Web Analytics:

Functions, KPIs and Reports in SMEs –

A Usage Framework and Guidelines

A thesis submitted for the

Bachelor of Science in Information Management

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Declaration/Erklärung

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Abstract

We are entering the 26th year from the time the World Wide Web (WWW) became reality. Since the birth of the WWW in 1990, the Internet and therewith websites have changed the way businesses compete, shifting products, services and even entire markets.

Therewith, gathering and analysing visitor traffic on websites can provide crucial information to understand customer behavior and numerous other aspects.

Web Analytics (WA) tools offer a quantity of diverse functionality, which calls for complex decision-making in information management. Website operators implement Web Analytic tools such as Google Analytics to analyse their website for the purpose of identifying web usage to optimise website design and management. The gathered data leads to emergent knowledge, which provides new marketing opportunities and can be used to improve business processes and understand customer behavior to increase profit. Moreover, Web Analytics plays a significant role to measure performance and has therefore become an important component in web-based environments to make business decisions.

However, many small and medium –sized enterprises try to keep up with the web business competition, but do not have the equivalent resources in manpower and knowledge to stand the pace, therefore some even resign entirely on Web Analytics.

This research project aims to develop a Web Analytics framework to assist small and medium-sized enterprises in making better use of Web Analytics. By identifying business requirements of SMEs and connecting them to the functionality of Google Analytics, a Web Analytics framework with attending guidelines is developed, which guides SMEs on how to proceed in using Google Analytics to achieve actionable outcomes.

Mit dem Beginn des 26. Jahres nach der Entwicklung des World Wide Web (WWW) kann festgehalten werden, dass das Internet seit seiner Gründung im Jahre 1990 gängige Wirtschaftsprozesse nachhaltig verändert hat, indem es den Wettbewerb zwischen den Akteuren in neue digitale Märkte verlagerte.

In diesem Kontext bietet Web Analytics eine Vielzahl von Chancen für Websitebetreiber, die jedoch neuen komplizierten Herausforderungen gegenüber stehen. Um diesen Anforderungen entgegen zu treten, wird Web Analytics Software zur Optimierung der Web-Ressourcen eingesetzt.

Das gewonnene Wissen über Nutzer der Website bietet neue Vermarktungsmöglichkeiten und kann gewinnbringend zur Verbesserung von Wirtschaftsabläufen und an Kundenverhalten orientierten Strategien eingesetzt werden. Deshalb spielt Web Analytics eine entschiedene Rolle bei der Informationsgewinnung und ist zu einer wichtigen Komponente der Entscheidungsfindung in webbasierten Umgebungen geworden.

Unabhängig von ihrer Größe versuchen kleine und mittelständische Unternehmen (KMU) mit ihrer oft größeren, digitalen Konkurrenz mitzuhalten, doch verfügen sie weder über die benötigten Ressourcen in Form von Spezialisten und Know-how, noch über die zeitlichen und finanziellen Mittel. Als Folge resignieren manche von ihnen und verzichten gänzlich auf den Einsatz von Web Analytics Software.

Dieses Forschungsvorhaben zielt auf die Entwicklung eines Web Analytics Framework und zugehörigen Anleitungen, um kleine und mittelständische Unternehmen bei der Verwendung von Google Analytics, als Web Analytics Software, zu unterstützen.

Das Ergebnis dieser wissenschaftlichen Arbeit ist ein ganzheitliches Framework mit zugehörigen Anleitungen, die KMUs bei Handhabung und Implementation von Google Analytics assistieren.

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1 Introduction

According to Avinash Kaushik (2010), the beginning of Web Analytics can be found in 1995 when Dr. Stephen Turner developed one of the first known log file analysis programs. This first chapter provides a short introduction to the reasons for using Web Analytics software today in small and medium-sized Enterprises (SME). Thereby the chapter starts in Section 1.1 with the motivation and problem statement for the research project. Moreover, it describes the research aim in Section 1.2 and leads to the research objectives and research questions in Section 1.3. The chapter ends by presenting the outline of the thesis in Section 1.4.

1.1 Motivation and Problem Statement

Web Analytics is a technological method to collect, measure, report and analyze websites and web application usage data and information (Burby and Brown, 2007). Within the last years, the importance of Web Analytics grew and is still growing. The Web Analytics US market is projected to reach 3.09 billion dollars in 2019 with an annual growth rate of 18.3% (Research and Markets, 2014). Due to case studies by Phippen (2004), affords in Web Analytics are essential for enterprises using web technologies. Enterprises often release free services and products such as web applications like Google Maps for the purpose of collecting analytic data. This collected information can be used to place ads effectively or to improve the product or service. Some products like Google Now, an intelligent personal assistant, are dependent on analytic data because the gathered usage data leads to improved algorithms, which are required for the basic search functionality of the product. Besides companies such as Amazon with their Kindle products can benefit from the collected analytic data to improve the user experience. For this reason, web platforms, which provide the most valuable analytic information and incorporate these data into an improved product, beat the competition. For example, Netflix is one company, which successfully regenerates customer web analytic data into a product. The Netflix movie recommendation engine collects data to identify the user's interests to suggest movies. This recommendation system is one reason for Netflix´s worldwide success.

On the contrary, Web Analytics are not only necessary for big enterprises, but also 74% of small businesses have a website (Clutch, 2015) and could therefore potentially benefit by collecting web data. Moreover, small and medium-sized enterprises play a critical role in our economy. For example, in Germany, SMEs represent 99,7% of all turnover tax businesses and provide 65,9% of all employments (Institut für Mittelstandsforschung Bonn, 2010).

The important role of SMEs in our economies causes a lot of research focuses on their performance and therefore measurement factors like their key performance indicators, which are also fundamental for Web Analytics.

The Commonwealth Scientific Industrial Research Organization has examined performance management systems for SMEs (Barnes, 1998).

Studies such as “The evolution of management accounting” (Kaplan, 1984) have traditionally used management accounting to create performance benchmarks.

By 1990, these studies have shown that financial data is not enough to satisfy the performance measurement in the economy because of the increasing complexity of organizations and the markets in which companies compete (Kennerley and Neely, 2002). This is related to financial reports, which are now less indicative of shareholder value.

Emphasized by Freeman (2011), sustainable shareholder value is instead driven by non-financial factors such as customer loyalty, customer and employee satisfaction, internal processes and innovation management. Web Analytics generates data to transform and improve these factors.

The outcome of this is a new increasing role of performance measurement related to Web Analytics.

The Internet provides new marketing opportunities, but managers of SMEs are facing the problem, that they need ways to enhance and measure performance from the enterprises interface to the World Wide Web, their website or web applications. As a result, online marketing and web design gain more and more importance and large enterprises shift more budget to their web analytic activities.

There is a broad range of different tools available to collect this valuable web analytic information. (TrustRadius, 2014). According to W3Tech.com (2014), Google Analytics is the most used website statistic service in the world. It is a web analytics tool that allows the user to analyze not only websites, but although search engines, email Marketing, social networks, mobile, conversion and advertising campaigns. Today increasing the number of website visitors is an essential factor to expand the scope of customers. Therefore, a framed Search Engine Optimization as a part of Web Analytics is indispensable, but difficult to realize for uninitiated companies and their employees. Major companies employ own departments to identify their business requirements continuously and analyze their websites to capture data efficiently and instructively. Consequently, these companies are enhancing their performance levels, and Web Analytics gives them a competitive edge. Small and medium-sized enterprises try to use Web Analytic tools in the same way, but often do not have the equivalent resources in manpower and knowledge to stand the pace (Dlodlo & Dhurup, 2010). For this reason, some even resign entirely on web analytics (Zumstein & Züger & Meier, 2011). Analog to big enterprises, SMEs need to create custom reports, segment audiences and tweak implementation to measure and assess the organization´s particular needs.

For the purpose of helping SMEs to gather actionable digital marketing data with Google Analytics and utilizing it in effective reports, this thesis seeks to combine the business needs and research literature to develop a Web Analytic framework that can guide SMEs to execute their web analytic requirements in an efficient way.

1.2 Aim of the Study

This thesis aims to develop a Web Analytics framework to assist small and medium-sized enterprises to make better use of Google Analytics. Therefore relevant Key Performance Indicators of SMEs are identified, analyzed, classified and mapped to the Google Analytics functionalities. Particular attention is thereby given to reports. The framework seeks to assist SMEs with choosing what metrics are important to monitor and how related reports are generated. The resulting Web Analytics data can be interpreted and reported to business stakeholders such as the marketing department.

1.3 Research Objectives and Questions

For the purpose of developing a Web Analytics framework, which strives to assist SMEs with guidelines to implement an effective Google Analytics setup, the study concerns four different research objectives.

First, to understand the status quo of Web Analytics, primarily Google Analytics and receive a general conspectus, existing web frameworks will be conducted.

In a second step business requirements will be identified and Web Analytics key performance indicators for small and medium-sized enterprises ascertained to discover the needs in the performance measurement of SMEs.

The third step examines Google Analytics to estimate the scope of provided functionalities and the information handling capabilities for captured data.

The fourth objective brings together and compares the research results from the previous steps to create meaningful reports and develop a framework that can guide SMEs to execute their Web Analytics requirements by mapping the KPIs to Google Analytics functionality.

In a nutshell the primary research objectives, which have to be investigated to achieve the specified goals are:

1. Distinguish and analyse existing Web Analytics frameworks
2. Identify business requirements and key performance indicators for SMEs
3. Examine Google Analytics to estimate the scope of provided functionalities
4. Compare and combine research results RO1, RO2, RO3 to develop a framework that is able to guide SMEs to execute their web analytic requirements

   To reach the aforementioned objectives the following research question was designed:

   How can a small or medium-sized business with limited capabilities make better use of Google Analytics?

Due to the complexity of the subject, the over-arching research question was specified more precisely in the following subsidiary questions, which guided the complete research project.

Q1a: How do existing frameworks classify Web Analytics?

Q1b: Which similarities do the frameworks contain?

Q1c: What framework is most appropriated to cover the needs of SMEs and the integration of Web Analytics?

Q1d: What are the differences for Web Analytics between small, medium and big sized companies?

Q2a: What are key performance indicators for small and medium-sized enterprises?

Q2b: What are the differences in the Web Analytics requirements due to the industry sector?

Q3a: What functionalities does Google Analytics offer?

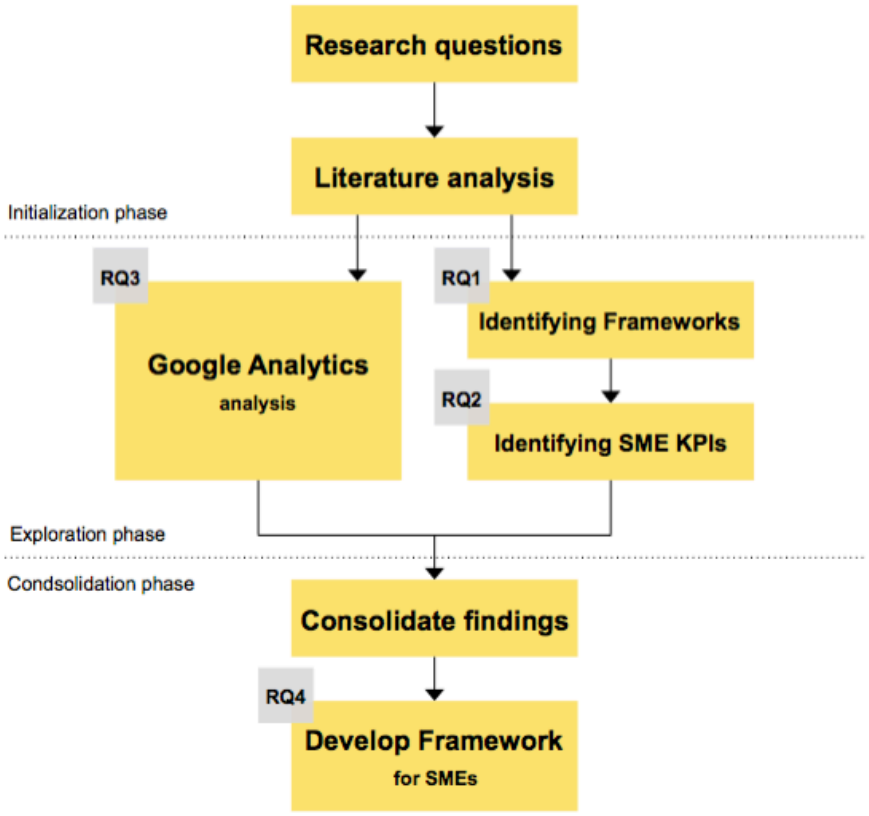
Q3b: How does Google Analytic store data and which possibilities do users have to interact with this information?

Q3c: What kind of specialization does a Google Analytic framework need?

Q3d: What additional features does Google Analytics Premium offer for small and medium-sized companies?

Q4a: What does a Web Analytics framework need to fit the business requirements of SMEs?

Q4b: What is the best method and form to design the Web Analytics framework and guidelines for Google Analytics?



Figue 1: Overview of Research Project

1.4 Outcomes of the Thesis

A framework, which delivers guidelines for SMEs to work efficiently with Google Analytics, identify business requirements and achieve the related Web Analytic information through reports will be the essential outcome. Additionally, guidelines to support the Web Analytics integration process according to the research objectives are created. All outcomes are designed The results will be captured and presented on a website to make the findings easily accessible to SMEs.

1.5 Outline of this Thesis

The thesis is presented in seven chapters.

Chapter 1 covers the background, approach and the research objectives of this study.

Chapter 2 explains the research steps to classify this thesis. Furthermore it introduces the research steps and indicates the limitations.

Chapter 3 clarifies the concepts of websites. In addition website classifications and website design principles are identified.

Chapter 4 reviews existing literature in the area of Web Analytics. The chapter explains the functionality, tracking methods and reports of Web Analytics.

Chapter 5 gives an overview of existing Web Analytics frameworks. To accomplish this, popular Web Analytics frameworks were analyzed and their strengths and weaknesses compared.

Chapter 6 studies the special characteristics of performance measurement in SMEs and the theoretical approaches to develop matching metrics and key performance indicators.

Chapter 7 gives an overview of Google Analytics as the used Web Analytic tool. A real world case website is used to introduce and implement the basic functionality of Google Analytics.

Chapter 8 describes and develops a new Web Analytics Framework and assisting guidelines for SMEs, based on previously obtained findings.

Chapter 9 is the summary and conclusion chapter. It summarizes the findings and concludes with suggestions on further research possibilities in the Web Analytics study field.

2 Research Design

This chapter explains the research steps of this thesis in Section 2.1. In addition a short discussion about the limitations of this research project is presented in Section 2.2.

2.1 Research Steps

The research project is divided into four research steps, shown in Figure 2 and started with Step 1 "Initialisation" and the problem definition. Due to the problem definition, a research aim and specific research objectives were formulated and complemented with research questions.

In addition, in Step 2 "Literature Research (ongoing) and Data Analysis" an intense literature research was undertaken, which defines the foundation of the several research steps. This literature research was continuously done during the accomplishment of all research steps. At the beginning, an extensive literature analysis was conducted. Reviewing Web Analytics theories, performance measurement in SMEs, Google Analytics and other Web Analytics subjects, leading to three main subjects: Web Analytic Frameworks for SMEs, KPIs for SMEs and Google Analytics. The analysis started with Web Analytics framework analysis. Within the gained information was used to analyse existing WA frameworks to figure out the strength and weaknesses of each framework. In addition Google Analytics functionality was analysed and key performance indicators for SMEs were identified. The Google Analytics analysis was accomplished by the use of the case website businessculture.org. In order to receive this essential information and start the analysis, the literature sources had to be chosen. The primary literature sources in this thesis are books and publications from Google Scholar, ACM Digital Library, SpringerLink and IEEE Xplore. All publications were retrieved into a set, and additional publications were added. After the final set of literature had been selected, the publications were reviewed, analyzed and finally presented. The literature that is used in chapter 3 to chapter 7 was collected and specified as a result of an iterative process. This refinement process is accomplished by refining a sample based on the title, abstract and full text of the publication. Furthermore contributing publications were selected to answer RO 1, RO2 and RO3. Forward and backward citations were also included in the sample set during the iteration. For example, in order to gather the initial set of research literature for the identification of Key Performance Indicators in Web Analytics, the following keywords were used "Web Analytics KPIs", "Small and medium-sized enterprises KPI", "Web Analytics Performance Measurement", "Web Analytics metrics", "Web metrics", Web Analytics Data Analysis" and "KPI Web Analytics Implementation". Due to the time limitation, the scope of this study does not claim to review the entire literature in the area of interest. Moreover, this thesis is trying to define the state of art based on samples with a focus on the main subjects Web Analytics in SMEs. As mentioned, the described literature review and literature analysis was performed and continued during all further research steps to achieve required knowledge in the further course of action.

After the literature research and data analysis, Step 3 “Visualisation” started to develop the Web Analytics framework and guidelines. Therefore, a KPI Design Template and KPI Recommendation Table were designed to simplify the KPI development for SMEs. Besides different Google Analytics functionality was researched to create a KPI–Metrics–Google Analytics–Mapping-Template. Based on this results and the framework analysis a new Web Analytics Framework was developed. To simplify and extend the framework for SMEs different guidelines were created, by combining the results of Step 1, Step2, and Step3.

In the last Research Step 4: Synthesis, the previous steps were reviewed and suggestions for future work issued.

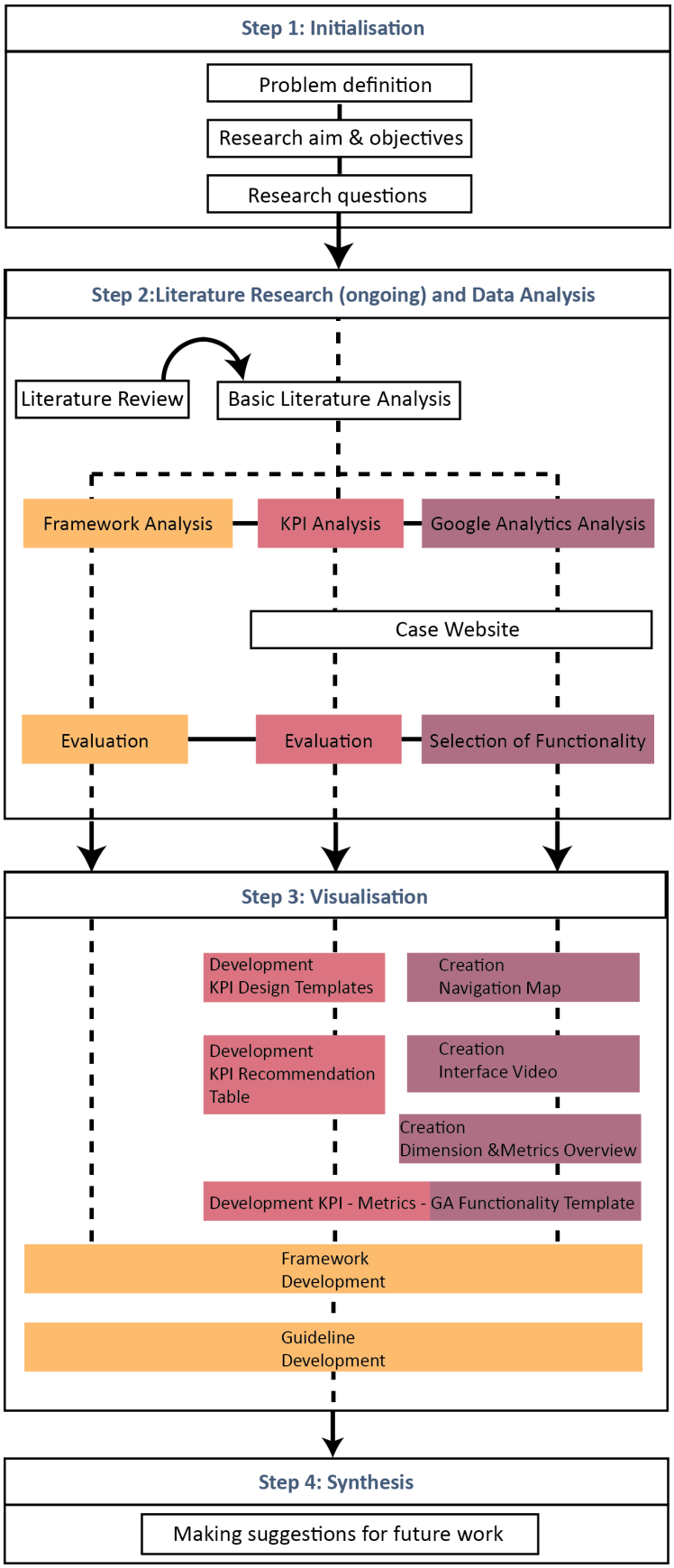


Figure 2: Research Steps

2.2 Limitations

This research project has some limitations. Even if Web Analytics and particularly Google Analytics has a significant importance for the development of websites and mobile applications, the topic is still young and diversifying (Clifton, 2012). Academic literature and papers are widespread, but often cursorily and moreover without a focus on SMEs. As a result and in addition to the time limitations the researcher could not exhaustively review the topic. Some technical details about Web Analytic algorithms or advanced Google Analytics functionality were not addressed deeply.

Another limitation has to be made due to the evaluation of the new Web Analytics framework and guidelines. They were developed using theoretical (Literature Research) and practical (Case Website) input, but they were not yet tested and evaluated in a real-world scenario to receive scientific evidence.

3 Websites and Website Classification

The first section gives an overview of the Internet creation and the evolution of websites. Furthermore the first section explains how websites can be classified. Following the growth and development of Web Analytics are outlined in section 3.2. Finally, section 3.3 explains principles for effective and aesthetic website design.

3.1 Websites

"The system we need is like a diagram of circles and arrows, where circles and arrows can stand for anything. We can call the circles nodes, and the arrows links. Suppose each node is like a small note, summary, article or comment. […] The system must allow any sort of information to be entered. Another person must be able to the information, sometimes without knowing what he is looking for." (Berners-Lee, 1989).

The World Wide Web, often named as "the Web", is an enormous collection of electronic records. These electronic documents consist of linked sets of pages written in the HyperText Markup Language (HTML). HTML is the standard markup language, which is used to create web pages. Every document is stored in files on servers around the global Internet. The basic concept of the World Wide Web was conceived in 1989 by Tim Berners-Lee, even if he was the first scientist with the idea of a linked node network. Berners-Lee was working at the European Particle Physics Laboratory (CERN) during this time when his paper "Information Management: A Proposal" got into the hands of Mike Sendall. The paper discusses the problem of information loss in complex systems and delivers a solution based on a hypertext system (Berners-Lee, 1989). After reading the proposal, Sendall assigned Tim Berner-Lee to program a prototype. Berners-Lee implemented a communication between a server and a HyperText Transfer Protocol client via the Internet. More and more user accessed the web server info.cern.ch over the first five months and the web grew and spread accelerated. In 1994 CERN and the Massachusetts Institute of Technology (MIT) established a consortium whose aim was to develop the web and standardise the protocols associated with it (Carpenter, 2013).

Another substantial contribution for the WWW development came from the National Center for Supercomputing Applications (NCSA), which developed MOSAIC the first interactive web browser with a graphical user interface (GUI).

Browsing for information is one of the most basic and essential interactions in the World Wide Web today (Ross, 2009). Information is provided on the web server at a site, which often integrates a whole set of one or more regarding web pages. Every Web page in one set contains links to other web pages. They can be stored on the identical server or any other server connected to the Internet. As mentioned before, every web page is typically written in HTML, which provides and structures all information to display the content of text, images and videos on the screen of the client. The browser accesses, locates and fetches every requested web page by interpreting the formatting commands that

each page contains. When the user clicks on a link, the page behind the link is accessed and interpreted with the same process. A link is termed hyperlink and the complete linkage comprises the used name of the scheme or application protocol, usually the hypertext transfer protocol (HTTP) and also the domain in which the web page is saved (Halsall, 2005).

Every web page is accessed and transferred through a TCP connection using the HTTP application-level protocol. When the browser starts an HTTP interaction, each request implicates an ASCII string and the response from the server in the RFC 822 format with MIME extensions. If the linked web pages are distributed over different servers, a separate TCP connection between client and server will be established for every interaction and after the response is received the regarding TCP connection will be cleared. Additionally to HTTP or HTTPS, which is used for encrypted secure communication, the browser can use a lot of different application protocols like the file transfer protocol (FTP), gopher protocol or network news transfer protocol (NNTP) to access web content (Ross, 2009).

