MASTER THESIS

IMPROVING CUSTOMER RETENTION FOR A SOCIAL NETWORKING SERVICE

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FOREWORD

When I first heard about the possibility to do my master assignment at StructWeb, I was very thrilled. For my thesis I was looking for a project in which I could not only broaden my scientific knowledge, but also for a project in which I could actively participate in the day to day work processes and where I could help improving products on a day to day basis. When I heard there was a possibility to do this at a young and dynamic team, developing the very interesting platform that StructWeb is, I was immediately convinced I wanted to take this unique chance. At StructWeb I got the opportunity to write my thesis on a subject they were eager to get more knowledge on and this provided the mixture of combining scientific knowledge with proposing practical improvement plans for StructWeb.

The subject itself, improving customer retention for a social networking service, made the research sometimes difficult, because of a lack of existing literature, but it also importance of this research, because it emphasized the usefulness of this research.

I really liked to be involved in the early-stage developments at StructWeb and continuously improve the product and user management. This sometimes made it difficult to balance the ongoing matters with booking progress on my thesis. I therefore want to thank my colleagues at StructWeb for helping me to find the motivation when I needed it. With special thanks to Wim Korevaar who, despite the other million things he had to take care of at StructWeb, always had the time to discuss my thesis and provide useful feedback.

Furthermore, I want to thank Lars Mol and Berend van der Grinten for the feedback they provided on my thesis throughout this research.

The last, but certainly not least, people I especially want to thank are the other two members of the graduation committee. Although it was not always fun to get their feedback, the feedback and insights of Dr. Wijnhoven and Dr. Constantinides gave me the needed guidance and motivation to continuously improve this thesis.

Vincent Kleiboer   Utrecht, June 2015

MANAGEMENT SUMMARY

To evaluate the customer journey on social networks, the lifecycle of users on the network can be modelled by customer lifecycle models. A first mention in literature of a customer lifecycle was by Ford (1980). Although he didn't use the term customer lifecycle specifically, he evaluated the customer relationship and how this changed over time. The fundamental work underlined the importance of establishing, understanding and developing the relationship with customers over time.

In this research it is investigated what motivates users of social networking sites throughout the user lifecycle. This is done by using the AARRR-model to define the user lifecycle. This model cuts the user lifecycle in 5 stages: Acquisition, Activation, Retention, Referral and Revenues (McClure, 2007). Measuring the performance in each of these stages can measure the effects and steer the organizations continuous improvements.

To help StructWeb, a social platform where this research is conducted, optimize their performance, the motivations of users in the first four of the five AARRR-steps are examined. The revenues step was left out of the scope, because it is reasoned that this is a logical result of active, retained users in combination with a revenue model. This makes the motivations of users important in the first 4 stages. Proposed revenue models for SNSs are advertisement, subscription and transaction models

The literature study performed in this research presents what motivates users to start using a social network (acquisition), why they become active (activation), why they keep coming back (retention), and why they tell others (and share messages to others) (referral). The presented motivators for retention, usefulness and enjoyment, are tested by a quantitative analysis. This is done by comparing questionnaire data on how users experience the different motivators for retention on StructWeb, with their amount of clicks. This analysis could not confirm that enjoyment and usefulness are predictors of retention at StructWeb. The low number of respondents to the questionnaire (N=31) is expected to have a big influence on this.

Although this research did not find enjoyment and usefulness as significant (at α=0.05) predictors of retention at Student.world, the results hint toward a positive relationship between enjoyment and retention quality with the relationship being significant at the 0,10 level.

The motivations presented in the literature study in Chapter 2 form a valuable scientific foundation for the further scientific research into the AARRR model. Furthermore this literature study can be used as a basis for further quantitative analysis into the motivations of SNS users. Finally, the performed literature study formed the basis for the advice given to StructWeb to further improve their product, marketing campaigns, community management and organizational strategy.

Contents

1 INTRODUCTION

This chapter starts with an introduction of the customer lifecycle on social networks. The organization in who's collaboration this research is performed is presented, together with the need for this research and its goals.

1.1. THE CUSTOMER LIFECYCLE ON SOCIAL NETWORKS

To evaluate the customer journey on social networks, their lifecycle on the network can be modeled by customer lifecycle models. A first mention in literature of a customer lifecycle was by Ford (1980). Although he didn't use the term customer lifecycle specifically, he evaluated the customer relationship and how this changed over time. The fundamental work underlined the importance of establishing and developing the relationship with customers over time. The ideas of Ford (1980) on establishing and developing relationships with customers are still valuable today, but a lot has changed since. With the Internet nowadays playing a more and more prominent role in daily life of many customers, the importance of incorporating information technology in the customer lifecycle models is growing (Khalifa & Shen, 2005; Piccoli, Spalding, & Ives, 2001). One specific lifecycle model is used in this research because it is a hands-on model and directly applicable in the evaluation of the lifecycle of web-service users. The model used in this research is developed by Dave McClure: The AARRR model. It splits the customer lifecycle in 5 different stages; acquisition, activation, retention, referral and revenues. McClure presents how the performance of organizations in these five steps can be measured. In Chapter 2 this model is further discussed and a comparison with other lifecycle models is made. Despite the use of this model amongst start-ups like Crowdcube (an investor platform with over 175.000 investors), Mapbox (a curated map platform with over 2.000.000 users) and many more (Trak.io), a theoretical foundation and justification of the model has not been reported in literature. Therefore, the scientific contribution of this research is a first theoretical basis for the model as it evaluates the motivations of users in the AARRR stages.

This research is carried out partially for StructWeb B.V. StructWeb is an internet start-up that is developing a new type of web service which can, according to the definitions of Boyd & Ellison (2007) and Lin & Lu (2011), be described as a Social Networking Site (SNS). Social networking sites are websites where you can create and see (semi) public profiles, that provide a new method of communicating, employing computers as a collaborative tool to accelerate group formation and escalate group scope and influence (Boyd & Ellison, 2007; Lin & Lu, 2011). StructWeb B.V.'s first product is a SNS tailored for students, named "Student.world". Although this research is performed at StructWeb B.V. and focuses on their first product Student.world, the aim is to

have general conclusions and recommendations applicable to a broad range of internet-based companies who want to evaluate the lifecycle of their customers.

1.2. ABOUT STRUCTWEB; TOWARDS A STRUCTURED WEB

StructWeb B.V. is an organization that develops software to enable people worldwide to structure relevant content on the web. The first product of StructWeb B.V. is a social platform tailored for students: Student.world. This is a first step into structuring the web. After this phase, Student.world will grow into a social platform for not just students, but for everyone. This is called "StructWeb". In this section the organization StructWeb B.V. is further discussed together with its vision and first product. To further introduce the product, examples of the user interface are given.

The internet comprises valuable pieces of information. But, by the large amount of information and the lack of a clear structure, it is still difficult to find the best, funniest or most interesting video's, documentaries or news articles on a certain subject. StructWeb therefore works on the realization of "StructWeb" as seen in Figure 1. A unique and social platform where you can share, discover and find the best content of the web. On StructWeb users can share everything they want with other users of the system. Because on a daily basis a lot of information will be shared, every piece of information is shared in a specific category, chosen by the user. This makes the structured, social network. Thanks to a much larger audience than just friends and colleagues on conventional social networks, and thanks to the structure, StructWeb enables you to find the most popular documentary at the moment, or that one top-2000 song. Wikipedia developed the crowd sourced encyclopedia, StructWeb aims to facilitate the crowd sourced structure of the web.
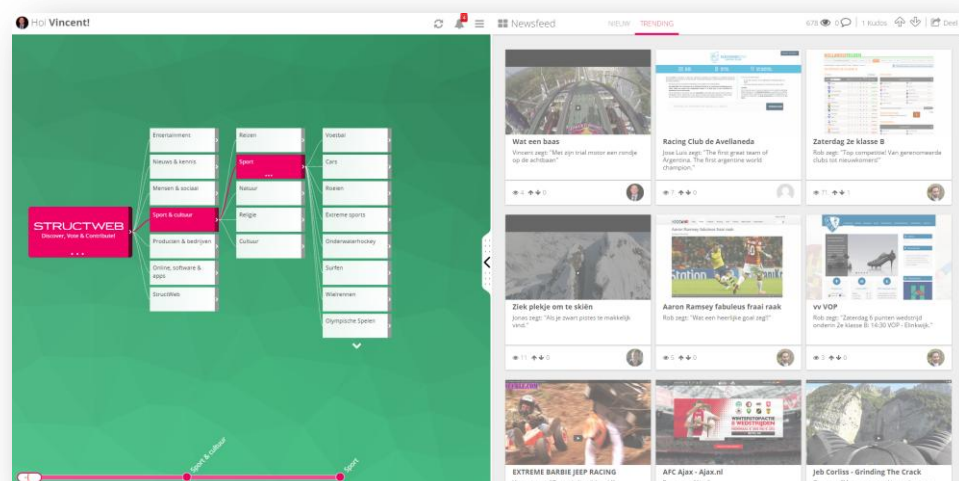

Figure 1   This figure shows a screenshot of the interface of the Structured Web. With on the left side a user-generated structure and on the right side a timeline of shared content. Using the structure users can focus the information at the right side to a specific topic.

StructWeb can be regarded as a social network. The people joining StructWeb can access a personalized newsfeed (similar to the right side of Figure 1) that is based on topics they like and the people they decided to follow. The possibility of following certain categories and people makes it possible to find specific information based on topics and people you like to follow. One person for instance is interested in sports in general, while another person is just interested in soccer highlights of the Dutch Eredivisie. The first person could therefore choose to follow a category called "Sports", while the second person can choose to follow the "Eredivisie" category which can be found deeper in the hierarchical structure. People can choose which and how many categories they want to follow and this leads to a personalized news feed, filled with information that is suited for that person. StructWeb is also making it easy to share information with people who are expected to like that information. A poststamp collector for instance will not share much stamp information on Facebook because probably a lot of family and friends are not that interested in stamps. But on StructWeb a category named "Stamps" can be created and people who follow this category are expected to like the information added about stamps. This in return creates small communities based on common interests. The addition of one user can inspire others to add information as well. One person finding an educational article about the distribution of wealth can inspire others to share a documentary about the richest people of the US, whereas another person adds an infographic about the change of wealth distribution over time. This leads to people discovering information about the wealth gap, which they otherwise probably wouldn't have discovered.

The difference with existing services is a combination of factors.

- The discovery of content is based on a structure, powered by categories, facets and search.
- All the structured information, including the structure itself, is generated by users in a democratic way.
- Users can share information from various platforms and types (video's, music, text, etc.)
- The combination of social features and sharing information based on interests

It is expected that in the beginning StructWeb will have a lot of similarities with a social network. But when the system grows, so does the available curated content and the number of people who share your interests, other than your friends. As more and more users structure more and more information on StructWeb, more information can be found on it, curated by more users. Therefore not only SNSs are part of the competitive environment of StructWeb B.V., but also search engines and content curation services. Search engines are describe by the Oxford dictionary as "A program that searches for and identifies items in a database that correspond to keywords or characters specified by the user, used especially for finding particular sites on the World Wide Web" (Dictionary, 2002). A content curation platform is a platform that deals with large bodies of content from diverse sources and involve the activities of identifying, selecting, verifying, organizing, describing, maintaining, and preserving existing artefacts as well as integrating them into a holistic resource (Rotman, Procita, Hansen, Sims Parr, & Preece, 2012) The competitive environment is schematically shown in Figure 2.

SNSs which may be compared to StructWeb include Twitter, Pinterest and Facebook. We will focus on Facebook, because in the Netherlands this is the largest SNS (Marketingfacts.nl). Content curation websites that may be compared to StructWeb include Pearltrees, Evernote and Delicious. We will focus on Pearltrees because, according to a marketscan in November 2014, performed by B&M Business development for StructWeb, their product shows most similarities with that of StructWeb. Finally Search engines StructWeb may be compared with include Google, Bing and Startpagina.nl. We chose to include Google because this is the most used search engine in the Netherlands (upwardonline.nl).
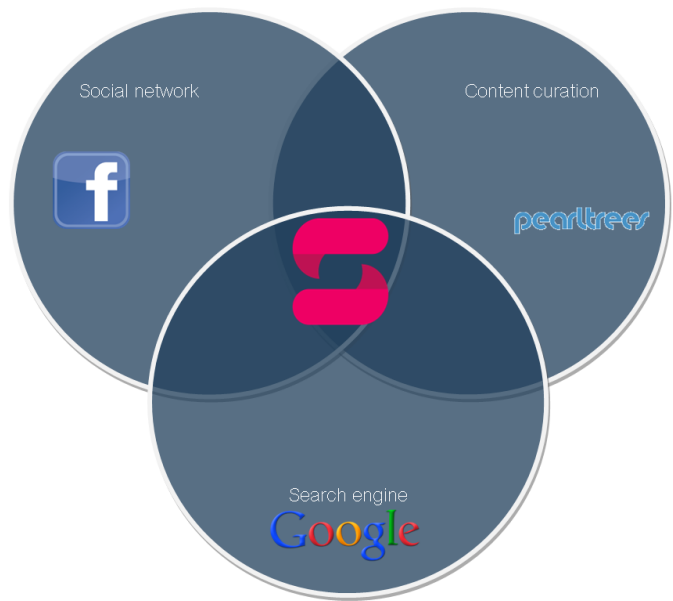

Figure 2 A schematic view of the competitive environment of StructWeb B.V. With Google as an example of a search engine, Facebook as a SNS and Pearltrees as a content curation platforms.

In the next section competitors of every part of the competitive environment are described and compared to StructWeb.

1.3. COMPETITIVE ENVIRONMENT OF STRUCTWEB:

In this section the competitors identified in Figure 2 are further discussed and compared with StructWeb.

1.3.1. SNS - FACEBOOK

With about 8 million users subscribed, Facebook is the largest social network in the Netherlands (facebook.com). Its mission is defined as: "Founded in 2004, Facebook's mission is to give people the power to share and make the world more open and connected. People use Facebook to stay connected with friends and family, to discover what's going on in the world, and to share and express what matters to them"(facebook.com). It is clear that Facebook is focusing on people and the world around them and that connections with people you know offline (family and friends) are important. This is a difference between StructWeb and Facebook. StructWeb lets you follow friends, but focuses more on interests. Therefore it is expected that users will follow users who they don't know offline, but share interesting content online as well as they will follow offline contacts. The possibility to follow categories that grasp your interests is different from Facebook. Because Facebook lets users "share and express what matters to them", the information you see is mainly dependent on your friends whereas the information found on StructWeb is shared by many, many more people and the structure helps you to quickly find the information you need.

