6. by the nature of the relationships between variables the study is mostly descriptive

(Krishnaswami, O.R. & Satyaprasad B.G. 2010: 40-42).

The implementation of the research methods are divided by the purpose. To determine the ROI of DS systems there were two methods. First method was an observational and experimental field study with TOK-TV to provide primary source information. The second method was a field research consisting mostly of secondary sources.

- TOK-TV field study: testing the effect of DS screens in Sokos Wiklund in Turku with a promotion campaign. Qualitative methods include evaluating the content (study ad images) with 3M Visual Attention Service tool and the type of content (still vs. animated). Quantitative methods include measuring how many customers saw the ad and took action.
- Data on DS ad sales pricing: The ROI of digital signage is defined by accounting how long is the payback time of a basic DS installation when the display is used also for selling advertising space. The average pricing for advertising space sales from digital signage displays in Finland is defined with interviews and by reviewing existing data.

To determine the criteria of effective DS content the method was an experiment of material in field settings.

- 3M VAS tool evaluation of existing DS material: still images used on existing FirstView screens of selected customers of First Technology Ltd will be evaluated with the 3M VAS tool to determine content effectiveness (qualitative method)

The choices of methods base on the needs of First Technology and the resources available (such as Turun Osuuskauppa's willingness to do a promotion, or the 3M tool used within FT). The study didn't include much data pertaining to human that in research methods would've meant eg. more interviews or surveys. These methods were left to a minimum to be able to provide customers of FT more objective and data related information, rather than human related, subjective study results (including eg. attitudes and opinions). As an IT-company FT is more used to and more expected to provide fact-based data and claims, rather than information that bases on opinions and thoughts.

5.1 Call to action-study: TOK-TV campaign April 2012

Turun Osuuskauppa (TOK) is one of the early adopters of DS and long-time FirstView customers in Finland who embarked DS system as a complete communication solution with dozens of displays in Turku area already in 2009. TOK also uses the displays to sell advertising space with their TOK-TV advertising channel. Today TOK has over 300 installed displays within their chains of business (ABC, S-Market, Sale, restaurants, departments stores, etc.).

To determine the effect of digital signage displays in POS environment, a promotional campaign was conducted in April 2012 in Sokos Wiklund department store in Turku. The TOK-TV research method is called an Action research. Greenwood and Levin (2007) describe the Action research method as a social process where the researcher pursues to improve a situation for either participants or organizations in question, which in this case were FT and Turun Osuuskauppa. Action research cycle involve change and learning with phases of action and reflection, consisting altogether of four stages; planning, implementing (action), evaluating, and reflecting the results of the first three steps as a basis for re-planning (Perry 2004:325). The TOK-TV promotion study follows this cycle, starting with planning. The design of the promotion study started by contacting Yrjö Kokkonen at TOK to investigate their willingness to let FT use their displays to conduct the study. The W wine & deli displays were chosen by TOK in order to promote the recently opened cafeteria and also to test the effectiveness of mix marketing with Sokos and S-Market screens.

The idea of the promotion was to give away free 2Gb USB memory sticks with every purchase of a certain product from W wine & deli cafeteria located inside the Sokos department store during the “after work hour” on Fridays from 4pm to 5pm. Digital signage displays within the department store and cafeteria were used to inform customers about this promotion to if the displays have the desired call to action effect. The promotional campaign was executed on four Friday afternoons (4-5pm) between 30th March and 27th April (second stage, implementation of action).

Together with restaurant manager Marje Nurmi all cold and hot beverages were chosen for the products included in the study. The promotion material for displays consist of a still image (first two times), that would be modified to be an animation (latter two times). The promotion material for displays was designed by the author (picture 5), and approved by Ilona Potinoja who is responsible for the marketing material and design of W wine & deli. The USB memory stick (promotional give-away product) was designed by the author (picture 6 and 7). The give-away gift was produced to interest and persuade viewers to buy beverages from W Wine & deli. The model of the memory stick was called USB Wallet (size and shape of a credit card) that were ordered from Flasbay, a company specialized in production of tailored IT products. The design of the memory sticks was made by the author, including FirstView graphic design.



W WINE & DELI
I. krs

Palkitse itsesi työviikon päätteeksi viinilasillisella tai herkullisella erikoiskahvilla!

W wine & delistä **tänään klo 16-17**

minkä tahansa juoman tilatessasi **SAAT LAHJAKSI** tyylikkään **USB Wallet** 2 gigan **MUISTITIKUN!**

Mainosnäyttötutkimus 2012

PICTURE 5: Promotion material (still image that was later animated) presented on displays



PICTURE 6: USB Wallet design promo gift, frontside design



PICTURE 7: USB Wallet design promo gift, backside design

Both the still image and animation was shown on 12 displays, two of which behind the W wine & deli sales counter, three next to checkout lines of S-market downstairs of the department store Sokos, and 7 spread around the department store floors. During the first two times of the promotion a still image was used, that was modified as an animation with the FirstView animation tool for the latter two promotion times. Animation was the same design as the still image, but to create movement the text lines 'dropped' to the screen from the top of the image, and the images faded in to the screen.

The material was shown during 15:50-16:55, 10 seconds a time between other material TOK had scheduled to be shown on the displays. **Showtime per promo time 15:50-16:55 in second is 65min x 60s =3900 sec.** The playlist length on display groups and altogether time the promotional image was shown:

Two displays in W wine & deli: playlist length originally 90 sec (5 presentations) + 10 sec promotion image → 100sec → 3900 sec / 100sec = promotional image shown 39 times/390sec/6,5min per display. 2 displays x 39 times =78 times/780 sec

Three displays in S-Market checkout: playlist length originally 280sec (12 presentations). Promotion image shown with a "frequent playback" function, that is a feature in FirstView content management software that allows a presentation to be 'pushed' after every other presentation scheduled on screen. Therefore 280sec playlist with 12 presentations, promotion image shown after every presentation → 12 times per loop → playlist length then 280sec + 12 x 10sec = 400sec → 3900sec / 400sec = playlist loop shown 9,75 times x promotional image 12 times on a loop =117 times/1170sec/19,5min per display. 3 displays x 117 times =351 times/3510 sec

Seven displays around the department store: playlist length originally 220 sec + 10 sec promotion image → 230sec → 3900sec / 230sec = promotional image shown 16 times/160sec/2,7min per display. 7 displays x 16 times =112 times/1120 sec.

ALTOGETHER the promotional material was shown during 15:50-16:55 on 12 displays for 78+351+112 =541 times/5410 sec/90min per promotion

x 4 Fridays = 360min/2164 times during the whole study.

The amount of customers buying beverages and collecting the promo gift/USB memory stick during the 1 hour promo on four Friday afternoons were:

- 1st promo (still image): 8 customers
- 2nd promo (still image): 10 customers
- 3rd promo (animation): 14 customers
- 4th promo (animation): 15 customers

The two latter stages of Action research, evaluation and overall reflection are described in the following chapter 6, Data analysis and evaluation.

5.2 Defining average advertising sales price in Finland: desk study

To determine what is the average pricing on selling advertising space from displays data was collected from the following companies:

- Frontal Contants media sales: interview with Pasi Brusi
- Turun Osuuskauppa TOK: TOK-TV price list
- Cor Group: Apteekkimedia price list
- Novia Finland Oy: Novia Sport price list

With this information the price of an advertising second is accounted to define an overhead price for a 10 second spot. The method used to gather information on ad sales prices was a desk study that could have been taken further by

gathering information on the amount of screens used for ad sales. This study was nevertheless limited to consider only pricing, mostly to keep the results more simple and comprehensive for the (potential) customers to consider with their own DS solution, not dependent on the amount of screens they might deploy.