Over time, the exclusive use of HTML to create web pages stumbled relating to integrate new features into web pages. To vanquish these restrictions, applets were developed to implement code into the page. This code is loaded independent of the HTML interpreter and gets identified and interpreted from the browser by tags.

As every applet is a self-contained program, the implementation advantage is that the parts of a page that contain code that is used to change in the form of applets do not have to be incorporated into the browser. One programming language that is used to embed code into an HTML page directly is JavaScript (Halsall, 2005).

3.2 Website Classification

Due to the Internet website Live Stats (Jan 2016), there are about 980.000.000 websites on the Internet in 2016. Over 75% of this websites are inactive and only used as parked domains. The other 25% consist of many different kinds of websites. Four different types of websites are exemplified closer in the following (Booth & Jansen, 2009).

E-Commerce Websites

The goal of the most e-commerce website is to generate profit by driving visitors to purchase products, services and subscriptions through the website.

Lead Generation Websites

These websites provide information about an organisation, product or a service to attract potential customers. As distinguished from e-commercial websites, a Lead Generation website does not offer direct online sales, often due to the unique, complex and customised services they provide. They are similar to Content websites but are executed by an organisational body.

Customer Service Websites

The purposes of Customer Service websites are partly based on commercial websites. These websites reduce expenses and improve customer experience by shifting common customer services to a website. Their goal is to process customer questions and problems.

Content Information Websites

Nearly every website provides content and information. A content website presents information on diverse topics. Some of these websites offer their content for free, while others derive revenue from advertisement or advertising support.

Examine the description above, it becomes apparent that the transitions between different types of websites are seamless and not always clear-cut. The categorisation often correlates with the personal perspective. Therefore the division and classification of websites into the types is not stringent. Anyhow, the webiste categorisation allows to focus Web Analytics and is therefore expedient. Beside websites are also categorised by their content and functionality such as news websites, blogs, wikis, video streaming services, online social networks, massive open online courses, search engines, gaming site, etc. (Booth & Jansen, 2009).

3.3 Website Design Principles

"Beauty is in the eye of the beholder."

(Magaret Wolfe, 1878)

Effective and aesthetic web design is one of the key requirements for a successful website and therefore for Web Analytics. The web design is judged by the website visitor, not the owner and should achieve excellent usability, form and function. According to a survey by Patel and Juric (2001) Internet users are especially attracted to content and user friendliness of a website, followed by the graphics. Websites that are not well designed tend to perform worse and reflect this downside in sub-optimal Web Analytics metrics. Niederst Robbins (2012) states that web designers need knowledge about a lot of unknown factors, such as size of the screen or browser window, visitor connection speed, desk or mobile user. Website content should be placed semantic and in a logical order. This thesis does not aim to cover detailed web design processes, nevertheless should some general design principles be respected to support SMEs or website owners to receive a basic understanding of web design and consider this influence factor in Web Analytics. To address a way of proceeding while designing a website, six simple questions, which guide the website owner to develop an engaging and effective design were created in dependence on the Kevin Hale (2015) design principles.

What is your product?

The website design should highlight and describe in one conspicuous sentence the product or service the website is offering.

What is it for?

A website should explain the product or service value to the customer.

Is everything legit?

In order to look professional, the design needs to be the stand of the art and if achievable, added with quality labels. If the website creator has no sense for web design, it is advisable to buy and use a design template.

What is the price?

All product and service costs should be presented clearly and understandable to the user.

Who is using it?

Testimonials and reviews are useful indicators of customer happiness and customer-oriented products or services. Therefore, they should be presented on the website.

To whom can I talk?

Many website visitors or customers have questions, that is why a questions and answers or customer support web page needs to be easily accessible.

One positive example for a website pursuing this design principles is the website of the American seed accelerator Y Combinator (2016), shown in Figure 3.

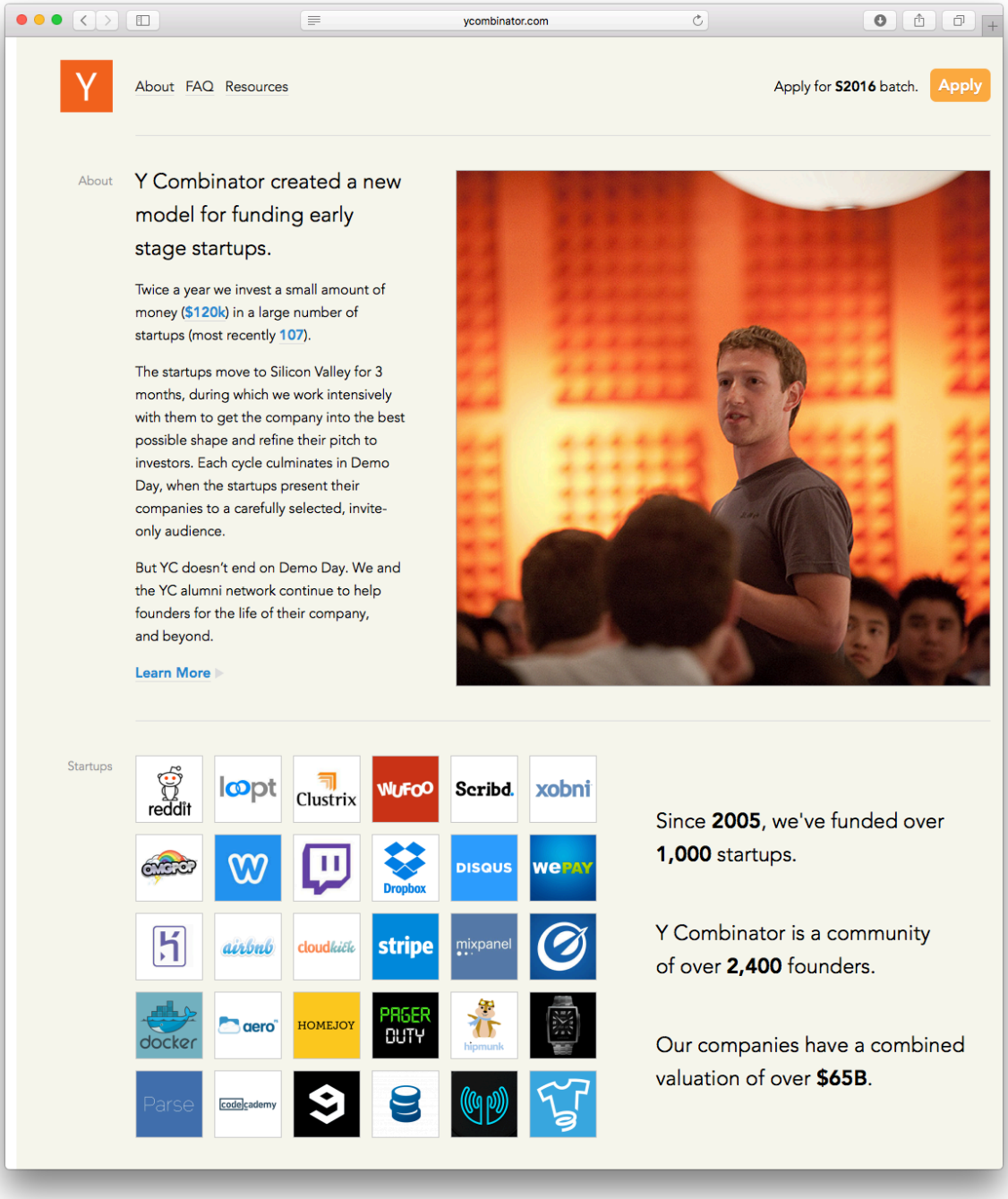


Figure 3: Example Web page, which follows the Web Design Principles (Y Combinator, 2016)

4 Web Analytics

This chapter reviews the literature on Web Analytics and Web Analytics frameworks. Thereby we understand Web Analytics as the technologies and methods to collect, measure analyse and report digital usage data in websites and web applications (Burby & Brown 2007). Web Analytics technologies are typically split into two categories, on-site and off-site Web Analytics. A data collection of a current Web site is called on-site Web Analytics (Kaushik, 2009). These tools are applied to measure most aspects of direct user-website interactions, such as the visitor traffic, time on site, click path, etc.

On the other hand, off-site Web Analytics software is often provided by third party companies such as Swydo (http://swydo.com). Their Web Analytics tools measure the potential website audience from a macro-view to compare one website to another. Therefore, they collect data from sources like surveys, market reports, public information, etc. (Kaushik, 2013).

The following section 4.1 outlines the evolution of Web Analytics. Continued by Web Analytics functionality, WA Tracking methods, analyses and reports, before chapter 5 concludes with an overview and discussion of existing Web Analytic frameworks and identification of connections between them.

4.1 The Evolution of Web Analytics

Around the year 1993, the first analysis of web server log files started and in addition to that the birth of Web Analytics was launched (Carpenter, 2013). A typical log file stored a record of every server request such as client IP addresses, page calls, page downloads, bandwidth, operating system, operating browser and version. Administrators used log files mostly for troubleshooting purposes. Over the time website owners recognised that analysing log files can lead to valuable information about the website users. As an example, to count IP addresses allows the administrator to enumerate the number of visitors to a website, which can be used to identify highly frequented websites. The uncomfortable analysis of long log files led to the development of simplified Web Analytic software. Web Trend was one of the first Web Analytic software and got commercially available in 1993. Only two years later in 1995 the first entirely free log file analysis programs such as “Analog” were introduced (Kaushik, 2007). They offered more functionality than Web Trends, such as improved reports with structured documentation and a better visual graphic layout (Schneider, 2010). Figure 4 shows a timeline of important steps in the evolution of Web Analytics.

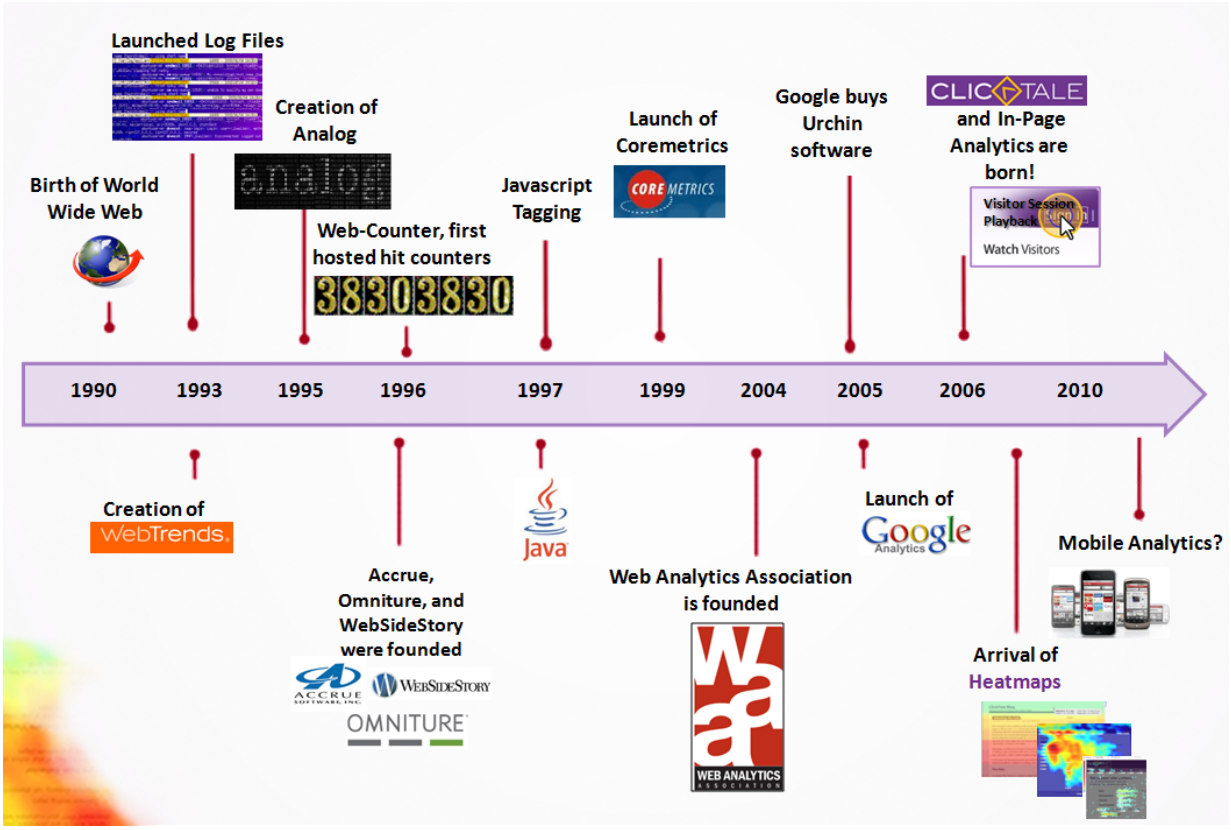


Figure 4: A timeline of the Web Analytic progress (blog.clicktale.com, 2010).

In 1996, the Web counter was conceived and represented the first Web Analytic tool to utilise the page tagging function, which is a data collection method. Over time web pages became more complex and contained images, flash files and videos. Due to the richer website content, approximately, in 1997 web page number hits were no longer representative for the number of web page requests (Bottégal, 2016). The counting of number page hits shifted to counting the number of individual users, who request the website. JavaScript got used in the web and the tagging of JavaScript code was used to collect Web Analytics data. Even today, JavaScript code tagging is one of the most popular methods to receive analytic information (Booth & Jansen, 2009).

The Web Analytics Association (WAA) was established in the year 2004. The WAA aims to standardise the Web Analytics terms, definitions and best practices used by the industry. Moreover, it develops and implements training and certification programs and consolidates Web Analytics professionals, consultants and end-users to improve analytic forces and combine the common interest. In 2012, the WAA changed their name to Digital Analytics Association (DAA) because of the increasing and incorporated diverse activities outside Web Analytics. This renaming abandons the term “Web Analytics” to advance the reference of particular website-only data collection. Nowadays there are a lot more similar organisations with standardisation agendas, which leads to further development, research and education in the field of Web Analytics and digital advertising. These organisations include the Joint Industry Committee for Web Standards in the UK and Ireland (JICWEBS), Audit Bureau of Circulations

electronic in the UK and Europe (ABCe) or the Interactive Advertising Bureau Europe (IAB) (Singal & Kohli & Sharma, 2014).

4.2 Web Analytics Functionality

The primary and essential function of Web Analytics is to collect and analyse usage data. Nowadays, Web Analytics is spread widely and used in different industries for various purposes such as advertising, campaigns, e-commerce improvement, web design and development, website performance optimisation etc (Kaushik, 2009). However, all on all we can identify four major use cases for Web Analytics: (1) website and web application design and user experience optimisation, (2) web application improvement and problem identification, (3) e-commerce optimisation (4) user experience.

1. The web is changing fast (Kaushik, 2012). Steady improvements are needed to be up to date. This implicates optimisations of the technical and information architecture, layout and design to improve the user interaction. The Web Analytics information can also be used to change and add functionality to the website or web application. One example is the site search integration, to show the search results and search queries, which enables to identify what the users are searching for on the website.
2. Web Analytics is able to address the issue of web code and site failures, detect errors in web applications and games to re-engineer features and functionality. Moreover, one significant factor is website performance. Zoompf, a former Web Analytics company, studied the impact of website speed on search rankings (Zoompf, 2013). They detected direct effects of the back-end performance of a website on the search engine ranking. They advised website owners to explore ways to test and improve their Time To First Byte (TTFB). The TTFB is a measurement method to indicate the responsiveness of web server, web page and network resources. Achievable through web server, web application and website code optimisation or database queries improvements. Besides, there are other studies, which identified intense correlations between page-load time and the likeliness of a user to convert to another service (Walmart, 2012).
3. Web Analytics is also used to improve e-commerce by enhancing customer orientation, acquisition and retention. Understanding the customer behavior and needs through usage data is important to attract attention and bind the customer to the e-commerce platform. This process has a direct influence on the revenue. There are multiple company goals like reducing the bounce rate to approach, that every visitor ends his platform usage with a targeted action (Clifton, 2012).
4. Web Analytics needs to distinguish between different visitor types, traffic sources and distribution and marketing channels to deliver precise usage data. It is used to detect and analyse diverse tracked traffic separately from various sources and furthermore to analyse correlations between for example a newsletter and a social media advertising campaign (Clifton, 2012).

4.3 Web Analytics Data Collection

Elementary Web Analytics aims to analyse collected web traffic to identify usage patterns. Xiaohua Hu and Nick Cercone (2004) created a dimensional model to inspect this data. The model divides data into two different data types named “measurement data” and “dimensional data”. Measurement data usually describes the usage count and time as a page view, which is one request for a web page, or a mouse click. With the help of metrics and dimensions it is possible to calculate metrics. Dimensional data comprises client information (browser type and version, operating system etc.), time, location, content and sessions.

The diverse Web Analytics data sources can be assorted into four categories (Zheng & Peltsverger, 2014):

- Direct HTTP request data
- Application data sent with HTTP requests
- Network and server generated data related to HTTP requests
- External data

Direct HTTP request data is gained from the HTTP request message. The web client sends an HTTP request to the web server to request a web page or any other web resource. Normally web traffic measurement consists of the requested page views. Every request has different dimensions such as page, technology, visitor, etc. An HTTP request contains a request line and the HTTP headers. The request line includes the method token, which indicates the method to be performed on the resource inspected by the Request-URI (united resource identifier), including host domain, IP and directory path. Moreover the request line consist of the mentioned Request-URI, a protocol version and the carriage return (CR) line feed (LF). Generally, the united resource identifier is the basic information to enable page counting (Fielding & Gettys, 1999).

Another important part of the HTTP request is the HTTP header. The request-header allows clients to pass additional information about the request to itself and the server. Those request header fields are mostly used to deliver dimensional Web Analytics data and contain request and client characteristics. Some important HTTP header fields for tracking are: (Zheng & Peltsverger, 2014):

User Agent field: contains client information such as browser version and type, operating system etc. This information is useful to create technology client profiles.

Referee: saves the last visited URL that leads to the current URL. This information can be used to analyse the users web movement, named clickstream, by connecting previous requests to generate a visiting path or to illuminate metrics like entry rate or exit rate.

Accept Language: is determined by the users default Operating System language locale for example “de” (German) to receive Web Analytic information of the user’s language and country.

Cookie: contains client side application information such as keyboard and mouse actions, which can be used to create analysis as Web Analytics heat maps. A heat map delivers a visual method to show visitor usage feedback by highlighting areas or elements on the web page, that users engage with.

Another important information source is **Application level data**, which is created by application level programs such as PHP or JavaScript.

Session data is used to calculate metrics such as frequency of visits, site time length, page views per visit etc. Important to gain this information is the session reconstruction. There is a time-oriented and a navigation-oriented approach to identify sessions. Time-oriented session reconstruction searches for a period of inactivity by a user. If the instant of time is reached a second session for the user begins once he returns. Session data is normally transmitted through the URL parameters or session cookies.

Referral data is a coded value, which acts for diverse sources leading to the current web resource. Therefore the data can be used to analyse expected and unexpected traffic levels or evaluate channel effectiveness in advertisement tracking.

User action data contains primarily user input data (keyboard and mouse actions, for example search terms or cursor coordinates) and special data such as audio or video file playing, bookmarking etc.

Client/Browser side data is user computer status information like display resolution or color depth.

Application level data is included in three differs options within the HTTP request. The first place is within the URL request as an, often specifically created, URL parameter, which can be parsed by the server side program. HTTP cookie header offers the second option. An HTTP cookie header is a small piece of data that is generally used to store application and profile data. Finally, the third possibility is to use an HTTP-method within the HTTP request body to deliver the application level data (Tappenden & Miller, 2009).

Network level data is needed to resolve an HTTP request transmission successfully. For example, the Web server logs the complete IP address and port number to return a response at the TCP/IP level. There will also be server-generated data stored into the log files to store information such as file size, processing time, request data etc.

External data is analysed to interpret web usage. Therefore, it has to be combined with on-site data to link information such as an IP address with geographic data. Additionally external data contains information that was mined in a separate process or search terms and advertisement keywords. If a Web page contains revenue or profit, information it can also be classified as external data.

4.4 Web Analytics Tracking Methods

This Section explains the main Web Analytics data collection methods and reveals the advantages and disadvantages of the different Web Analytics tracking methods.

There are mainly five different methods to collect Web Analytic data. Every collection method differs from the data quality and complexity of collection. Therefore, the collection method has to be chosen wisely. Most current Web analytic companies use a combination of two or more methods to collect data for Web Analytics.,

The six different collection methods are (Hassler 2010, S.28ff):

- Log files (Server-side data)
- Page tagging (Client-side data)
- Application level logging
- A/B multivariate data analysis
- Survey
- Interviews

Throughout the following sections, the three most used Web Analytics methods will be discussed in detail.

4.4.1 Log files (Server-side data)

The log file analysis is one of the oldest Web Analytics measurement methods and was used before the commercial application of the Internet to collect Web Analytic data. The web servers store every file, which is needed to run a website. These, primarily HTML files, describe the structure and content of the website. If the user opens a website in his browser, the browser displays the HTML files of the web server.

This movement on the website is stored in log files. Every user interaction can be used to reconstruct a Web Analytic path during a session. All requests and actions are collected on the web server. As a result the log file analysis is focusing on the sever-side data collection (Hassler, 2009, S.45ff).

Typically the web servers save information like the IP address, browser type and version, operating system, requested content, time, state number and the size of the delivered information. The NCSA Common Log example shows a typical access log entry by an Apache Web Server, which records all requests processed by the web server (Apache Server Documentation, 2016).

NCSA Common Log example:

111.111.123.123 - dheller [10/Oct/2015:21:01:12 +0500] "GET /index.html HTTP/1.0" 200 1043

Log analysis software such as Analog can be applied to extract and analyse the log files. One advantage of the log file analysis is the simple setup und structure. Gathered data is stored locally and coherent "one view, one log" (Aden, 2009, S.33ff). This simple structure is an advantage and at the same time a disadvantage. When the website user pushes the refresh button, the web server is not able to differ between users who are new to the website and those who already visited the website.

Therefore, the web server creates a new entry in the log file, which leads to a large scale of entries that are complicated to analyse and interpret. To address this problem, it is possible to use cookies. A cookie provides the user with a session ID and is stored locally on the user's computer. Due to the session ID the web server is able to recognise information like date and time of a specific website visit. As a result, the web server can identify a recurring website visitor and create sessions bringing smaller and more pertinent data, due to the possibility of identifying if the user requested the website repeatedly during a definite time period. Nevertheless, cookies are no universal remedy, because users are able to delete the local set cookies or disable them completely.

Another problem of log file analysis is the incapability to measure input action like mouse clicks effectively. The web server is only able to collect data, which is generated through to different website requests. Accordingly the interaction in Adobe Flash cannot be tracked in detail and all information inside the application is stored in one file, leading to one single entry in the log file (Reese, 2008, S.228ff).

4.4.2 Page tagging (Client-side data)

Since the advent of the Web 2.0 the more recent method for Web Analytics tracking is using client-side programs, for instance embedded scripts, browser add-ons and plugins. Even if the use of flash content in websites is decreasing, there are other advantages of page tagging such as the precise input recognition and detection of following user interactions. Furthermore, page tagging offers compatibility to a wide variety of programs and plugins.

Instead of the server-side data collection, the information is gathered on the client-side as shown in figure 5.