Furthermore, StructWeb needs to grow to get users while Facebook already has a large group of users, making it for a large audience more interesting, This network effect is described as "Network externalities" which is further discussed in Chapter 2.4.7. Finally, Facebook is focused more on the social connections and personal messages.

1.3.2. CONTENT CURATION SERVICES - PEARLTREES

Pearltrees is a French internet startup that describes itself as "a place to organize all your interests. This free service lets you organize, explore and share everything you like. Save web pages, files, photos or notes and organize them naturally. Explore amazing collections that relate to your interests and subscribe to their updates." (pearltrees.com) As this quote of their webpage already implies, the way Pearltrees identifies the same problem as StructWeb. They also identify that more and more information becomes available every day and that it is hard to keep track on what you think is interesting, without being drowned in an overflow of information. The way Pearltrees does that is a bit different from the way StructWeb does that. Where StructWeb tries to provide a structure that should enable you to find something that grasps your interest by clicking on more and more focused categories (for instance by choosing for sports>team sports>football), Pearltrees looks at the collection you have made, and uses this to suggest other collections which they think you will like. A collection can be seen as a sort of community that is filled with relevant information by many users.

1.3.3. SEARCH ENGINES - GOOGLE

Google is delivering value to its users by organizing the world's information and making it universally accessible and useful. In a way, this is exactly what StructWeb does, giving users access to the worlds information by structurizing it. An important difference however, is the way this information is presented. Google presents the information in a list and is using algorithms to determine what comes on top of the list. While the search at Google is unstructured, StructWeb provides a structured search. Second, the importance of the information is not determined by a machine or algorithm, but users determine which information is relevant, and where this information should be structured.

So although Google's mission is much alike that of StructWeb, the way these two try to realize this differs. Especially at the beginning of StructWeb, when Google searches almost every webpage on the internet, and StructWeb only those pages that users added to it.

1.4. MOTIVATION OF THE RESEARCH

StructWeb's success depends on its core value proposition to users, letting users discover, connect and share content with their peers and discover other people who share their interests. When StructWeb serves the interests of the web users well, it should be able to get users in, to motivate them to actually use the service¸ to embed it into their daily routine, to let users provide positive referrals to friends and ultimately to contribute to the (future) revenues raised by the company. To improve the performance of StructWeb in each of these steps, it is important to know what motivates users to register, to become active, to come back on a regular basis and to refer their friends. StructWeb uses the AARRR model to measure the performance of their platforms, but no research has been done on this model. Therefore it is important for StructWeb B.V. to understand the motivations of their users in each of the steps of the AARRR model. Why do users start visiting a SNS? Why do users become active? Why do they come back? And why do they refer their friends? This research is performed to give StructWeb – and SNSs in general – insight in these motivations of users, and it ultimately provides a scientific basis for the AARRR model.

1.5. RESEARCH GOALS

The goal of this research is to cope with the lack of scientific research on the AARRR model. Therefore there is a lack of scientific knowledge and understanding of what motivates users in the different stages of the AARRR model. This lead to the following research problem:

The little scientific research on the AARRR model leads to a need for more understanding of the motivations of users in each of the stages of the AARRR model, so SNSs can evaluate how they can improve their performance in every AARRR stage.

This problem definition leads to the formulation of the following four goals of this research, that help solving the problems for StructWeb.

- **Provide a comprehensive theoretical description of user motivations in the first four steps of the AARRR model.** The theoretical description is provided by a literature study on the motivations of users of SNSs.
- **Empirical validation of the theoretical description of motivations for retention, based on a case study at StructWeb.** The retention phase is validated through a quantitative analysis of the experiences users have on StructWeb and how this relates to the retention statistics.
- **Providing insight in how StructWeb users perceive the fit between the offerings of StructWeb and the motivation of users to become daily users.** This quantitative analysis should give StructWeb an insight in how users experience certain factors that, according to the theoretical foundation, influence retention.
- **Recommendations for StructWeb on how they can change their product, user-management and/or organizational strategy, to improve the retention of users.** The way users experience the different factors of retention is used to advice StructWeb on how to improve their performance.

1.6. RESEARCH QUESTIONS

The aforementioned research goals lead to the following research question:

"What are the key motivations influencing the performance in the different stages of the AARRR model, and what strategic improvements can StructWeb make to further improve the performance in terms of the AARRR metrics."

This research question is finally answered by answering the following sub questions:

- *What are, based on a literature study, the key motivations of users in the first four stages of the AARRR model?*
- *Do the motivators for retention also predict retention at Student.world?*
- *How does StructWeb perform on the different variables of motivation for retention?*
- How can StructWeb change their product, community or organizational strategy to improve AARRR performance, with an emphasis on user retention?

1.7. RESEARCH MODEL

To reach the above stated research goals, a model is set up to carry out this research. First, a literature study is performed to get a deeper understanding of the current knowledge on what motivates users in the first 4 stages of the AARRR model. This literature study will lead to theoretical description of the motivations of users in the first four stages of the AARRR model. This theoretical description will be the basis for the questionnaire on

retention, as well as it will lead to a scientific foundation for the AARRR model. The questionnaire will then lead to an insight in how users experience the score of StructWeb on the different variables of factors of retention. These scores will be the basis of a comparison between the experienced scores and the actual retention of StructWeb, as well as it will lead to and advice in how StructWeb can improve their performance on retention. This is summarized in the research model found below.
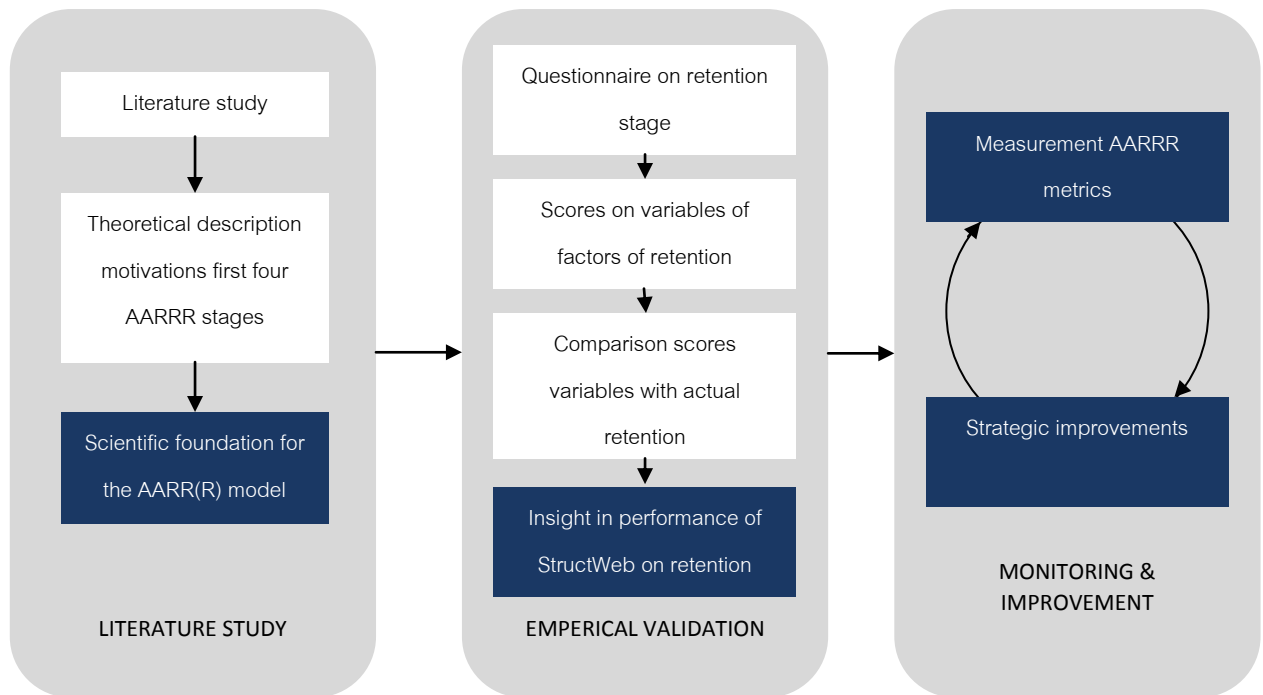
Figure 3 Research model that summarizes how this reasearch will be performed.

1.8. PREFACE TO THE REST OF THE REPORT

Chapter 2 presents a literature study into the customer lifecycle of SNS users. The AARRR model is compared to other lifecycle models and described in more detail. The motivations of users in the first four stages of the AARRR model are discussed. In Chapter 3, the methodology of this research is discussed. The scope and research design are presented, and possible threats to its validity are discussed. Chapter 4 presents the results of the survey on how users experience the factors of retention. The quantitative data is presented and evaluated in this chapter. Chapter 5 shows the strategic and product improvements to improve the AARRR performance, along with their effects (if measured). Chapter 6 presents the conclusions of this research. The research questions are answered and the performance of StructWeb is discussed. Furthermore, this chapter presents the limitations of this research and suggestions to StructWeb and for further research.

2 CUSTOMER LIFECYCLE MANAGEMENT FOR A SNS

This chapter provides a literature study addressing the motivations of users to join and (actively) use social networking services. To assess an SNS performance in terms of user management, *customer lifecycle (CLC) models* are introduced and reviewed.

2.1. CLASSIFYING STRUCTWEB

As discussed in Chapter 1, the competitive landscape of StructWeb is formed by search engines, social networking services and curation services. To evaluate what the key motivations are of users of a web-service like StructWeb, it is important to classify StructWeb. Therefore the three types of web-services discussed in Chapter 1, are evaluated to classify StructWeb, in order to give a focused description of the key motivations of StructWeb users.

One might argue that StructWeb can be regarded as a search engine. The Oxford dictionary describes a search engine as "A program that searches for and identifies items in a database that correspond to keywords or characters specified by the user, used especially for finding particular sites on the World Wide Web" (http://www.oxforddictionaries.com/). So for StructWeb to classify as a search engine, it needs to:

- Search and identify items in a database that correspond to keywords of the user
- Be used for finding particular sites on the world wide web

But, in the beginning StructWeb will only contain a few thousands of websites and therefore it is not possible to search the whole web with it. In a later stadium, when large parts of the web are added to StructWeb, the website will show more and more similarities with a search engine. For now, we can disqualify StructWeb as a search engine.

Another class of website with which StructWeb is also often associated with, is a content curation platform. Content curation deals with large bodies of content from diverse sources and involves the activities of identifying, selecting, verifying, organizing, describing, maintaining, and preserving existing artifacts as well as integrating them into a holistic resource (Rotman et al., 2012). So in order to classify StructWeb as a content curation platform, StructWeb needs to:

- Deal with collection of information of content from diverse sources
- Facilitate the activities of identifying, selecting, verifying, organizing, describing, maintaining, and preserving existing artifacts
- Integrate existing artifacts into a holistic resource

StructWeb can be classified as a curation platform. Information from diverse sources can be gathered and this information can be identified, selected, verified, organized, described, maintained and preserved. Furthermore, the collection of different pieces of information should make it more valuable than the pieces of information on itself, making it integrated in a holistic resource.

Another class of websites in the competitive environment of StructWeb is the SNS. Lin & Lu (2011) define these SNSs as sites that "provide a new method of communicating, employing computers as a collaborative tool to accelerate group formation and escalate group scope and influence". Boyd & Ellison (2007) define SNSs as "web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system." From these two definitions the following five characteristics of a SNS website are extracted:

- SNSs provide a new way of communicating
- SNSs provide the ability to construct a semi public profile
- SNSs accelerate group formation through sharing
- SNSs interact with other users
- SNSs escalate group scope and influence

In order to classify StructWeb as a SNS, it needs to have these five characteristics derived from Lin & Lu (2011) and Boyd & Ellison (2007). Because StructWeb is a new website where users can communicate with one another, the usage of StructWeb provides a new way of communicating with one another; through StructWeb. This can be done by messages on one's profile wall, or by communicating through the comments on items. Although it is noted that StructWeb offers lass communication possibilities than SNSs like Facebook or Twitter. Finally users can share items with one another and add messages to it. On StructWeb, users can create their own profile. Users can add a profile picture to their profile and general information about the user is noted. Users can fill their profile with items they like by sharing it to their wall. An example of a profile at StructWeb is presented Figure 4.
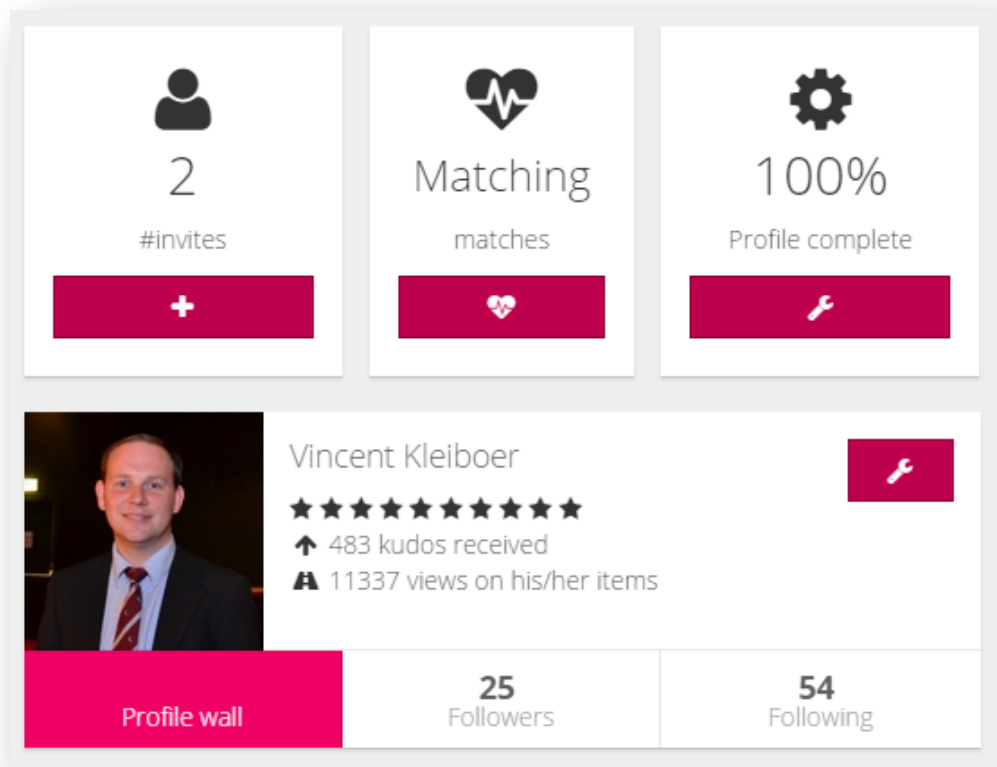
Figure 4 An example of a userprofile at StructWeb with a profile image and general information about the user.