Frontal Contacts ad sales prices:

10 sec spot for: 1 week 100€ (10sec); 4 weeks 300€ (40sec) ; 10 weeks 500€ (100sec)

Average price per second

1 week: $100\text{€}/10\text{sec}=10\text{€/sec}$

4 weeks: $300\text{€}/40\text{sec}=7,5\text{€/sec}$

10 weeks: $500\text{€}/100\text{sec}=5\text{€/sec}$

Average price per second FRONTAL CONTACTS:

$10+7,5+5=22,5/3=7,5\text{€/second}$

(interview with Pasi Bruski 12.10.2012)

Turun Osuuskauppa ad sales prices:

10 sec spot for: 1 week 1450€ (10sec, 145€/sec); 2 weeks 2610€ (20sec, 130,5€/sec); 3 weeks 3695€ (30sec, 123,2€/sec); 4 weeks 4640€ (40sec, 116€/sec)

20 sec spot for: 1 week 1812,50€ (20sec, 90,63€/sec); 2 weeks 3262,50€ (40sec, 81,56€/sec); 3 weeks 4618,75€ (60sec, 77€/sec); 4 weeks 5800€ (80sec, 72,5€/sec)

30 sec spot for: 1 week 2030€ (30sec, 67,7€/sec); 2 weeks 3654€ (60sec, 60,9€/sec); 3 weeks 5173€ (90sec, 57,5€/sec); 4 weeks 6496€ (120sec, 54,1€/sec)

Average price per second:

for 1 week campaign: $145+90,63+67,7=303,33/3=101,11\text{€}$

for 2 week campaign: $130,5+81,56+60,9=272,96/3=90,9\text{€}$

for 3 week campaign: $123,2+77+57,5=257,7/3=85,9\text{€}$

for 4 week campaign: $116+72,5+54,1=242,6/3=80,9\text{€}$

Average price per second/TOK: $101,11+90,9+85,9+80,9=358,81/4=$

89,7€/second

(TOK-TV price list 2012.)

Apteekkimedia ad sales prices:

For 1 week: 5 sec 1495€; 10 sec 2242,50€; 15 sec 2990€; 20 sec 3737,5€; 25 sec 4485€; 30 sec 5232,50€

Average price per second

5 sec spot: $1495/5=299\text{€}$

10 sec spot: $2242,5/10=224,25\text{€}$

15 sec spot: $2990/15=199,3\text{€}$

20 sec spot: $3737,5/20=186,9\text{€}$

25 sec spot: $4485/30=149,5\text{€}$

30 sec spot: $5232,5/30=174,42\text{€}$

Average price per second APTEEKKIMEDIA:

$299+224,25+199,3+186,9+149,5+174,42=1233,37/6=205,6\text{€/second}$

(Apteekkimedia media card 2012.)

Novia sport ad sales prices:

Overhead price for 1 month 2085,7€; for 3 months 4642,9€

Assuming an average of 10 second spot per week:

4 weeks 2085,70€ (40 sec, 52,14€/sec)

12 weeks 4642,9 (120 sec, 38,7€/sec)

Average price per second NOVIA SPORT:

$52,14+38,7=90,84\text{€}/2=45,42\text{€}/\text{second}$

(Novia Sport media card 2012.)

Average price per second for advertising sales on digital signage displays in Finland:

FRONTAL 7,5€ + TOK 89,7€ + APTEEKKIMEDIA 205,6€ + NOVIA 45,42€
=348,22€/4

=87,05€/PER SECOND

The average price of ad sales is further utilized when defining the ROI of DS systems in the following chapter, Data analysis and evaluation.

5.3 Defining criteria for efficient content: 3M VAS material analysis

Most used material on screen are images and text templates, according to a customer satisfaction survey conducted in October 2012 by FT. Both materials are presented on displays as still images. The effectiveness of the sample image material used by selected FirstView customers is analyzed with a Visual Attention Service provided by technology provider 3M. This analysis will provide information on which content is effective in terms of catching the viewer's attention with a glance (3-5 seconds). This information will help to validate design choices and teach FirstView customers to produce material with maximum visual impact.

The analyze will provide:

- area of interest (AOI) score that indicates the probability of each AIO getting attention. AIO is selected by the author of the study
- a heat map that graphically shows the distribution of visual attention
- a region map that shows the predicted probability that a person will look at the region

- a visual sequence that shows the most likely path that the human eye will follow when viewing the image

The images analyzed with 3M VAS are:

- Employment and Economic Development office Turku: promotion image of Vero.fi tax card service (picture 8)
- Coffee House: a candy shake advertisement (picture 9)
- Arina Osuuskauppa: cider and beer ad for restaurant (see Appendix)
- Sokos Hotel Paviljonki: sauna opening times (see Appendix)
- KodinTerra product offer ad (see Appendix)

These images are analyzed separately as independent images. Side by side comparisons are made for the following pairs of images (same content on image, but different style of design):

- Prisma product ads (picture 10)
- Car dealer promotion images (see Appendix)
- S-Pankki service promotion (see Appendix)

The method used to study the images is a Content analysis. Content analysis is seen as a quantitative method, because it involves summing and counting together data. Content analysis is used to study symbolic material, which in this case are the still images. One of the main reasons and advantages of this method is that it enables the researcher to conduct a primary research and figure facts to use as evidence in further arguments. Content analysis is a persuasive method that generates reliable, replicable facts that in this case is the criteria for efficient content production. (Stokes 2003: 56-58).

The Visual Attention Service VAS is a web-based tool that uses computational model of visual attention to make predictions of where initial fixations will occur in an image. The software uses for example eye movement tracking to determine what and where a person will look within 3-5 seconds and with what probability. VAS is a software that bases on 30 years of research that are converted into mathematical equations and algorithms to make explicit analyses. VAS tool determines where a person might look and in which order

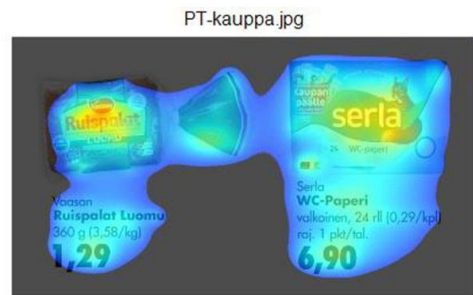
based on for example early perceptual properties such as color, motion, and contrast. The initial surveying of a scene (any vision, magazine page, ad, interior, or new visual scene) occurs in the first 3-5 seconds, during which a persons' visual system is attracted to low-level perceptual features such as color, luminance, edges, motion, and other elements. With this information a person is able to decide if there is something interesting or important for him/her in the scene. The predictive efficiency of 3M VAS is between 85%-94%, depending on the content of the image (photo, ads, text). (3M Validation Study 2010.) The complete set of original analysis reports and images produced by the 3M VAS software are found in the Appendix.



PICTURE 8: Employment and Economic Development office: tax card service promo



PICTURE 9: Coffee House: a candy milkshake advertisement



PICTURE 10: Prisma product advertisement comparison side by side

6 DATA ANALYSIS AND EVALUATION

6.1 Effect of digital signage displays: TOK-TV study

According to the restaurant manager Marje Nurmi and the employees of W wine & deli cafeteria, the amount of customers didn't significantly differ from any other Friday afternoon. There was a slight growth in the amount of customers during the latter two Fridays when the promotion content was animated. Still the effect wasn't as great as hoped for, considering the amount of eyeballs reached with the promotion during the hours on Friday afternoons and compared to the actual amount of shoppers that came to the cafeteria. There are many reasons for why the promotion didn't have the desired call to action-effect on buyers.

For example Kinetic has made a study that shows that digital advertising can have a significant impact and clearly varies by environment, depending on the mood, mindset and situation, and time of day, day of week and demographic (Kinetic 2010).

The study was conducted on a very limited time (one hour) on a limited period (Fridays in April). Also the promotion itself might have been uninteresting, with the demand of

- a) making a purchase
- b) having time to spend on a cafeteria
- c) feeling the need to consume a beverage

The promotion gift that worked as the "bait" in the study (the USB Wallet memory stick) might've been too unfamiliar or undesired for customers to awake enough interest to overcome the barriers set by the demands mentioned above. According to interviews with the sales personnel there were several customers that were surprised to get the promo gift, not knowing what it is or why they received it. With the USB Wallet promo gift a leaflet was given that explained how to use the memory stick and what the gift was about (FirstView marketing study 2012). The data for the study would be more solid if the customers had been questioned with a survey whether they actually saw the promo ad or came just because they desired coffee or other refreshments.