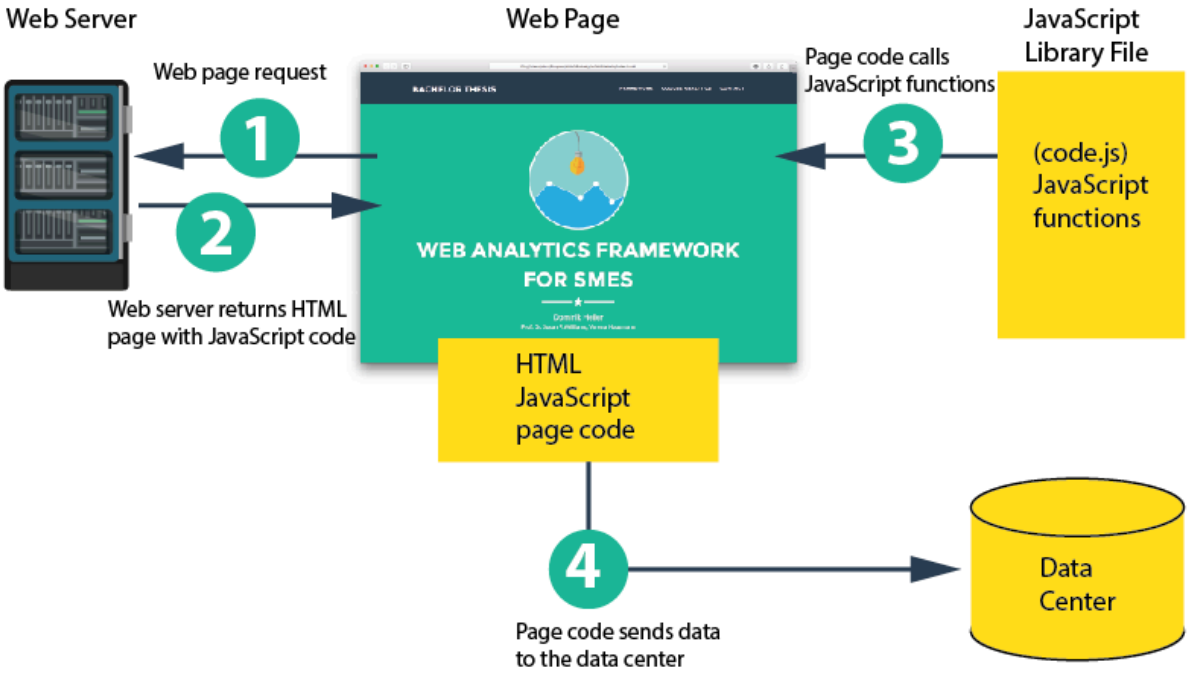


Figure 5: Web Page Tagging

This method is using the web server only to store files, which are needed for the website architecture. In addition an external tracking server gathers all user requests and inputs in page tag files to analyse them (Hassler 2009).

Web Analytics data is collected in the browser to measure information as the users' interaction between two website requests. This technique is possible by implementing a tracking code into the website's source code. Typically this integrated JavaScript code tracks the entire user website activities and interactions and saves the information into a cookie. The locally stored cookie information is sent to the tracking server (Reese, 2008).

The tracking server is usually located at the Web Analytic tool provider and not in the website hosting company.Companies specialised in Web Analytics such as Google or WebTrend are running these tracking servers to gather, store and analyse the data. To explain the functionality of page tagging, Google Analytics is used as an example. The specific tracking code is available at the Google Analytics website (Google Analytics, 2015):

```
<script>
 (function(i,s,o,g,r,a,m){i['GoogleAnalyticsObject']=r;i[r]=i[r]||function(){
 (i[r].q=i[r].q||[]).push(arguments)},i[r].l=1*new Date();a=s.createElement(o),
 m=s.getElementsByTagName(o)[0];a.async=1;a.src=g;m.parentNode.insertBefore(a,m)
 })(window,document,'script','//www.google-analytics.com/analytics.js','ga');
```

ga('create', 'UA-27744900-1', 'auto');

ga('send', 'pageview');

</script>

This tracking code is used to measure the interaction on the website and sent to the Google Analytics tracking server. Once the user requests a website, which is provided with a tracking code, a cookie is generated on the user's computer and the data collection starts.

The tracking code requests a 1x1 sized pixel image, named Tracking Bug or Web Bug, from the tracking server to start the data transmit to the tracking server. In addition to the Web Bug, the tracking JavaScript code is responsible for the data collection. All information is obtained directly from the website visitors browser. Page tagging is able to collect much more data than Log files such as mouse clicks and movement, cursor position, keyboard interaction, screen resolution, language, country, installed plug-ins, etc. (Hassler, 2009).

As mentioned before, the tracking method solves the significant problem of mouse click and movement recognition, even so caching and proxy problems are still extant.

Web Analytic companies are continuously optimising and updating their Web Analytic tools to ensure broad software compatibility. Nevertheless, the usage of firewalls and the deactivation of JavaScript in the users browser can prevent the data collection. Furthermore, the page tagging method has the same log file cookie disadvantage, because cookies are used for the website visitor identification as well.

4.4.3 Application level logging

Another data collection method is application level logging, which is closely tied to an application. Application level logging shifts the focus from collecting data through HTTP requests and user interactions to the application unique usage data. Web application examples are a forum, an online picture editor, an e-mail service, a word processor or a social network service. The gathered data is collected by the application itself or an additional functional module like SharePoints particular Web Analytics service framework.

4.5 Web Analytics Analyses and Reports

To analyse the web traffic efficiently, it is necessary to define relevant and measurable metrics and relate them to the company business goals.

Due to Kaushik (2010, S.55 ff) the most common metrics used in Web Analytics are:

Visit count: number of page views and unique visitors

Visit duration: measured time on website

Bounce rate and **exit rate**

The most important analyses are explained subsequently (Zheng & Peltsverger, 2014):

Dimensional analysis integrates measures and dimensions on different levels to generate analyses and reports.

Trend analysis is focusing on data regarding to the time dimension to show a chronological variation of the used metrics. As an example, the gathered information can reveal if the request frequency of a gender group has changed during the past six months.

Distribution analysis evaluates metric values, which are often a calculated partition of the total dimensions. The main function is to study client and visitor profiles. One field of application is the measurement of different operating systems in the last two years to receive information about the client diversity. In addition other often used dimensions are location, browser type and version, display resolution, color depth, supported technologies and traffic sources.

User activity or behaviour analysis attempts to measure information about user interaction with a Website such as clickstream analysis, in-page analysis and engagement analysis.

Engagement analysis is about measuring the visitors involvement into website and is therefore one the most used analysis in the market. To receive this information, Engagement analysis focuses on unfinished conversions and tries to create engagement calculations to distinguish between different user visits.

Clickstream analysis is used to create a click path and analyses how the visitor is navigating through a website. This clickstream data consists of a list that includes all visited websites in chronological order during a session. Analysis result in navigation, information architecture and structure improvements to optimise the visitor´s web movement (Kaushik, 2012).

Visitor interest analysis measures user attention on a website. This measured data can be received by using the page tagging approach to collect input information such as mouse pointer movement to create for example heat maps in Google Analytics or to measure mouse scrolling, which is important for modern one-site web pages. The break down helps to develop and improve website structure and content placement to find for example the best position for ad banners or other advertisements.

Conversion analysis is among the most applied analyses in the e-commerce sector. The conversion rate expresses a percentage that defines the outcomes divided by unique visitors or visits. Submissions of orders on an e-commerce website are usually called outcomes. Exemplarily Google Analytics offers Multi-Channel Funnels conversion reports to reveal which campaigns or channels have contributed to a website visitors conversion (Kaushik, 2012).

Performance analysis is used to find, evaluate and solve performance problems or errors of websites. For example, old and new websites can be analyses and verified by software such as Google PageSpeed tools to monitor web server, web application performance by testing access times of the website or run an additional test like HTTP headers, Ns records lookups, PortScan tests.

5 Frameworks for Web Analytics

To overcome the inadequacies of analysing web data, the implementation and the usage of Web Analytics software, various divergent frameworks were developed. The common approach in each of the frameworks echoes the identification of the participants, their interplay and connection to Web Analytics processes. In order to receive an overview and to choose a framework for the further research approach, five different Web Analytics frameworks were selected due to the literature analysis and described in detail.

5.1 Framework for Web Analytics by Hausmann (2012)

The aim of the Web Analytics framework by Hausmann, Williams and Schubert is to guide SMEs through the whole process of Web Analytics. They divide their Web Analytics framework into two pictures. Figure 6 shows the five steps within the High Level WA Process Cycle.

Figure 6: High Level WA Process Cycle (Hausmann & Williams & Schubert, 2012)

The five phases of a Web Analytics projects are:

- Business Requirements
- Planning for Web Analytics
- Developing a Data Collection Capability

- Achieving Useable and Actionable Results
- Evaluation of Actions

Each of the five steps is outlined in more detail and with a consistent colour structure in Figure 7.

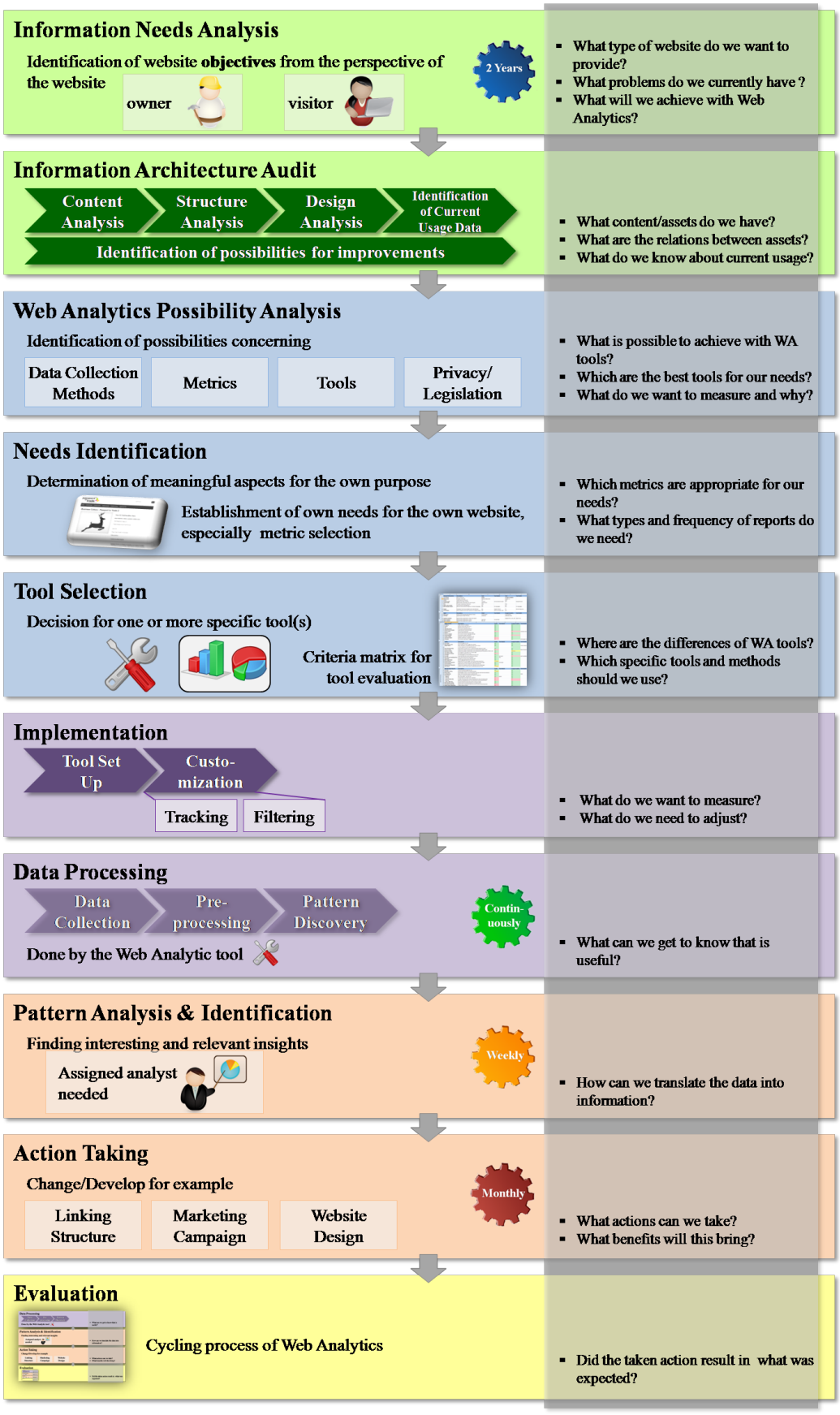


Figure 7: The WA Process Framework (Hausmann & Williams & Schubert, 2012)

The process cycle starts with the *Business Requirements*, which emphasises the identification of needs and the architecture of the website. This phase includes two stages named Information Needs Analysis and Information Architecture Audit. Information Needs Analysis aims to identify the objectives of the website owner and potential visitors regarding to the website. In the second stage Information Architecture Audit the website is analysed due to content, structure, design and usage data leading to essential knowledge about the website itself.

Moreover, the second phase *Planning for Web Analytics* extends the business requirements by conducting a detailed analysis of Web Analytic possibilities such as data collection methods, metrics, tools, privacy and legal issues. Additionally the identification of organisation needs observes meaningful facets of the organisations website itself before the Web Analytics tools selection starts.

In addition, Phase 3, *Developing a Data Collection Capability* is all about the implementation of the Web Analytics tool and the data processing. The first activity Implementation of the Web Analytics tool instructs to set up the selected tool and adapt the processes to measure the required metrics. Following Data Processing contains the data collection, preprocessing and pattern discovery, which is done automatically by the most Web Analytics tools.

Phase 4, *Achieving Useable and Actionable results* add a pattern analysis, identification and the action taking to analyse gathered information and convert them into an optimised Web Analytics proceedings.

Concluding in phase 5, *Evaluation of Actions*, which reviews the Web Analytics processes and taken actions to question if the improvements have led to positive outcomes. This final stage conducts phase 3 to 5.

There are different needs for action over time. Data processing should be done continuously, despite the pattern analysis and identification, which should be accomplished weekly. Furthermore, the data needs to be checked and the linked tool readjusted if new data types are needed. On a higher scale, monthly action aim to website fine tuning, updating or debugging. Finally, two-yearly action involves fundamentally website review to for example re-design or reposition the website.

The Web Analytics framework by Hausmann, Williams and Schubert (2012) builds a perfect foundation for the development of the new Web Analytics framework and guidelines for SMEs, because of the phased, well-structured integration process and WA focus on SMEs.

5.2 Major Components of an Online Marketing System (Tonkin et al, 2012)

Tonkin et al. (2012) developed the framework of “major components of an online marketing system” shown in Figure 8.

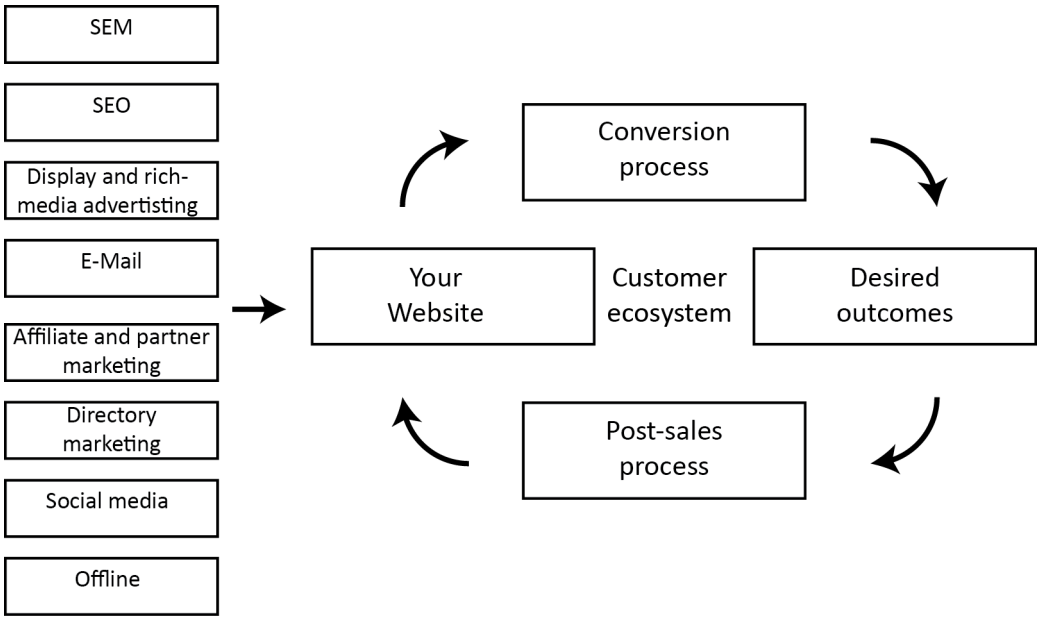


Figure 8: Major Components of an Online Marketing System (adapted from Tonkin et al, 2012)

This model is based on the idea that a modern website is part of an interconnected system that is needed to improve the company´s business requirements. The approach indicates Web Analytics to be a method to measure and analyse e-commerce components to support the achievement of the business objectives.

Tonkin divides the framework into two major parts. The left part contains the eight inbound marketing channels, which represent possibilities to engage with website visitors and potential new website visitors, which are linked to acquisition channels. Web Analytics is used to analyse relations between all these channels and to evaluate the value of each channel by measurements such as return on investment. Additionally the right side of the framework contains the customer ecosystem cycle, including the essential conversion process and the post-ales process. A conversion process covers conversion goal achievement of a website regarding to the business objectives. Besides the post-sales process includes actions to effect optimisations in repeat business. Due to Tonkin, the expansion of the customer ecosystem by increasing the number of repeat buyers and the conversion rate of visitors is the essential purpose of Web Analytics.

The Major Components of an Online Marketing System framework by Tokin (2012) expresses the importance of the connection between the website and the business requirements, which needs to be respected in the creation of a new Web Analytics framework.

5.3 Trinity Approach by Kaushik (2010)

One widely used Web Analytics framework is the Trinity approach by Kaushik (2010). It aims to generate Web Analytics actionable insights and metrics. The overall approach tends to achieve genuine understanding about website visitors that leads to sustainable competitive transcendence.

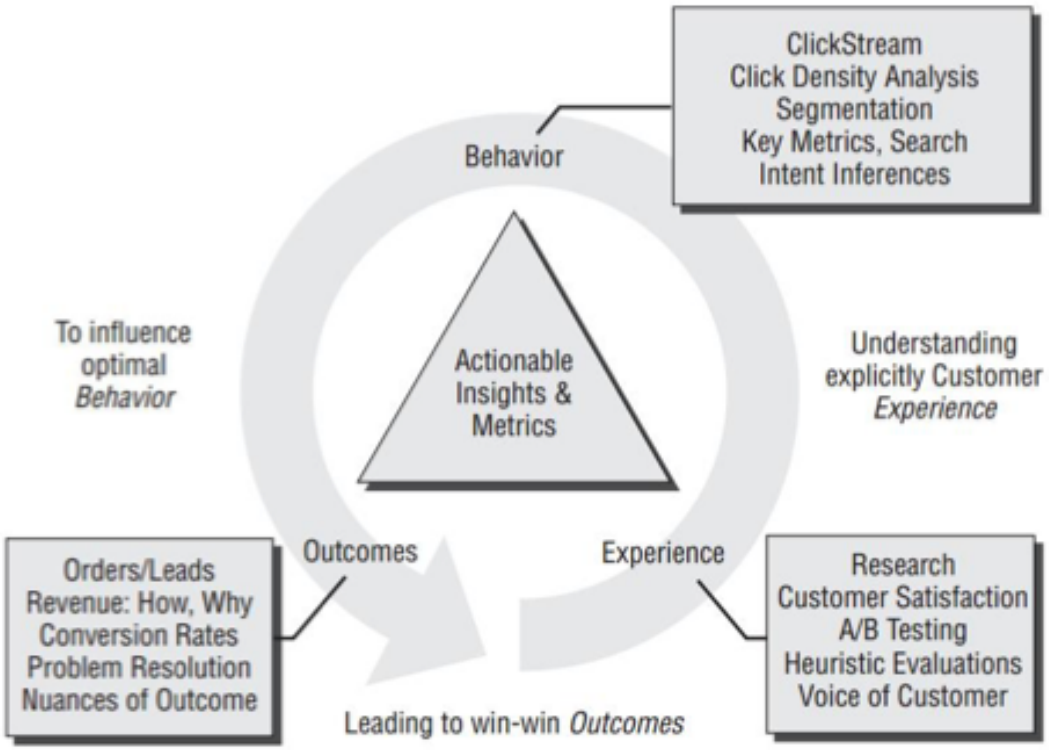


Figure 9: Trinity Approach (Kaushik, 2010)

The frameworks built on the three components: behaviour, experience and outcomes. Behaviour analysis consists of clickstream data, which is used for click density analysis, visitor segmentation and identifying key metrics to gather website visitor behaviour information. Outcome analysis is the monitoring component and tries to gain data about the goal achievement. Every website owner should define clear website objectives. For example, online retailers can measure sales revenues or purchases per visit, whereas information websites can look for new unique visitors, average visit time or the amount of shared information by measuring conversions. Finally, the third part of the framework is Experience Analysis, which aims to identify the website visitor action and behaviour information. Gained data delivers information about what visitors do on the website, not why they browse or use the website. Due to the framework experience analysis tools can contain visitor surveys, A/B testing methodology and lab usability testing (Kaushik, 2010). In the comparison of both Tonkin et al. (2012) and Kaushik (2007) frameworks it is obvious that they are relating website usage with website conversion. Analysing visitor behaviour achieves increasing conversion. Furthermore, financial measures are

not needed to reach conversion goals, which can therefore include engagement goals to cause interest and awareness.

Kaushiks Trinity Approach framework has a strong focus on website visitor behavior, which needs to be integrated into the new Web Analytics frameworks and guidelines for SMEs to guarantee a customer orientation.

5.4 Framework of Relations between Web and E-Business Metrics (Basel and Zumstein, 2009)

Basel and Zumstein (2009) created the framework of the relations between web and e-business metrics. This approach is mainly focusing on online retailers, although an application to other types of websites are possible.

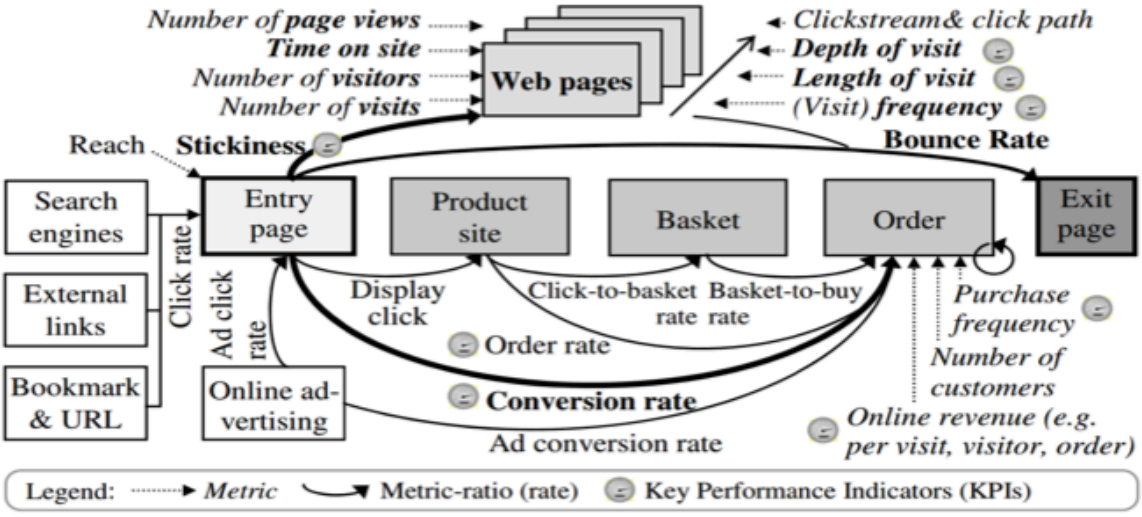


Figure 10: Framework of Relations between Web and E-Business Metrics (Basel and Zumstein, 2009)

The framework start is concentrating on the diverse traffic sources that lead to an entry page of a website. These traffic sources are linked with the inbound marketing channels of Tonkin et al. (2012). Efficiency can be proofed by analysing each traffic source. Following the website visitor browses through the web pages until he leaves from an exit page. If the entry and exit page are identical the usage can be tracked by the bounce rate. Similar to Kaushiks framework different metrics can be created due to the visitor behaviour, including for example number of page views, visit frequency, the length of visit and depth of visit. On the basis of this metrics diverse rations can be calculated such as the conversion rate. In addition the framework recommends a few metric and ration KPIs. The separated web and e-business metrics can be merged into KPIs to link website objectives into business objectives. This objective focus is also similar to the outcome analysis by Kaushik. Merged KPIs are online revenue per visit and online revenue per unique visitor. The last part of the framework illustrates a product purchase, beginning with product site, leading to the basket and closing at the order web

page. Basel and Zumstein declare different ratios to specify the visitors exit point out of the purchase process.

The framework by Basel and Zumstein was selected and analysed to observe a Web Analytic framework that focus on objectives, which evolve by mixing metrics to connect website objectives into business objectives.

5.5 Startup Metrics Framework by David McClure (2005)

The Startup Metrics framework was developed by Dave McClure (2005) and is based on five elements, which should lead to a successful business.