Because at StructWeb you can follow categories and people you are interested in, groups are formed based on interests of people. For instance the category "dance music" is expected to be followed by people who like dance music. This can be seen as the formation of the group "people who like dance music". Interaction between users is done by communicating through messages and by sharing content. Sharing an item in a category means other users see this item as well and therefore interact with them through content. The possibility to see who a user is following, and followed by (as seen in Figure 4), makes user interaction possible. Group scope is escalated and influenced through creating different "communities" in the categories. When a lot of people like one category, a lot of people see contributions to that category. This group then determines whether these new submissions are approved or not, and when they get approved, they determine if this is a high or low quality item by voting it up or down.

Because StructWeb can meets all the requirements (to a smaller or larger extent), it can be regarded as a social networking site. StructWeb can thus be classified as a content curation website as well as a SNS. The disadvantage of classifying StructWeb as a SNS is that in the beginning not much friends will be present.

Starting on a small community like a university campus can lower this problem, because this is expected to make the percentage of peer members larger than when everyone can join, and therefore making it look as a site where your social network is present.

A problem with classifying StructWeb as a curation platform is that in the beginning, there isn't much to curate and not enough curators are present. This lowers the value of curated content, because only one or a few persons might have curated it. Also, in the definition of the curation platform, there is little attention for the contact between users. And although there is little room for personal status updates on StructWeb, users can communicate through discussion pages, on their walls and on the message pages of the content.

In this research StructWeb is classified as a SNS. Based on the discussion above and in particularly because it fits with the value proposition of the platform in an early stage, the rest of this research will focus on SNSs, although it is noted that StructWeb can be classified as a different class of websites as well.

2.2. CUSTOMER LIFECYCLES MODELS

To measure the performance of a website, different kind of measures or metrics can be used, such as the amount of clicks, the number of visitors, average time spent on the website, etc. But what do these metrics tell you? A way of interpreting these metrics is through a customer lifecycle (CLC) model. These models regard the customer relationship as a lifecycle in which the customer arrives (or is pulled) in the relationship with the target organization, where it is in the relationship, and at some time, leaves the relationship. These CLC models help organizations understand, evaluate and improve the user lifecycle. For instance a large number of user, but hardly any page views indicates users who are ending the relationship quickly. If you are just looking for users to do one thing for one time, like filling in a questionnaire, this is no problem, but if you are a SNS and hope user come back on a daily basis, this indicates a problem in retaining users in the relationship.

Because it is important for a SNS to have users enter the relationship and keep them in the relationship this research therefore uses a customer lifecycle model as a basis for improving the performance of SNSs.

In this section current customer lifecycle (CLC) models and the requirements of a CLC model are discussed. The first part is a discussion on what the requirements of a CLC model are, to help a SNS in the management of their users. After this discussion, three CLC models are discussed. The first model is that of Kamakura et al. (2005), followed by the model proposed by Stauss, Gouthier, & Seidel (2007). Finally, the AARRR model is reviewed (the model already used by StructWeb before the beginning of this research)

2.2.1. REQUIREMENT ANALYSIS FOR A CLC MODEL?

There are some difference between the management of a lifecycle of a paying customer and the management of a lifecycle of a non paying SNS user. While a customer is someone that buys products of an organization, and creates value by paying money for products or services, while non paying SNS users are people who make use of a SNS and create value by being an audience for advertisers (Enders, Hungenberg, Denker, & Mauch, 2008). Therefore it is important that a CLC model can also cope with people that deliver value in other ways than by buying products or services.

Another difference is the amount of customers. Where some organizations only need a few customers to create enough revenues, at a SNS often a large number of users are needed. This is linked to their way of creating revenues. In 2013 the average price per advertisement click on Facebook was around 30 cents (salesforcemarketingcloud.com). That means that a SNS needs a lot of users that click on an add to make profits, and even more users who see their ads. Therefore a SNS regularly needs a lot of users to become profitable. This means that for a SNS it is more effective to look at groups of users instead of individual ones. The CLC model needs to help a SNS in detecting these user groups and determining strategies for these different user groups.

Another difference between customers and users can be the contact with the customer and user. While organizations with customers who come to their stores can interact personally with their customers to steer them through the customer lifecycle, SNSs often don't have real life contact with their users. Therefore the CLC model needs to be applicable for organizations that don't have real life contact with their customers or users.

Finally a CLC model for a small organization like StructWeb needs to be direct applicable and realizable without too many organizational changes. A large organization can afford to have separate departments or management teams for all the phases of the CLC, but StructWeb is a startup and doesn't have the resources to form large management teams on the CLC. Therefore the CLC model for StructWeb should give direct insight in the CLC, making it easy to recognize, track and respond to different user groups.

Summed up, the CLC model to be used by StructWeb will need to meet the following requirements:

- *The model should be applicable to non paying users.*
- *The model should be applicable to large user groups instead of just to individual users and should steer development and the marketing of a SNS based on the evaluation of these user groups.*
- *The model should be applicable to organizations that don't have personal contact with the customers or users.*
- *The model should be a hands-on model that is directly applicable and help to understand the lifecycle of a user.*

In the next section, three customer lifecycle models will be presented and afterwards compared to each other, based on the requirements presented above. First the customer lifetime value model by Kamakura et al. (2005) is discussed, then the customer relation lifecycle as discussed by Stauss et al. (2007) is discussed. The third model that is discussed is the AARRR model by McClure (2007). Finally one of these CLC models is chosen to help evaluating and improving the performance of StructWeb B.V. on the user lifecycle.

2.2.2. CUSTOMER LIFETIME VALUE BY KAMAKURA

Kamakura et al. (2005) define three basic steps in the customer lifecycle. Acquisition, development and retention. The authors argue that a customer has a certain lifetime value during the tenure with an organization. This customer lifetime value (CLV) needs to be known to determine how much can be invested in a customer to keep making profit. The authors explain what is important in the three steps of the customer life cycle regarding the CLV.

- *Acquisition: The acquisition strategy objective is to obtain more profitable customers. Therefore it is important to know what kind of customers are acquired in what kind of way. Some channels are more successful than others and therefore the costs will drop by selecting the right channel. Also the CLV can be higher for some customers. For instance customers that focus on price are expected to be less loyal and therefore have a lower CLV. Therefore it is important to know what type of customer, the targeted customer is.*

- *Development: The development of a customer refers to the growth of the CLV by increasing customer demand. This could be done by up-selling (increasing demand in existing categories), cross selling (encouraging customer to buy across categories) and channel management (migrating customers across different selling channels to lower cost or increase demand through channel-specific promotions)(Kamakura et al., 2005). When an organization knows what the expected response will be of a certain group of customers on up-selling and cross-selling of certain products, they can maximize their expected CLV and therefore the revenues. This can be achieved through higher sales in the same length of a cycle and through extending the lifecycle and therefore sell over a longer period of time. Knowing the response of a customer to different kinds of marketing activities, will lead to cuts in expenses, and therefore increasing profits. When it is known that promotional activities for certain groups cost more than they return in revenues, organizations can cancel these activities. Therefore it is important to measure the responses of different groups of customers to the different promotional activities.*

- *Retention: The retention of customers is important because this affects the length of the customer lifecycle. By scoring higher on retention, the CLV will increase due to a longer period of time in which the customer will buy things. Important in retention is to know what causes customer defection (churn). For retention the customer data is important to measure how effective retention mechanisms are for every customer segment. Organizations are using different mechanisms to improve their customer retention and these mechanisms work better for one group than for the other. People who focus on pricing are expected to be more motivated by loyalty programs that offer discounts than customers who value a service and therefore are*

more interested in a better service quality. But improving service, setting up a loyalty programs or plan interventions to prevent churn are no guarantee to improve retention, let alone increase profits. Therefore it is important to measure what works best for what customer group at what costs and how much this increases the CLV.

2.2.3. CUSTOMER RELATION LIFE CYCLE BY STAUSS, GOUTHIER, & SEIDEL

Stauss et al. (2007) had a somewhat different view on the customer lifecycle. They investigated the relationship with the customer over time, and formed a strategy for each stage of the relationships with the customers. They define 3 larger stages, that partially overlap with the model of Kamakura et al. (2005). Stauss et al. (2007) also formulated an activation and retention stage, but added a regain stage to it. Furthermore, they split up these larger stages in smaller phases:

- **Initiation phase**: During the initiation phase the (potential) customer gets familiar with the product offering. The goal of this phase is to initiate new business relationships and the customer oriented management task here should be acquisition management.

- **Socialization phase**: This phase is entered when the new customer makes the first purchase and is entering the "social relationship". The goal of this phase is to consolidate the new business relationship and this should be done through new customer management.

- **Growth and maturity phase**: When the regular customer makes its second purchase the customer enters the growth phase. The customer was satisfied with their first purchase and could have made contact with corporate support through customer retention management. When the rise in the customers spending decline, the maturity phase has been reached. The goal in these two phases is to strengthen the stable business relationship and this should be done through retention management.

- **Endangerment phase**: When the relationship stops growing the degeneration phase has been entered for as long as the customer has not yet terminated the relationship. This can be referred as the endangerment phase. When the intensity of the relationship flattens, this can indicate a depreciation in attractiveness of the provider for the customer. Therefore endangerment phase can be entered every time a customer is dissatisfied with a product or think about terminating the relationship. The goal of this phase is to stabilize endangered relationships with complaining customers and to prevent terminations of relationships. Complained management and switching prevention management should be used to reach these goals.

- **Termination phase**: Now customers have determined to end the relationship and stop to buy goods. It is important for organizations to identify typical "points of rupture" to prevent customers from ending their relationship. The goal in this phase should be to revoke notices. The management task in this phase should be termination management.

- **Revitalization phase**: Some ex-customers never come back, others have again changing circumstances which make them possibly come back to an organization. In this phase customers can be regained to start a new

cycle. The goal in this phase should be to reinitiate new business relationships through revitalization management.

Stauss et al. (2007) used these different phases to determine a customer type, goals and customer oriented management task for each of these phases, summarized in

Figure 5, presented below.
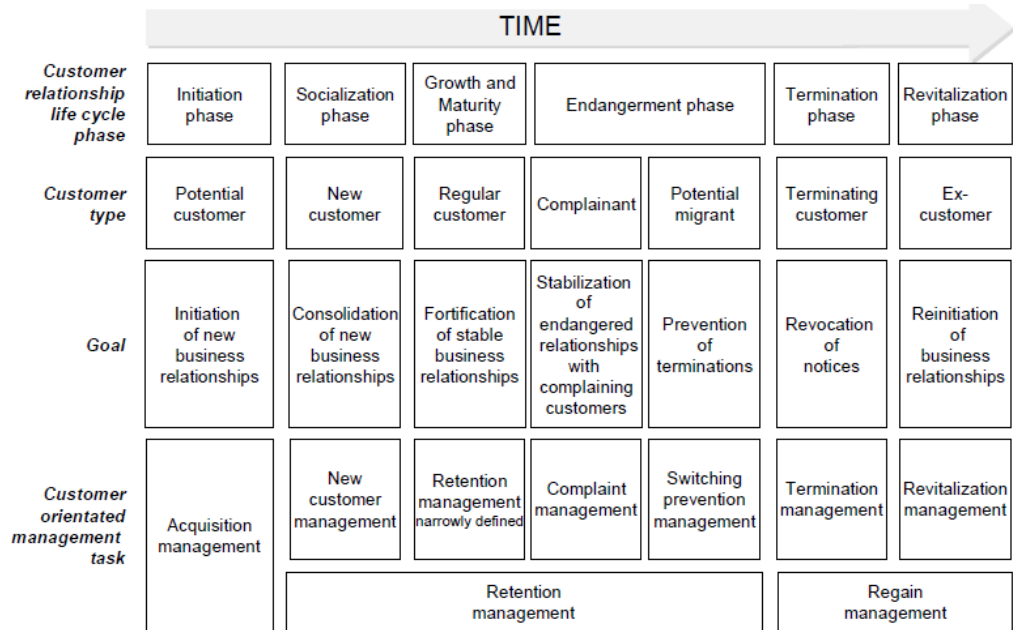
Figure 5: The tasks for the customer relationship life cycle phases as a function of time, as defined by Stauss et al. (2007)

2.2.4. THE AARRR MODEL

The AARRR model, or also referred to as pirate metrics for startups, is a customer lifecycle model developed for internet startups and it is developed by Dave McClure and is already used by StructWeb before this research started. Dave McClure is a venture capitalist and founding partner of "500 startups", a startup seed-fund and incubator. McClure ran the 2009 fbFund for Facebook, was marketing director at PayPal and helped developing the first Stanford course on Facebook and social networking. McClure invested (time and/or money) in 250 startups and developed a specific CLC model for web based organizations , called the AARRR model, which helps the web based organizations to succeed (McClure, 2007). The AARRR model distinguishes the following five stages in the CLC:

Acquisition: The acquisition step is all about acquiring new users. This could be done through various channels. From campaigns, to blogs, to ads on Facebook. Important in this step is the volume of a channel, the cost of a channel and the performance on conversion of a channel(McClure, 2007). The conversion of a channel is the percentage of people that are flowing from one into another stage. An example of these conversion metrics is given in Figure 2. The goal of this conversion matrix is twofold. First, it helps to identify what the conversions of users are, and therefore helps steering the organization to improve the bottlenecks of the service. Second, it helps to determine the (potential) value of a user throughout the different stages in its lifecycle. This steers the organization, because it helps understanding which user group creates the most value, and which investments need to be made. If, for example, a marketing campaign or system development is expected to reach 100.000 users and is expected to improve the conversion with 5% and every user who makes this conversion is estimated to be worth 1$ extra, this means that the campaign or development will generate (0.05*100.000*1$) 5.000$. This information can then be used by the organization to select the campaigns or developments with the most expected returns.