The promotion content was also made with the kind of colors and fonts that aren't the best possible to suit a digital signage display (as presented earlier in Chapter 4.5. Importance of content and design). The content was later evaluated with the 3M VAS tool (picture 11). The analysis shows whether the will catch the attention of a viewer within the first 3-5 seconds.



PICTURE 11: 3M VAS analysis of the W wine & deli promotion material

The analysis shows, that the most probable areas that the viewer will look are the face of the girl, the logo of W wine & deli, and the time of the promotion. The actual message of the image didn't reach the limits that would arouse interest to result in action. It can be assumed that the results of the study would've been better if the content had been made with a different emphasis (highlighting the text, not the image areas).

When the still image material was animated with the FirstView animation tool, the amount of customers in the cafeteria rose from average of 9 customers to average of 14.5 customers (61%). Kinetic study observations showed that while basic, still images (non-animated digital copy) perform well, the animation of the content increases attention by 28%. After a certain level of animation, additional

creative movement appears to have no additional effect on attention levels (Kinetic 2010). The TOK-TV promotion demonstrates same kind of results.

When considering the effect of digital signage to buying behavior, the TOK-TV study is very limited and somewhat subjective. The study should be made with longer period of time, with a simpler, more interesting promo idea, and with a further developed material.

International studies justify the effect of a DS system to buying behavior and growth in sales. One of these studies is the Walmart's result report for 18 month of using a SMART digital signage network. Walmart's study provides also insight on how the proper installation of a DS system will benefit the deploying company. Walmart replaced its old TVs with modern flat screen that were installed on the viewers' eye level.

The old and new network were compared by:

- Old Walmart TV network: 1. Audience aggregation 2. 30 second ads 3. Single-channel CRTs 4. CPM-based pricing
- New SMART Network: 1. Helping shoppers shop smarter 2. Formats designed for retail 3. Zone specific screens 4. Lift-based pricing

Since the new SMART networks data about which content has been shown on which displays for how long, Walmart was able to compare this data to the sales data. The results during the 18 months were:

- Sales lift by departments: Electronics – 7% Over the counter TC – 23% Food – 13% Health/beauty – 28%
- Sales lift by product type: Mature item boost – 7% Item launch – 9% Seasonal push – 18% Price leadership (items on rollback) – 6%

(DSE 2010.)

Optimization of the network will allow advertisers to run multiple campaigns and "decide" which ads are most effective based on point-of-sale metrics. The ads that have proven to be most effective can then be repeated and adjusted to bring further profits. (DSE 2010.)

Also Arbitron Retail study in 2005 and JC Decaux TescoTV study in 2006 express causes for consumer receptivity and the fact that digital signage indeed *is* effective. The Arbitron study that involved over 1400 US shoppers in malls showed that 40% of the shoppers were more likely to make a purchase in stores that use digital signage. They were also 1.56 times more likely to recall an ad, and 81% remembered content that was focused on merchandise available in the store. The JC Decaux TescoTV study made by eyetracking in 100 stores with 50 displays in each showed that 85% of shoppers looked at the screens, and an average customer passed by approximately 20 displays per visit and looked eight of them. (Schaeffler 2008: 32-33.)

Neo Advertising found significant sales uplifts in convenience stores for products promoted on its Coop Pronto TV network. A 10 second spot ran for a week in 167 stores. Altogether the spot was broadcasted over 600 000 times reaching a total of 1,5 million consumers. The 25% growth in sales can only be attributed to the digital signage networked since no other medias were used to advertise this product and there were no other point-of-sale promotions. Monica Jäggi of agency Konnex that has worked with another campaign for Emmentaler states that the best complement for a TV campaign is a DOOH campaign for it works as a great reminder for consumers right before the act of purchasing. (Retail digital advertising 2012.)

This kind of wide studies conducted with sufficient resources should be made also in Finland in order to determine the effectiveness of DS screens with the average Finnish shopper. The TOK-TV study alone is too narrow to present how digital signage creates the call to action that result in sales uplifts. The methods used for this study should be applied to sales data in order to fully determine the effectiveness of displays. An action study for example a certain product (line) could be made to further develop and validate the results of this study. TOK-TV study was limited in terms of defining the full effectiveness of displays. Still, although not the main focus of the study, this narrow research managed to indicate that when still images are animated, the effect is immediately greater.

6.2 Generating better ROI by selling advertising space

Companies continuously look for ways to justify the costs of digital signage. The use of ad space to pay some or all of the cost of a given project is certainly nothing new. Sponsorship is a way of life, from football stadiums to ATMs. Advertising with digital signage can do more than subsidize costs. It also can improve the look of the store, as well as entertain and inform customers. (POPAI 2010.)

Advertising sales is one way of creating a better ROI. Finnish companies continuously search for ways to make the digital signage system generate profits, and advertising sales is one way to do it. The desk study showed that the average cost per second varies greatly and is heavily affected by the amount of screens that it's tied to. Some providers that sell ad space from DS screens have an infrastructure of screens that distributes the ad to thousands of viewers, whereas some only have couple of displays in a limited area with a fewer eyeball count. Therefore, the average price accounted in this study for an advertising second from displays is not completely self-explanatory but can be used when determining the ROI of a digital signage system. The prices do not include VAT.

Advertisements are assumed to be sold in 10 seconds spots for one week at a time to make the study more manageable and comprehensive. The price of a spot is: average 87,05€/per second x 10 seconds= 870,5€ per spot (ad).

A basic investment for digital signage system by which the ROI is calculated with consists of a 42-inch flat screen, a media player, and the installation of the system. The average price for this kind of system in Finland is 1830€. This sample system and price base on the pricing of First Technology and has been verified by representatives of another DS solution providers in Finland. The ROI is calculated with the following scenarios that the company purchasing a digital signage system can take into consideration when justifying the cost.

- a) The ROI of a one 42" display installation when one 10 sec advertisement spot is sold per week
- b) The ROI of ten 42" display installations when one 10 sec ad sold per week (ad broadcasted on all screens)
- c) The ROI of hundred 42" display installations when one 10 sec ad sold per week (ad broadcasted on all screens)
- d) The ROI of ten 42" display installations when 5 different customers buy a spot for a month at a time (5 spots per week for 4 weeks)

Calculating by FT's experience and knowledge of the cost of marketing activities and average salaries in Finland, the marketing of the advertisement space is assumed to cost roughly 200€ per week, and managing the ad material (distribution and scheduling to screens) requires 35€ in salaries and system maintenance expenses. Then **the profit for a 10 second ad sold for a week is: $870,50€ - 200€ - 35€ = 635,5€$.**

Calculating the investment payback time (break-even) when **ad spots are sold constantly from screens**

- a) investment 1 x 1830€/revenue per week 635,5€ = 2,9 ~3 weeks
- b) investment 10 x 1830€ = 18 300€/revenue per week 635,5€ = 28,8 ~30 weeks (7,5 months)
- c) investment 100 x 1830€ = 183 000€/revenue per week 635,5€ = 287,9 ~288 weeks (72 months/6 years)
- d) investment 10 x 1830€ = 18300€/revenue per month 12 710€ (5 spots x 635,50€ x 4 weeks) = 1,4 months

Calculating the return on investment (ROI) for **10 display installation in a year when**

- a) **100%** of weeks/ad space is sold (one 10 sec spot a week, 52 weeks in a year)
- b) **70%** of weeks/ad space is sold (one 10 sec spot a week, 36,5 weeks in a year)

- c) **50%** of weeks/ad space is sold (one 10 sec spot a week, 26 weeks in a year)
- d) five 10 sec ads/spots are sold for a month at a time for altogether four months in a year

Return on investment is calculated by (Investopedia 2012)

$$ROI = \frac{(\text{Gain from Investment} - \text{Cost of Investment})}{\text{Cost of Investment}}$$

Gain from investment consists 870,5€/week per 10 sec ad. Cost of investment consist of a 10 display installation 18 300€ + 200€/every week +35€ for 'sold' weeks. Accounted by the scenarios presented above:

- a) gain from investment= 52x870,5€=45266€/year
 cost of investment= 18300€+12220€ (52x235€)=30520€
 ROI= 45266 – 30520 /30530 =0,48 * 100 =**48,3%**
- b) gain from investment= 36,5x870,5€=31773,25€
 cost of investment 18300€+10400(52x200€)+1277,5(36,5x35€)=29977,5
 ROI= 31773,25 – 29977,5 /29977,5 =0,059 * 100 =**5,9%**
- c) gain from investment= 26x870,5€=22633€
 cost of investment= 18300€+10400€+910€(26x35€)=29610€
 ROI= 22633 – 29610 /29610 =0,235 * 100 =**23,5%**
- d) gain from investment= 17410€ (5 spotsx870,5€x4weeks) x4= 69640€
 cost of investment= 18300€+10400€+560€(16x35€)=29260€
 ROI= 69640 – 29260 /29260 =1,38 * 100 =**138%**

The calculations are based on the assumption that 800€/month (4 x 200,€/week) is used to advertise the ad sales possibility to companies such as suppliers, partners, sponsors, and one person uses one hour (35€) for a sold week to manage the ad (distribute is to screens). These assumptions base on the usability of professional digital signage solutions (such as FirstView) that enables scheduling, remote content management, and simple adding and

editing of material/presentations. The 10 second ad can consist of still images, animation, video, flash, or any other material wanted and possible to present on screens. These calculations show that even if advertising space is not sold for 100% of time, the investment generates profits within a relatively short period of time and with relatively small efforts (both financial and human).

6.3 Defining the criteria for efficient content: 3M VAS analysis

The 3M VAS is a scanning tool that lets you scientifically analyze design effectiveness, based on how the average human eye responds. For one image the 3M analysis generates a heatmap that shows the pinpoint that will attract a viewer, a region map that shows areas that are likely to get the viewers' attention, proximity of areas of interest getting attention chosen by the researcher, and a visual sequence that shows the path of a human eye. (3M 2012.)

The analysis made for the still images used by FirstView customers indicate that

- familiar shapes, such as squares or circles grab a viewers' attention better than iridescent and unshaped objects
- shapes and areas that are separated from other objects grab a viewers' attention better than multiple objects within the same area
- greater contrast of colors (ie. white and black, green and red, white and blue) are more likely to catch attention than lower level of contrast (ie. black and grey, green and darker green)
- too much objects on one image (display) divide the attention, when bigger, fewer areas of information are more likely to catch the viewers' attention within the first 3-5 seconds
- the faces of people are very likely to catch the attention
- shapes, objects, and images catch the attention and interest better than text
- bigger font sizes make the text form more object-like shapes, that initially create interest

The results confirm the guidelines presented earlier in the theoretical framework, and provide further information on how to produce efficient digital signage content. It also shows that the areas meant to gain most interest and attention (i.e. price, description, slogan) might not be the most ostentatious and notable for the human eye as the producer of the content might assume. Even if the advertisement seems clear and visually good looking for marketers, it might not catch the attention of a viewer due to psychological and cultural factors of what the human eye is most likely to scan and observe within the first 3-5 second of scanning an image or scene. The study provides information that is able to be put to use when designing the content consultation service and written guide for FirstView customers.

7 CONCLUSIONS

More and more companies both globally and in Finland are taking digital signage into their marketing communication strategies. For some companies a system has already been chosen, installed, and in good use. For others the process is still unfinished, and the search for the right system has some question marks left. For some digital signage still seem to be unfamiliar, unbeneficial, and feels risky to invest in.

Any team operating a digital signage system or planning a network has an opportunity to set some precedents and continuously bring excellence to this fast growing, emerging industry. Innovative approaches use content as the source and cause to add relevancy to DS broadcasting and networks. Maybe less innovative but more factual approaches search for actual data to answer the underlying questions of how a digital signage can benefit a business. Whatever the motive and the question might be, one thing seems to be certain; digital signage has proved to have many advantages and has become a medium that no (B2C) business can pass on without prejudice.

As more institutions and companies come to realize the potential of digital signage network, their use will proliferate resulting that good and even great quality content will evidently get better. That means that the pivotal consumer experience improves. The tweaking of the technology usually results in lower unit costs as larger volumes of hardware is produced. This also allows more perfected DS network models for businesses, less risk, and more overall profit. (Schaeffler 2008: 238.)

For digital signage, the return on investment is measured in multiple forms depending on the type of the digital signage network. For point of sale (POS) networks it is the sales that ultimately measure the success of the network. For point of transit (POT) networks, such as busses, shopping mall corridors or elevators, the return is driven mostly by the eyeballs or people reached. For

point of wait (POW) networks, such as bank waiting lobbies, check out queues, or bus stops, the return is a combination of call to action, eyeballs reached, and behavioral attitude changed with the customer's experience. Whatever the network, digital signage is almost always more cost-effective in delivering the same message than traditional media, such as prints. The savings over time for designing print material, printing, delivery, suspension, and recycling as well as savings in the materials (paper, ink, energy required) can be significant. The most valuable part of digital signage ROI is the effectiveness of delivering a message. With appropriate content the digital display connects with the viewer in moments and places where they are receptive, and can create better and more consistent message transfer. This transfer generates returns in increased sales, and boosted brand value and awareness. Marketers can reallocate less efficient forms of advertising, and shift those expenditures to digital signage to further increase ROI. (Kelsen 2010: 6-7.)

This leads to the growing interest of businesses to make greater returns on investments by using the network not only to their own broadcasting but to profit from selling advertising space for suppliers, partners, sponsor, ad agencies, or other stakeholders. Also this study shows the dispose of advertising time from a company's screens can only be one limited part of the digital signage system usage strategy, but still result in great benefits and profit for the company. The TOK-TV promotion, albeit narrow and very limited, suggests that especially animated material on displays does have an effect. Reflected with the data of growth in sales and customer satisfaction gathered by multiple studies throughout the world ensure the impressiveness of this particular broadcasting medium.

There's no certainty of what digital signage will be in five years, as the possibilities for the future of technology and content, and the ways of how we deploy, create, perceive, and interact with are endless. This century of technology-driven visual media brings with it the knowledge from cinemas to personal computers and finally mobile devices. The greater the number of previous influences, the more complex the potential combinations are for the medium that follows, which in this case is digital signage. It has the potential to combine a plethora of established content creation practices, software tools,

programming methods, Internet marketing, and poster advertising techniques. Today the content on digital signage screens is still in its infancy, but not for long. The expanding capabilities of digital signage and the know-how on content creation grow each day. New technologies and content practices will have even greater impact on viewers and businesses within different industries and in different kind of use. (Kelsen 2010: 215-216.)

This study managed to present the basics for efficient content creation for digital signage displays. As noticed with the 3M VAS tool analysis and backed up with the theoretical framework the content has some guidelines to follow and traps to avoid. Producers of content should for example avoid the poster-like usage of different shade of the same color, or vague shapes alongside of too small, decorative fonts. These guidelines provide insight for marketers to create better content for digital displays, to gain better results, and make the whole DS network more profitable for the deploying company.

All in all this study amongst others within the industry and topic of DS profitability and content efficiency verify the advantages of investing in a digital signage network and using its full capabilities in order to gain more profits. The profits that digital signage can generate can be higher than possibly other mediums have been able to reach. Especially beneficial digital signage is within the point-of-sale, point-of-wait, and point-of-transit environments that have had the potential to reach great numbers of consumers but so far lacked the efficient medium to do so.

Digital signage certainly has some features that we've already seen on futuristic movies like *Minority Report*. However today's networks have a lot more common sensibility and usefulness to both the businesses and viewers than utopist science fiction. Different business models and usage of networks will in the future of DS drive what the technology already provides, whereas the content will drive the value and experience that those networks are able to provide for all of us, whether standing behind or in front of digital signage displays.