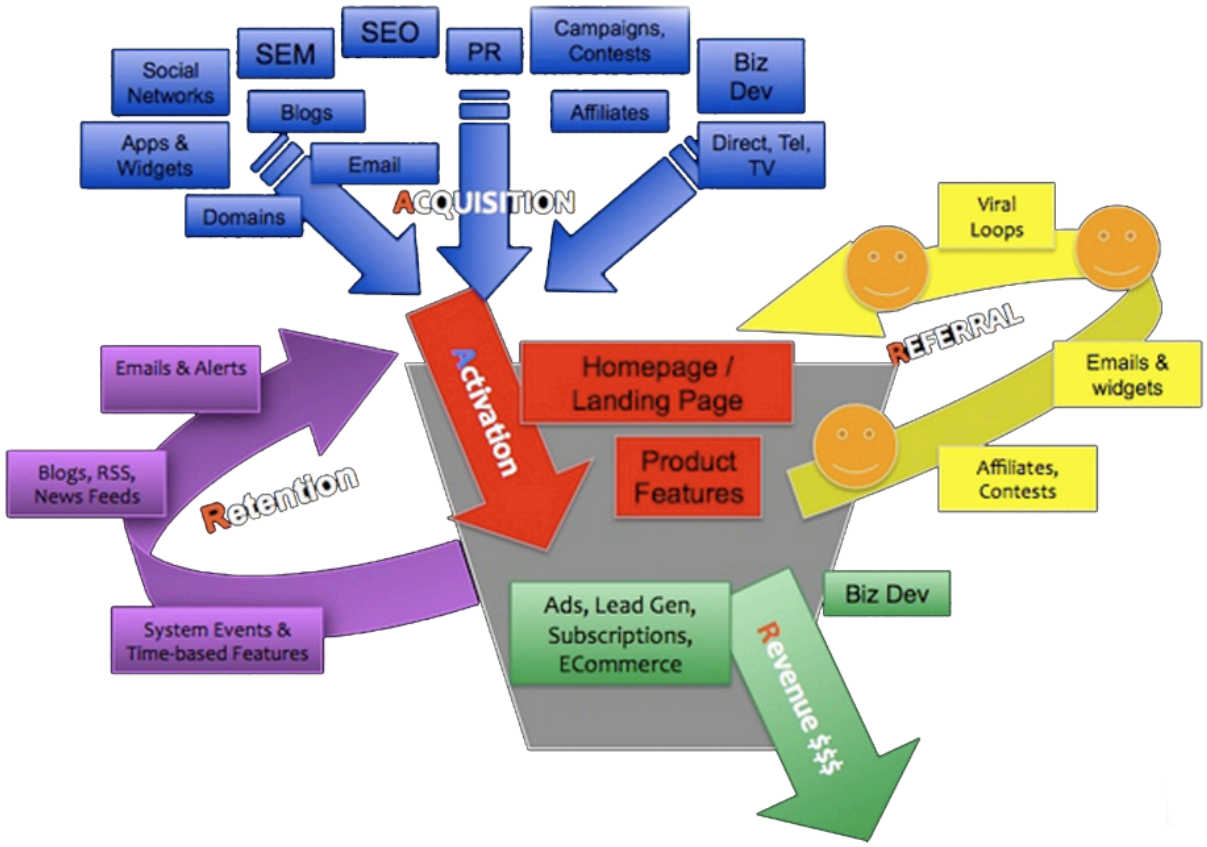


Figure 11: Startup Metrics Framework (David McClure, 2005)

These five elements are furthermore metrics and named acquisition, activation, retention, revenue and referral. One distinctiveness in comparison to all other frameworks is that the elements are not following a strict order. Therefore, the focus of the framework is primary on developing improvement through one of the metrics. The *Acquisition* is used to generate attention through a variety of organic and inorganic means and includes metrics such as traffic, mentions, cost per click and search results. Following *Activation* wants to turn the resulting drive-by visitors into enrolled visitors. Appropriate

metrics are enrolments, signups, completed onboarding process and subscriptions. *Retention* is needed to convince users to come back and bind them to the website, which leads to metrics such as engagement, time since the last visit or daily and monthly active use. The fourth element *Revenue* contains the business outcomes, which varies by the unique business model. Regarding metrics are customer lifetime values, conversion rates or click through revenues. Finally, the last element is the *Referral*. Referral is the viral recommendation of the website to other potential visitors, which can be measured by metrics such as invites sent, viral cycle time or viral coefficient.

David McClure (2005) created a Web Analytics framework with a strong focus on SMEs and their resource allocation and investment. This perspective needs to be attended in the new Web Analytics framework for SMEs.

5.6 Comparison between Web Analytics Frameworks

To provide a better overview about all analysed frameworks, two tables were designed to make the comparison of the frameworks easier. Table 1 illustrates the characteristics, premises, relative strategy, relationship, functions, historical background, basic structure and evolution of each discussed framework.

Characteristics / Frameworks	Web Analytics Framework	Major components of an online marketing system	Trinity Approach	Relations between Web and e-Business metrics	Startup Metrics
Premises	A Web Analytics framework should combine the theoretical view of Web Analytics with the practical implementation in the company.	Emphasises that a website is not existing in isolation and therefore an interconnecting addition to achieve a companies business goals.	Kaushiks framework wants to illuminate the practical integration of metrics by identifying visitor behaviour.	Web Analytics is needed to analyse potential purchaser by measuring their pass through the product purchase funnel.	A framework should elucidate where a SME has possibilities to invest resources on their website to attract visitors.
The position of strategy in the model	Provides a practical attempt to divide the implementation into five different processes.	Theoretical attempt to achieve business goals by analysing key component of e-commerce.	Practical approach to achieve actionable insights and metrics.	The model should identify the website visitors navigation and purchase process with the help of structured measurement through KPIs.	Practical approach to identify resource investment channels to attract website visitors.
Logical relationship between the criteria	Each process is converted in different steps. The steps are constructed on each other. After the last step a continuously repeating of the last five steps is destined to improve the results.	Eight inbound marketing channels present the way to engage with customers through a website. The website is part of the customer ecosystem cycle.	The framework consists of a cycle with three components: experience analysis, behaviour analysis, outcome analysis.	Different traffic sources lead to an entry page, where the visitor navigates a site until he leaves through the exit page. Every navigation step in the funnel can be measured with regarding KPIs and metrics.	Acquisition - Users come from different channels. Activation - For example they might experience the landing page of a website. Retention - Engage with the features of the website for time period and come back. Referral - Refer the website to friends. Revenue - Purchase or adds fund the website.
Proposed functions	The model is used to identify business requirements, plan web analytic integration, develop a data collection capability, achieve useable results and evaluate all actions.	The model should demonstrate different marketing channels and connect them with the ecosystem cycle, which quantifies value of each channel through Web Analytics.	Analyse user behaviour to understand customer through actionable insights and metrics.	Based on visitor behaviour different metrics can be generated. KPIs are more important than metrics. Matching metric can lead to connect a website with business objectives.	Develop a good product, market the product, monetarise it by identifying investment opportunities.
Background when it was founded	To develop a framework that is able to support SMEs to provide an easy entry point for undertaking Web Analytics software.	The framework was founded to describe the components and relationships of an online marketing system.	Instead of achieving mere reporting, this framework wants to gain visitor understanding.	A framework to focus on metrics and KPIs to achieve purchase improvements on e-commerce websites.	Framework leaves the marketer with the decision about where to spent time.
Basic structure	The framework is divided into a five phases cycle, which contains ten process steps. Each step has assigned specific tasks and questions which guide the applicant through the process.	Eight marketing channels provide the possibility to lead the user into the company´s customer ecosystem. The ecosystem consist of a cycle of four sale processes.	The circle contains the three analytic components, which include different methods to measure customer experience and behaviour to achieve leading to win-win outcomes.	A purchase funnel of five website parts effects in every step different KPIs and metrics.	Activation, Retention, Acquisition, Referral and Revenue channel are connected through the activation channel.
Evolution process	Developed in 2012, the framework was lightly improved due to the year 2016.				

Table 1: Comparison of Web Analytics Frameworks

Due to the different background and temporal connections every framework has diverse strengths and weaknesses in the aspect of Web Analytics. These are shown in Table 2.

	Strengths	Weaknesses
Web Analytics Framework	- Overcomes the shortcoming of standard Web Analytic frameworks - Strong and well structured implementation steps - The phases containing tasks and questions help to pass through the integration easily - Focus on results, action taking and performance improvement - Considers nearly every implementation step	-Only focuses on the vaguely processes -Missing the detailed guidance for SMEs
Major components of an online marketing system	-Detailed inbound channels	-Does not provide execution or implementation steps -Nearly no Web Analytic processes are explained -Short of Web Analytic logic among every edge
Trinity approach	-Strong focus on KPIs and Metrics -Attempt to understand user, instead of tracking often valueless metrics -Customer behaviour analysis	-Does not provide execution or implementation steps
Relations between web and e-business metrics	-Strong focus on e-commerce perspective -Practical KPI and metric thinking	-Perspective framework -Does not provide execution or implementation steps
Startup metrics	-Strong focus on the website visitor -Practically relevant investment strategy -Tests each visitors needs and opportunities -Contribution to quick implementation -Focus on results, action taking and performance improvement	-Does not provide execution or implementation steps

Table 2: Strength and Weaknesses of Web Analytic Frameworks

After the comparison of the different Web Analytics frameworks above, it becomes apparent that the Web Analytics framework by Hausmann, Williams and Schubert (2012) combines the most comprehensive Web Analytics integration approach for SMEs of all frameworks. No other Web Analytics

framework structures the WA implementation process more precisely and phased, while providing a simplistic application. Therefore the further research will concentrate primarily on the Web Analytics framework by Hausmann, Williams and Schubert and use it as the foundation for the new Web Analytics framework and guidelines. However the framework has no focus or process sections especially for Goolge Analytics and some of the phases are only examining the implementation superficially. This aggravates the application for SMEs with limited knowledge and increases the requisition for supporting Web Analytics and Google Analytics guidelines.

6 Web Analytics Performance Measurement of SMEs

This chapter delivers the fundamental theoretical background to measure Web Analytics in SMEs and to develop a Web Analytics framework and guidelines for Web Analytics usage in SMEs. ThereforeSection 6.1 of this chapter gives an overview of Performance Measurement. In Section 6.2 small and medium-sized Enterprises are questioned and their importance for economies is determined. Following this, Section 6.3 explains the concept of Object Key Results, Key Performance Indicator and metrics development in relation to Web Analytics.

6.1 Performance Measurement

Performance measurement is a widely used concept in diverse areas. Usually, performance is a measure of how well a mechanism or process achieves its purpose. In enterprise management, Moullin (2003) states an organisations performance as “how well the organisation is managed” and “the value the organisation delivers for customers and other stakeholders.” For this research, ‘performance’ is related to achieving stockholder/investor interests.

Measuring performance is a multi-dimensional concept. Effectiveness and efficiency are the two essential dimensions of performance. This is emphasized by Neely, Adams et al. (2002): “Effectiveness refers to the extent to which stakeholder requirements are met, while efficiency is a measure of how economically the firm’s resources are utilized when providing a given level of stakeholder satisfaction”. To attain superior relative performance, an organization must achieve its expected objective with greater efficiency and effectiveness than its competitors (Neely 1998). To illustrate efficiency, effectiveness, and the value delivered, multi-measures should be used. These measures are essential for SMEs to understand the development and condition of the business. Moreover performance measurement allows to induce estimated behavior, when goals are defined and feedback is obtained (McFadden, 2005). To analyse traffic on a website, there is a wide range of Web Analytics tools such as “Google Analytics” and some are even free of charge. Though there exists a barrier for SMEs to using Web Analytics efficiently, which is especially linked to literature and therewithin on how to implement the use of Web Analytics. Authors such as Hassler (2010) or Parmenter (2010) recommend that a business should develop Key Performance Indicators, while providing rarely advice on how SMEs can begin to initiate performance measurement in Web Analytics.

6.2 Small and Medium-sized Enterprises

Small and Medium-sized Enterprises are the backbone of most economies in the world today. SMEs are crucial to growth and success of economies and account between 50 and 70% of jobs in OECD countries. Exceptions are Japan and Italy with larger shares than usual and the United States with relatively small shares (OECD, 2009). A typical example of the impact of SMEs is the UK, with over 4.8 million SMEs, which account more than 50% of employment and company turnover (Treasury, 2010).

This significant impact is also appreciable in low and middle-income countries such as Nigeria. 70% of industrial employment and 60% of labor force are accounted by SMEs (Lawal, 2007). Small firms are known to be innovative, adaptive, flexible or vital and thereby play a crucial role for the strength of an economy. Sadly, due to their scale of operations and financial circumstances most do not have adequate implementations of Web Analytics (Clutch, 2015). A lot of SMEs are facing financial difficulties because of their young existence, inexperienced and informational opaque (Ekpu, 2016). According to IBI Research (2011) the key factors for not using Web Analytics are time (51%), know-how (40%) and cost (30%).

There are no worldwide-accepted definitions of small and medium-sized enterprises (SMEs). Therefore, the definition differs between countries and is often related to the total size of the economy as seen in Table 3. Typical definitions are grounded on categories such as number of staff and annual turnover. In Germany the "Institut für Mittelstandsforschung" (IfM) defines SMEs as companies with staffing between 1-499, divided in small businesses with 1-9 employees and turnover proceeds under 1 million euro and medium companies with 10-499 employees and turnover proceeds under 50 million euro. In this study, the German definition is used and the Web Analytic framework and guidelines try to align pre-eminently the needs of small enterprises without analytic specialists.

		Micro	Small	Medium	SME	Large
Germany	No. of Staff Turnover	1-4	1-9 <=€1 mil	10-499 <=€50 mil	1-499	>=500
EU	No. of Staff Turnover	<10 <2€ mil	<50 <€10 mil	<250 <€ 50 mil	1-250	>=250
OECD	No. of Staff Turnover	1-9	10-49	50-499	1-499	>=500
China	No. of Staff Turnover		<300	300-2000	1-2000	>=2000

Table 3: SME Comparison (UN-ECE (1996), NBSC (2003), IFM (2007))

6.3 Identifying Key Performance Indicators and Metrics for Web Analytics

One essential element of this thesis is the identification of KPIs and metrics of SMEs. These KPIs are used to discover business requirements and will be implemented afterwards in the Web Analytics software Google Analytics. This Section seeks to explain and address the way of proceeding.

6.3.1 Measure and Metrics

Measure is the definition of how success in reaching a business objective is determined. Defining specific measures prohibits ambiguity (Neely, 2002).

Two business partners are taking about their Web Analytics plans. Both are tracking website visitors to collect information. Each one has an own understanding of the term visitor. Therefore one is tracking the overall amount of visitors, while the other one is tracking unique visitors. As a result one will determine new and old website visitors, whereas the other only measures new unique visitors, excluding known visitors. Regarding to this profound difference, it is essential to define a single and clear measure.

Metrics are the basic information for analysing web traffic and are used to optimise a website to meet the goals. Due to the Web Analytics Association (2008) there are three types of web metrics: counts, rations and KPIs. The basic unit of a measure is called count such as the total number of visitors. Ratios are counts divided by other counts for example the click-through ratio, which contains the number of click-throughs for a link divided by the number the link was viewed. In addition a KPI can be a count or a ratio. Basic counts can be applied by all website types. However a KPI is connected to a business strategy. There is an individual element of a dimension that can be measured as a sum or ratio. Furthermore a dimension is a source of data that can be applied to define diverse types of segments or counts and stand for a dimension of visitor behavior or site dynamics. A metric is measured across a dimension. The Web Analytics Association Standards committee identified the three most important metrics to be: Unique Visitors, Visits/Sessions, Page Views (Web Analytics Association, 2008).

6.3.2 Key Performance Indicators

Due to Brian Clifton (2010, p.55) Key Performance Indicators “represent the key factors, specific to your organization, that measure success”. Moreover, the selected KPIs should reflect the organisation’s goals and must be measurable. There are almost infinite characteristics regarding to Key Performance Indicators. An important difference between Key Performance Indicators and Performance Indicators is that metrics are not always classifiable as Key Performance Indicator. Performance Indicators to reveal the difference in more detail six possible KPIs are chosen:

- Conversion rate
- Bounce rate
- Navigation patterns
- Average order value
- Average visit value
- Customer loyalty

These six KPIs are all connected to specific business goals. If a company declares KPIs, it is nevertheless possible that the intention of the KPI is construed differently between the employees. A web designer for example could look for every KPI, but concentrate only on the data that he is able to act on such as the navigation patterns. Owing to this the web designer receives reports about six KPIs, but handles only one as a KPI and five as PIs.

To develop KPIs it is necessary to define strategic business goals. Therefore Clifton (2010) shows six fundamental points to prepare KPIs:

- Set Objectives and Key Results
- Translate the Key Results into KPIs
- Proof KPIs to be actionable and accountable
- Create hierarchical KPI reports
- Define partial KPIs
- Consolidate

These points can be applied as a guideline to handle the process of constructing and developing KPIs.

6.3.3 Creating Objective Key Results and KPIs

Objective Key Results (OKRs) are providing information about business goals. They have to be prepared before the specific KPIs are chosen.

The definition of OKRs can be handled in four steps. At first the stakeholders have to be mapped. Stakeholders are internal or external organisational units such as a marketing agency, content creator or a CEO who is affected by the created Web Analytic reports. They should provide their perspective on how the analytic data fits to their department. In the second step the stakeholders determine requirements and expectation by discussing the current status, what data can be collected, the accuracy and limitations of Web Analytics information.

Following the third step defines or sets the OKRs. Therefore the websites objectives from different points of views have to be selected. Objectives can lead to more revenue as well as add insights. One example for a content website is the identification and removing of the least popular article, which is the result, by measuring the web page traffic, which is the related objective. After the identification of the OKRs, all objectives have to be linked to metrics that function as a KPI. Noteworthy, unlike metrics, which represent numerical data, KPIs belong to a business strategy.

The next Table 4 shows some matching examples for OKRs and KPIs:

Stakeholder OKR	**Suggested KPIs**
To see more traffic from search engines	Percentage of visits from search engines

	Percentage of conversions from search engine visitors
To sell more products	Percentage of visits that add to shopping cart Ratio of visits that complete the shopping cart over the number that started Percentage of visits in which shopping cart is abandoned at position X in the process
To see visitors engaging with our website more	Percentage of visits that leave a comment, click a love button (Facebook Like, Twitter Follow, Google +1, etc.) or download a brochure Percentage of visits that complete a Contact Us form or click a mailto link Average time on site per visit Average page depth per visit
To cross-sell more products to our customers	Average order value Average number of items per transaction
To improve the customer experience	Percentage of visits that bounce (single-page visits) Percentage of internal site searches that produce zero results Percentage of visits that result in a support ticket being submitted

Table 4: Stakeholder and matching KPIs (Clifton, 2010)

All developed KPIs need to be actionable and accountable. Due to Clifton measurement changes of KPIs, which do not lead to take action are not well defined. Vice versa efficient KPIs create expectation and drive action by helping the organisation to quickly analyse and understand visitor data. Furthermore important is to create hierarchical KPI reports, which contain only relevant information to focus the attention of the observer.

The next step is to define partial KPIs, also named “micro conversion”. One example for a partial KPI is the navigation to the download area, when the conversion is a purchase process. Partial KPIs deliver additional information to the measurement. In the last step all KPIs have to be evaluated. Some constructed KPIs may gain important metrics, others have to be consolidated or deleted in order to achieve the best goals.

Based on the knowledge and insights of the previous chapters and sections, a template was developed which can be used to define KPIs (see Table 5). The template structure allows searching for OKR, which will be divided into different KPIs. Matching metrics and goals can be defined to link them to the specific KPI. With the help of this template a clear structure and process-oriented development of KPIs is

enabled. The template user does not have to stick to the layout, an OKR can have a random amount of KPIs and as a consequence a KPIs can have any number of matching metrics and goals.

Web Analytics Guideline

Year: 2016

Objective Key Result	KPI	Metric / Goal

Objective Key Result 1							
KPI1		KPI2		KPI3		KPI n	
Metric 1	Goal 1	Metric 1	Goal 1	Metric 1	Goal 1	Metric 1	Goal 1
Metric 2	Goal 2	Metric 2	Goal 2	Metric 2	Goal 2	Metric 2	Goal 2
Metric n	Goal n	Metric n	Goal n	Metric n	Goal n	Goal n	Goal n

Objective Key Result 2							
KPI1		KPI2		KPI3		KPI n	
Metric 1	Goal 1	Metric 1	Goal 1	Metric 1	Goal 1	Metric 1	Goal 1
Metric 2	Goal 2	Metric 2	Goal 2	Metric 2	Goal 2	Metric 2	Goal 2
Metric n	Goal n	Metric n	Goal n	Metric n	Goal n	Goal n	Goal n

Objective Key Result 3							
KPI1		KPI2		KPI3		KPI n	
Metric 1	Goal 1	Metric 1	Goal 1	Metric 1	Goal 1	Metric 1	Goal 1
Metric 2	Goal 2	Metric 2	Goal 2	Metric 2	Goal 2	Metric 2	Goal 2
Metric n	Goal n	Metric n	Goal n	Metric n	Goal n	Goal n	Goal n

Table 5: OKR Planning Template

According to Clinton (2010) an organisation is good advised to define a maximum of ten KPIs. In contrast to Clinton, Peterson (2006, p.13) recommends a model that advocates a different view:

- Senior strategists, such as the CEO of a retail website should get 2-5 KPIs
- Mid-tier strategists, such as the Vice President of Marketing should get 5-7 KPIs

- Tactical resources, such as the Director of Online Marketing get the same KPIs as their managers plus detailed KPIs on reporting, which leads to 7-10 KPIs

In addition and considering that this thesis aims to address SMEs, Dave McClure (2015) recommends to define a maximum of 2-5 KPIs for SMEs.

As an example Table 6 presents a fictive OKR with KPIs and matching metrics and goals.

Year 2016

Objective Key Result	KPI	Metric / Goal

Increase Widget Sales by 15%							
Macroconversions		Microconversions		Sales Productivity		Remarketing	
eCommerce Sales	+5%	Instagram Follows	+800	Lead Response Time	-20%	Brand awareness	+10%'
Computer Orders	+25%	Web Registrations	+150	Average Deal Size	+15%	Social Media	+10%
Voucher Sales	+12%	Newsletter Signups	+4000	Unit Trans.	+10%	Referrals from RM	+55%

Table 6: OKR Planning Example Template

6.3.4 KPI Characteristic Guideline

Based on the previous theory, it is possible to define characteristics for well-defined KPIs. All characteristics are influenced by the research of Parmenter (2010) and Clifton (2010).

Relevant: All performance indicators need to be matched to the organisational strategy and provide valuable data.

Well-defined: KPIs are defined clear and without ambiguity to deliver explicit results.

Understandable and useable: Stakeholders of different departments have to be able to understand the equivalent meaning and know how to use the KPI.

Comparable

In order to compare metrics with other organisations and to find advice when facing problems, the KPI should be chosen comparable.

Testable: The gained KPI data needs to be stored and made available for evaluation.

Cost effective: KPIs have to be resource-conserving to measure and deliver more value to the user.

Attributable and Responsive: The measured performance indicator should be affected by the user in order to improve the website.

Create innovation: Innovative business processes and ideas should not be prohibited by consistency in measurements.

Statistically valid: The data needs to be valid to cause relevant analytics.

Efficient:

The KPI needs to be measurable in a reasonable amount of time.

To simplify and reduce these characteristics Doran (1981) defined the “S-M-A-R-T” characteristics of KPIs:

- Specific
- Measurable
- Attainable
- Realistic
- Time bound

All these characteristics are also recovered in the detailed ten KPI characteristic guidelines, but are as well useable as a more basic and solid specification to select relevant KPIs.

6.3.5 The KPI Design Template

Considering all information about KPIs and based on the OKR Planning Template, an additional KPI Design template was developed. This KPI Design template contains all information about one specific KPI. When the SME management unified their strategy on relevant KPIs, supplemental information is needed to implement the KPI effectively. At first, the KPI name is written into the template. Furthermore, the responsible stakeholders are predefined as well as the previously defined goal is copied.

Afterwards one question needs to be defined, which describes the exact objective target of the KPI. In addition, the template user needs to search for the ideal data collection method and the regarding data source. This can be a feature of a Web Analytics software or another medium such as a survey with the dedicated data source. Optionally a scale can be chosen, which defines the scale of the data collection method in detail. The targets are associated with the goal and define it precisely. All other template fields are needed to schedule collection, reporting frequency and the expiry date. When the KPI is implemented and data is collected, the last point KPI evaluation can be used to record inference about the KPI.