Stage	User State	Conversion %	Estimated Value
Acquisition	**Visit Site** (or landing page)	100%	$0.01
Acquisition	**Stays on Site** (views 2+ pages, stays 10+ seconds, 2+ clicks)	70%	$0.05
Activation	**Happy 1st Visit** (views X pages, stays Y sec, Z clicks)	30%	$0.25
Activation	**Email Signup** (or anything that could lead to a repeat visit)	5%	$1.00
Activation	**Account Signup** (includes profile data)	2%	$3.00
Retention	**Email Open -> Clickthrough**	3%	$2.00
Retention	**Repeat Visitor** (3+ visits in first 30 days)	2%	$5.00
Referral	**Refer 1+ Users Who Visit Site**	2%	$3.00
Referral	**Refer 1+ Users Who Activate**	1%	$10.00
Revenue	**User Generates Minimum Revenue**	2%	$5.00
Revenue	**User Generates Breakeven Revenue**	1%	$25.00

Figure 6 An example of a conversion matrix with conversionrates and values of users in different stages by McClure (2007).

Activation: The second step is to get users active by creating a happy experience the first time a user visits the website. So in this stage people who visit the site must stay there and become more active. For instance someone could be seen as activated if he views A pages, is B seconds on the website and makes C clicks. But signing up for a newsletter or making an account could be seen as activation as well. This depends on the kind of website. A news website like nytimes.com has a different view on an "active user" than youtube.com does.

Retention: After their first visit, it is the aim that users come back. This is called retention. McClure (2007) gives 3 examples of reminding people to come back: Through e-mail, blogs and RSS. He advises to do this after 3, 7 and 30 days after the last visit. Off course other things will get users to come back as well, like advertisements or banners.

Referral: At this step, users tell other people about your product. An important factor in this step is to make sure users are happy with the product. When you want users to tell other people about your product, you want them solely to tell positive things about your product. Therefore it is important user satisfaction is reached before starting a viral marketing campaign (McClure, 2007).

Revenues: In this step the money gets made. This could be done through ads or by getting paid per referral or on another way that supports your business model. This depends on the kind of website you are running. Important for this step is to know what the revenues are of the different conversions. If, for instance a user who is an active contributor, leads to much more revenues than a user who is just a consumer of information, it is a good idea to focus on the contributor group.

2.3. CUSTOMER LIFECYCLE MODELS FOR SOCIAL NETWORKING SITE USERS

In this section the three different CLC models are compared, based on the criteria for a CLC model in section 2.2.1. This section will end with a conclusion on what CLC model is the best fit for StructWeb B.V. to evaluate the lifecycle of their users.

2.3.1. KAMAKURA AND THE CLV OF A SOCIAL NETWORKING SITE USER

Requirement	Model of Kamakura et al. (2005)
Applicable to non paying users.	A strong focus on the value of a customer, but focuses on creating more value by selling more products to a customer. It is hard to determine the value of a user group as it not only depends on the number of users, but also how specialized the users are (Enders et al., 2008)
Applicable to large user groups instead of just to individual users.	Although maybe hard to compute, it's possible to calculate the value of user groups as well.
Applicable to organizations that don't have personal contact with the customers or users.	The value of customers in different phases can be calculated and measure the effects in the proposed way, by evaluating data.
The model should be a hands-on model that is directly applicable	Although it is hard to determine the value of a user, the whole idea of investigating the costs of acquiring a user is very helpful in selecting

Table 1 Evaluation of the suitability of the model of Kamakura et al. (2005) for evaluating the lifecycle of a SNS user

The advantage of the model as proposed by Kamakura et al. (2005) is that determining the value of a user group is very helpful in determining what users deliver the most value. This in return helps determining in what activities to invest to maximize the expected profits, given the available resources. However, they only distinguish 3 different stages and are very targeted to the relation with a paying customer. This comes to light when Kamakura et al. (2005) present their advice on raising the customer's lifetime value. The propose ideas like cross selling products, which is very specific to an organization that sells products.

2.3.2. STAUSS ET AL. AND THE CUSTOMER RELATION LIFECYCLE OF A SNS USER

Requirement	Model of Stauss et al. (2007)
Applicable to non paying users.	Although the relation with a paying customer is expected to differ from the relation with a non paying SNS user, the stages defined by Stauss et al. (2007) are expected to play a role in the lifecycle of a SNS user as well and therefore it is expected to be applicable to non paying users as well.
Applicable to large user groups instead of just to individual users.	If the data allows a SNS to identify user groups and the stages identified by Stauss et el. (2007), it can be well applicable to evaluate user groups in these stages of the lifecycle. But even if the data does not identify the user groups, a SNS can still measure the different stages users end up in, to identify where improvements should be made.
Applicable to organizations that don't have personal contact with the customers or users.	Although Stauss et al. (2007) based their model on paying, real life customers, the formation of strategies for every stage is very useful to improve performance in every stage. However, the stages defined by them might not be applicable to online users as well as to paying customers.
The model should be a hands-on model that is directy applicable and help understanding the lifecycle of a user.	By making SNSs think about their strategies in the described stages, the SNSs are expected to better understand the user lifecycle because they are forced to think about what action is needed in every stage. However, it doesn't give a hands-on approach to determine the costs and benefits of certain actions and strategies in the presented stages of the CLC.

Table 2 Evaluation of the suitability of the model of Stauss et al. (2007) for evaluating the lifecycle of a SNS user

The model of Stauss et al. (2007) is helpful in determining a strategy for users in every stage of their lifecycle model. This can steer organizational investments to support the formed strategies. However, this model misses a more pragmatic approach and does not help determining how much to invest in different stages and what the expected revenues are.

2.3.3. THE AARRR MODEL IN THE CUSTOMER LIFECYCLE OF A SNS USER

Requirement	The AARRR model
Applicable to non paying users.	Evaluating the costs per channel and monitoring the effects are very useful. But it is hard to determine the value of a user group as it not only depends on the number of users, but also how specialized the users are (Enders et al., 2008)
Applicable to large user groups instead of just to individual users.	If the data allows a SNS to identify user groups and the stages identified by the AARRR model, it can be well applicable to evaluate user groups in these stages of the lifecycle. But even if the data does not identify the user groups, a SNS can still measure the different stages users end up in, to identify where improvements should be made.
Applicable to organizations that don't have personal contact with the customers or users.	Made for evaluating data to give an insight in, and improve the performance in every stage of the model. Therefore personal contact with users is not needed.
The model should be a hands-on model that is directly applicable and help understanding the lifecycle of a user.	By thinking about what metrics determine in what stage a user is, a SNS already needs to think about their expected user behavior. This will help SNSs to get a direct insight the performance in every stage of the model as well. But, because of the importance of these stages it might be hard to judge them which can lead to, the numbers of the AARRR model telling them everything is going perfectly, but in reality, their performance is very bad.

Table 3 Evaluation of the suitability of the AARRR model for evaluating the lifecycle of a SNS user

The AARRR model is helpful in determining the value of user groups in different stages and how different user groups convert through the stages of the AARRR model. This information can steer marketing decisions, as well as development of the product. Marketing can be steered because the expected costs and revenues of marketing channels can be calculated, while the development is steered through the conversion information the AARRR model provides. If the metrics of the AARRR model indicate that a lot of users never reach the activation stage, the development can be steered to improving the conversion of the acquisition stage. As earlier discussed, the choice of the good thresholds between the different stages is important to get valuable

information out of the AARRR model. The formation of wrong thresholds could muddle the information the AARRR model gives which can lead to choosing the wrong marketing channels or the development of the wrong features. Furthermore, the AARRR model defines strict stages, but it is not sure whether users are always at one stage or in multiple stages at once. One could think of a user who has not reached the activation stage yet, but does invite his or her friends. The focus on moving from one stage to another through the AARRR lifecycle can make organizations ignore other possible ways users can move through these stages and therefore miss opportunities to for example have people refer their friends.

2.3.4. CONCLUSIONS

The above discussed models can all be valuable to a SNS in the management of the lifecycle of their users. For StructWeb B.V. it is important to have a model that steers their business as a whole, not just the marketing channels, strategy or developments. In the beginning StructWeb B.V. cannot determine the user (lifetime) value because there are not user related revenues yet. However, the evaluation of costs of different strategies can be calculated and their success can be measured in the number of new members in each individual stage. Because the user value cannot be calculated, the CLV model by Kamakura et al. (2005) is not used in this research. The advantage of the AARRR model over the customer relationship lifecycle of Stauss et al. (2007) is that it gives a more hands-on approach with direct measures to evaluate the performance on the user lifecycle. Determining when users convert from one stage to another may however be a problem. On the other hand, in the model of Stauss et al. (2007) the different stages need to be defined as well.

Because the AARRR model is better suited to handle online customers than the customer relationship lifecycle model of Stauss et al. (2007) and because the AARRR model has a more hands-on approach, this model is chosen to evaluate the lifecycle in the rest of this research.

2.4. MOTIVATION OF USERS

2.4.1. HOW THIS LITERATURE STUDY IS PERFORMED

The first part of this research is a literature study to get a more thorough understanding of what motivates users in the first four stages of the AARRR model. The literature is searched in Scopus and Web of Science. In both systems all titles are searched for "social network* site*". This search returned 1046 articles on Scopus, therefore this search is then refined with a search for "motiv*" in title, abstract and keywords. This resulted in 102 articles in Scopus and 53 articles in Web of Science. Because the top 10 most cited articles on Web of science were also found on Scopus, this research focused on the articles that are found in Scopus. A note that needs to be made is that al these articles were searched for between September and December 2014 and therefore a future similar search is expected to result in different findings. The motivations of SNS users to become acquired, become activated, stay retained and refer are withdrawn out of these 102 articles. This should lead to a scientific foundation for the AARRR model. The only exception that is made to this literature search is for the referral stage. The described method did not give enough information for the literature study. A search on "Referral" on Scopus showed a lot of medicine studies and other unrelated papers because referral is a very broad term. The results furthermore showed that "word of mouth" was often used in articles that are valuable for this literature study. Therefore Scopus was searched for the term "word of mouth" in the title, and this was narrowed down with a search for "friend" in the title, abstract or keywords. This resulted in 31 additional documents that can be used for the literature study on the referral stage.

To continuously improve the performance of a SNS (and in specific for StructWeb) in terms of AARRR, it is important to understand what motivates users in each of the stages of the AARRR model. This understanding of motivations should lead to a product that is better tailored to the demands of their users. But what is motivation? Ryan & Deci (2000) define a motivated person as someone who is moved to do something. Therefore, in this research a motivated user is defined as a user who is moved to do something.

2.4.2. ACQUISITION: WHAT MOTIVATES PEOPLE TO VISIT A SNS?

As McClure (2007) noted, it is important to track why users are coming to your website. Therefore it is important what motivates people to visit a social networking site. Trusov, Bucklin, & Pauwels (2009) compared the effect of word of mouth (WOM) marketing and traditional marketing on the member growth on a SNS. Because users generate the content, users directly benefit from bringing in more friends (Trusov et al., 2009). Therefore they hypothesized that WOM would be more effective than traditional marketing like marketing events and media exposure. In their research they found proof for this and as they expected users were more motivated to join a SNS by WOM marketing than by traditional marketing methods. For SNSs this means that they have to think about how they market their product, and how they facilitate the WOM marketing. For instance it might be more

effective for SNSs to promote inviting friends instead of promoting their product themselves through advertisement.

This is confirmed by Wu, Tao, Li, Wang, & Chiu (2014), who did research on the motives of people to switch between SNSs and to start using SNSs. They found that the top reasons for people starting to use SNSs are convenience (75%), peer pressure (58%), user interface (42%) and friends recommendation (42%). Wu et al. (2014) did not only investigate what motivates users to switch between SNSs, but what motivated users not to change as well. They described this as the switching barrier. Switching costs determine the switching barrier and the higher the switching costs, the less people are motivated to change of SNS. Important in evaluating the switching costs are economic risk, learning, benefit loss and evaluation costs. So these are factors that demotivate people to switch between SNSs (Wu et al., 2014). These factors are therefore important for a SNS to keep in mind, to retain their users by rising switching barriers and by attracting users by lowering barriers through lowering switching costs.

Another important factor in the use of a SNS is described by Lorenzo-Romero & Constantinides (2011). They investigated what important factors in the motivation of people to use SNSs are. In their research they found that the intention to use SNSs significantly influences the actual use of SNSs. They furthermore found strong evidence that this intention to use was influenced by the attitude towards SNSs and the perceived ease of use. The perceived ease of use is described as the easiness of the interaction with the technology. This attitude towards SNSs was then again, with a high significance, influenced by the perceived usefulness and trust, while the perceived ease of use was influenced by trust as well (Lorenzo-Romero & Constantinides, 2011). Perceived usefulness is described by Lorenzo-Romero & Constantinides (2011) as the degree to which a person believes that their performance is enhanced by using a particular technology. So for a new SNS it is important to shape possible users' attitude towards SNSs and their trust in SNSs. Furthermore perceived usefulness and perceived ease of use are important factors in the motivation to use SNSs (Lorenzo-Romero & Constantinides, 2011). Since these two factors play a role, a new SNS needs to pay extra attention on how they improve these perceptions of users and how they can use this in their marketing campaign.

Chen (2013) investigated what motivates people to use SNSs as well. He found that enjoyment is a strong motivation for site usage and that this enjoyment is influenced by:

- *Social presence: The extent to which a computer medium allows a user to experience the others as psychologically present.*
- *Ease of use: The degree to which a person believes that using a SNS would be free of effort.*
- *Extroversion: Because SNS offer many ways of expressing yourselves through profiles and the possibility to share content, it is argued that extrovert people are more likely to appreciate the value of a SNS and enjoy their engagement.*

Furthermore he found that risk has a negative effect on site use and this risk is influenced by:

- *Internet risk perception: Is shaped by an individuals' belief in the internet environment and measures one's uneasiness about using internet. This perception may lead to exaggerating uncertainties in SNSs and subsequently overestimating the risk of using SNSs.*
- *Privacy abuse concerns: This reflects one's uneasiness about the potential opportunistic behavior related to one's personal information.*

So in addition to the findings of Lorenzo-Romero & Constantinides (2011), Chen (2013) recognizes social presence, extroversion and enjoyment as drivers for people to use SNSs.