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The thesis process has been somewhat different than I originally expected. The point of view of a *student* slowly subsided whilst the point of view, and reality, of a *worker* within the business field grew stronger. The reality of working within the digital signage industry brought with it the questions that lead to writing this thesis. The need for answers, the curiosity to know more about the industry, and the desire to grow as a marketing professional within this industry all added their perspectives and incentives into the mix that resulted into this study.

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I also want to thank my absolutely fantastic family and friends, who have backed me up and been there to lift my spirits and make me carry on with a smile whilst I've balanced through the past years of studies and work. Last but not the least I want to thank my wonderful fiancée, Jan Rucidlo, for understanding (or at least always trying to) the pressure I've had, for encouraging me and appreciating the things I've done and choices I've made, for being there even when I've gone somewhat crazy during the thesis process, and for being my constant source of inspiration, and reflective other.

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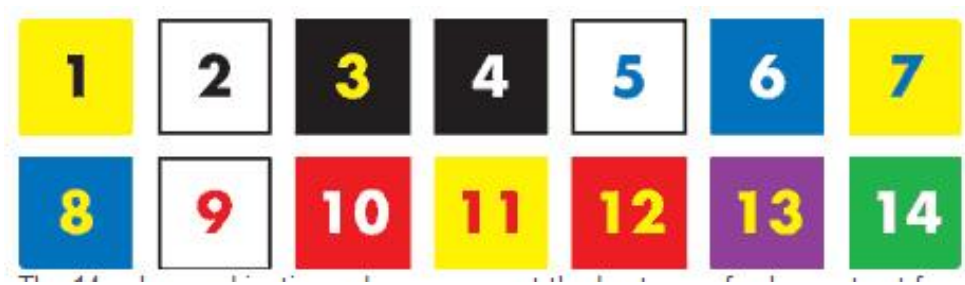
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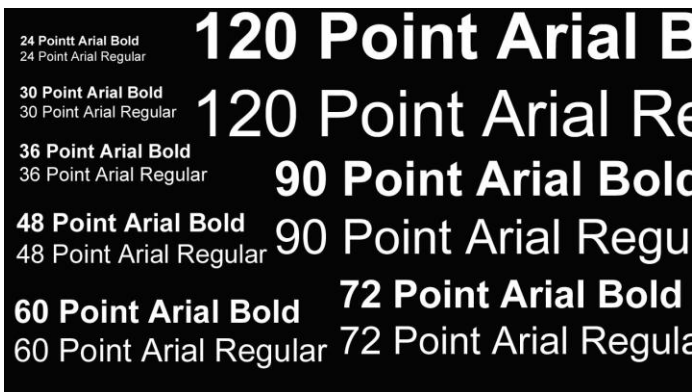
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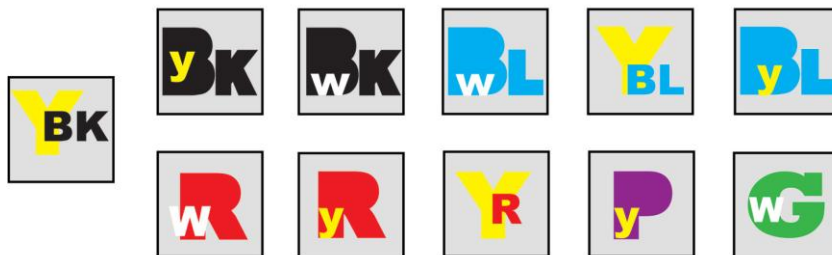
APPENDIX: Sample material for content production



The color combinations above represent the best use of color contrast for readability on traditional or reflective content. Example one is the most legible color combination while example 14 is the least legible. (ClearChannel 2012).



The following image to test font sizes can be downloaded from <http://5thscreen.info/figure6-12.html>. Test it on a for example 42-inch flat screen to see which font size should be used at that particular display location (considering what is the viewing distance).



To test the contrast of a display this image can be downloaded from <http://5thscreen.info/figure6-21.html>. (Kelsen 2010).

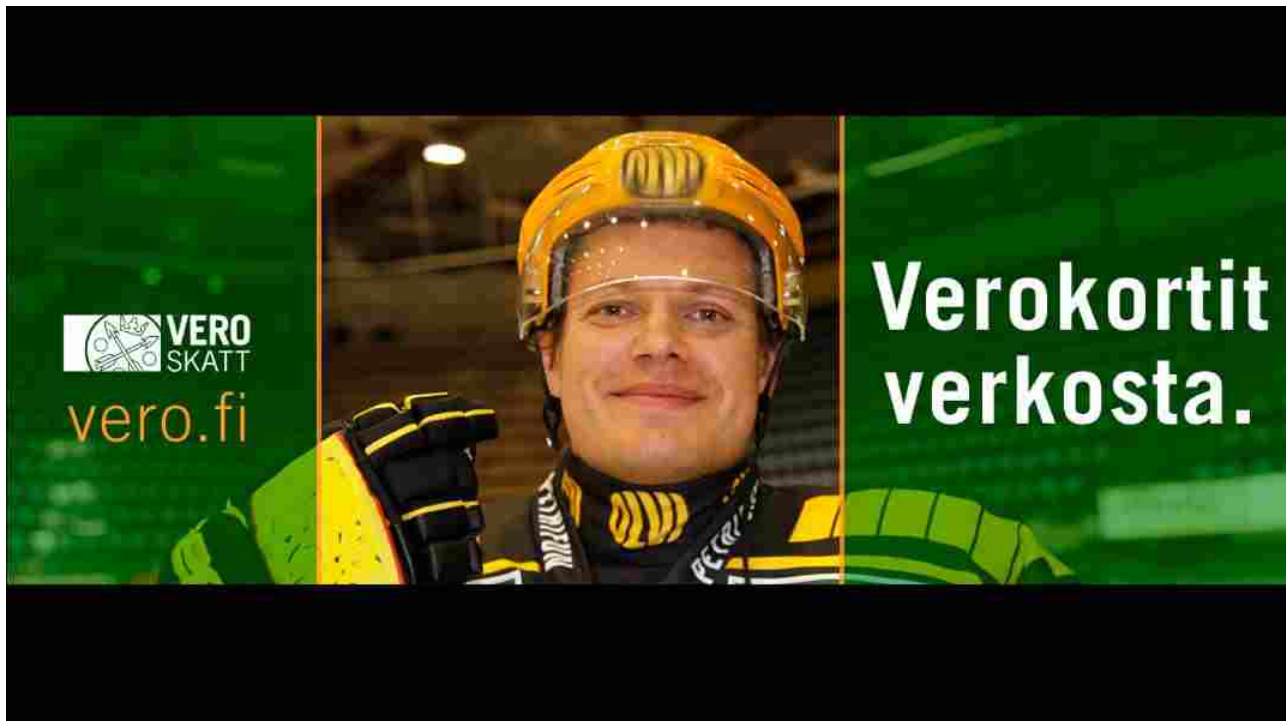


tyokkari1.jpg 10/9/2012 11:22 AM GMT

This report shows a predictive analysis of visual saliency for the first 3 - 5 seconds of viewing the image. Visual saliency is the probability that a viewer will fixate on a particular area of the image. Results using this analysis are highly correlated with eye-tracking studies.