KPI Design
Net Promoter Score

Key Stakeholder	**Marketing Team**
Primary Goal	**Grow Customer Satisfaction**
Addressed Audience	**Website visitors**
Key Performance Question	**To what extent are our customers satisfied with our service?**
Key Performance Indicator Name:	**Net Promoter Score**
Data Collection Methods:	**The data will be collected using Google Analytics and the FanExam plugin.**
Scale	**Using a 0-10 scale (Not at all likely to extremely likely) participants answer: How likely would you recommend Company x to a friend or colleague NPS = pecentage of Promoters (score 9–10) Passives (score 7-8), Detractors (score 0-6)**
Targets	**50 per cent by the end of 2020**
Data Source	**Survey of Website Visitors**
Collection Frequency	**Daily**
Reporting Frequency	**Weekly**
Expiry / Revision Date	**6 months**
KPI Evaluation	

Table 7: KPI Design Template

6.3.6 KPIs related to a Website Type

Small and medium enterprises have to work conserving resources. Therefore the creation of KPIs due to the website type is an efficient approach to begin with (see Table 8). Based on McFadden a few KPIs are developed to describe the course of action in website type KPI creation.

Commerce	• Conversion rates • Average order value • Average visit value • Customer loyalty • Bounce rate
Lead Generation	• Conversion rates • Cost per lead • Bounce rate • Traffic concentration
Content / Media	• Visit depth • Returning visitor ratio

	• New visitor ratio • Page depth
Support/Self service	• Page depth • Bounce rate • Customer satisfaction • Top internal search phrases

Table 8: The four types of Websites and examples of associated KPIs (McFadden, 2005)

The case website used within this thesis belongs to the content / media type websites and therefore the further description will be focusing on content websites.

Content websites are generally concentrating on advertising and promotion with the main goal to increase website visitor traffic by keeping known visitors and gaining new visitors. One success factor is the continuously improvement and creation of new site content. Some content websites use their content only to link it to other types of websites to engage the user to the website. McFadden (2005) mentions four main KPIs for content websites including returning visitor ratio, new visitor ratio, visit and page depth.

The visit depth indicator provides the measurement of the ratio between unique visitors and page views, meaning the total number of pages a visitor requests each visit. This can be used to see how many and steps a visitor makes as he passes through the website and how long he is visiting each page. Normally, visitors with a higher visit depth are engaging more with the website. Vice versa website visitor with a low visit depth are requesting fewer web pages and can therefore be seem to not be interested in the website content. If the visitor depth is low, a way to increase the visitor depth is to look for the KPI target and address the targeted audience with more attractive content. Another attempt to attract the website visitor is the development of more interactive website content to increase the involvement (McFadden, 2005).

To measure returning visitors, a ratio between unique visitors and overall visits has to be calculated. This KPI measures the loyalty of the website visitor, an important indicator of retention, which reveals information about the activity and effectivity to return visitors. A high ration in this KPI indicates that not many visitors are returning, therefore the ration should be low. A low ration also implies that the visitor is engaged to the website and its content. Very low ratios could signify problems with the bounce rate or click fraud. Persons or scripts that produce sham or simulated website requests without having any interest into the site are called click fraud. According to Clicktale (2013) the average ratio for returning visitors is about 25%. An increased returning visitor rate can be achieved by improving and creating quality content.

Another important KPI is the new visitor ration. This ration measures new visitor vs. unique visitors and indicates if the website is able to interest new visitors. An influencing factor is the age of the website, cause new websites often attract new visitors. Reminding the Startup metrics framework, the

customer orientation is another factor. The website can focus on new visitors in the acquisition phase or try to address channels such as retention and referral to keep and engage customers. Normally the new visitor ration is decreasing over time, while vice versa the returning visitor ratio is increasing. Gaining new visitors can be achieved by developing and running new marketing strategies or campaigns.

An essential KPI for content websites is called page depth. This ratio measures the pages views of unique visitors for a particular website. While visit depth is concentrating on the visitor, the page depth KPI is focusing on the esteem of a website. Visit depth is used to identify in which websites visitors have special interests and that these interests are consistent with the website goals. Web pages with a higher than average page depth indicate an exceptionally interest of the website visitors to the web page. When pages with high page depth ratios are not part of the websites major content, a switch and reorientation to other content can be advisable.

In order to proof the website type KPIs of McFadden (2005) and to identify more relevant KPIs for SMEs an overview from seven different Web Analytics specialists (Marr, McFadden, Sammer, Cohan, Knight, Szotos, Kaushik) was created. Table 9 shows the result comparison. All listed KPIs are especially suggested for small and medium-sized enterprises.

Recommended KPIs for SMEs by Field of Application

KPI	Field of Application	B. Marr	McFadden	W. Sammer	P. Cohan	G. Knight	D. Szotos	A. Kaushik	Count
360-degree feedback score	Employees	x							1
Abandonment Rate	Behavior							x	1
Absenteeism Bradford factor	Employees	x							1
Average order value	Outcomes		x				x		2
Average visit value	Outcomes		x				x		2
Bounce rate	Behavior		x	x		x	x	x	5
Capacity utilisation rate	Internal Process	x							1
Capital-raising barometer	Outcomes				x				1
Cash conversion cycle	Outcomes	x							1
Cash-burn rate light	Outcomes				x				1
Conversion rate	Customer	x	x	x		x	x	x	6
Cost per lead	Aquisition		x			x	x	x	4
Count of Visits	Aquisition		x			x		x	3
Customer Acquisition Cost (CAC)	Aquisition			x		x			2
Customer Lifetime Value (CLV)	Aquisition			x		x			2
Customer loyality	Behavior		x						1
Customer profitability score	Outcomes	x							1
Customer retention rate	Outcomes	x							1
Customer satisfaciton	Behavior		x						1
Customer-growth monitor	Behavior				x				1
Delivery in full, on time (DIFOT) rate	Internal Process	x							1
Earned value (EV) metric	Internal Process	x							1
Employee engagement level	Employees	x							1
Gross profit margin	Outcomes	x							1
Human capital value added (HCVA)	Employees	x							1
Monthly Recurring Revenue (MRR)	Outcomes			x					1
Net profit	Outcomes	x							1
Net profit margin	Outcomes	x							1
Net promoter score (NPS)	Customer	x				x			2
New visitor ration	Aquisition		x		x			x	3
Operating profit margin	Outcomes	x							1
Order fulfilment cycle time	Internal Process	x							1
Page depth	Behavior	x	x				x		3
Per Visit Goal Value	Outcomes							x	1
Process downtime level	Internal Process	x							1
Product-development tracker	Internal Process				x				1
Project cost variance	Internal Process	x							1
Project schedule variance	Internal Process	x							1
Quality index	Internal Process	x							1
Relative market share	Customer	x							1
Retention Rate	Behavior			x					1
Return on investment	Outcomes	x							1
Returning visitor ration	Behavior		x				x		2
Revenue growth rate	Outcomes	x				x			2
Staff advocacy score	Employees	x							1
Top internal search phrases	Behavior		x						1
Traffic concentration	Behavior		x				x		2
Visit depth	Behavior		x					x	2

Table 9: Recommended KPIs for SMEs by Field of Application

The overview in Table 9 highlights the most named KPIs, which are also covered by McFadden (2005). On these grounds, the KPIs identified by website type in Table 8 can be recommended. In addition Table 9 adds a field of application to every KPI, which is independent of the website type. The field of application classifies KPIs into the categories: employees, behavior, outcomes, internal process and acquisition. These categories can be used to get an idea of the application possibilities. Moreover becomes apparent, that the advised KPIs of all analysts are often unrelated to each other. This indicates the difficulty of suggesting common KPIs for SMEs. Nevertheless, the information in Table 9 is a useful proposal for SMEs to find matching KPIs.

7 Google Analytics Implementation

Google Analytics (GA) is the most used Web Analytics tool on the market. According to the W3Tech website, which provides a broad range of information about web technologies, GA is installed in 40% of all known websites (W3Tech, 2016).

Developed after the acquisition of Urchin in 2005 Google Analytics was improved rapidly and proved popular in the web industry. The improvement process started with an optimised reporting interface for greater customisation and collaboration in 2007 and continued with advanced segmentation and dashboard management, custom reporting and motion charts, until the introduction of profile conversions in 2009.This update enabled the user to create goals for site time, page views and furthermore to set alters and notification for events.

Two years later Google improved the profile management to switch quickly between different dashboards and views. 2012 was an important turning point for Google Analytics with the launch of Google Analytics Universal. Universal offers the possibility to track users across diverse platforms. This is achieved by referring a unique ID to every website visitor to track the visitor on different devices. In addition features such as flexible tracking codes for every domain, organic search, referral and search term exclusion were introduced.

Google Analytics is part of the Google software family and therewith integrated in other Google software such as Google AdWords or other tracking software. A lot of third party Web Analytics platforms are compatible to Google Analytics or use it to receive analytic data for their platform.

7.1 Case Website

In order to be able to develop a useful, effective framework and regarding guidelines based on the literate research, a real website is needed. Therefore the case website www.businessculture.org (see Figure 11) was accessible for the researcher and was used for testing.

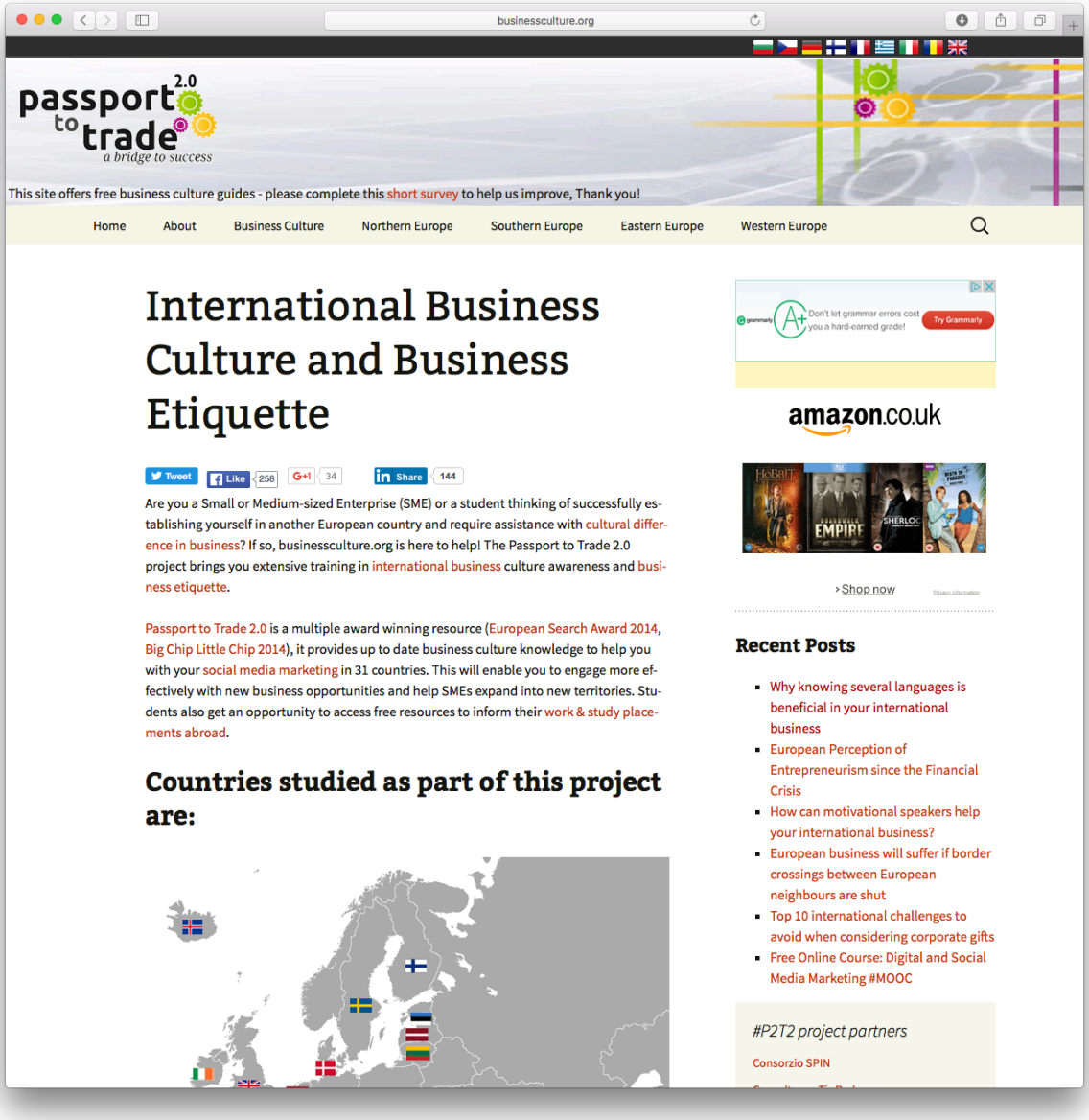


Figure 11: Case Website www.businessculture.org (2015)

Businessculture.org contains the project Passport to Trade 2.0. This project aims to develop free online training materials to help European SMEs and students to work abroad (businessculture.org, 2016). The award-winning website offers European business culture guidelines for online and face–to-face communication. It includes information such as up-to-date insights into European business culture for about 31 European countries and is accessible in nine languages.

The website belongs to the content website type as it is focusing on offering content to the website visitor. The landing page contains a top navigation bar with seven drop down menus. In addition a language bar on the top is available on every web page to switch between the nine languages. Furthermore conspicuous is the social network integration for Twitter, Facebook, Google Plus and LinkedIn.

The consistent right side of the website includes an advertisement banner, a recent posts selection, linkage to project partners, a Twitter and Facebook widget and finally the search field.

Businessculture.org offers a responsive design that is compatible to mobile devices. Even though the overall look is outdated and the underlying CSS stylesheet seems to position and arrange the boxes imprecisely, Google Analytics is already integrated into the website, wherefore the Google Installation chapter is based on the literature review.

7.2 Google Analytics Standard vs. Premium

The thesis uses Google Analytics as the only Web Analytic software approach, because it is the most used Web Analytics software on the market due to W3Techs (2016). Furthermore, Google Analytics offers a free usage plan, which is resource-efficient and therewith suitable for SMEs. The wide spread usage does also facilitate a knowledge exchange between SMEs. However even if the thesis is focusing on Google Analytics, it is advisable for an SME to compare all Web Analytics software products on the market before choosing one unquestioningly. An endorsed competitor of Google Analytics is the open source software PIWIK as an example (PIWIK, 2016).

In general the major difference between the standard and premium version of Google Analytics is the amount and sources of collectable data. Google Analytics Premium includes higher volumes to collect data and furthermore extra slots for custom dimensions and metrics. Another feature is the Roll-up properties, which enables the analyst to combine multiple properties.

If the analyst is in need for the DoubleClick platform, which is an integrated ad-technology platform, to import data in addition to Google AdWords, Google Analytics Premium has possibilities to include these services. The important reporting features are nearly the same, even if Google Analytics Premium is offering custom funnel reports, which enable better flow reporting.

In terms of sampling, Google Analytics Premium is supporting much more precise samples due to the higher volume of collected data. Google Analytics pre-calculates reports on relatively small amounts of data to generate quick requests. Therefore in Google Analytics Premium a sampling is less often needed. A major difference is the service support, where Google Analytics Premium includes service interaction and support in contrast to Google Analytics Standard. Table 10 gives an overview of the differences between both Google Analytics versions in detail.

Google Analytics	**Standard**	**Premium**
Data Collection		
Hits Per Month	10 million	1 billion +
Custom Dimensions/Metrics	20 each	200 each
Properties Per Account	50	50+
Views Per Property	25	25+
Roll-up Properties		x

Data Freshness	No timeframe guaranteed	4 hours guaranteed
Importing Advertising & Other Data		
AdWords Integration	x	x
AdSense Integration	x	x
DoubleClick Campaign Manager Integration		x
DoubleClick Bid Manager Integration		x
DoubleClick for Publishers Integration		x
Import Custom Data Sources	x	x
Query-time Data Import		x
Reporting		
Standard Reports	x	x
Custom Reports, Dashboards, & Segments	x	x
Custom Funnel Reports		x
Intelligence Alerts	x	x
Real-time Reports	x	x
Flow Visualization Reports	x	x
MCF Reports & Attribution Modeling	x	x
Data-driven Attribution Model		x
Sampling		
Standard Reports Pre-aggregated	x	x
Report Row Limit Per Day	50k	75k
Session Threshold for Sampling in	500k per property	50m per view
Report Row Limit		200k
Unsampled Reports		x
Unsampled Report Row Limit		3m
APIs		
Standards & MCF Report Data	x	x
Real-time Data	Beta	Beta
Configuration Management	x	x
Configuration Management Write Access	Beta	Beta
Unsampled Reports		x
Raw Session Data Via BigQuery		x
Service		
Service Level Agreements		x

Customer Support		Included
Customized Training		Included
Participation in Google Events		x
Early Enrollement in Betas		x

Table 10: Comparison of Google Analytics Free and Premium (Lunametrics.com, 2015)

A Google Analytics Premium Plan costs about 105.000€ per year due to Clifton (2015). This price will be not reconcilable with the resources of most SMEs. Moreover does Google Analytics offer a wide range of functionality for free and the data limitation is not a break to a successful and broad Web analysis, if the SME manages the free data collection capabilities efficiently. The thesis will therefore be conducting the free Google Analytics version.

7.3 Information Ethics, Security and Privacy

From a user perspective, collecting controlled analytic digital data is a unobtrusive method. Most Web Analytics methods are unobtrusive methods. An unobtrusive method does not require the researcher to intrude the participant and data is not a direct elicitation of the participant. One great benefit for the researcher is the observer effect, which limits the environmental intrusion. The observer effect implies that people react and behave differently, when they are feeling observed. Sociological research states that the researcher´s "intervention should not impair the non-reactivity of the erosion and trace measures by permitting the subjects to become aware of his testing" (Webb et al., 2000). This unperceived approach of Web Analytics, especially the user tracking, without explicit tagging rises to ethical considerations.

The thesis intents to use Google Analytics as the Web Analytics software approach. Google Analytics offers functionality such as diverse demographic features that has been often criticised ethically. Web Analytics tracks the website visitor's behaviour across the borderless Internet and creates, based on the collected data, user profiles to infer demographics and personal interests of the website user. Furthermore will this demographic data is stored centrally at Google's data centers and sold to website publishers.

Another intervention into the sphere of personal privacy can be found in Google Analytics terms of use. Google describes, that "Google Analytics collects user interaction information anonymously." (Google Analytics, 2016). In addition the terms of use reveal, that "Through cookie created information about your website use is transmitted (including the IP-Address) and stored on Google servers in the US" (Google, 2016).

The IP Address is classed among personal data and is stored by Google completely unexpurgated. Therefore, the usage and storage of the IP Address would normally need a statement of agreement from every website visitor. This agreement will be gathered through a small pop up window on every Web Analytics using website, without delivering further details and explanation for ingenious users. Furthermore problematically, the IP address in combination with additional usage data and is stored in

a foreign legal space from by service provider with diverse commercial application interests and possibilities.

Due to extensive criticism against Web Analytics the W3C developed the Do-Not-Track policy (Akkus et al. 2012, p 687). Furthermore, a community of analytics practitioners has published the Web Analytics: Code of Ethics to accomplish more integrity by providing the full disclosure of data collection practises (Digital Analytics Association). Browser developers such as Mozilla have developed features for their users to prevent them from being tracked. For example, there is a Do Not Track feature in FireFox that sends a Do Not Track HTTP Header to the website to opt-out of third-party tracking for purposes including behavioural advertising. Moreover some researchers started to build own analytics software on ethical grounds. Akkus et al. (2012) and Chen et. al (2013) describe a web architecture for Web Analytics which does not track individual users.

Another ethic analytics attempt from Leiva and Vivó (2013, 26) is the non-identifiable data collection. Their Web Analytics tool collects data input events without associated character codes to prevent the tracking of raw keystroke data, which allows to identify users and sensitive information. On a major position the government of Finland already adopted rules in 1999 that require the holder of personally identifiable data to publish personal information registry notice (Finnish personal information law).

7.4 Key Features

The following section will essentially be based on Clifton´s book Advanced Web Metrics with Google Analytics (2012) and focus on interesting functionality for SMEs.

Google Analytics offers a wide range of functionality. Table 11 shows an overview about the complete functionality in feature groups.

Advertising and Campaign Performance
Advertising Reports
Campaign Measurement
Cost Data Import
Mobile Ads Measurement
Remarketing
Search Engine Optimization

Just for mobile apps
App Profiles
App-Specific Metrics and Dimensions
Crash and Exception Reporting
Google Play Integration
iOS and Android SDKs

Analysis and Testing
Advanced Segments
Annotations
Content Experiments
Custom Reports
Dashboards
Real-Time Reporting

Product Integrations
Adsense
Adwords
Google Display Network
Google Tag Manager
Google+
Wildfire

Audience Characteristics and Behavior
Audience Data & Reporting
Browser / OS
Custom Dimensions
Flow Visualization
Map Overlay
Mobile Traffic
Social Reports
Traffic Sources

Sales and Conversions
Attribution Model Comparison Tool
Data-Driven Attribution
Ecommerce Reporting
Goal Flow
Goals
Multi-Channel Funnels

Cross-device and cross-platform measurement
Universal Analytics

Site and App Performance
Alerts and Intelligence Events
Event Tracking
In-Page Analytics
Site Search
Site-Speed analysis

Data Collection and Management
API
Filters
User Permissions

Table 11: Google Analytics Functionality Overview (Google Analytics, 2016)

The following functionality are standard features of Google Analytics, which include basic metrics that most SMEs will need to get an initial understanding of their website performance (Clifton, 2012):

Campaign Reporting

Google Analytics is able to track, compare and combine data about website visitors from mediums such as organic search, paid ads, referrals, newsletters, links, search engines etc. which forward the user to the Google Analytics connected website.

AdWords Integration

Campaigns can be tracked easily with Google Analytics due to the AdWords integration. Therewith an import of cost and impression data is possible, if the AdWords Landing pages URLs are tagged in Google Analytics. With the help of AdSense, reports can be generated showing which content achieves the most revenue.

Social Media Buttons

Social media buttons which are able to share website information on social networks, as included in the businessculture.org website, are tracked in Google Analytics. Therefore Google Analytics offers a section of reports to analyse this visitor engagement.

E-commerce Reporting

For e-commerce websites, Google Analytics is able to trace transactions to campaigns or keywords, fetch loyalty and latency metrics and identify revenue scores. The collected information can be observed per-product or per-category.

Goal Conversions (KPI)

Key page views or key events are named goal conversions. Goals to identify visitors are for example the fulfillment of a registration, a file download, a movie request, blog comments or submitting a survey such as the net promoter score. Besides determining goal conversions as page views and events, thresholds can be set such as time on site longer than 60 seconds.

Funnels

Google Analytics enables the analyst to create funnel steps. A funnel for example is an e-commerce purchase process that can be defined and analysed in individual steps. This leads to information about the visitor path, which allows to determine which web pages result in lost conversions.

Dashboard

The dashboard is a selection of created report widgets, which reflect your key data. It is possible to include twelve widgets into one customised report. This function will be explained in detail later in the chapter.

In-Page Analyst reports

In-page analytics offers a visual overview to control the popularity of links on the web pages. Key metrics are directly on the web page links.

Geomap Overlay Reports

Google Analytics is able to present data about the visitor location around the world and reveal it in reports. IP-address data is used to show key metrics overlaid on the world, continent, country or regional maps regarding to the dimension.

Segmentation

Through to segmentation Google Analytics can isolate subsets of visitor traffic data to analyse it in detail. Segments can be combined side by side to isolate and define specific visit patterns. In addition the advanced table filtering can mark out particular table rows in a report.

Data Export

Companies often need to further use the gathered data. Therefore reports can be automatically exported in diverse file formats such as CSV, TSV or PDF. Additionally a time based forwarding of the reports through E-Mail is implementable.

Internal Site Search Reporting

Websites with many web pages are often in need for structural improvements. Site search inputs can be used to identify the website visitors search patterns. Furthermore is possible to identify pages resulting in search requests, used search phrases and post search destination pages.

Customised Reports

Another important features for SMEs are customised reports, also outlined in detail later this chapter. Customised reports present selected information through to metrics and dimensions.

Event tracking

In-page actions are called events and used to identify interaction with website elements such as HTML 5 embedded videos, Ajax or widgets. Events round up your page view reports with additional important information and can also be used to find broken links or errors on web pages.

7.5 Installation

The Google Analytics installation is very simple and therefore even feasible for people without specific technical knowledge.

Firstly a Google account has to be created. This account can afterwards be used to login on www.google.com/analytics. The account can also be created on the analytics website. After the user is signed up, the welcome screen of Google Analytics appears. For the purpose of this thesis the installation into a website, not a mobile app, is explained further.