Chang & Zhu (2011) used the theory of planned behavior (TPB) to understand SNSs adaption in China. According to TPB individual behavior is determined by attitude, subjective norm and perceived behavior control. Chang & Zhu (2011) defined attitude as an individual's positive or negative feelings about performing the target behavior. Subjective norm is defined as an individual's perception that most people who are important to him think he should or should not perform the target behavior. This is similar to what Wu et al. (2014) described as peer pressure. Finally perceived behavior control is defined as an individual's perception of how easy or difficult it would be to perform a certain behavior. The researchers found strong evidence that all three factors of the TPB were correlated positive with the intention to adopt a SNS. This was also supported by Osorio & Papagiannidis (2014) who did similar research in the UK. They found that all three TPB factors were significantly influencing the attitude towards joining a SNS. Furthermore, looking for information and entertainment were two reasons that influenced the attitude. Another significant influencer was described as conformity, which is described as the need to do what your friends are doing (Chang & Zhu, 2011; Osorio & Papagiannidis, 2014).

Acquisition motivator	Feature requirements	Marketing requirements
Referral of a friend/recommendation	Refer a friend must be possible.	Promote WOM marketing.
Convenience/ease of use	Make the system as convenient, easy to use as possible.	Promote why it is convenient.
Peer pressure/conformity	Make sure content and features are somewhat exclusive for users so non users feel left out/miss out on things.	Point out what this SNS adds to someone's life and that of their friends.
User interface	Make an attractive user interface.	Point out what is better on the user interface, show it.

Attitude towards SNSs	Make sure that what causes a negative attitude towards SNSs isn't affecting your SNS. For instance the privacy settings.	Focus on what is good and better on your SNS. Note why a certain negative attitude towards SNSs isn't found on your SNS.
Social presence	Let users see peers are present by showing their names and contributions	Use central community members to show the popular people are on your SNS
Extroversion	Make sure users can express and present themselves.	Make sure the marketing message states that this is a place to express yourself.
Trust	Let users know what is and what is not protected from others.	Make sure the message is clear and feels safe for new users.
Looking for information	Make sure that what people look for can be found on your system. Whether this is information or a certain user.	Send out a clear value proposition. When users don't expect to find certain information, they won't be disappointed.

Table 4 Motivations of people to become a SNS user and the implications for the SNSs system and marketing.

2.4.3. ACTIVATION: WHAT MOTIVATES PEOPLE TO CONTRIBUTE TO A SNS?

The success of a social network depends on the amount of contributions any one member's social contacts make (Burke, Marlow, & Lento, 2009). So according to these authors it is important that people contribute content, because the more content one gets to see, the more successful the social network will be. This is in line with the earlier presented network externalities which lead to the conclusion that there must be a critical mass of people around to make the network interesting. Burke et al. (2009) investigated whether seeing more contributions from your friends in the first two weeks of SNS usage, led to more contributions of that users themselves. They argued that seeing your friends upload a lot of content leads to the understanding that this is what is expected of users and therefore people were more triggered to upload content as well. Research of Burke et al. (2009) shows that users receiving more comments on their content and users who experienced a wider distribution of their content were expected to produce more content. So how much content friends

produce, how much they comment and how much they share a user's items is positively related to the amount of content a user produces.

Huang, Basu, & Hsu (2010) investigated what motivates SNS users to share travel knowledge on SNSs. They found that information dissemination and personal documentation where two key motivators for people to share travel knowledge. Information dissemination was done primarily because people wanted to help peers by sharing their personal experiences, while personal documentation was done because people wanted to document their life and experiences, as well as to tell others about themselves. So the helping others and self presentation are motivating users to add content. This was partially confirmed by Oreg & Nov (2008), who investigated what motivates contributors of Wikipedia. They found that self improvement and the desire to help others (altruism) were the strongest motivators for people to contribute to Wikipedia. Self improvement was accomplished through contributing, because other people are likely to give feedback and therefore people learn by contributing. Altruism lead to contributions because people experienced they were helping others with their contributions.

Huang et al. (2010) researched barriers for people to share travel knowledge on SNSs. In their research they found evidence that privacy concerns and time issues form barriers for travel knowledge sharing. Users simply didn't want everyone to know their travel experiences or found it was too time consuming.

Motivator for activation	Feature requirements
Content produced by peers.	Give users the feeling peers produce a lot of content. For instance by making sure the recommendations of peer users are seen instead of a more global recommendation.
Feedback given by others on a user's items.	Make sure it is easy and attractive to give feedback on produced items. Also make sure the user sees al the feedback like comments and likes.
Other users who share a user's items	Let sharing be attractive for other users, and make sure a user knows when their items are being shared.
Personal documentation	Let contributions, actions and favorites of a user be traceable for themselves.
Privacy concerns (Negative)	Be clear about what information is private and what not. Show options to influence settings
Possibility to help others	Let it be easy to contribute like uploading content or answering questions.

Self improvement	Let users comment on each other and notify users when a comment is placed on their actions so they can learn from these comments.

Table 5 : Motivations of people to become a active SNS user and the implications for the SNSs system.

2.4.4. RETENTION: WHAT MOTIVATES A USER TO COME BACK ON A DAILY BASIS?

As previously stated, Ryan & Deci (2000) define a motivated person as someone who is moved to do something. But motivation is not a unitary phenomenon. According to Ryan & Deci (2000) motivation can vary in level and in orientation. The level of motivation means how much motivation a person has, while the orientation says something about the type of motivation. The authors define two types of motivation, intrinsic and extrinsic. Intrinsic motivation is doing something because it is interesting or enjoyable, whereas extrinsic motivation is doing something because it leads to an outcome that is better than when you do nothing.

Lin & Lu (2011) investigated what caused a continued intention to use SNSs. They used the motivation to form two factors of perceived benefits. They distinguish extrinsic and intrinsic benefits and as in the motivation theory extrinsic benefits are benefits that are useful. Intrinsic benefits are formulated as enjoyment. Lin & Lu (2011) hypothesized that these two ways of perceived benefits are affecting the continuation of the intention to use SNSs. Combining the findings of Lin & Lu (2011) and Ryan & Deci (2000), doing something because of its usefulness can be defined as doing something because it leads to an outcome that is better than when you do nothing, while doing something for its enjoyment, it is done because it is interesting or enjoyable.

They started with defining perceived benefits. In their research, Lin & Lu (2011) defined intrinsic benefits as enjoyment and extrinsic benefits as usefulness. Lin & Lu (2011) found that both enjoyment and usefulness were positively correlated with users continued intention to use. But the authors mentioned that enjoyment had a larger effect than usefulness.

Since enjoyment and usefulness are very wide and non specific concepts, it is hard to let users evaluate these two factors because all users will have their own perception of what useful and enjoyment are. Therefore it is needed to investigate what the variables of these factors are.

Koufaris (2002) researched what influenced the intention to return of online consumers and found evidence that (shopping) enjoyment and perceived usefulness where a positive influence on consumers' intention to return.

Perceived web-skills, value added search mechanisms and positive challenges influence the shopping enjoyment (Koufaris, 2002). He defined perceived web-skills as "an individual judgment of one's capability to use a computer" (Koufaris, 2002). Value added search mechanisms are search mechanisms that provide extra information on top of the information someone searched for. This information is provided for instance, when buying a book, the websites show what books you might be interested in as well, based on the behavior of other consumers who bought that book. So making sure users feel skillful, offer users value added search mechanisms and offer them positive challenges will lead to a more enjoyable experience. So Perceived web-skills, value added search mechanisms and positive challenges are expected to be variables of enjoyment.

Kwon, Park, & Kim (2014) researched users intention to use SNSs and focused on Facebook and Twitter users. They found a positive relationship between perceived usefulness and users' intention to use, but also investigated what influenced the perceived usefulness. They found that perceived mobility and perceived connectedness are positively correlated with perceived usefulness, and in the case of Facebook, perceived security had a positive correlation with perceived usefulness as well. According to the research of Kwon et al. (2014) these 3 aspects of perceived usefulness explained 78.1% (Twitter) and 47.7% (Facebook) of the variance in the perceived usefulness.

Lin & Lu (2011) suspected that the perceived benefits, being enjoyment and usefulness, where influenced by network externalities. Results of their research showed that the number of peer user affected the continued intention to use positive, usefulness and enjoyment. Furthermore the researchers found that the perceived complementarity has a strong correlation with both enjoyment and usefulness. Finally the (total) number of members was found to be positively related with the usefulness.

Joinson (2008) investigated what uses and gratifications people derived from SNSs. They found that content gratification, building social capital and communication where reasons for people to use a social networking site. These uses and gratifications are defined as following:

- Content gratification: *The effect that the content is used to satisfy the user*.
- Building social capital: *Creating a larger and/or stronger network, so the sum of the possible available resources through this network gains*.
- Communication: *The communication with others.*

"Communication" and "Social network surfing" are also confirmed by the research of Constantinides, Lorenzo-Romero, & Alarcón-del-Amo (2011), who found that sending private messages and searching for people where the top two reasons for people to often carry out activities on a SNS. Joinson (2008) also concluded that content gratifications leads to increased time spent on the website. So for realizing retention, meaning recurrent visits, social connection gratification is an important factor.

Factors of retention:	Variables of that factor	Feature Requirement
Enjoyment	Perceived web-skills	Make users feel skilled. For instance by providing users positive feedback on their actions.
	Positive challenges	Challenges for people with rewards when they complete them(a medal or level up or something like that)
	Content gratification	Make sure that seen content is what users expect. By gathering data about their views for instance. Or make sure users select the content they want to see.
Usefulness	Perceived mobility	Make an app and make sure the service is accessible on all kinds of devices without needing to download a program.
	Perceived connectedness	Make sure users can interact with each other and send messages to friends.
	Perceived security	Let users feel safe by letting them know what is done with their user data and how the product is safe for usage. By making it possible to report someone for instance.
	Building social capital	Provide users with the possibility to connect with others and give insight in what resources are available to a certain user.
	Communication	Make is possible to communicate in an easy way.
Number of peer users		Let users see peers and their activity. Make it easy to invite peers
Perceived complementarity		Make users see information they perceive as complementary. For instance by suggesting content.

Table 6 Motivations of people to become a retained SNS user and the implications for the SNSs system.

2.4.5. REFERRAL: WHY DO USERS REFER TO THEIR PEERS?

McClure stated that making users happy will ultimately lead them to send referrals to their friends. In this section the motivation for people to refer friends will be discussed. As discussed in Section 2.4.1, this chapter contains literature of referrals in general, because the literature found on SNS referral was not sufficient.

Phelps, Lewis, Mobilio, Perry, & Raman (2004) investigated what are important factors in electronic word of mouth advertising. One of their research questions was focused on what motivates people to send pass-along emails. To investigate the motivations of these people, Phelps et al. (2004) used the interpersonal communication motives scale of Rubin, Perse, & Barbato (1988) which enlists 28 reasons for people to communicate with others. Phelps et al. (2004) found that the top four reasons for people to forward a pass-along emails were for enjoyment, for entertainment, to help others and to communicate caring. This questionnaire was followed by some open ended questions about the pass-along emails. The key findings of this part are that for a pass-along email to be sent, the email must contain an important message or something that the receiver is expected to like.

Although this research focused on pass-along emails, it does provide a useful insight in what motivates people to advertise to others. Users who share an item on social networking sites are actually doing the same. They evaluate content and send it along to others by sharing it on their wall. For SNSs this means that if they want to promote sharing of content, they need to focus on enjoyable, entertaining, helping or compelling content. The importance of a message or expectancy of a receiver to like it, is important for a sender to send information as well. This will help SNSs to further stimulate users in their behavior. For instance when someone likes an item, a SNS can add to it "If you like it, maybe your friends like it as well, share it with them!" instead of just asking people to share. These seemingly small adjustments can make the difference between someone referring an item or not.

As earlier noted, Trusov et al. (2009) stated that SNS users directly benefit from bringing in more friends, because users generate content. This should also be a focal point of SNSs to make users refer to their peers. Making sure users understand what is in it for them and therefore willing to refer to friends. Dropbox does this by given people more space if they refer friends, Facebook does this by creating a larger audience and more content. SNSs therefore need to focus on promoting the benefits for their users when they refer the SNS to friends. Furthermore, the SNS can build in some features that are more appealing when more peers are present to further stimulate users to invite peers.

Motivator for referral	System requirements
Enjoying content	Make sure a user sees content which he is likely to find enjoyable.
Informing content	Make sure a user sees content which he is likely to find informing. And therefore is expected to help others.
Important content	Focus on what is important in a message/content. For instance users can write a recommendation on why this is important. Let every user be able to edit this recommendation when sharing because he is most likely to know what is important for his peers.
Content that is expected to be liked by peers	Focus on the fact that when he likes something his peers will like it as well. Let users write their own recommendations
Benefit from a referral	Let users know they benefit from referring a friend and let them know what their benefits are. Maybe even design features that are more appealing when more friends are around.

Table 7 Motivations of people to refer their peers and the implications for the SNSs system.

2.4.6. REVENUES

The value of a user can be defined in every stage of the user AARRR model. To calculate the value, it is important to know how this user leads to revenues for the SNS. Therefore the revenue model of a SNS plays an important role in the determination of the user value in every stage of the AARRR model. Enders et al. (2008) identify three different revenues models that are suitable for a SNS:

Advertisement models: According to Enders et al. (2008) the foremost form of revenue generation on SNSs due to the tendency among users to demand free services. The authors distinguish between affiliate and banner models. In affiliate models, SNSs steer traffic to an "affiliate" website and these websites pay the SNSs for these referrals. Banner models create revenues by charging fees for displaying advertisements. The advertisement model needs a lot of traffic on a SNS in order be interesting enough for advertisers and create enough revenues.

Subscription models: These are revenue models where a website offers its users content or services and charges a subscription fee for access to some or all of its offerings. A particular subscription based model is the freemium model where users get basic features for free and need to pay for more advanced features. SNS need to create enough customer value when implementing a subscription model, or else users are not willing to pay for the service. SNSs deliver this value through (user-generated) content and interaction. When a user can find interesting profiles of other users and tap into expert groups, this is likely to result in a higher networking intensity which again is linked to more customer value (Enders et al., 2008). Therefore the authors identify increasing levels of content, frequently updated and expanded profiles and multiple membership packages with corresponding pricing schemes as important factors in this model.