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Image Type:

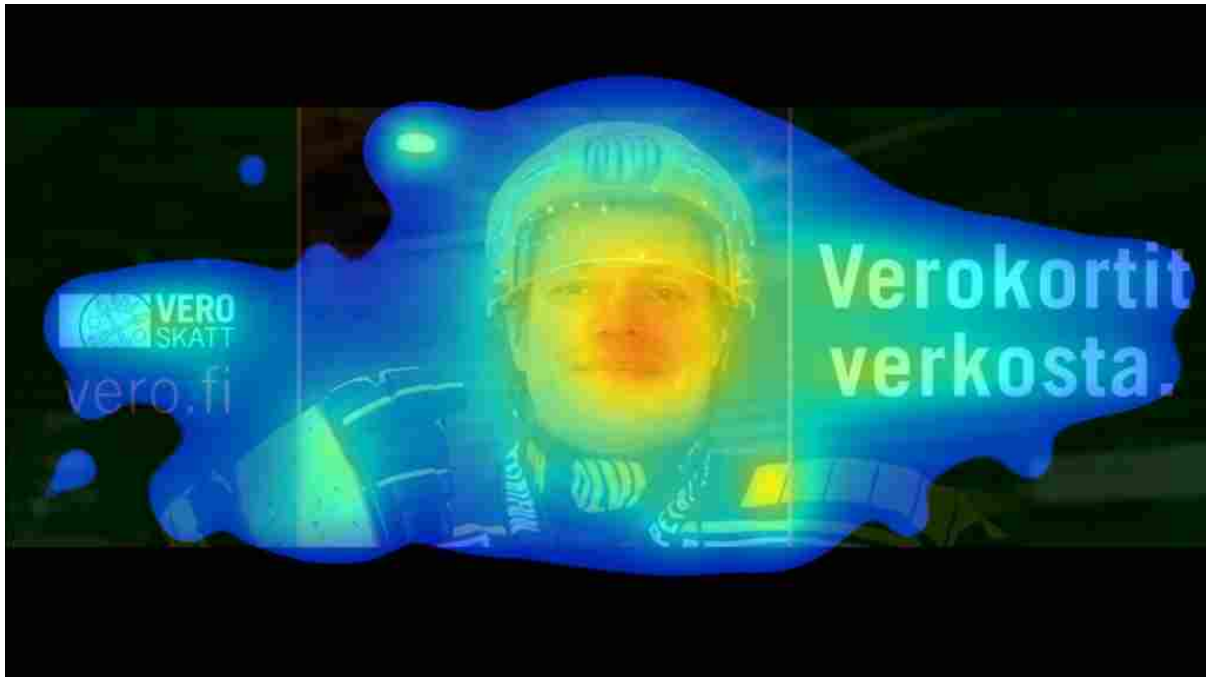


Heatmap

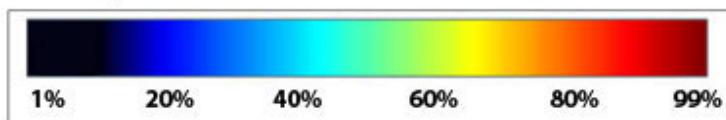
Heatmaps graphically show the distribution of visual attention within the first 3 to 5 seconds.

Red areas are likely to draw the most immediate attention followed by yellow to green to blue areas which are least likely to draw attention.

Image Type:



Probability that a viewer will fixate areas in the first 3-5 seconds:



Area of Interest

The image below shows the Area of Interest (AOI) analysis results. The AOI is selected by the user. 3M VAS processes the area and returns a score.




The AOI score indicates the probability that each Area of Interest will get attention during the first 3 - 5 seconds.

Image Type:



3M Visual Attention Service - Results Legend

Probability of visual fixation within the first 3-5 seconds:

-  70% to 99%
-  40% to 70%
-  20% to 40%

Visual features that contribute the most to visual saliency:

-  Brightness/Contrast
-  Yellow/Blue Contrast
-  Red/Green Contrast

Region Map

This view shows the predicted probability that a person will look at the region within the first 3 - 5 seconds.

- The number associated with each region shows the 3M VAS score. This is the predicted probability that a person will look at the region within the first 3 - 5 seconds.
- Icons appearing in the regions indicate the visual features that had the highest impact on the 3M VAS score.

Image Type:



3M Visual Attention Service - Results Legend

Probability of visual fixation within the first 3-5 seconds:

 70% to 99%

 40% to 70%

 20% to 40%

Visual features that contribute the most to visual saliency:

 Brightness/Contrast

 Yellow/Blue Contrast

 Red/Green Contrast

Visual Sequence

Visual Sequence shows the most likely path that the human eye will follow when viewing the image.

The numbers indicate fixation points; successive spots where the visual gaze is maintained on a single location.

Image Type:



How to interpret 3M VAS results

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The 3M VAS algorithm takes into account basic visual attributes such as contrast, shape, color, faces and text. VAS does not predict emotional responses.

3M VAS has been proven to consistently match eye tracking patterns for the first 3-5 seconds of exposure. VAS predictive efficiency when compared to eye tracking is generally 90% or better.

Using VAS Results

To best use 3M VAS results, compare VAS predictions to your visual goals.

If red/yellow regions cover your visual goals and there are no red/yellow regions outside of those areas - then you have met your visual goals.

If there is a distracting area that is drawing unwanted attention, consider removing or replacing that portion of your design.

Faces can have a powerful effect on visual saliency. Adding a face will almost always attract a great deal of attention. Faces can also be distracting elements that draw attention away from key design elements.

You can use the icons to help guide your design decisions. Icons indicate which visual attributes contribute the most to visual saliency.

Brightness/Contrast icon (Black/White)

Reduce attention: Decrease light/dark contrast

Increase attention: Boost light/dark contrast

Color Contrast icons (Yellow/Blue, Red/Green)

Reduce attention: Decrease color differences

Increase attention: Boost color differences

If there are no strong red-areas of visual attention, you can "intensify" a region by adding light/dark contrast, color contrast, edges/text and faces.



Coffee_house.jpg 10/9/2012 10:13 AM GMT

This report shows a predictive analysis of visual saliency for the first 3 - 5 seconds of viewing the image. Visual saliency is the probability that a viewer will fixate on a particular area of the image. Results using this analysis are highly correlated with eye-tracking studies.

Go to <http://www.3m.com/vas> for more information.

Image Type:

S-Etukortti VISA

Fazer
Karkki-pirtelöt
turkinpippuri, tutti frutti, pätkis

S-Etukortilla
3,90 (norm. 4,20)

COFFEE HOUSE
coffeehouse.fi

Heatmap

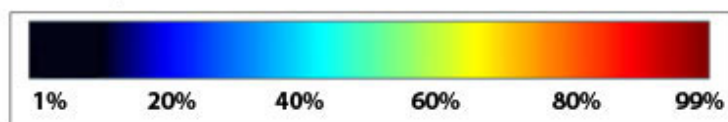
Heatmaps graphically show the distribution of visual attention within the first 3 to 5 seconds.

Red areas are likely to draw the most immediate attention followed by yellow to green to blue areas which are least likely to draw attention.

Image Type:



Probability that a viewer will fixate areas in the first 3-5 seconds:



Area of Interest

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The AOI score indicates the probability that each Area of Interest will get attention during the first 3 - 5 seconds.

Image Type:



3M Visual Attention Service - Results Legend

Probability of visual fixation within the first 3-5 seconds:

 70% to 99%

 40% to 70%

 20% to 40%

Visual features that contribute the most to visual saliency:

 Brightness/Contrast

 Yellow/Blue Contrast

 Red/Green Contrast

Region Map

This view shows the predicted probability that a person will look at the region within the first 3 - 5 seconds.

- The number associated with each region shows the 3M VAS score. This is the predicted probability that a person will look at the region within the first 3 - 5 seconds.
- Icons appearing in the regions indicate the visual features that had the highest impact on the 3M VAS score.

Image Type:



3M Visual Attention Service - Results Legend

Probability of visual fixation within the first 3-5 seconds:

 70% to 99%

 40% to 70%

 20% to 40%

Visual features that contribute the most to visual saliency:

 Brightness/Contrast

 Yellow/Blue Contrast

 Red/Green Contrast

Visual Sequence

Visual Sequence shows the most likely path that the human eye will follow when viewing the image.

The numbers indicate fixation points; successive spots where the visual gaze is maintained on a single location.

Image Type:



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Brightness/Contrast icon (Black/White)

Reduce attention: Decrease light/dark contrast

Increase attention: Boost light/dark contrast


Color Contrast icons (Yellow/Blue, Red/Green)

Reduce attention: Decrease color differences

Increase attention: Boost color differences

If there are no strong red-areas of visual attention, you can "intensify" a region by adding light/dark contrast, color contrast, edges/text and faces.



 This image is smaller than the recommended size for VAS. For best results, images should be larger than 600 by 600 pixels. Smaller images can cause a reduction in accuracy.