The field website URL has to contain the URL of the website such as “www.businessculture.org”. In addition the industry and the account name has to be chosen, matching to the website. By confirming the Data Sharing Settings Google will be able to deliver you additional information of industry competitors to compare your results. By confirming this settings the website owner is also sharing his data.

A new window shows the possibility to create a Tracking ID, which is unavoidable to install Google Analytics on the website. The generated Universal Analytics Tracking code (see Figure 12) has now to be copied into the HTML code of the website. It is important to paste the Tracking code exactly on every single web page before the ending head tag “</head>” of the HTML code.

If the tracking code was installed correctly, the phrase “Status: Receiving Data” will appear right next to the “Tracking ID” field.

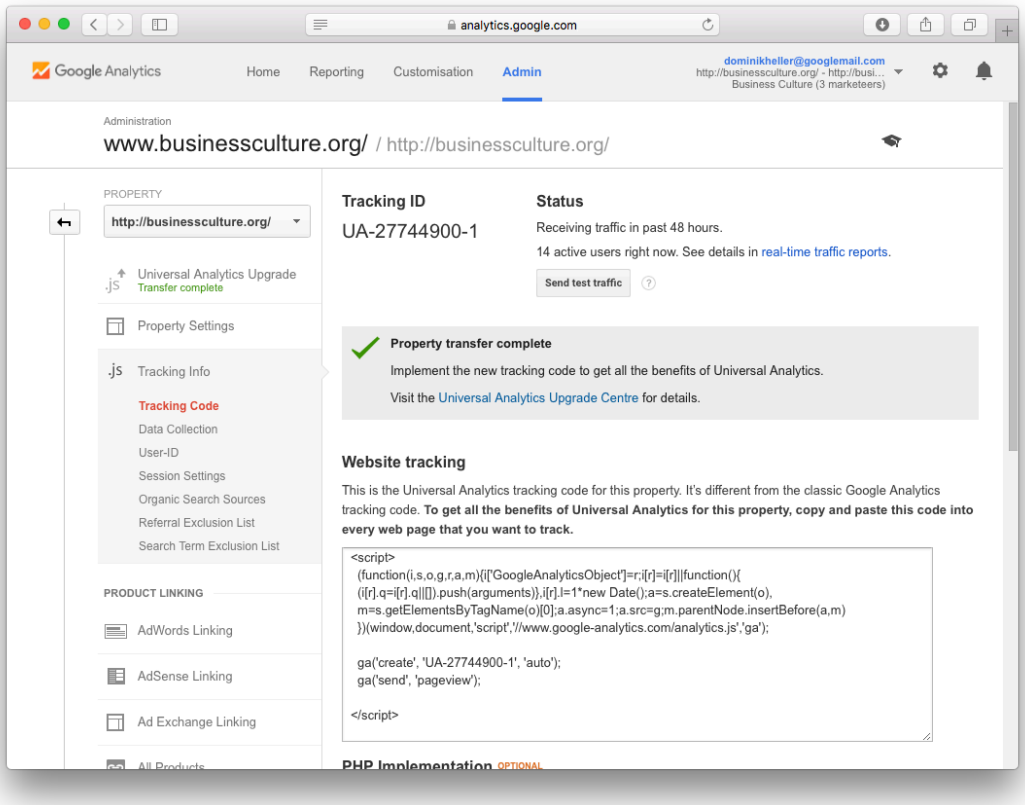


Figure 12: Universal Tracking ID

7.6 Google Analytics Interface

In addition to explain the Google Analytics Interface in detail a short video was created to introduce the Google Analytics user.

The Google Analytics interface, shown in Figure 13, is based on a consistent reporting view structure. The view contains the report data that has been collected. Generally the view is including an account structure with a single account, a single property and single view. The views are customisable and can in and exclude specific data. Another important part of the interface is the report navigation. The account list can be used to switch easily between different accounts and views. A list of all accounts, properties and views can be accessed through the Home tab. The Home tab also includes a summary of the session numbers, average session duration, bounce rate and conversion rate. The Reporting tab includes all pre-built core reports.

In order to find single reporting views, an overview containing all view elements was created with matching identifiers (see Table 11).

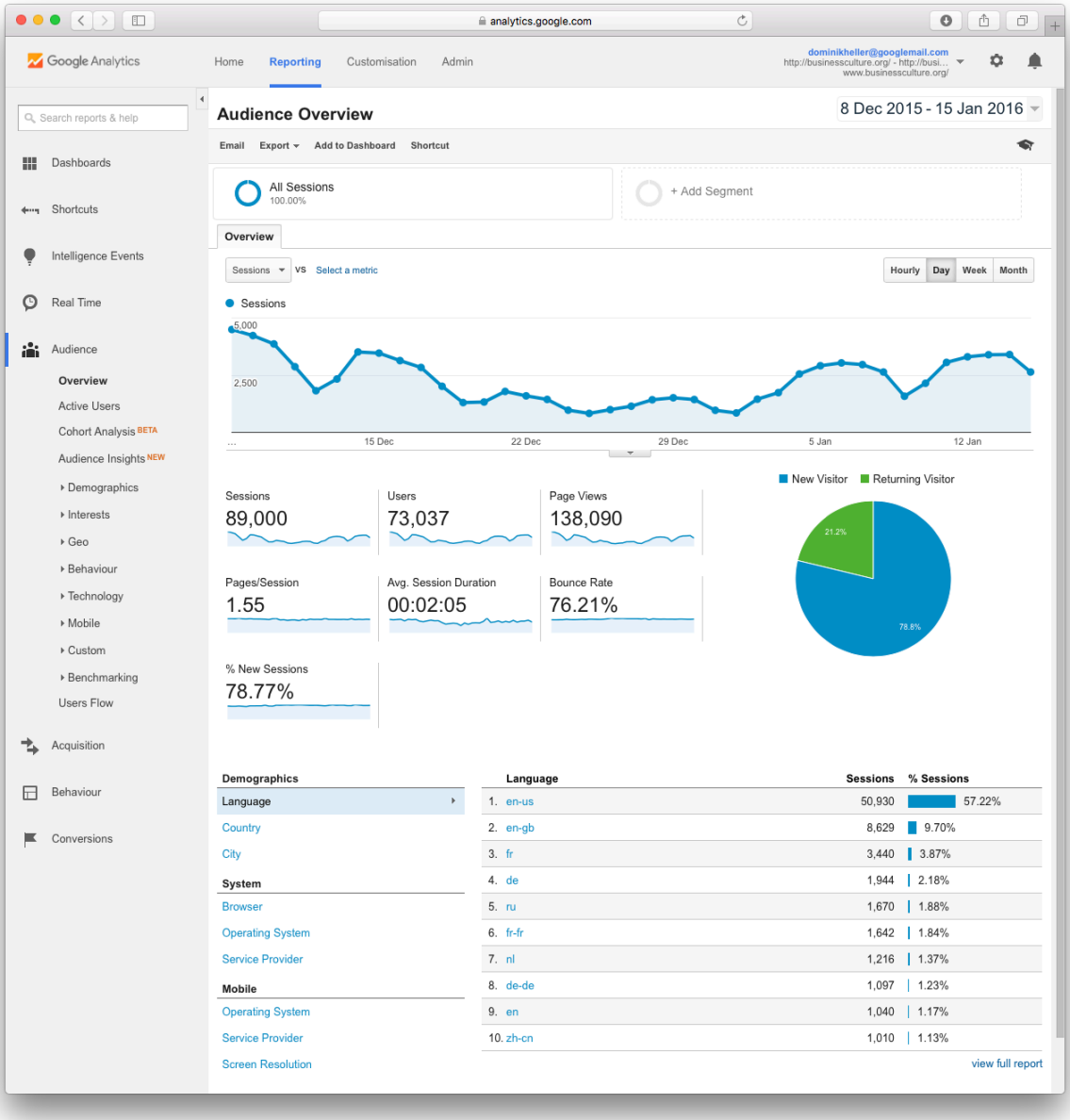


Figure 13: Google Analytics Interface

Google Analytics Report Navigation Map			
	F1	F2	F3
Da1	Dashboard	Private	
Da2	Dashboard	New Dashboard	
Sh1	Shortcuts	Overview	
In1	Intelligence Events	Overview	
In2	Intelligence Events	Daily Events	
In3	Intelligence Events	Weekly Events	
In4	Intelligence Events	Monthly Events	
Re1	Real Time	Overvie	
Re2	Real Time	Locations	
Re3	Real Time	Traffic Sources	
Re4	Real Time	Content	
Re5	Real Time	Events	
Re6	Real Time	Conversions	
Au1	Audience	Overview	
Au2	Audience	Active Users	
Au3	Audience	Cohort Analysis	
Au4	Audience	Audience Insights	
Au5	Audience	Demographic	Overview
Au6	Audience	Demographic	Age
Au7	Audience	Demographic	Gender
Au8	Audience	Interests	Overview
Au9	Audience	Interests	Affinity Categories
Au10	Audience	Interests	In-Market Segments
Au11	Audience	Interests	Other Categories
Au12	Audience	Geo	Language
Au13	Audience	Geo	Location
Au14	Audience	Behaviour	New vs Returning
Au15	Audience	Behaviour	Frequency and Recency
Au16	Audience	Behaviour	Engagement
Au17	Audience	Technology	Browser and OS
Au18	Audience	Technology	Network
Au19	Audience	Mobile	Overview
Au20	Audience	Mobile	Devices
Au21	Audience	Custom	Custom Variables
Au22	Audience	Custom	User-Defined
Au23	Audience	Benchmarking	Channels
Au24	Audience	Benchmarking	Loction
Au25	Audience	Benchmarking	Devices
Au26	Audience	UserFlow	

Table 11: Google Analytics Report Navigation Map

7.7 Reports

The report view enables the analyst to present data in different views. The source/medium report highlights the ways visitors connect to the website. Customised reports are an essential element to re-

ceive analytic information regarding to the defined KPIs. By adding a new report in the customisation top menu the analyst has to enter the following report content:

- Name: an individual name describing the report content can be chosen.
- Type: defines if the report data should be displayed in the explorer, flat table or map overlay.
- Metric Groups: contains every metrics that is needed to gather the specific data.
- Dimension: defines the dimension in which the data will be collected.
- Filter: are used to add optional commands such as regular expressions. Therewith it possible to search for and match particular elements within text
- View: selects the view in which the report will be created.

7.8 Dashboards

The dashboard is used to quickly view key information in a single report. Therefore the dashboard can be customised to show the reporting requirements of the SME. A new dashboard can be created by navigating to “Dashboards” and selecting “New Dashboard”. The next step allows to choose between a blank canvas or starter dashboard. A blank canvas is needed to build a dashboard containing the specific data. The single data views of the dashboard are called “widgets”. A standard widget contains:

Metric: displays diverse metrics such as the bounce rate.

Timeline: displays a trendline in the dashboard.

Geomap: locates a map report in the dashboard.

Table: shows a table of information.

Pie: includes a pie chart.

Bar: includes a bar chart.

In addition it is possible to create real-time widgets, containing a counter, timeline, map and table.

7.9 Key Performance Indicator Implementation

In chapter 6.3 the effective creation of KPIs was explained. The next step for an SME, after the installation of Google Analytics, is the implementation of these KPIs into Google Analytics. Therefore the Google Analytics functionality has to be mapped to the defined KPIs metrics and dimensions. This section explains and illustrates the implementation of KPIs into a customized dashboard with the example of the businessculture.org website.

Businessculutre.org belongs to the content / media website type. One dedicated KPI for example is “Visits” and “% New Visits by Landing Page”, sorted by the landing page. This KPI collects data, that implies information about which landing page is requested the most referring to the most sessions and furthermore the percentage of new sessions. The gained information can be used to see which

landing pages are popular and due to the session rate it can be estimated if the page content interests the visitor. The mapping process starts with the identification of matching metrics. Therefore a list of all Google Analytics dimensions and features was created, which is grouped by features (see Table 12).

Google Analytics Dimensions and Metrics Overview		
Feature	**Dimension**	**Metric**
User	ga:userTypeUser Type	ga:usersUsers
	ga:sessionCountCount of Sessions	ga:newUsersNew Users
	ga:daysSinceLastSessionDays Since Last Session	ga:percentNewSessions% New Sessions
	ga:userDefinedValueUser Defined Value	ga:1dayUsers1 Day Active Users
		ga:7dayUsers7 Day Active Users
		ga:14dayUsers14 Day Active Users
		ga:30dayUsers30 Day Active Users
		ga:sessionsPerUserNumber of Sessions per User
Feature	**Dimension**	**Metric**
Session	ga:sessionDurationBucketSession Duration	ga:sessionsSessions
		ga:bouncesBounces
		ga:sessionDurationSession Duration
		ga:hitsHits
Feature	**Dimension**	**Metric**
Traffic Sources	ga:referralPathReferral Path	
	ga:campaignCampaign	
	ga:sourceSource	
	ga:mediumMedium	
	ga:sourceMediumSource / Medium	
	ga:keywordKeyword	
	ga:adContentAd Content	

Table 12: Google Analytics Dimensions and Metrics Overview Excerpt

The defined KPI needs the metric “Sessions” and “% New Sessions”, and in addition the dimension landing page, because only landing pages should be combined with the metrics.

In a next step the defined metrics and dimensions have to be included into the referring fields of the “+Add widget” window (see Figure 15). After the information is typed in and the dialogue is saved, the widget will appear and present the searched data.

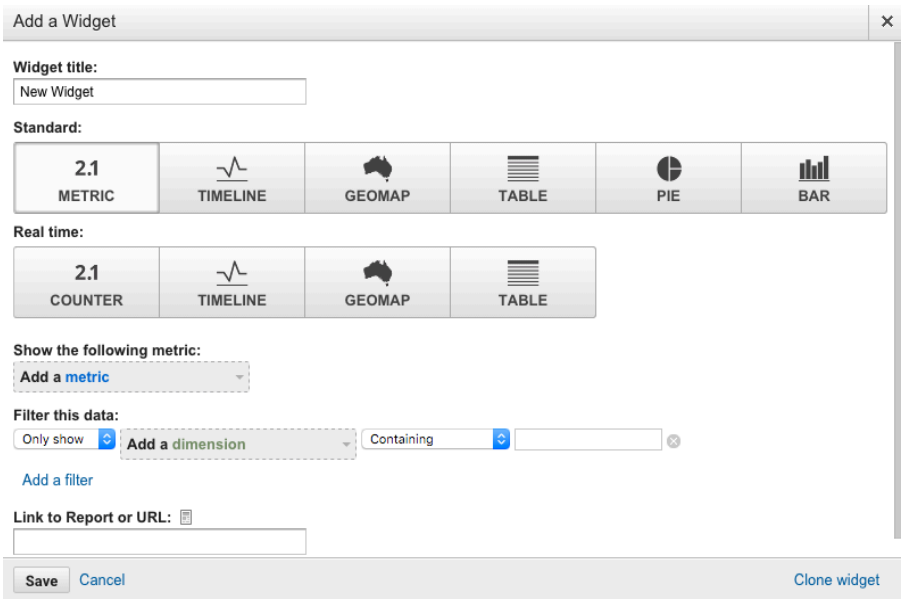


Figure 15: Widget Creation

In order to help SMEs with this course of action, a mapping table (see Table 13 or Appendix B) was created, which shows the needed metrics and dimensions for some KPIs. The table also divides the KPIs in website categories and is based on the Google Analytics functionality window design.

Dashboard

WebSiteType				Name (KPI)	Link to Report or URL	Metrics		Dimensions	Filter
Commerce	Content	Lead Generation	Support						
x	x	x	x	Visits		Sessions			
x				Visits and Product Revenue by Mobile		Sessions	Product Revenue	Mobile	
x				E-commerce Conversion Rate		E-Commerce Conversion Rate			
x				Visits and Product Revenue by Source / Medium		Sessions	Product Revenue		
x				Top 10 Products by Revenue		Product Revenue	Unique Purchases	Product	
x				Total Revenue		Revenue			
x				Transactions		Transactions			
x				Average Order Value		Average Order Value			
x				Average Revenue by Session		Per Session Value			
	x			Pageviews and Unique Pageviews by Page Title	Behaviour / Site Content / All Pa	Page Views	Unique Page Views	Page Title	
	x			Visits and % New Visits by Landing Page	Behaviour / Site Content / Landi	Sessions	% New Sessions	Landing Page	
	x			Avg. Time on Page and Bounce Rate by Page Title	Behaviour / Site Content / All Pa	Avg. Time on Page	Bounce Rate	Page Title	
	x			Exits and Pageviews by Page	Behaviour / Site Content / Exit P	Exits	Page Views	Page	
	x			Pageviews by Country / Territory		Page Views		Countrys	Page Title / Reg Exp "(.*)"
	x			Pageviews by City		Page Views		City	Page Title / Reg Exp "(.*)"
x	x	x	x	Unique Visitors		Users			Audience / Overview
x	x	x	x	Overall Visits		Sessions			
x	x	x	x	Signup Conversion Rate		Share Social Content (Goal 1 Conversion Rate)			
x	x	x	x	Conversions by Social Network		Sessions	Share Social Content (Goal 1 Conversion Rate)	Socail Network	Social Source Referral / Exactly Matching/ Yes
	x	x		Blog Visits		Sessions			Page Path Level / Containing / Blog
	x	x		Blog Pages / Visit		Page / Sessions			Page Path Level 1 / Containing / Blog
	x	x		Blog Post Visits		Sessions		Page Title	Page Path Level 1 / Containing / Blog
x	x	x	x	Organic Visits by Keyword	Acquisition / Campaigns / Organ	Sessions	Avg. Session duration	Keyword	Traffic Type / Exactly Matching / Organic
x	x	x	x	Avg. Page Load Time (sec)	Behaviour / Site Speed / Page Ti	Avg. Page Load Time (sec)			
x	x	x	x	Average Visit Duration	Audience / Behaviour / Engagem	Avg. Session Duration			
x	x	x	x	Average Pages per Visit	Audience / Behaviour / Engagem	Pages / Session			
x	x	x	x	Visitor Loyalty		Sessions	Social Actions	Count of Sessions	
x	x	x	x	% New Visits by Destination Page	Conversions / Goals / Overview	% New Sessions		Destination Page	

Table 13: KPI - Google Analytics Mapping

Therewith it is simple to implement a KPI into the Google Analytics functionality. Furthermore can this table be used to create and develop new KPIs.

This approach was also realized for the customized report function of Google Analytics (see Appendix B). SMEs can also use the Google Analytics Report Navigation map to find all pre-based reports more easily (see Appendix D).

In the example of the businessculture.org website, the defined KPI leads to data showing that the page “business-culture/cultural-differences-in-business/” has the most sessions. The “% New Ses-

sions" metric with 86.83% indicates that the web page is not very attractive for returning visitors. Nearly every web page of businessanalytics.org has a new sessions indicator of above 80%, which indicates that the website is not focusing on or attracting visitors to come back. This could be explained with the business culture content, which is normally not needed to be reviewed many times.

8 Developing the Google Analytics Framework and Guidelines for SMEs

This chapter presents the development of the new Google Analytics framework. The framework development is based on the previous findings of the thesis. At first the new framework, based on Hausmanns, Williams and Schuberts (2012) Web Analytics framework is introduced. After this attending guidelines for SMEs are invented, which guide SMEs to the overall WA process.

8.1 Issue Identification

The issue of Web Analytics in SMEs is a new field of research. Hausmann developed one of the first approaches to address this operational area in detail. Only the Startup metrics framework by Dave McClure contains similar rudiments of guiding SMEs to Web Analytics. The framework components containing Acquisition, Activation, Referral, Reference and Revenue pursue a remarkable point of view and method to Web Analytics for SMEs. Among the other Web Analytics frameworks is no framework that is concentrating primarily on Web Analytics for SMEs. Moreover the other frameworks are paying most attention on Web Analytics for e-commerce websites, have only superficial consideration of business requirements or KPIs, do not identify the purpose of the website and corresponding Web Analytics requirements and are not providing assistance in the comprehension of WA measurement. As mentioned in Chapter 1.1, especially SMEs are struggling in terms of time, know-how and cost with regards to Web Analytics. Therefore the underlying attempt of attentive selection from one or more of the five components to invest resources is significant for nearly every SME with limited financial and human resources. As opposed to this, the Web Analytics framework by Hausmann shows less consideration for the detailed resource management. In return it is offering the most detailed designed implementation process of Web Analytics that was found during the literature research. Therefore the new framework and guidelines for SMEs should observe the Web Analytics Framework by Hausmann by refining and developing it further on the missing edges.

In Table 14, issues of Web Analytics in SMEs from different approaches are addressed. To identify the strength and weaknesses of each approach, the typology in Table 14 is used as foundation for the analysis. Based on this overview key approaches and requirements for a new framework for Web Analytics are defined.

	Web Analytics Framework	Startup metrics	Trinity Approach	Relations between web and e-business metrics	Major components of an online marketing system
Have flexible and dynamic adaptability	**x**	x	x		

Develop strategy	**x**	x	x	x	x
Identify OKRs and KPIs			x	x	
Lead to action taking and performance results	**x**	x	x	x	x
Structure the integration and implementation into logical steps	**x**			x	
Consider different participants	**x**	x			
Concentrate on one Web Analytics software					
Be specialised on SMEs	**x**	x			
Support and guide SMEs through the complete Web Analytic process cycle	**x**				
Be applicable for Web Analytics beginners		x	x	x	
Explain Web Analytics functionality					
Sustain evolution and change process	**x**				

Table 14: Web Framework Requirement Comparison

The requirement comparison shows once more, that the Web Analytics framework by Hausmann, Williams and Schubert (2012) delivers a solid foundation for the new Web Analytics framework and

guidelines. The Web Analytics framework fulfills the most requirements and combines a unique and effective approach to implement Web Analytics into a SME. Besides, it is not using a predefined Web Analytics software such as Google Analytics, the main weaknesses are deriving from the more theoretical, structural process for Web Analytics implementation. For example, phase 2 “Planning for Web Analytics” mentions the identification of data collection methods and metrics, but does not explain the course of action in further detail. This gap will be addressed by the new guidelines.

8.2 Developing an Effective Google Analytics Framework

At first the framework of Hausmann, Williams and Schubert (2012) is taken into a new flat design approach, which is in form and content equal to the current design (see Figure 16).

All original content and information is exactly transferred into the new design. The new design indicates the different phases of Hausmann´s “High Level WA Process Cycle” through a coloured triangle at the left side of each single framework step. The continuously improvement of the Data Processing, Pattern Analysis & Identification, Action Taking and Evaluation phase is expressed through the doted line on the right side, tagging it as a continuous cycle.

In a next step the framework has to be matched to the new requirements (see Figure 17). Therefore the steps have to be adapted to the new conditions, regarding to the use of Google Analytics. Because of that the Web Analytics Possibility Analysis step is removed and merged into the Google Analytics step. In addition the Tool Selection step is also abstracted from the WA framework for focusing on Google Analytics as the WA tool of choice. Therefore the new Google Analytics step builds the basis of the new framework. A Web Analytics tool implementation is related to knowledge acquisition. Moreover need data collection methods and matching metrics be identified to fulfill the step. Within, the step indicates also, that Google Analytics can be implemented standalone or with additional tools such as Google AdWords. Next the Implementation step was changed into the Google Analytics Implementation step. The contained implementation activity was adopted without changes. Implementation involves the setting up of Goolge Analytics and its customisation to capture and process the relevant data types and metrics. All the other steps, including “Data Processing”, “Reporting, Pattern Analysis & Identification”, “Action Taking”, “Evaluation” can be carried over without change, because of the similar Web Analytics proceeding. Websites are subject to continuous development and evaluation, which is perfectly reflected in the framework steps.

The new Google Analytics framework is complemented with a number on each triangle. This numbers are used to match the steps of the framework to the SME guidelines.