Transaction models: With this type of revenue model, the SNS creates revenues by enabling or executing a transaction for a third party. To create sufficient revenues from this model, a critical mass of users is essential that is willing to pay for a service or product. There is a certain interdependence between the two factors. If, for example, a SNS receives a certain percentage of the traded value and the values are relatively high, the critical mass of users may be relatively small (Enders et al., 2008).

In addition to the revenues model, also the conditions that define each stage, influence the user value. For example in the acquisition stage: One SNS might only have information accessible after login in, whereas another SNS shows information to all visitors, logged in or not. This can affect the way these two SNSs see a user as acquired. The open SNS can define an acquired user as a visitor, while the more closed SNS might only see users who create an account as acquired.

Due to these differences per SNS, it is impossible to present one way of calculating the value of a user in every stage, that is applicable to every SNS. But it is possible to present a more general way of thinking that can help to evaluate the user value in each stage to steer strategic decision making.

To do so, first the conditions per stage need to be defined. This can be defined for all users at once, or per user group. For instance a distinction between contributors and consumers can be made, but also between men or women, or any other difference between users that is relevant for a SNS to identify. Second, the conversion rates need to be determined. If there are already users on a SNS, the statistics of these users can be used. If there are no, or very little users, an estimation must be made. This step helps to get an insight in how users transform from the one to another stage. Although it is suggested that users follow a sequential path from acquisition to activation, to retention, to referral and to revenues, it is not necessarily the case. A user could for instance still be in the activation stage, but already refer to his friends, or create revenues without referring a friend. Therefore it can be valuable to monitor the conversions from a specific stage to all other stages.

If the conversions are known, the actual value per stage can be calculated. This depends largely on the revenues model. For instance in a advertisement model, every click on an advertisement creates revenues,

whether the users is just acquired or already retained therefore one could say that almost every user reaches the revenues stage while in a subscription model only those users who pay for a subscription reach the revenues stage.

For a simple subscription model, where users are paying one price for a subscription and are either subscribed or not, the conversion rate for each stage to the revenues stage can be calculated by determining the percentage of users in a stage that sign up for a subscription. This combined with the average revenues per user in the revenues stage can then give an insight in the value of a user. This calculation can be further extended by also taking the conversions to other stages and their corresponding values into account. This is just a simple example, for SNSs with multiple types of subscriptions and multiple user groups the model quickly gets more voluminous.

For an advertisement and subscription model, users keep creating revenues by clicking on advertisements, or by viewing them (depending on whether the SNS uses an affiliate or banner model). An easy way of calculating the value of a user, is by calculating the average revenues per advertisement click (or view) and the percentage of clicks (or views) on advertisements. Multiplying these numbers gives an average amount of revenues per click. If then the average amount of clicks of users in a specific stage are determined, the average value of a user in that group per strage can be calculated. This is also a recommended approach for StructWeb. Again this calculation can be further extended by taking the conversions to other stages, different user groups and multiple advertisement types into account.

2.4.7. NETWORK EXTERNALITIES

Since the number of peer users plays an important role in all the discussed CLC stages this is more thoroughly discussed in this section. Users experience differences in the utility of a service, depending on the number of co-users in their network. This effect is the network externalities effect (Katz & Shapiro, 1985). Therefore, it is important to understand the effect of network externalities on the usage of a SNS. Katz & Shapiro (1985) define two types of network externalities:

- *Direct generated externalities: For instance a telephone. When you are the only one, you can't call anyone, the utility of a telephone that is experienced by users, grows when more people have a telephone.*
- *Indirect generated externalities: For instance a mobile phone operating system (OS). When no one uses the same OS you use, new apps won't be developed for your OS. But when the number of users of your OS rises, so does the need for software developers to make their software compatible with your OS.*

Chieh-Peng & Bhattacherjee (2008) state that direct network externalities result from the demand side, where indirect externalities result from the supply side. These authors also propose to make a distinction in the direct generated externalities. They state that for some SNSs the number of friends who use it, is far more important

than the number of users overall. Chieh-Peng & Bhattacherjee (2008) use the example of Skype to illustrate their proposition. With Skype you can call with people all over the world via the internet and therefore save on the telephone bill. But for a user it is far more valuable to have a few friends using Skype, than a lot of people they don't know using Skype. This proposition is backed by the research of Vasalou, Joinson, & Courvoisier (2010). They found that Facebook users were, when using Facebook, more concerned with seeking their off-line social connections then they were with seeking new contacts. Therefore another network externality is added by Chieh-Peng & Bhattacherjee (2008): *Peer generated externalities:* The number of friends who make use of the same network.

The here above presented examples are examples of positive externalities; things get better when there are more users. But there are negative externalities as well. When there become more motorists on a freeway, they create traffic congestion which slows them down, reducing the attractiveness of the freeway for all motorists (Chieh-Peng & Bhattacherjee, 2008). In this case, more users result in a less attractive network.

A distinction is made between compatible and incompatible networks. When your network is incompatible with another network, the total number of users is the number of users on your network (Katz & Shapiro, 1985). For instance the online gaming networks of Playstation and Xbox. When you own an Xbox, you can only play against other Xbox users. But if two firms' systems are interlinked, or compatible, then the aggregate number of unique subscribers to the two systems constitutes the appropriate network (Katz & Shapiro, 1985). For instance Facebook and Twitter. You can share your tweets via Facebook and therefore your twitter followers and your Facebook friends see your tweet.

Lin & Lu (2011) expected that network externalities influence the continued intention to use. They tested the effect of network externalities on the perceived benefits, and the direct effect on continued intention to use.

The network externalities were defined as following:

- *Number of users: Direct network externalities were represented by the number of users.*
- *Number of peers: The number of friends who are using the network, were used to represent the peer network externalities.*
- *Perceived complementarity: Do users think a SNS provides complementary services? This is linked to indirect network externalities.*

The number of peers intensified the users (continued) intention to use because there was a significant relationship between the number of peers and the (continued) intention to use.

2.5. HYPOTHESES

The literature study presented above has two main objectives. First, it serves as basis for an advice to SNSs in general – and StructWeb B.V. in specific - on how to improve their performance on the metrics of the AARRR model. The identified motivations for acquisition, activation, retention and referral can be used to evaluate the product offering of StructWeb B.V. This evaluation can be found in Appendix A and its results are further discussed in Chapter 6.

Second, the literature study is used to form hypotheses. Ryan & Deci (2000) defined two different types of motivation. Intrinsic and extrinsic motivation. These two types of motivation are in this research described as enjoyment (intrinsic) and usefulness (extrinsic). Enjoyment is an important factor in the retention of SNS users (Koufaris, 2002; Lin & Lu, 2011). Furthermore, they suggest that usefulness is an important factor in the retention of SNS users, and this is confirmed by the research of Kwon et al. (2014). Therefore the effect of enjoyment and usefulness on retention are hypothesized and tested. This leads to the formulation of the following two main hypotheses:

H1: Enjoyment has a positive effect on the retention of users.

H2: Usefulness has a positive effect on the retention of users.

Since enjoyment and usefulness are broad concepts, it is hard to let users evaluate these two factors because users will have their own perception of what usefulness and enjoyment are. Therefore these two factors need to be operationalized into smaller, more clear and less ambiguous variables.

Koufaris (2002) found that perceived web-skills and positive challenges have a positive effect on the enjoyment. Therefore these two are expected to be variables of the factor enjoyment. This is further complemented by the findings of Joinson (2008), who found that content gratification is also influencing the enjoyment.

Kwon et al. (2014) discussed the factor usefulness and found that perceived mobility, perceived connectedness and perceived security play a role in the perceived usefulness. This was further complemented by the research of Joinson (2008) who found that the ability to build social capital, and the possibility to communicate with others, were influencing the perceived usefulness as well.

Finally, there are some factors that are expected to affect both usefulness and enjoyment. Lin & Lu (2011) found that the number of (peer) users, and the perceived complementarity affected both usefulness and enjoyment. These two factors are additionally found to directly influence retention (Joinson, 2008; Lin & Lu, 2011). Therefore the correlation of these two factors with enjoyment, usefulness and the quality of retention will be tested as well. This leads to the following hypotheses:

H3a: The number of peer users is positively correlated with the retention quality

H3b: The number of peer users is positively correlated with enjoyment

H3c: The number of peer users is positively correlated with usefulness

H4a: The perceived complementarity is positively correlated with the retention quality

H4b: The perceived complementarity is positively correlated with Enjoyment

H4c: The perceived complementarity is positively correlated with usefulness

The methodology to test these hypotheses is presented in the next chapter, together with an assessment of the validity of the research.

3 METHODOLOGY

In this chapter the methodology of this research being conducted is outlined. The scope, sample, research design, measurement model and the validity of this research are presented and analyzed. The goal of this chapter is to give an insight in the methods that are used to conduct the research and which ultimately lead to the conclusions, and to discuss and minimize possible threats to its validity.

3.1. SCOPE

Several choices have been made to narrow down the scope of this research. The five stages of the AARRR model are discussed, but only the retention stage is validated with a quantitative analysis. This stage is chosen because StructWeb is specifically interested in improving the retention of their users because StructWeb expects that the retention of users – embedding it in their daily routine – is difficult to achieve. Although the research conducted only validates the retention stage, the methodology as outlined in this chapter, can be equally well applied to other stages of the AARRR model.

The scope limits to SNSs. The AARRR model can be used at other (web-based) organizations were the customer lifecycle plays a prominent role as well, but the optimum CLC model should be determined case by case. Because of the focus on SNSs, only literature for SNSs is used in this research.

Because the validation of the motivators for retention are only tested on users of Student.world, the scope of this validation is even further narrowed down to the users of Student.world. What this means for the sample size is discussed in the next section.

3.2. POPULATION, TARGET GROUP AND SAMPLE

3.2.1. POPULATION

Student.world is launched amongst students from the University of Twente (UT) and Utrecht University (UU). This means that the population exists of UU- and UT-students. But this study is looking at the retention of Student.world users, therefore the population is limited to those students who use Student.world. This limits the population to around 540 people (measured on the 15th of may 2015). This is caused by the fact that Student.world is in beta and open to a limited audience.

3.2.2. TARGET GROUP

The target group of Student.world consists of students in the Netherlands, while the target group of StructWeb consists of a lot broader audience with, in the beginning, everyone in the Netherlands with an internet connection, and in a later stage everyone in the world with an internet connection. While the presented literature study in Chapter 2 is directed to the motivations of SNS users worldwide, and applicable to the worldwide target group, the quantitative analysis is performed with Student.world users, and thus only students who study in the Netherlands. Therefore the quantitative analysis is better applicable to the Student.world target group. This will be further discussed in section 3.4.

3.2.3. SAMPLE

To get as many respondents as possible, the whole population will be approached to fill in a questionnaire. Because only 31 respondents filled in the questionnaire, the sample size in this research is 31. To calculate the margin of error, the following formula is used:

$$SS = \frac{Z^2 \cdot p \cdot (1-p)}{MOE^2}$$

SS represents the sample size, Z represents the Z value corresponding with the confidence level (1.96 for 95%), P represents the percentage of users picking a certain choice, and the MOE is the margin of error.

Because the hypotheses tested is whether the presented factors of retention, are a good prediction of retention at Student.world, the population of which a statement is made, is the 540 Student.world users. With a sample size of 24 respondents, a confidence level of 95% and a percentage picking a choice set at 50% (to prevent a too optimistic percentage, as answers are overall widely spread), the calculator shows the margin of error is 17.1%.

3.3. RESEARCH DESIGN

The literature study in Chapter 2 was the first part of this research. This literature study presented what motivates users in each of the first four stages of the AARRR model. What motivates users in the retention stage is further tested with an quantitative analysis

3.3.1. QUANTITATIVE RESEARCH

The second part of this study is a quantitative analysis. According to Newman (1998) a quantitative analysis is used "when one begins with a theory (or hypothesis) and tests for the confirmation or disconfirmation of that hypothesis". Therefore a quantitative analysis is performed to test whether the motivators of retention, as obtained from the theory, are indeed affecting the retention at Student.world. This quantitative analysis should help reaching the following two research goals, as described in Chapter 1:

- **Empirically validating the theoretical description of motivations for retention, based on the case of StructWeb.** The retention phase is validated through a quantitative analysis of the experiences users have on StructWeb and how this relates to their retention statistics.

- **Providing insight in how StructWeb users perceive the fit between the offerings of StructWeb and the motivation of users to become daily users.** This quantitative analysis should give StructWeb an insight in how users experience certain factors that, according to the theoretical foundation, influence retention.

The data collection is done in two ways. The users fill in a questionnaire that gives information about how these users experience the different variables of enjoyment and retention, along with their perceived complementarity and the number of peer members. This is done using a 5 point Likert scale because the papers where the questions where derived from also used these 5 (or in some cases 7) point Likert scale, and this scale is commonly used to measure attitude, providing a range of responses to a given question or statement (Jamieson, 2004). Therefore, this research uses the five point Likert scale in its questionnaire.

To compare this questionnaire data with the retention, a problem arises. Since one could say users have either reached the retention stage or not, this would mean that retention is a dichotomous ordinal variable, i.e. either you score a 1 or a 0 on retention. Defining retention as a dichotomous ordinal variable can be problematic because this brings in the need for a threshold between a retained and a non retained user. The choice of a threshold has a large influence on the outcomes of this research and therefore make the outcomes very arbitrary. Previous research used the term (continued) intention to use or return to measure retention (Koufaris, 2002; Kwon et al., 2014; Lin & Lu, 2011). This defines retention as a continuous use. Then the same question arises, what is continuous use? One daily visit, one weekly visit?

In this research, therefore is chosen for an indicator of retention. For this indicator the retention quality is chosen, which is defined as the amount of clicks a user made on the system in the last month. The advantage of this scale is that distinctions can be made between every user. Additionally it circumvents choosing a (possible arbitrary) threshold. An advantage of looking at the amount of clicks over days of visit is that some users might visit more than once every day, and by measuring the clicks, this can be identified, assuming that more visits a day will result in more clicks a day.

The data retrieved from the survey is linked to the retention quality to test if enjoyment and usefulness are good predictors of the retention quality of a user, and what the role of perceived complementarity and the number of peers is in this relationship. This also means that the hypotheses that are tested need to be changed to what is actually tested. Therefore hypotheses 1 and 2 are reformulated into:

H1: Enjoyment has a positive effect on the retention quality of users.