Sauna_hissi.png 10/9/2012 11:07 AM GMT

This report shows a predictive analysis of visual saliency for the first 3 - 5 seconds of viewing the image. Visual salience is the probability that a viewer will fixate on a particular area of the image. Results using this analysis are highly correlated with eye-tracking studies.

Go to : <http://www.3m.com/vas>

Image Type:

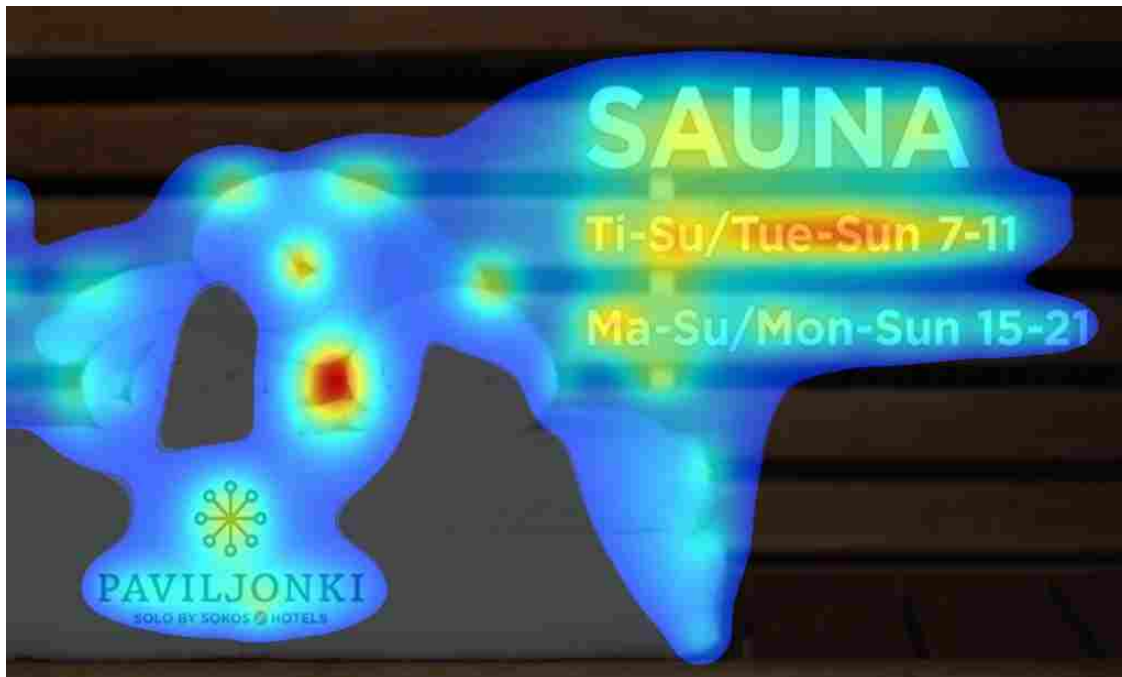


Heatmap

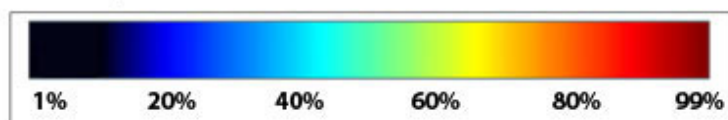
Heatmaps graphically show the distribution of visual attention within the first 3 to 5 seconds.

Red areas are likely to draw the most immediate attention followed by yellow to green to blue areas which are least likely to draw attention.

Image Type:



Probability that a viewer will fixate areas in the first 3-5 seconds:



Area of Interest

The image below shows the Area of Interest (AOI) analysis results. The AOI is selected by the user. 3M VAS processes the area and returns a score.

The AOI score indicates the probability that each Area of Interest will get attention during the first 3 - 5 seconds.

Image Type:



3M Visual Attention Service - Results Legend

Probability of visual fixation within the first 3-5 seconds:

 70% to 99%

 40% to 70%

 20% to 40%

Visual features that contribute the most to visual saliency:

 Brightness/Contrast

 Yellow/Blue Contrast

 Red/Green Contrast

Region Map

This view shows the predicted probability that a person will look at the region within the first 3 - 5 seconds.

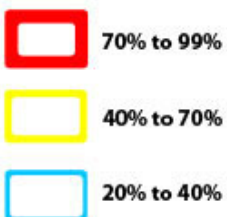
- The number associated with each region shows the 3M VAS score. This is the predicted probability that a person will look at the region within the first 3 - 5 seconds.
- Icons appearing in the regions indicate the visual features that had the highest impact on the 3M VAS score.

Image Type:



3M Visual Attention Service - Results Legend

Probability of visual fixation within the first 3-5 seconds:



Visual features that contribute the most to visual saliency:



Visual Sequence

Visual Sequence shows the most likely path that the human eye will follow when viewing the image.

The numbers indicate fixation points; successive spots where the visual gaze is maintained on a single location.

Image Type:



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Color Contrast icons (Yellow/Blue, Red/Green)

Reduce attention: Decrease color differences

Increase attention: Boost color differences

If there are no strong red-areas of visual attention, you can "intensify" a region by adding light/dark contrast, color contrast, edges/text and faces.



satakunta_terra.jpg 10/18/2012 9:45 AM GMT

This report shows a predictive analysis of visual saliency for the first 3 - 5 seconds of viewing the image. Visual saliency is the probability that a viewer will fixate on a particular area of the image. Results using this analysis are highly correlated with eye-tracking studies.

Go to <http://www.3m.com/vas> for more information.

Image Type:



Heatmap

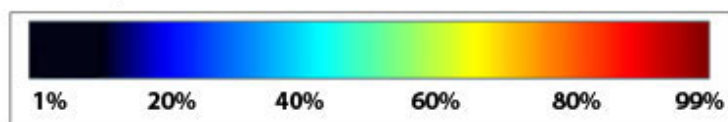
Heatmaps graphically show the distribution of visual attention within the first 3 to 5 seconds.

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Image Type:



Probability that a viewer will fixate areas in the first 3-5 seconds:



Area of Interest

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The AOI score indicates the probability that each Area of Interest will get attention during the first 3 - 5 seconds.

Image Type:



3M Visual Attention Service - Results Legend

Probability of visual fixation within the first 3-5 seconds:

 70% to 99%

 40% to 70%

 20% to 40%

Visual features that contribute the most to visual saliency:

 Brightness/Contrast

 Yellow/Blue Contrast

 Red/Green Contrast

Region Map

This view shows the predicted probability that a person will look at the region within the first 3 - 5 seconds.

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- Icons appearing in the regions indicate the visual features that had the highest impact on the 3M VAS score.

Image Type:



3M Visual Attention Service - Results Legend

Probability of visual fixation within the first 3-5 seconds:

 70% to 99%

 40% to 70%

 20% to 40%

Visual features that contribute the most to visual saliency:

 Brightness/Contrast

 Yellow/Blue Contrast

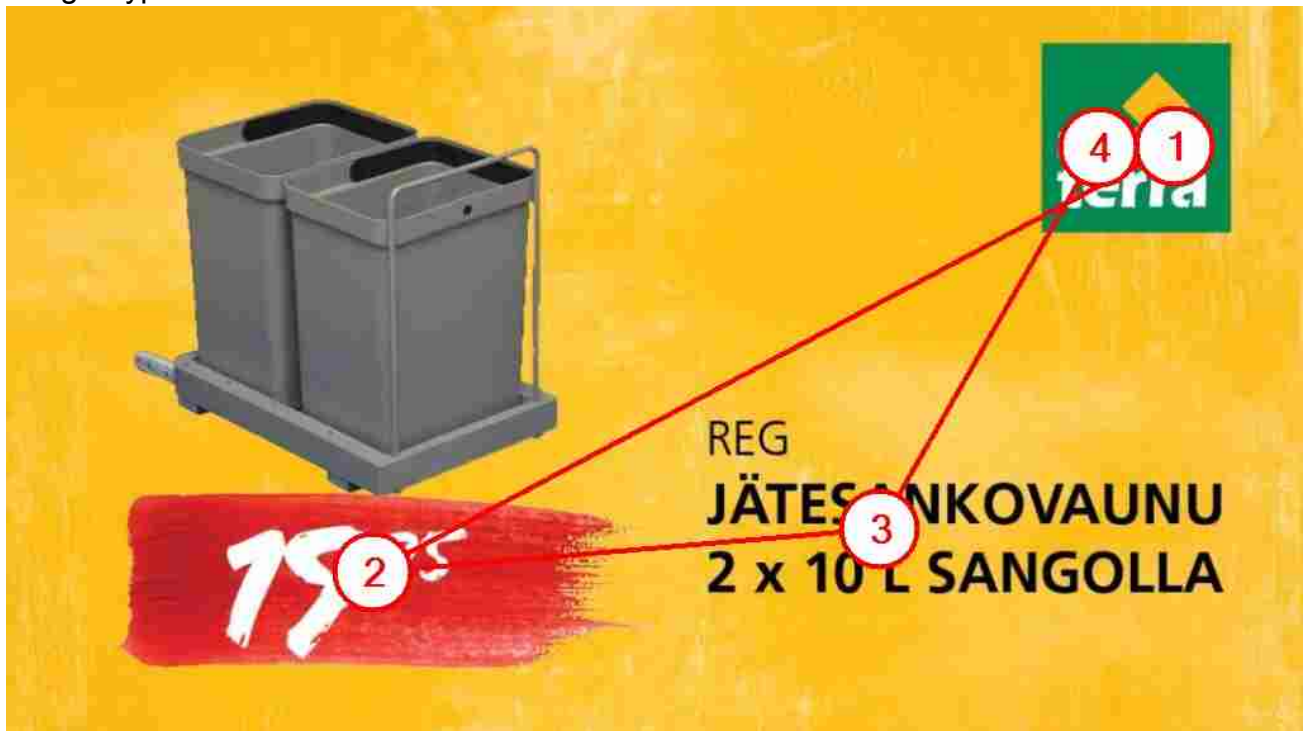
 Red/Green Contrast

Visual Sequence

Visual Sequence shows the most likely path that the human eye will follow when viewing the image.

The numbers indicate fixation points; successive spots where the visual gaze is maintained on a single location.

Image Type:



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Arina_olut_sidumainos.jpg 10/9/2012 11:26 AM GMT

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Go to <http://www.3m.com/vas> for more information.

Image Type:

Lapin Kulta
Arctic Malt Dark
4,6% | 0,35 l

Happy Joe
Oakwood Apple
4,7% | 0,33 l

Lapin Kulta
Arctic Malt Pils
4,6% | 0,35 l

5€/plo

S-Etukortti
VISA

S-Etukortilla
syys-lokakuun
ajan

Ilman S-Etukorttia 6 €/plo

Osuuskauppa Arinan
ravintoloissa

ARINA
Meidän Meidän varten.

Heatmap

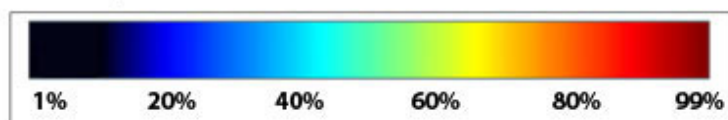
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Image Type:



Probability that a viewer will fixate areas in the first 3-5 seconds:



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 40% to 70%

 20% to 40%

Visual features that contribute the most to visual saliency:

 Brightness/Contrast

 Yellow/Blue Contrast

 Red/Green Contrast

Visual Sequence

Visual Sequence shows the most likely path that the human eye will follow when viewing the image.

The numbers indicate fixation points; successive spots where the visual gaze is maintained on a single location.

Image Type:

The image is an advertisement for Lapin Kulta beer and Happy Joe cider. It features three bottles of beer and one can of cider. The bottles are labeled 'Lapin Kulta Arctic Malt Dark' (4.6% | 0.35 l), 'Lapin Kulta Arctic Malt Pils' (4.6%), and 'Happy Joe Oakwood Apple' (4.7% | 0.33 l). A red line with numbered circles (1, 2, 3, 4) indicates the visual sequence: 1. Happy Joe can, 2. S-Etukortti card, 3. Lapin Kulta Arctic Malt Pils bottle, 4. Lapin Kulta Arctic Malt Dark bottle. The price '5 €/plo' is prominently displayed. The text 'S-Etukortilla syys-lokakuun ajan' and 'Ilman S-Etukorttia 6 €/plo' is also present. The Arina logo is in the bottom left corner.

Lapin Kulta Arctic Malt Dark 4,6% | 0,35 l

Happy Joe Oakwood Apple 4,7% | 0,33 l

Lapin Kulta Arctic Malt Pils 4,6%

5 €/plo

S-Etukortti VISA

S-Etukortilla syys-lokakuun ajan

Ilman S-Etukorttia 6 €/plo

Osuuskauppa Arinan ravintoloissa

ARINA Meidän Meidän viikot.

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Increase attention: Boost light/dark contrast

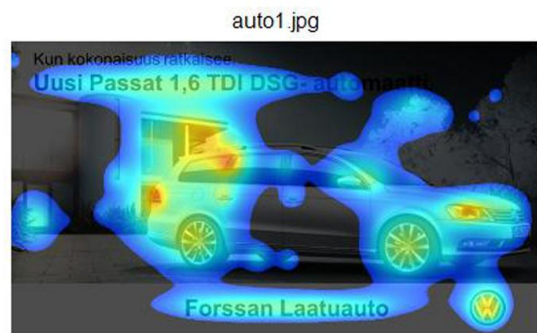
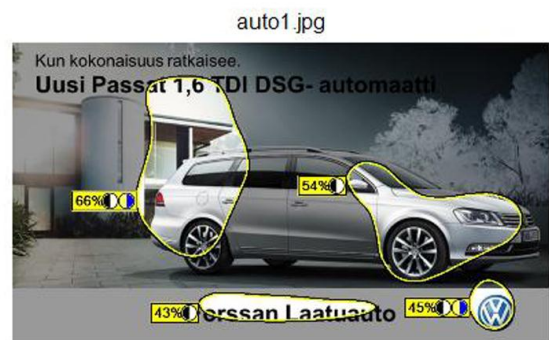
Color Contrast icons (Yellow/Blue, Red/Green)

Reduce attention: Decrease color differences

Increase attention: Boost color differences

If there are no strong red-areas of visual attention, you can "intensify" a region by adding light/dark contrast, color contrast, edges/text and faces.

APPENDIX: 3M Visual Attention Service side by side image comparison



Car dealer promo comparison side by side, 3M VAS

s-pankki2.jpg



s-pankki1.jpg



s-pankki2.jpg



s-pankki1.jpg



s-pankki2.jpg



s-pankki1.jpg



s-pankki2.jpg



s-pankki1.jpg



S-Pankki service promotion comparison side by side, 3M VAS

INTERVIEW NOTES: Pasi Brusi, Frontal Contacts 12.10.2012

1. Miksi haluatte alkaa myydä mediatilaa näytöiltä (vrt. pelkästään oman yrityksen tai yhteistyökumppaneiden mainosten esittäminen)?

V: Laajempi pohja asiakkaita kattaa kustannukset paremmin ja antaa pohjan kannattavalle liiketoiminnalle mainosten myymiseksi.

2. Mihin hinnoittelunne perustuu?

V: Hintana on kiinteä viikkohinta. Hintamme ovat 100€/viikko, 300€/4 viikkoa, 500€/10 viikkoa

3. Miksi uskotte yritysten kiinnostuvan mediatilan ostamisesta?

V: Näyttö sijaitsee paikassa, jossa huomioarvo tulee olemaan korkea ja kontakteja paljon (hinta on kohdallaan). Mainosaineistona voidaan käyttää pitkälti olemassa olevia materiaaleja ts. tuotantoprosessi on mainostajalle helppo ja nopea.

4. Mitä haasteita mediatilan myynnissä näytöiltä olet todennut?

V: Viesti, tuote ja prosessi pitää vastata sekä suurten brändimainostajien että pienten paikallisten mainostajien tarpeita. Uudella alalla on kirjava valikoima erilaisia toimintatapoja ja pelureita.