Figure 16: Web Analytic Framework based on Hausmann, Williams and Schubert (2012)

Figure 17: The new Google Analytics Framework

8.3 Developing Web Analytics Framework Guidelines

In consideration of the literature review and all gained findings and information about the integration of KPIs into Google Analytics, a guideline needs to be developed to further assist SMEs, which are willing to implement Google Analytics on their website. The previous sections 8.1 and 8.2 analysed the gap and issue identification, which showed that the Google Analytics framework needs additional guidelines to address the gap between theory and practice to support the SME with the Web Analytics implementation. However, the outcome of this is the grounded idea for guidelines, which are designed in the form of a cooking recipe to complement the Goolge Analytics framework. These guidelines show where and how to begin with Web Analytics and allow the SME to complete the guideline step by step in a structured process. All significant previous findings need to be integrated and easily realisable. According to these requirements a Google Analytics Guideline for SMEs was created. It is shown in Figure 18 and divides the Web Analytics implementation in ten different steps, which are connected through a blue marked number to the Google Analytics framework. Each step begins with a question related to Web Analytics, that the user can answer with yes or no. If he already knows the answer to the question, the user can skip the step and start with the next question, highlighted by the green arrow. If the guideline user does not know the answer, he can follow the instructions behind the red arrow. By following the descending order of the guideline, the user is introduced to the Web Analytics implementation step by step. Every instruction is designed focusing on SMEs and represents the literature findings.

Following every step and instruction is outlined and described:

Do you know your website category and matching KPIs?

To identify the website category and matching KPIs Figure 23 was created. With the help of the information provided in Figure 23 and chapter 6 the guideline user is able to identify the SME´s website type and find related, commonly used KPIs with the “OKR Planning Table” (see Table 5).

Are you satisfied of your website?

Website design is an important part of the Web Analytics process. Figure 20 offers recommendations for an efficient and aesthetic web design.

Do you know your Goals and KPIs?

One of the most important Web Analytics implementation steps is the identification of Goals and KPIs. Therefore Figure 22 shows KPI characteristics in an overview. To guide the SME a structured approach was designed, resulting in the OKR Planning Template (see Table 5) and the KPI Design Template (see Table 7).

Is Google Analytics installed?

The installation of Google Analytics is simple and explained in detail in chapter 7.5. In addition, to get a basic understanding of some important Web Analytics definitions, Figure 22 was created.

Do you know the interface?

To get to know the Google Analytics interface a video was created, which guides the user through the Google Analytics interface.

Do you know the metrics you want to track?

After all OKRs and KPIs are developed, matching metrics have to be identified. Chapter 6 explains the process in detail and adds the recommended KPIs and metrics table (see Table 9) to find KPIs and metrics related to the field of application. An overview of all metrics in Google Analytics is offered in Appendix C with the Google Analytics Dimensions and Metrics Overview. If the user identified relevant metrics, the next step is the implementation in Google Analytics with the help of the dashboard and customised reports table.

Have you worked with the dashboard?

Users can get an introduction to reports by following chapter 7.9 “KPI Implementation” and using the Dashboard table in Appendix B.

Do you know how to create reports?

The creation of reports is explained in chapter 7.9 and is based on the Google Analytics Reports Map and customised reports table (see Appendix B), which describes a simple method to implement reports. The sheets or tables already contain predefined report settings and can be extended by the user.

Do your analytic reports perform action?

The report evaluation is part of chapter 6.3 “Identifying Key Performance Indicators and Metrics” and chapter 7.8 “Reports”. Small and medium-sized enterprises differ in size, business requirements and goals, which are linked to the Web Analytics performance. Therefore every SME has different Web Analytics demands and requirements. To support the SMEs anyhow the KPI development helps with the goal identification, while Google Analytics reports are explained in the thesis and extended with the Report Navigation Map (see Appendix D), Dashboard and Customised reports to generate fitting and efficient reports due to the website type of the SME.

Are interested in additional functionality?

The last step has no instructions at the moment and was integrated to allow the extension of additional content.

In addition Figure 19 shows the Web Analytics path to see an overview about all tables and figures, which are used during the Web Analytics implementation process.

Finally, to share the research results of the Google Analytics framework and guidelines, a basic website was created shown in Appendix A.

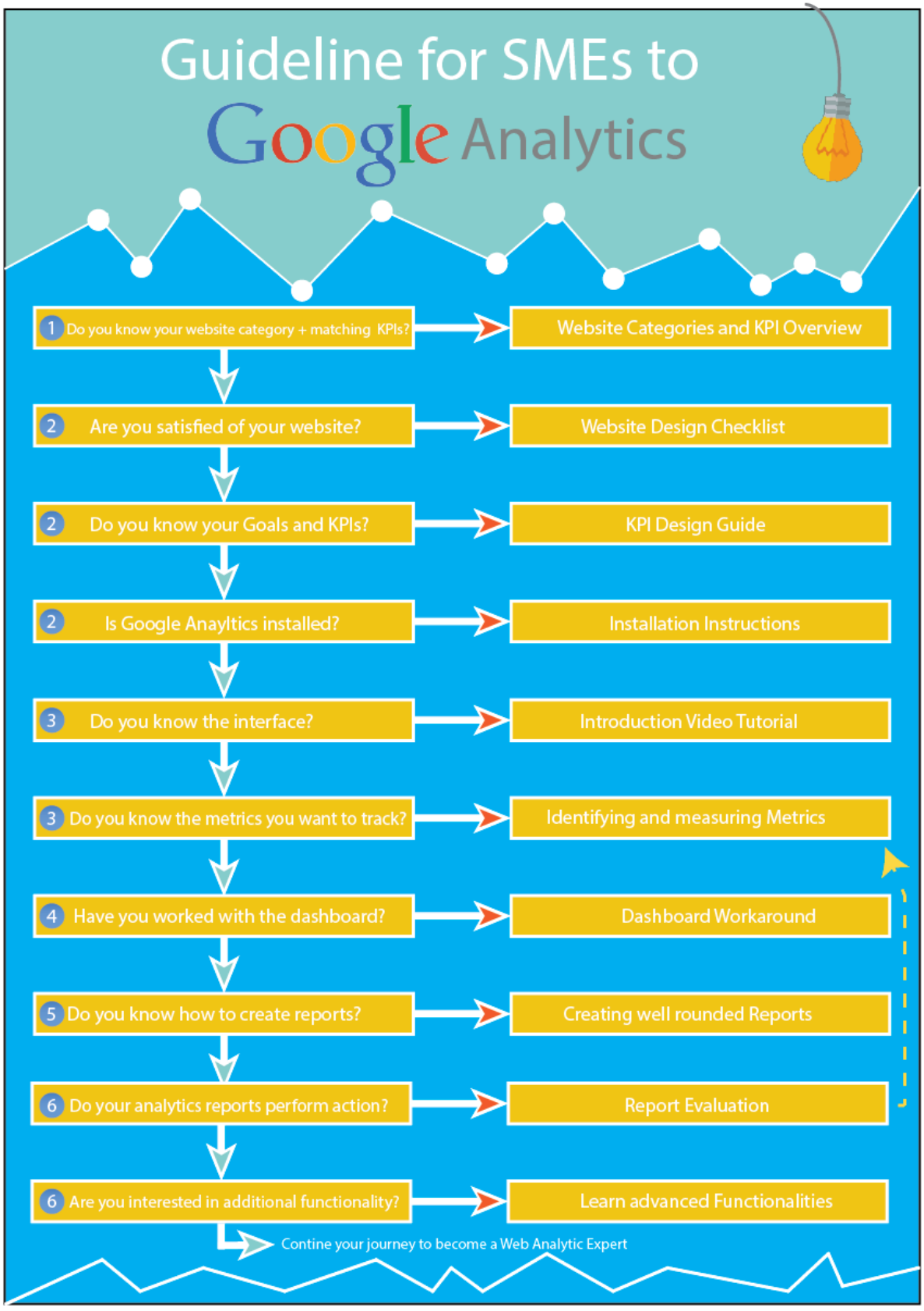


Figure 18: Guidelines for SMEs to Google Analytics

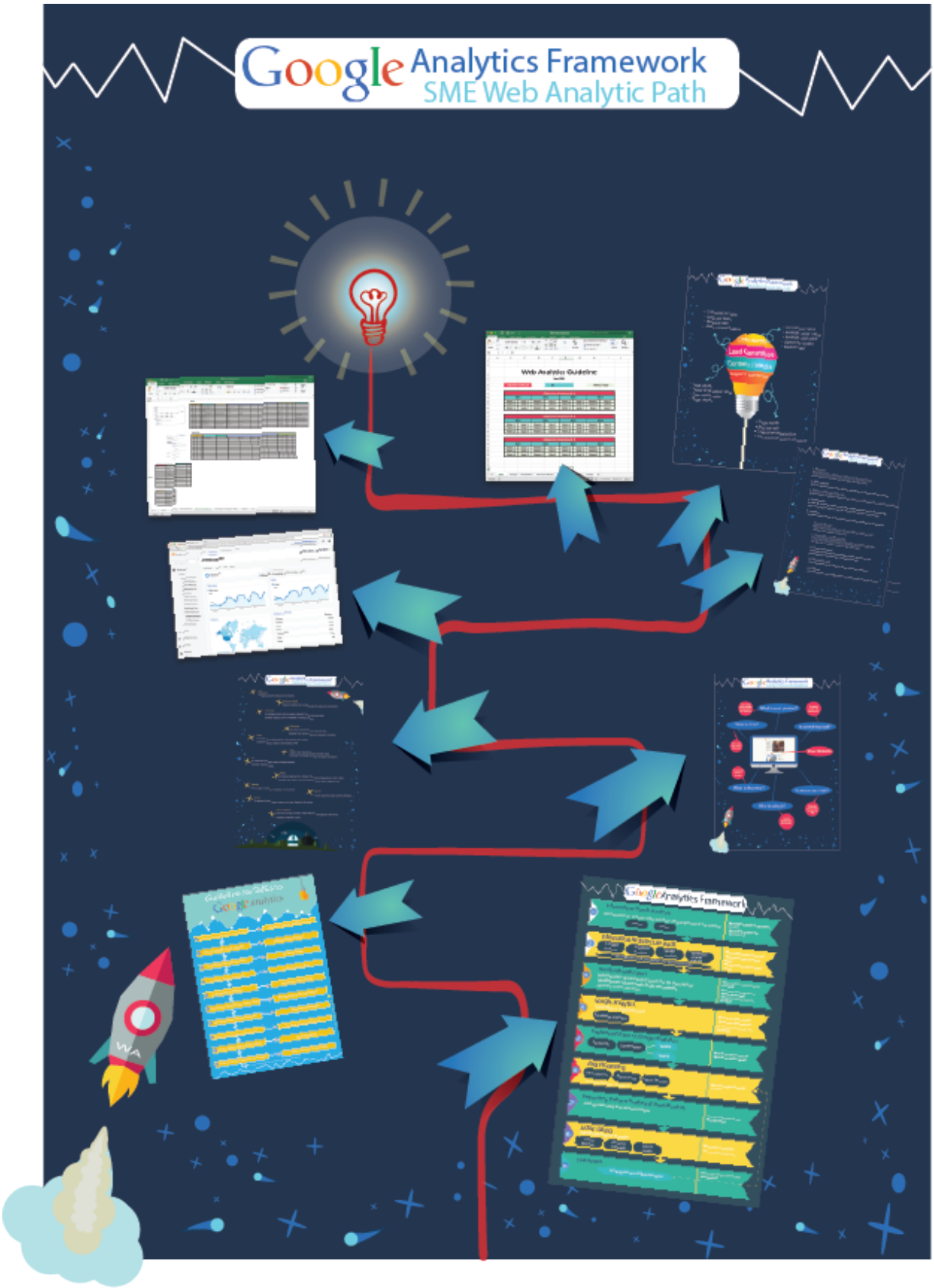


Figure 19: SME Web Analytics Path

Figure 20: Design Recommendations

Figure 21: KPI characteristics

Figure 22: Web Analytics Defintions

Figure 23: Website Categories / KPIs

8.4 Framework Limitations

Due to the time limit, the new guidelines are subject to some restrictions. The framework and guideline illustrate and pave the way for additional content and extensions. Google Analytics provides a wide spectrum of functionality, which needs to be added into the guidelines and the related executions. Furthermore, the framework was not evaluated by a SME to give evidence for the impact and scope of the development. Another limitation was given through the restricted access on the case website. Changes and advanced impacts could not be verified and additional functionality not be integrated into the website. Due to the usage of the case website and Web Analytics framework by Hausmann, Williams and Schubert (2012), a special focus was placed on content or informational websites of SMEs, even if the guidelines and KPI development addresses all website types.

9 Summary and Conclusion

In this final chapter the researcher summarises the thesis and brings together the major conclusion drawn from the research findings. Therefore all research questions are addressed and suggestions for future work are defined.

9.1 Research Questions

At the beginning of this thesis an overall research question was defined

RQ: *How can a small or medium-sized business with limited capabilities make better use of Google Analytics?*

and a set of 12 subsidiary research questions, which have been addressed during the diverse stages of the thesis.

RQ1a: How do existing frameworks classify Web Analytics?

The existing frameworks classify Web Analytics from different point of views. Every author has a different approach and sets priorities to a different subject of Web Analytics. The differences are described in detail in Chapter 5.6.

RQ1b: Which similarities do the frameworks contain?

All frameworks are addressing the Web Analytic subject. Nevertheless has every framework a different approach. Further details are shown in Chapter 5.

RQ1c: What framework is most appropriated to cover the needs of SMEs and the integration of Web Analytics?

Without proof for evidence, the best discovered method during the research was the development of a guideline with a similar to recipe structure.

RQ1d: What are the differences for Web Analytics between small, medium and big sized companies?

Because of the totally different amount of collectable data and the availability of resources, do these companies handle Web Analytics differently. While big enterprises need to gather more data and therefore analyse it in deeper dimensions to receive similar detailed samples, are smaller companies in need of support in the investment of resources due to the lack in knowledge, time and cost.

RQ2a: What are key performance indicators for small and medium-sized enterprises?

KPIs for SMEs were defined and compared in chapter 6.

RQ2b: What are the differences in the Web Analytics requirements due to the industry sector?

The industry sector is often involved or attended by a special type of website. Four different types of websites were defined and all have other requirements in Web Analytics.

RQ3a: What functionalities does Google Analytics offer?

The essential functionality of Google Analytics is explained in chapter 7.4. In addition table 11 shows all offered functionalities.

RQ3b: How does Google Analytic store data and which possibilities do users have to interact with this information?

Google Analytics stores data without guaranteed data freshness. Furthermore are only 10 million hits per moth included and rows are limited to 50.000. The user can interact with the data through the Google Analytics API or export data as a CSV, TSV or PDF file.

RQ3c: What kind of specialization does a Google Analytic framework need?

All requirements are defined in chapter 8.1.

RQ3d: What additional features does Google Analytics Premium offer for small and medium-sized companies?

This questions addressed in table 10. Generally remains to ascertain that SMEs are not in need of additional functionality and will normally not be able to fund the related costs of Google Analytics Premium.

RQ4a: What does a Web Analytics framework need to fit the business requirements of SMEs?

The framework needs to fit the different metrics and KPIs.

RQ4b: What is the best method and form to design the Web Analytics framework and guidelines for Google Analytics?

The framework needs to be well structured in individual steps, while being reduced on the important processes. Furthermore the framework should be designed attractively.

9.2 Key Contributions and Future Work

By answering the above outlined research questions the author addressed all predefined objectives.

The new Google Analytics framework and guidelines deliver a new approach to guide and assist SMEs to make better use of Google Analytics. A simple and clearly arranged structure provides an uncomplicated integration of Google Analytics into the SME. Every step of the implementation from the development of the KPIs to the mapping to Google Analytics functionality is guided with templates. Thus this research project has contributed to the development of a holistic concept to the theory and practice of Web Analytics usage in SMEs.

Nevertheless, this has opened up a number of areas for future research. In addition to qualify the framework and guidelines, a scientific evaluation or case study has to be conducted. This could also be extended with the usage of an e-commerce website to address the needs of many SMEs in more de-

tail. Furthermore an analysis of necessary KPIs with matching metrics for different website types and web applications could reveal strongly needed insights.

In Addition, more features and functionality of Google Analytics needs to be classified and transformed into the concept to expand the capabilities.

With the use of Google Analytics numerous violations of data security and privacy go along, which could be avoided by using non-trackable Web Analytics software methods or open source software such as PIWIK.

In order to simplify the use of Web Analytics, the development of automated reports could be promoted.

Moreover could the framework and guidelines be adapted to the Lean UX Design process, which aims to decrease process ballast and increase customer interaction.

Further studies could also use different case websites without restrictions and integrate newer Web Analytics fields such as web application, mobile application and Internet of Things (IoT) devices.

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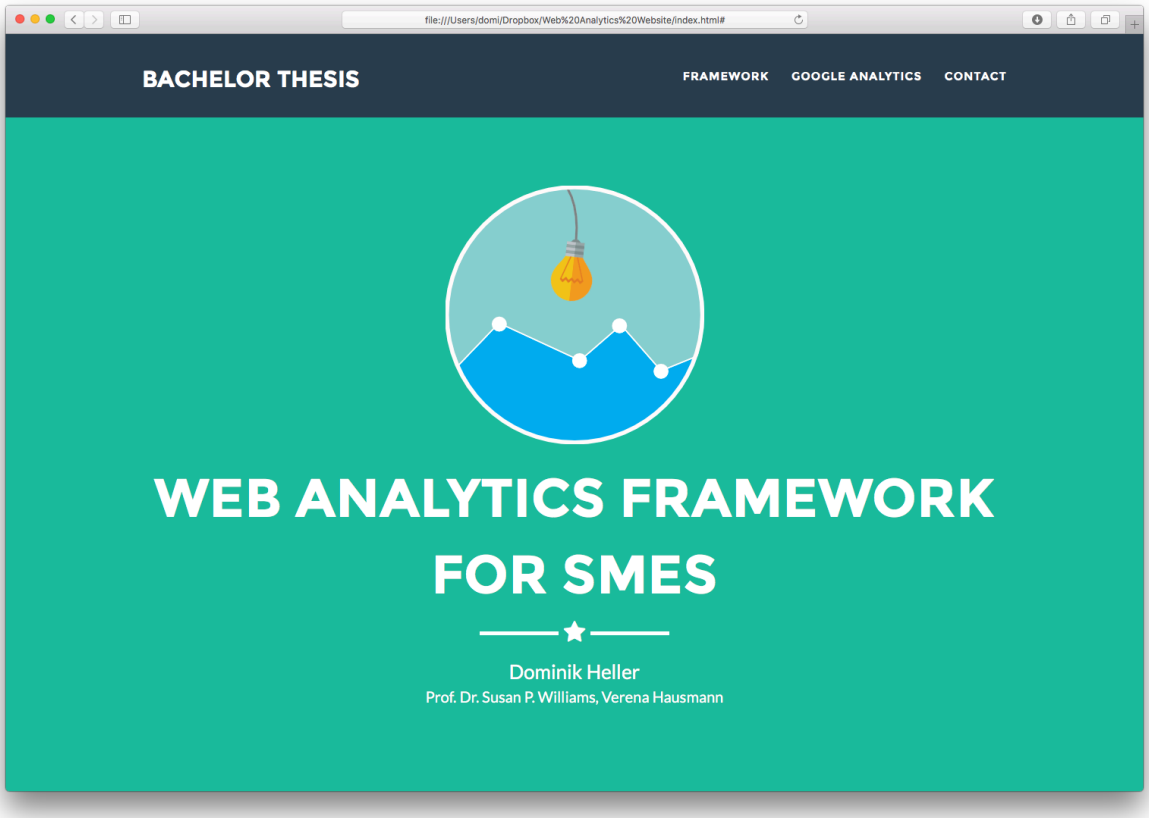
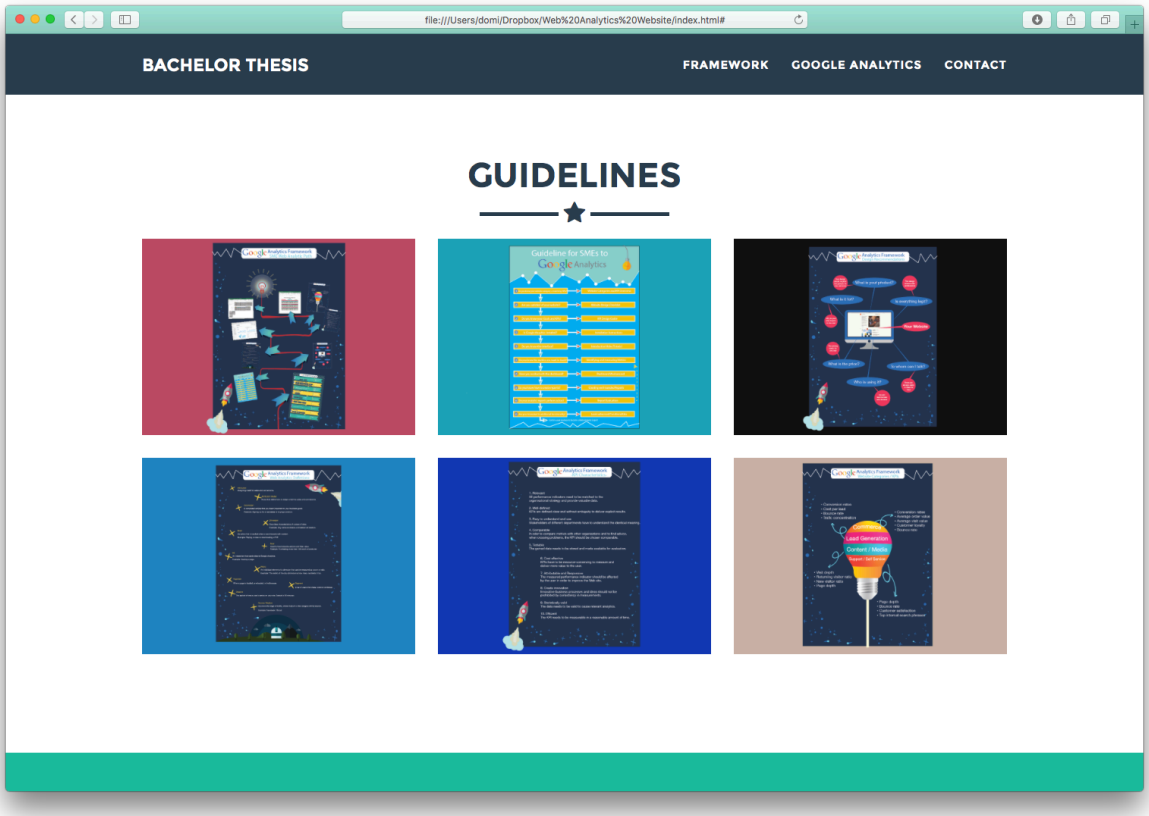
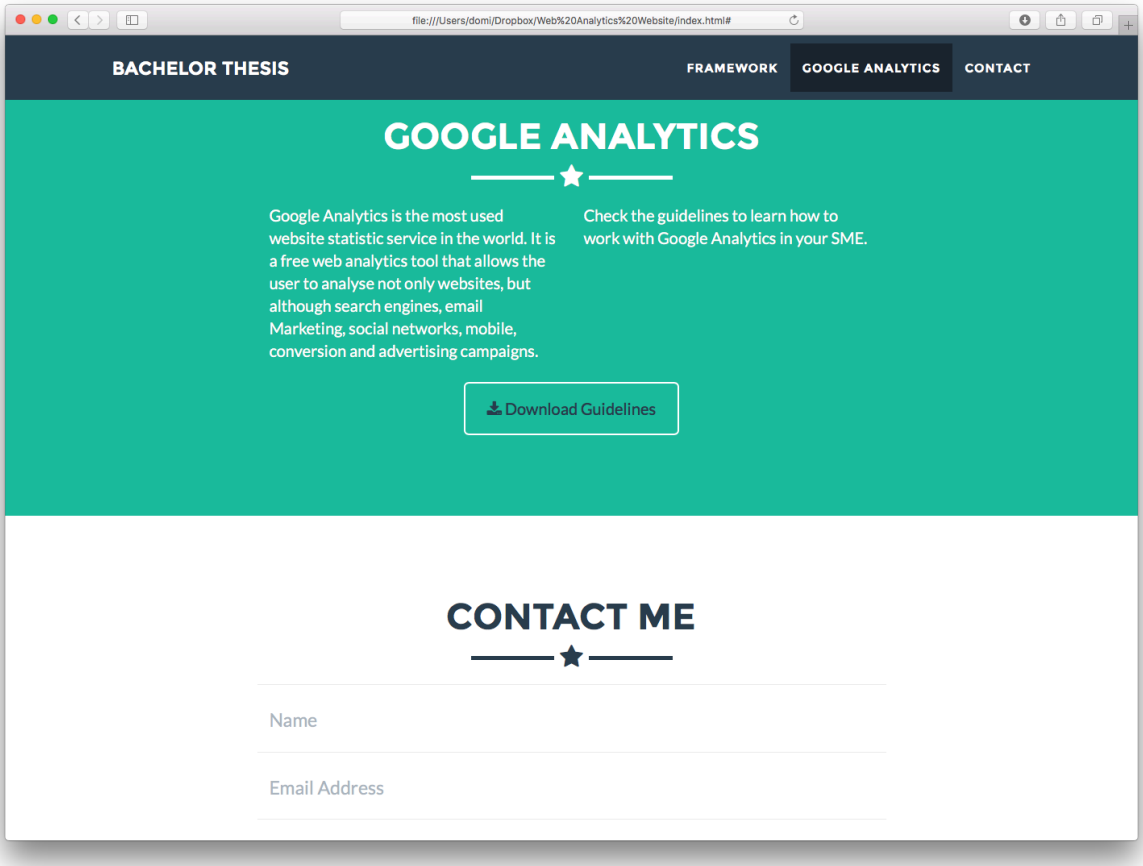
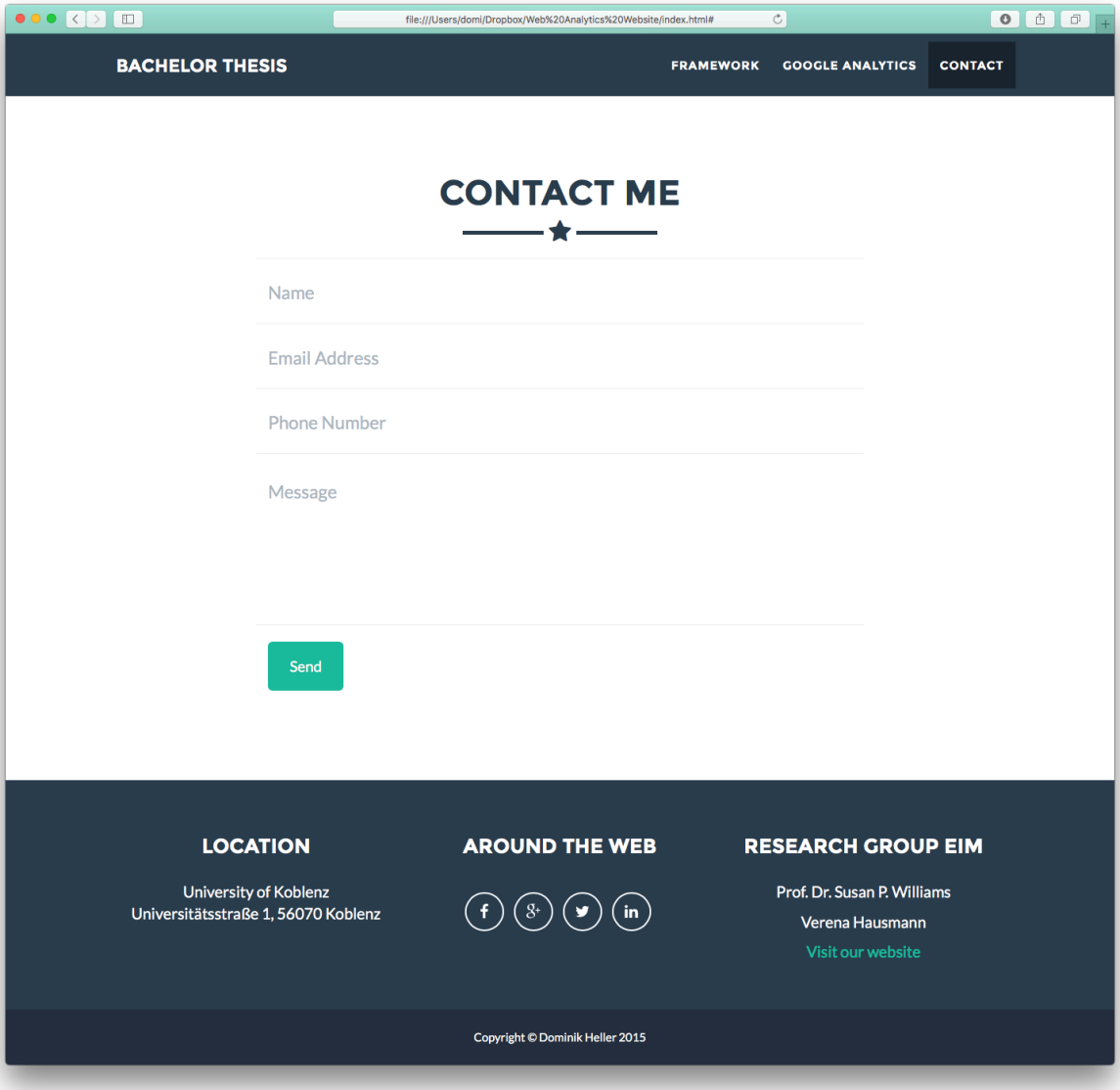
Appendix A – Framework and Guideline Website