H2: Usefulness has a positive effect on the retention quality of users.

3.3.2. MEASUREMENT

This paragraph explains how to test if these factors are positive correlated with the quality of retention. This is done in two parts.

The first part is visualizing the hypotheses by making a model of the hypothesis testing structure. As explained before it is expected that three variables explain the latent variable (an unobserved variable that is inferred by other variables (Borsboom, Mellenbergh, & Van Heerden, 2003)) enjoyment, and that five other variables explain the latent variable usefulness. Furthermore it is expected that a higher score on usefulness and/or enjoyment will lead to a higher quality of retention:
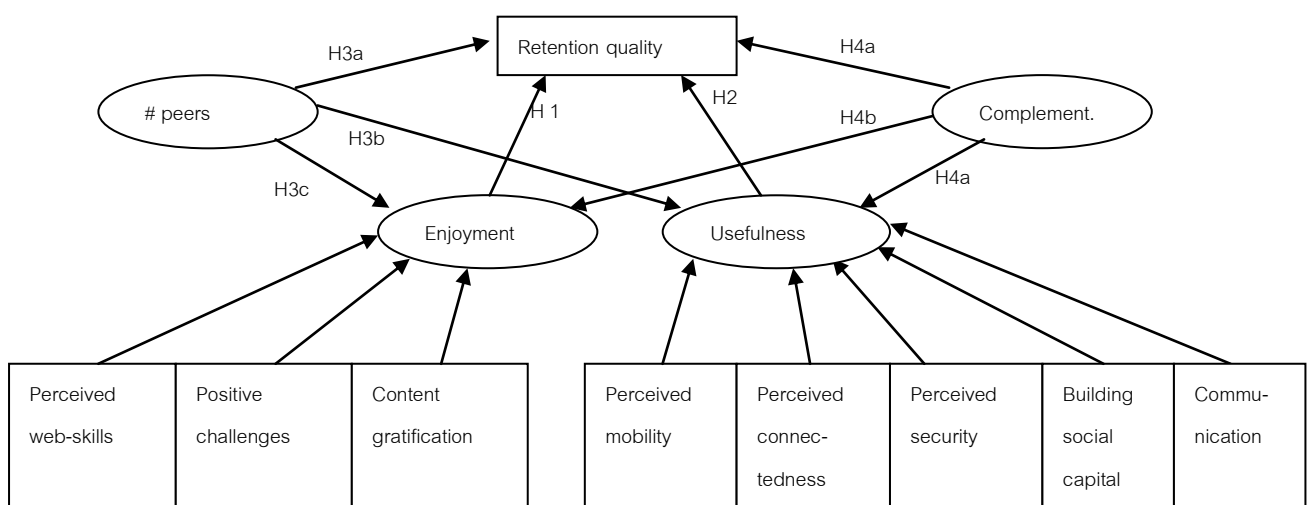
Figure 7 A schematic view of the measurement model.

The second part of this research will be testing the hypotheses. In order to test hypotheses H1 and H2, it is important to know enjoyment and usefulness are 2 completely different factors, and whether the proposed model, fits the data. The factor analysis is a way to test this. But as previous researchers state, there needs to be a minimal sample size for the factor analysis to have valuable results. Some researchers say this depends on the number of respondents (N) itself, while others state the subject (respondents) to variable ratio is important (Arrindell & Van der Ende, 1985; Velicer & Fava, 1998). But what both views have in common is that 24 respondents is not enough. If the data is split up and the factor analysis is only analyzing the factor enjoyment, there are 3 different variables, and therefore the ratio is 8 subjects for every variable of enjoyment (for usefulness this is even lower, under 5 cases per variable). Although Cattell (1977) states that a ratio of 3-6 can be acceptable, he additionally states that a minimum of 250 cases is needed for a valuable factor analysis. While Arrindell & Van der Ende (1985) investigated the number of cases needed for a valuable factor analysis,

independent from the amount of variables, and found that the absolute minimum advised in previous research is 100 cases (Arrindell & Van der Ende, 1985). Since our number of cases does not come close to this number, the factor analysis is not expected to give any valuable results, and is therefore recommended, but not used in this research.

Cronbach's Alpha is sometimes thought to be a measure for detecting factors as well, but, as Cortina (1993) describes, Cronbach's Alpha is a function of the extent to which items in a test have high communalities and thus low uniqueness. It is also a function of interrelatedness, although one must remember that this does not imply unidimensionality or homogeneity. This means that although items might measure different constructs, they might be interrelated. For instance a user who enjoys StructWeb, might think it's useful as well and therefore items of usefulness and enjoyment could be in one test and still score high on Cronbach's Alpha. Cortina (1993) additionally notes that Cronbach's Alpha is sensitive for the amount of items. A construct with more items result in a higher Alpha and therefore might give the wrong idea as well. This is a consequence of the way Cronbach's Alpha is calculated. Because the test adds the scores of all the items, the impact of one or a few items as a part of a large number of items, is low. This can be a reason for Cronbach's Alpha to have an acceptable value, while measuring two or more different constructs. Therefore Cronbach's Alpha is not used to test whether the variables describe the factors as well.

To test whether enjoyment and usefulness are predictors of retention quality at Student.world, regression analysis is used. Although some researchers say that parametric methods like the regression analysis can only be used with ratio or interval variables (Huizingh, 2007), others state that the use of a regression analysis on Likert scale variables can be done without worrying about drawing the wrong conclusions (Norman, 2010). The argument for using Likert scale items in a parametric test is that the Likert scale could be seen as a semi interval scale. This means that the difference between agree and neutral is approximately just as big as the difference between neutral and disagree. The Likert scale is often used in combination with parametric tests like the regression analysis (Boone & Boone, 2012; Norman, 2010). Therefore, in this research the Likert scale will be used in combination with a the regression analysis to test whether the factors enjoyment and usefulness have are predictors of the retention quality. This test is used to confirm or reject H1 and H2.

Finally H3a-c and H4a-c are tested. With H3a-c being:

> H3a: The number of peer users is positively correlated with the retention quality
>
> H3b: The number of peer users is positively correlated with enjoyment
>
> H3c: The number of peer users is positively correlated with usefulness

And H4a-c being:

> H4a: The perceived complementarity is positively correlated with the retention quality

> H4b: The perceived complementarity is positively correlated with enjoyment

> H4c: The perceived complementarity is positively correlated with usefulness

To test these hypotheses the spearman correlation will be used. Although it is noted that this is a parametric test as well and therefore only can be used with interval variables as well.

3.4. CONSTRUCT, INTERNAL AND EXTERNAL VALIDITY

It is essential to assess the validity of the research design to make sure that the results and conclusions drawn from this research are well founded. This is done by evaluating the construct, internal and external validity. Construct validity is concerned with whether the measurement is measuring what is thought to be measured (Cronbach & Meehl, 1955). Internal validity is reached when a causal relationship between two variables is properly demonstrated (Shadish, Cook, & Campbell, 2002), and external validity is the extent to which a study or experiment can be generalized to a larger population (Shadish et al., 2002). Hereunder these three validities are further discussed.

3.4.1. CONSTRUCT VALIDITY

All constructs that are tested are based on the literature presented in Chapter 2. The questionnaires used in that literature to test these constructs are also used in this research to test the constructs in this case. As these questions from other researches are already validated, we assume that they are a good representation of the different constructs which we aim to measure. The usage of (parts of) validated questionnaires is therefore assuring the measurement reliability and validity.

This can however be influenced because the questionnaire has been translated. To better fit the target group of Student.world, the questionnaire is translated to Dutch. To prevent this having an effect, the questions have not been changed but just translated. Therefore it is assumed that this translation has a very little effect on the outcomes.

A problem with the construct validity can be what Shadish et al. (2002) define as "Novelty and Disruption effects". The fact that StructWeb is a company started by a student of the University of Twente and that this is something new, can lead to users being extra positive or extra sceptical about the product. Because this effect has influence on the high-retained user as much as on the low-retained users, the novelty and disruption effect is not expected to have a lot of influence on the relative scores.

3.4.2. INTERNAL VALIDITY

Internal validity is described by Shadish et al. (2002) as "molar causal validity". Causal refers to the causal inference that is needed between two attributes. So it must be clear that one attribute causes the other. The word molar recognizes that treatments in experiments are a complex set of components and are tested as a whole in the treatment rather than individual components.

Shadish et al. (2002) identify 9 threats to internal validity;

- **Ambiguous temporal precedence**: In this research it is tested if enjoyment and usefulness stimulate the retention of users. Based on the theory presented in this research, it is presumed that usefulness and enjoyment stimulate retention, and not the other way around. Therefore, based on the presented theory, ambigual temporal precedence is not expected to have a significant effect on the internal validity.

- **Selection**: Because Student.world is only having students as users. It is possible that there are differences between how students experience Student.world and how non students, in a later stage, will experience StructWeb. This is something that should be considered when trying to generalize the results of this research to other target groups than the target group of Student.world, as discussed in section 1.1.1.

- **History**: It is possible that there are some important changes that influence the outcomes of this research. But the small time of gathering data is preventing this for a big part.

- **Maturation**: Again, the relative short period of time in which the date is gathered, should help preventing maturity affecting the results.

- **Regression**: Asking users to fill in the questionnaire via social media, email and when visiting Student.world, will help prevent only selecting extreme scores. Furthermore these users are not only selected on their extreme scores, every Student.world user can fill in a questionnaire.

- **Attrition**: This can be a threat to the validity. Non active users are expected to respond less on the questionnaire. To prevent attrition having an effect, retention quality is chosen instead of the dichotomous variable retention (retained or not), but a ratio variable (retention quality as the amount of clicks). The results of this research can therefore still tell us whether certain motivators boost retention quality or not. A second way of dealing with the attrition is using email and social network messages. A user that is not active (anymore) can still be willing to fill in the questionnaire to share his displeasure.

- **Testing**: Because this test looks like the difference between users who fill in the same test, this is not expected to have an effect on the outcomes of the results.

- **Instrumentation**: Since the measurement runs only for a short period of time, this is not expected to have a significant effect on the outcomes.

- **Additive and interactive effects of threats to internal validity**: This could especially be the case of the combination of regression and attrition. Where with attrition the danger is that users who don't like StructWeb won't respond to the questionnaire. This could again cause regression to play a role as well. Therefore it is important to critically review the descriptive statistics for this effects and make sure that during interpretation of the results, the possible additive and interactive effects are taken into account.

3.4.3. EXTERNAL VALIDITY

Shadish et al. (2002) define external validity as "inferences about whether the cause-effect relationship holds over variations in persons, settings, treatments, and outcomes". This research Especially focuses on the cause-effect relationship between usefulness and retention, and enjoyment and retention. The importance of external validity is emphasized by Wijnhoven & Bloemen (2014) who investigated the external validity in sentiment mining.

A threat to the external validity of this research could be that this research only tests students. Therefore generalization of the outcomes of this research to other groups than students can be problematic. For every motivator it is useful to think about the effects that this specific sample group of just students has on the outcomes of the experiment. A clear example is that of evaluating a book. If it is written for with no background in mathematics, it should be evaluated by people with no background in mathematics (Wijnhoven & Bloemen, 2014). By looking at just a small group of students, it is questionable that their opinions about the system are representing the opinions of the larger student audience, or that of other groups. This can influence whether the outcomes of this research hold over different kinds of persons.

Another problem in generalizing results of this research is the community itself. An university, especially a small one like the University of Twente, is a community in which a lot of people know one another. This can also have a significant effect on the outcomes of this experiment. Some idea's and beliefs that are formed in a community can affect the way the members of the community experience StructWeb and therefore this community factor can muddle the results.

Finally, this research tries to tell something about the AARRR model in SNSs. This experiment however only tests users of StructWeb. StructWeb is a SNS, but that doesn't mean that all SNSs are the same. The StructWeb users may not be representative for the general SNS user. The generalization to other SNSs should therefore be taken with care. Whether the results are applicable should be judged on case by case.

4 RESULTS

In this section the results of the quantitative analysis are presented. First, it is explained how the different variables are formed and general information about the sample is given. Then the data is analyzed and the hypotheses presented in section 3.3.2 are tested.

First, the amount of clicks users have made the last month is reviewed, to see if only active users have replied to the questionnaire, or maybe only inactive users. The results tell us that not only active, or inactive users have responded, since high values are noted, as well as very low values, as seen in Table 9 on the next page.

Since the top two values (9606 and 10468 clicks), are more than 3 times the standard deviation (2488.30) away from the mean (786.35) as seen in Table 8, these two values can be seen as outliers and will therefore not be used in this test. This brings back the data to 29 respondents.

Descriptive Statistics

	N	Mean	Std. Deviation
Retention quality	31	786.35	2488.308
Valid N (listwise)	31		

Table 8 Descriptive statistics of the sample

Retention quality

	Frequency	Percent	Cumulative Percent
0	6	19.4	19.4
1	3	9.7	29.0
6	1	3.2	32.3
8	1	3.2	35.5
13	1	3.2	38.7
15	1	3.2	41.9
25	1	3.2	45.2
27	1	3.2	48.4
29	1	3.2	51.6
30	1	3.2	54.8
60	1	3.2	58.1
67	1	3.2	61.3
77	1	3.2	64.5
127	1	3.2	67.7
150	1	3.2	71.0
162	1	3.2	74.2
172	1	3.2	77.4
216	1	3.2	80.6
470	1	3.2	83.9
487	1	3.2	87.1
837	1	3.2	90.3
1322	1	3.2	93.5
9606	1	3.2	96.8
10468	1	3.2	100.0
Total	31	100.0	

Table 9 The frequency table of the amount of clicks in the last month of users who filled in the questionnaire.

The theory discussed in Chapter 2 leads to the definition of two factors that are expected to predict retention; usefulness and enjoyment. According to the presented theory the latent variable usefulness is defined by the variables perceive mobility, perceived connectedness, perceived security, building social capital and communication. According to the presented theory the latent variable enjoyment is defined by the variables perceived web-skills, positive challenges and content gratification. These variables of usefulness and enjoyment are measured by a questionnaire, using 3 items per variable. The value of the 3 items were added to

each other to form the variables. As discussed in section 3.3.2, the Likert scales are viewed as interval scales, and therefore this is assumed to give an accurate representation of the different variables. The descriptive statistics of these variables are presented in Table 10 (enjoyment) and in Table 11 (usefulness).