The following pages show the website for the new Google Analytics Framework and Guidelines. This website can be used to present all results to interested SMEs in order to take the research further and receive feedback for the research project results. The website is built on a responsive design to ensure simple access from every web browser or mobile web browser.








file:///Users/domi/Dropbox/Web%20Analytics%20Website/index.html#
BACHELOR THESIS
FRAMEWORK
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Name
Email Address
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LOCATION
University of Koblenz
Universitätsstraße 1, 56070 Koblenz
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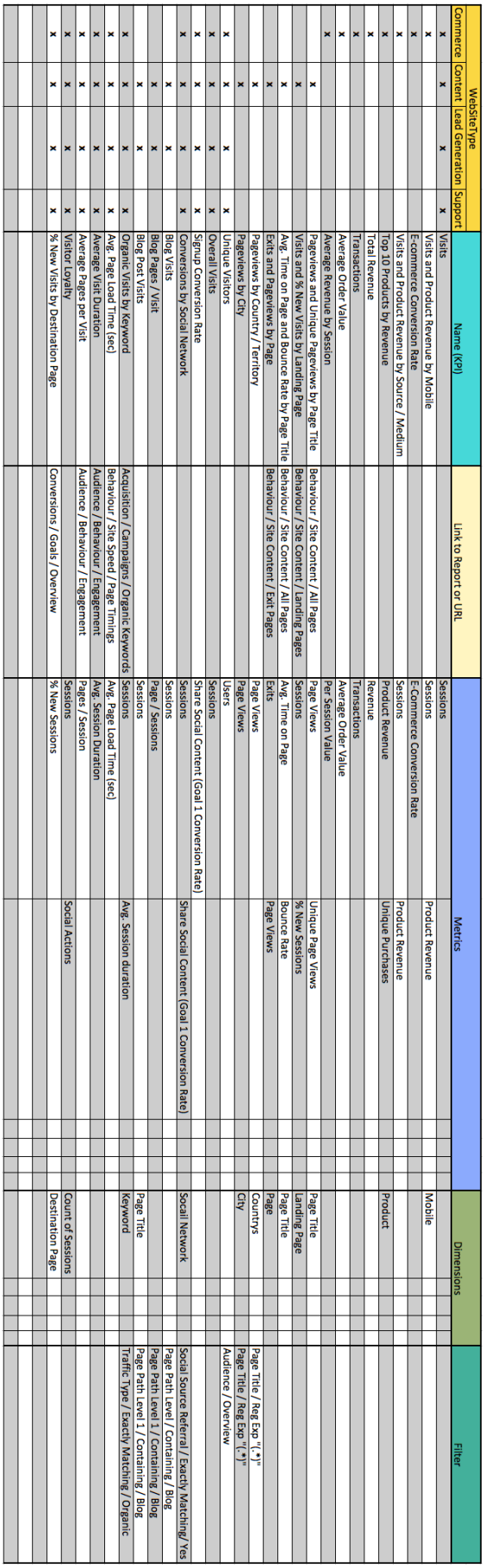
Appendix B – KPI meets Metrics: Dashboard and Customised Reports



WebSiteType								
Commerce	Content	Lead Generation	Support	Name (KPI)	Link to Report or URL	Metrics	Dimensions	Filter
x	x	x	x	Visits		Sessions		
x				Visits and Product Revenue by Mobile		Sessions		
						Product Revenue	Mobile	
				E-commerce Conversion Rate		E-Commerce Conversion Rate		
x				Visits and Product Revenue by Source / Medium		Sessions		
						Product Revenue		
x				Top 10 Products by Revenue		Product Revenue		
						Unique Purchases	Product	
x				Total Revenue		Revenue		
x				Transactions		Transactions		
x				Average Order Value		Average Order Value		
x				Average Revenue by Session		Per Session Value		
	x			Pageviews and Unique Pageviews by Page Title	Behaviour / Site Content / All Pages	Page Views		
						Unique Page Views	Page Title	
	x			Visits and % New Visits by Landing Page	Behaviour / Site Content / Landing Pages	Sessions		
						% New Sessions	Landing Page	
	x			Avg. Time on Page and Bounce Rate by Page Title	Behaviour / Site Content / All Pages	Avg. Time on Page		
						Bounce Rate	Page Title	
	x			Exits and Pageviews by Page	Behaviour / Site Content / Exit Pages	Exits		
						Page Views	Page	
	x			Pageviews by Country / Territory		Page Views		
x	x	x	x	Unique Visitors		Users	Country	
x	x	x	x	Overall Visits		Sessions		
x	x	x	x	Signup Conversion Rate		Share Social Content (Goal 1 Conversion Rate)		
x	x	x	x	Conversions by Social Network		Sessions	Socail Network	
	x	x		Blog Visits		Sessions		
	x	x		Blog Pages / Visit		Page / Sessions		
	x	x		Blog Post Visits		Sessions		
x	x	x	x	Organic Visits by Keyword	Acquisition / Campaigns / Organic Keywords	Sessions	Keyword	
x	x	x	x	Avg. Page Load Time (sec)	Behaviour / Site Speed / Page Timings	Avg. Page Load Time (sec)		
x	x	x	x	Average Visit Duration	Audience / Behaviour / Engagement	Avg. Session Duration		
x	x	x	x	Average Pages per Visit	Audience / Behaviour / Engagement	Pages / Session		
x	x	x	x	Visitor Loyalty		Sessions	Count of Sessions	
x	x	x	x	% New Visits by Destination Page	Conversions / Goals / Overview	% New Sessions	Destination Page	

WebSiteType				Name (KPI)	Filter	Metrics						Dimensions				
Commerce	Content	Lead Generation	Support													
x	x	x	x	Landing Pages Analysis		Sessions	Entrances / Page Views	Bounce Rate	Avg, Time on Page	Page Value		Page	Keyword	City		
	x		x	Internal Site Search Analysis		Total Unique Searches	% Search Exits	Results Page Views / Session	Search Refinements	Total Events	Goal Completions	Search Term	Start Page	Keyword		
x	x	x		Content Efficiency Analysis		Page Views	Avg. Page Load Time	Page Load Sample	Bounce Rate			Page Title	Country	City		
x				E-Commerce Traffic Report		Sessions	% New Sessions	Bounce Rate	Pages/Session	Revenue	Average Session Value & Per Session Value	Source/Medium	Campaign			

Appendix C – Google Analytics Dimensions and Metrics Overview

Feature	Dimension	Metric
User	ga:userTypeUser Type	ga:usersUsers
	ga:sessionCountCount of Sessions	ga:newUsersNew Users
	ga:daysSinceLastSessionDays Since Last Session	ga:percentNewSessions% New Sessions
	ga:userDefinedValueUser Defined Value	ga:1dayUsers1 Day Active Users
		ga:7dayUsers7 Day Active Users
		ga:14dayUsers14 Day Active Users
		ga:30dayUsers30 Day Active Users
		ga:sessionsPerUserNumber of Sessions per User

Feature	Dimension	Metric
Session	ga:sessionDurationBucketSession Duration	ga:sessionsSessions
		ga:bouncesBounces
		ga:sessionDurationSession Duration
		ga:hitsHits

Feature	Dimension	Metric
Traffic Sources	ga:referralPathReferral Path	
	ga:campaignCampaign	
	ga:sourceSource	
	ga:mediumMedium	
	ga:sourceMediumSource / Medium	
	ga:keywordKeyword	
	ga:adContentAd Content	

Feature	Dimension	Metric
Adwords	ga:adGroupAd Group	
	ga:adSlotAd Slot	
	ga:adTargetingTypeTargeting Type	

Feature	Dimension	Metric
Goal Conversions		ga:goalXXStartsGoal XX Starts
		ga:goalStartsAllGoal Starts
		ga:goalXXCompletionsGoal XX Completions
		ga:goalCompletionsAllGoal Completions
		ga:goalXXValueGoal XX Value
		ga:goalValueAllGoal Value

Feature	Dimension	Metric
Platform or Device	ga:browserBrowser	
	ga:browserVersionBrowser Version	
	ga:operatingSystemOperating System	
	ga:operatingSystemVersionOperating System Version	
	ga:mobileDeviceBrandingMobile Device Branding	
	ga:mobileDeviceModelMobile Device Model	
	ga:mobileInputSelectorMobile Input Selector	
	ga:mobileDeviceInfoMobile Device Info	
	ga:mobileDeviceMarketingNameMobile Device Marketing Name	
	ga:deviceCategoryDevice Category	
	ga:dataSourceData Source	

Feature	Dimension	Metric
Geo Network	ga:continentContinent	
	ga:subContinentSub Continent	
	ga:countryCountry	
	ga:regionRegion	
	ga:metroMetro	
	ga:cityCity	
	ga:networkDomainNetwork Domain	
	ga:networkLocationService Provider	
	ga:cityIdCity ID	
	ga:countryIsoCodeCountry ISO Code	
	ga:regionIdRegion ID	
	ga:regionIsoCodeRegion ISO Code	

Feature	Dimension	Metric
System	ga:flashVersionFlash Version	
	ga:javaEnabledJava Support	
	ga:languageLanguage	
	ga:screenColorsScreen Colors	
	ga:sourcePropertyDisplayNameSource Property Display Name	
	ga:sourcePropertyTrackingIdSource Property Tracking ID	
	ga:screenResolutionScreen Resolution	
Feature	**Dimension**	**Metric**
Page Tracking	ga:hostnameHostname	ga:entrancesEntrances
	ga:pagePathPage	ga:pageviewsPageviews
	ga:pageTitlePage Title	ga:uniquePageviewsUnique Pageviews
	ga:landingPagePathLanding Page	ga:timeOnPageTime on Page
	ga:exitPagePathExit Page	ga:exitsExits
	ga:pageDepthPage Depth	
Feature	**Dimension**	**Metric**
Content Grouping	ga:landingContentGroupXXLanding Page Group XX	
	ga:previousContentGroupXXPrevious Page Group XX	
	ga:contentGroupXXPage Group XX	
Feature	**Dimension**	**Metric**
Internal Search	ga:searchUsedSite Search Status	ga:searchUniquesTotal Unique Searches
	ga:searchKeywordSearch Term	ga:searchSessionsSessions with Search
	ga:searchKeywordRefinementRefined Keyword	ga:searchDepthSearch Depth
	ga:searchCategorySite Search Category	ga:searchRefinementsSearch Refinements
	ga:searchAfterDestinationPageSearch Destination Page	ga:searchDurationTime after Search
		ga:searchExitsSearch Exits
Feature	**Dimension**	**Metric**
App Tracking	ga:appInstallerIdApp Installer ID	ga:screenviewsScreen Views
	ga:appVersionApp Version	ga:uniqueScreenviewsUnique Screen Views
	ga:appNameApp Name	ga:timeOnScreenTime on Screen
	ga:appIdApp ID	
	ga:screenNameScreen Name	
	ga:screenDepthScreen Depth	
	ga:landingScreenNameLanding Screen	
	ga:exitScreenNameExit Screen	
Feature	**Dimension**	**Metric**
Event Tracking	ga:eventCategoryEvent Category	ga:totalEventsTotal Events
	ga:eventActionEvent Action	ga:eventValueEvent Value
	ga:eventLabelEvent Label	ga:sessionsWithEventSessions with Event
Feature	**Dimension**	**Metric**
Ecommerce	ga:transactionIdTransaction ID	ga:transactionsTransactions
	ga:affiliationAffiliation	ga:transactionRevenueRevenue
	ga:sessionsToTransactionSessions to Transaction	ga:transactionShippingShipping
	ga:daysToTransactionDays to Transaction	ga:transactionTaxTax
	ga:productSkuProduct SKU	ga:itemQuantityQuantity
	ga:productNameProduct	ga:uniquePurchasesUnique Purchases
	ga:productCategoryProduct Category	ga:itemRevenueProduct Revenue
	ga:checkoutOptionsCheckout Options	ga:localItemRevenueLocal Product Revenue
	ga:internalPromotionCreativeInternal Promotion Creative	ga:internalPromotionClicksInternal Promotion Clicks
	ga:internalPromotionIdInternal Promotion ID	ga:internalPromotionViewsInternal Promotion Views
	ga:internalPromotionNameInternal Promotion Name	ga:localProductRefundAmountLocal Product Refund Amount
	ga:internalPromotionPositionInternal Promotion Position	ga:localRefundAmountLocal Refund Amount
	ga:orderCouponCodeOrder Coupon Code	ga:productAddsToCartProduct Adds To Cart
	ga:shoppingStageShopping Stage	ga:productCheckoutsProduct Checkouts
		ga:productDetailViewsProduct Detail Views
		ga:productListClicksProduct List Clicks
		ga:productListViewsProduct List Views
		ga:productRefundAmountProduct Refund Amount
		ga:productRefundsProduct Refunds
		ga:productRemovesFromCartProduct Removes From Cart
		ga:quantityAddedToCartQuantity Added To Cart
		ga:quantityCheckedOutQuantity Checked Out
		ga:quantityRefundedQuantity Refunded
		ga:quantityRemovedFromCartQuantity Removed From Cart
		ga:refundAmountRefund Amount
		ga:revenuePerUserRevenue per User
		ga:totalRefundsRefunds
		ga:transactionsPerUserTransactions per User

Feature	Dimension	Metric
User Timings	ga:userTimingCategoryTiming Category	
	ga:userTimingLabelTiming Label	
	ga:userTimingVariableTiming Variable	
Feature	**Dimension**	**Metric**
Exceptions		ga:exceptionsExceptions
		ga:fatalExceptionsCrashes
Feature	**Dimension**	**Metric**
Content Experiments	ga:experimentIdExperiment ID	
	ga:experimentVariantVariation	
Feature	**Dimension**	**Metric**
Custom Variables or Columns	ga:dimensionXXCustom Dimension XX	ga:metricXXCustom Metric XX Value
	ga:customVarNameXXCustom Variable (Key XX)	
	ga:customVarValueXXCustom Variable (Value XX)	
Feature	**Dimension**	**Metric**
Time	ga:hourHour	
	ga:minuteMinute	
Feature	**Dimension**	**Metric**
Adsense		ga:adsenseRevenueAdSense Revenue
		ga:adsenseAdUnitsViewedAdSense Ad Units Viewed
		ga:adsenseAdsViewedAdSense Impressions
		ga:adsenseAdsClicksAdSense Ads Clicked
		ga:adsensePageImpressionsAdSense Page Impressions
		ga:adsenseExitsAdSense Exits
Feature	**Dimension**	**Metric**
Ad Exchange		ga:adxImpressionsAdX Impressions
		ga:adxMonetizedPageviewsAdX Monetized Pageviews
		ga:adxClicksAdX Clicks
		ga:adxRevenueAdX Revenue
Feature	**Dimension**	**Metric**
Channel Grouping	ga:channelGroupingDefault Channel Grouping	

Appendix D – Google Analytics Navigation Map

	F1	F2	F3
Da1	Dashboard	Private	
Da2	Dashboard	New Dashboard	
Sh1	Shortcuts	Overview	
In1	Intelligence Events	Overview	
In2	Intelligence Events	Daily Events	
In3	Intelligence Events	Weekly Events	
In4	Intelligence Events	Monthly Events	
Re1	Real Time	Overvie	
Re2	Real Time	Locations	
Re3	Real Time	Traffic Sources	
Re4	Real Time	Content	
Re5	Real Time	Events	
Re6	Real Time	Conversions	
Au1	Audience	Overview	
Au2	Audience	Active Users	
Au3	Audience	Cohort Analysis	
Au4	Audience	Audience Insights	
Au5	Audience	Demographic	Overview
Au6	Audience	Demographic	Age
Au7	Audience	Demographic	Gender
Au8	Audience	Interests	Overview
Au9	Audience	Interests	Affinity Categories
Au10	Audience	Interests	In-Market Segments
Au11	Audience	Interests	Other Categories
Au12	Audience	Geo	Language
Au13	Audience	Geo	Location
Au14	Audience	Behaviour	New vs Returning
Au15	Audience	Behaviour	Frequency and Recency
Au16	Audience	Behaviour	Engagement
Au17	Audience	Technology	Browser and OS
Au18	Audience	Technology	Network
Au19	Audience	Mobile	Overview
Au20	Audience	Mobile	Devices
Au21	Audience	Custom	Custom Variables
Au22	Audience	Custom	User-Defined
Au23	Audience	Benchmarking	Channels
Au24	Audience	Benchmarking	Loction
Au25	Audience	Benchmarking	Devices
Au26	Audience	UserFlow	

Ac1	Acquisiton	Overview	
Ac2	Acquisiton	All Traffic	Channels
Ac3	Acquisiton	All Traffic	Treemaps
Ac4	Acquisiton	All Traffic	Source/Medium
Ac5	Acquisiton	All Traffic	Referrals
Ac6	Acquisiton	AdWords	Campaigns
Ac7	Acquisiton	AdWords	Treemaps
Ac8	Acquisiton	AdWords	Keywords
Ac9	Acquisiton	AdWords	Search Queries
Ac10	Acquisiton	AdWords	Hours of Day
Ac11	Acquisiton	AdWords	Destination URLs
Ac12	Acquisiton	Search Engine Optimisation	Queries
Ac13	Acquisiton	Search Engine Optimisation	Landing Pages
Ac14	Acquisiton	Search Engine Optimisation	Geographical Summary
Ac15	Acquisiton	Social	Overview
Ac16	Acquisiton	Social	Network Referrals
Ac17	Acquisiton	Social	Data Hub Activity
Ac18	Acquisiton	Social	Landing Pages
Ac19	Acquisiton	Social	Trackbacks
Ac20	Acquisiton	Social	Conversions
Ac21	Acquisiton	Social	Plug-ins
Ac22	Acquisiton	Social	User Flow
Ac23	Acquisiton	Campaigns	All Campaigns
Ac24	Acquisiton	Campaigns	Paid Keywords
Ac25	Acquisiton	Campaigns	Organic Keywords
Ac26	Acquisiton	Campaigns	Cost Analysis
Be1	Behaviour	Overview	
Be2	Behaviour	Behaviour Flow	
Be3	Behaviour	Site Content	All Pages
Be4	Behaviour	Site Content	Content Drilldown
Be5	Behaviour	Site Content	Landing Pages
Be6	Behaviour	Site Content	Exit Pages
Be7	Behaviour	Site Speed	Overview
Be8	Behaviour	Site Speed	Page Timings
Be9	Behaviour	Site Speed	Speed Suggestions
Be10	Behaviour	Site Speed	User Timings
Be11	Behaviour	Site Search	Overview
Be12	Behaviour	Site Search	Usage
Be13	Behaviour	Site Search	Search Terms
Be14	Behaviour	Site Search	Pages
Be15	Behaviour	Events	Overview
Be16	Behaviour	Events	Top Events
Be17	Behaviour	Events	Pages
Be18	Behaviour	Events	Events Flow
Be19	Behaviour	Publisher	Overview
Be20	Behaviour	Publisher	Publisher Pages
Be21	Behaviour	Publisher	Publisher Referrers
Be22	Behaviour	Experiments	
Be23	Behaviour	In-Page Analytsis	
Co1	Conversions	Goals	Overview
Co2	Conversions	Goals	Goals URLs
Co3	Conversions	Goals	Reverse Goal Path
Co4	Conversions	Goals	Funnel Visualisation
Co5	Conversions	Goals	Goal Flow
Co6	Conversions	E-Commerce	Overview
Co7	Conversions	E-Commerce	Product Performance
Co8	Conversions	E-Commerce	Sales Performance
Co9	Conversions	E-Commerce	Transactions
Co10	Conversions	E-Commerce	Time to Purchase
Co11	Conversions	Multi-Channel Funnels	Overview
Co12	Conversions	Multi-Channel Funnels	Assisted Conversion
Co13	Conversions	Multi-Channel Funnels	Top Conversion Pages
Co14	Conversions	Multi-Channel Funnels	Time Lag
Co15	Conversions	Multi-Channel Funnels	Path Length
Co16	Conversions	Attribution	Model Comparsion Tool