Descriptive Statistics

	N	Mean	Std. Deviation
PerceivedWebSkills	29	9.76	2.355
PositiveChallenges	29	5.21	2.541
ContentGratification	29	6.10	2.396
Valid N (listwise)	29		

Table 10 Descriptive statistics of the measured variables of enjoyment

Descriptive Statistics

	N	Mean	Std. Deviation
PerceivedMobility	29	5.79	2.289
PerceivedConnectedness	29	7.52	1.785
PerceivedSecurity	29	8.90	2.512
SocialCapital	29	1.86	1.642
Communication	29	1.14	1.642
Valid N (listwise)	29		

Table 11 Descriptive statistics of the measured variables of Usefulness

When looking at the means of the variables, two variables score extremely low. Every user scored 3 questions per variable from 0-4 (don't agree to agree) and the scores on the 3 questions are added to form the variables. This means that a value of 6 indicates a neutral score, lower than a 6 a negative score, and higher than a 6 a positive score. This indicated that users on average scored very low on using Student.world for building social capital and communication. Since these two variables were measured with questions like "I use Student.world for finding people you haven't seen for a while" it was expected that the results would be low on these variables, because of the limited group of students who are able to sign up in the current Beta phase. Furthermore, it is seen that perceived mobility and positive challenges score below average as well.

The next step is to test the hypotheses formed in Section 3.3.2. We start by evaluating Hypotheses 1 and 2.

H1: Enjoyment has a positive effect on the retention quality of users.

H2: Usefulness has a positive effect on the retention quality of users.

Since the literature proposed that both enjoyment and usefulness have an effect on the retention quality, both enjoyment and usefulness are included in the regression model. The linear regression analysis is performed by using usefulness and enjoyment as independent variables, and the retention quality as the dependent variable. Testing H1 and H2 with the regression analysis indicates no significant predicting value of enjoyment (0.155) or usefulness (0.861), as seen in Table 12. But because a positive relation is inferred by the literature, the exceedance probability is halved. Although this brings both factors closer to a exceedance probability lower than 0.05, this still does not make the results significant.

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-243.340	315.651		-.771	.448
	Enjoyment	16.263	11.090	.285	1.466	.155
	Usefulness	1.947	10.995	.034	.177	.861

Table 12 Regression analysis of predicting retention quality by enjoyment and usefulness.

Although a positive effect of both enjoyment and usefulness are implied, both factors are not confirmed to be a significant predictor of the retention quality. Even when the factors are tested individually, they both do not have a significant predicting value. Therefore H1 an H2 are not confirmed.

The next step is to evaluate the role of peer members and perceived complementarity in enjoyment, usefulness and the retention quality. This is done by using the Pearson correlation matrix. And since the literature suggests that the relationship is a positive relationship, the test is a 1 tailed test, because the positive relationship is assumed. This correlation matrix will test H3a-c an H4a-c.

H3a: The number of peer users is positively correlated with the retention quality

H3b: The number of peer users is positively correlated with enjoyment

H3c: The number of peer users is positively correlated with usefulness

H4a: The perceived complementarity is positively correlated with the retention quality

H4b: The perceived complementarity is positively correlated with Enjoyment

H4c: The perceived complementarity is positively correlated with usefulness

		Retention quality	Usefulness	Enjoyment	Perceived Complementarity	NumberPeers
Retention quality	Pearson Correlation	1	.111	.294	-.078	.272
	Sig. (1-tailed)		.284	.061	.343	.077
	N	29	29	29	29	29
Usefulness	Pearson Correlation	.111	1	.268	.663**	.501**
	Sig. (1-tailed)	.284		.080	.000	.003
	N	29	29	29	29	29
Enjoyment	Pearson Correlation	.294	.268	1	.105	.303
	Sig. (1-tailed)	.061	.080		.294	.055
	N	29	29	29	29	29
Perceived Complementarity	Pearson Correlation	-.078	.663**	.105	1	.522**
	Sig. (1-tailed)	.343	.000	.294		.002
	N	29	29	29	29	29
NumberPeers	Pearson Correlation	.272	.501**	.303	.522**	1
	Sig. (1-tailed)	.077	.003	.055	.002	
	N	29	29	29	29	29

Table 13 Correlation matrix of the correlations between, the amount of clicks, enjoyment, usefulness, the number of peers and perceived complementarity with Correlation is significant at the 0.05* or 0.01** level (1-tailed).

As the table shows, neither the number of peers, nor the perceived complementarity is significantly correlated to the retention quality or enjoyment, which means that H3a+b and H4a+b are rejected. The table also shows that there were other relationships found to be significant.

Because a significant relationship is found between the number of peers and Usefulness, H3c is confirmed, meaning that the number of peers a user has on Student.world, is positively correlated with the usefulness of the system. Although this analysis does not infer a causal relationship, it can be argued that the more peer users one can find on Student.world, the more useful is it will be. Especially if it is taken into account that communication and building social capital are 2 factors of usefulness, that are expected to be largely influenced by the number of peers present.

Furthermore, perceived complementarity is found to have a significant relationship with usefulness, and therefore confirming H4c. This means that the usefulness of Student.world is related to the way users perceive its complementarity.

Another interesting finding of this correlation matrix is that there is a significant relationship between perceived complementarity and the number of peer users. Confirming that there is a relationship between these two variables. Although no causal relationship is proved, it can be reasoned that the more peers a users can find on a SNS, the more complementary its will be.

This indicates a mediating role for one of the two variables on usefulness. Because both are significantly correlated to usefulness, the regression analysis can show whether one of the two variables is a mediator of the other (Huizingh, 2007). A regression analysis is performed, with usefulness as the dependent variable, and perceived complementarity and the number of peers as independent variables.

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	16.142	2.022		7.983	.000
NumberPeers	.401	.316	.212	1.270	.215
Perceived Complementarity	.877	.265	.552	3.306	.003

Table 14 regression analysis of the effect of the number of peers and perceived complementarity on usefulness

As can be seen in Table 14, the role of perceived complementarity on the usefulness is significant (sig. = 0.003) and the number of peers is not (sig. = 0.215). Therefore the influence of the number of peers on usefulness is mediated by the perceived complementarity.

5 STRATEGIC CHANGES TO BOOST PERFORMANCE ON THE AARRR METRICS

During this research, the first platform of StructWeb B.V. has been launched at the University of Twente. This first group of users provided StructWeb B.V. with a lot of useful feedback and was an important way to learn how people actually used the platform. This has driven the development of the product, marketing campaigns, community management and organizational strategy. In this chapter the different developments, the expected effect and their actual effect are discussed. To structure this discussion, the different developments will be discussed per stage of the AARRR model.

A note that needs to be made, is that the following developments are not being made one at a time, but were combined together. The first few months after the launch were used for continuous developments & improvements of the product. As the changes are deployed in a continuous manner it was often difficult to isolate the effects of a single improvement. Therefore – from an academic viewpoint – it is difficult to clearly outline the cause-effect relationships, but despite that, we like to mention these 'best practices' to inspire other SNSs to improve their AARRR performance.

Improving the ease of use: This was mainly done by constantly lowering the threshold for user to sign up and improving the usability of the system by making functionalities easier to find and to use.

> StructWeb is working hard on an open version of the system. A read only version where everyone can watch the content shared on StructWeb, without having to sign up. However, If a user wants to contribute something, they do need to sign up. This makes it easier to start using StructWeb and according to Chen (2013) this will have a positive effect on the acquisition of new users. Showing the interface to the users is something that already proved to have a positive effect on the acquisition of users. After using the interface to share information (previously only the item itself was shown with a small hint to StructWeb), over 10 times as much visitors converted to registered users.

Improving word of mouth marketing: This was mainly done by inviting boards, creating viral quizzes and making sharing content on other SNSs easier.

StructWeb developed a "guess the board quiz". Board members are often known among a large group of students, which would enlarge the chance of a user recognizing one of the people on the picture, and with an average of about 5 board members per board, 10 photo's would mean 50 people on these pictures.

This quiz was developed for Utrecht University (UU) and is played over 2000 times, which represents almost 10% of the UU students. This quiz led to an increase of almost 10% of signed up users. These users where not only students from the UU, but from other universities as well and therefore not everybody was able to activate their account immediately.

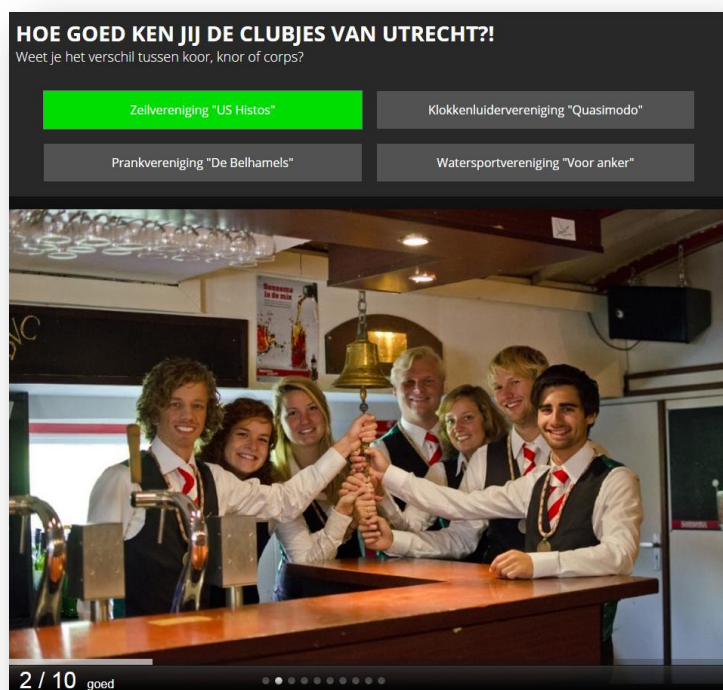Figure 8 A screenshot of the "gues the board" quiz developed for Utrecht University, where students were challenged to guess which board is seen on the picture.

Improving the user interface: By constantly improving the position of buttons, the functionalities and design.

An example of this is making adding more easy by placing it into the feed (right side of the interface) of every category.
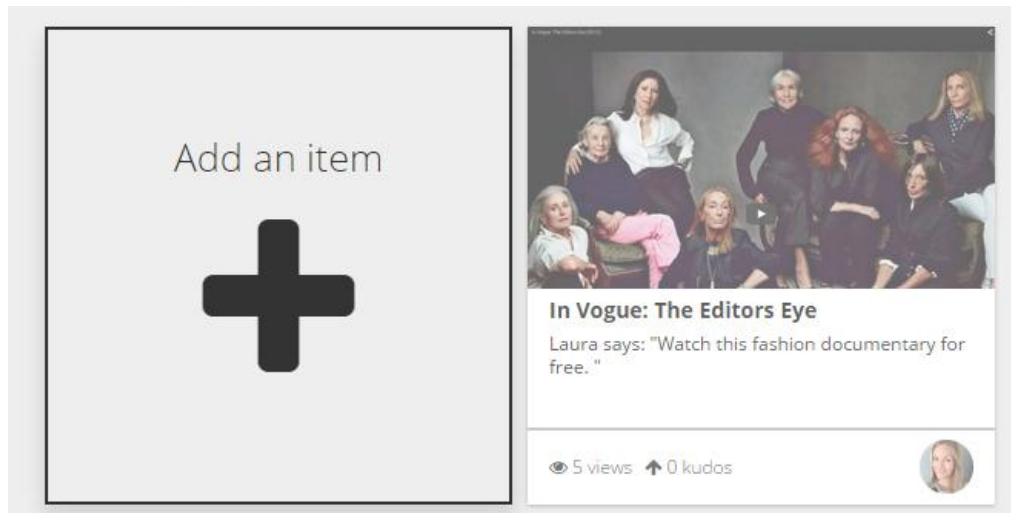
Figure 9 the new way of adding and item, by clicking on the big plus, you can add an item in this category.

Improving mobility: By launching apps for iOS and Android.

The apps were released several weeks after the launch of StructWeb itself. Because the desktop/laptop interface is not suitable for a mobile phone, a different interface needed to be designed and approved by the different app stores, and this delayed the development of the app. It is reasoned that because the app was released after the desktop/laptop version, a smaller number of members have installed the app. This can be a reason for the lower score on perceived mobility, because a mobile app likely to positively influence the perceived mobility. An example of the app interface is given below.
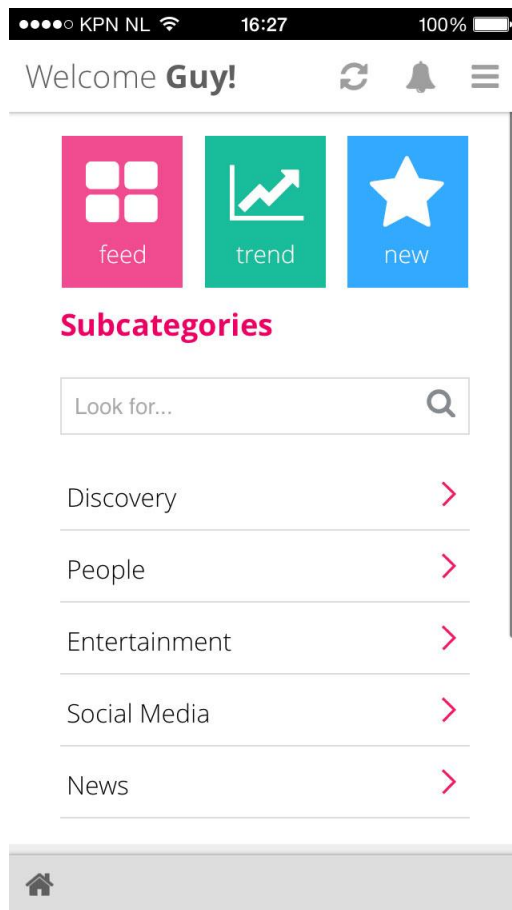
Figure 10 The interface of the app, with on top the different kind of feeds, and below the category names

Improving positive challenges: By making the top-contributors better visible

Top contributors at StructWeb are the top three most active users in a category. Each category can be seen as a community for likeminded users. At first, the top-contributors were only visible on the information page of a category. This page was not much visited by users, which leaded to almost no user knowing who were the top contributors of a category, including the top-contributors themselves. This was improved by showing the top contributor on top of the feed of every category, as seen in the top left corner of figure 11.

Figure 11 A screenshot of a category feed with in the top left corners the profile pictures of the 3 top-contributors.

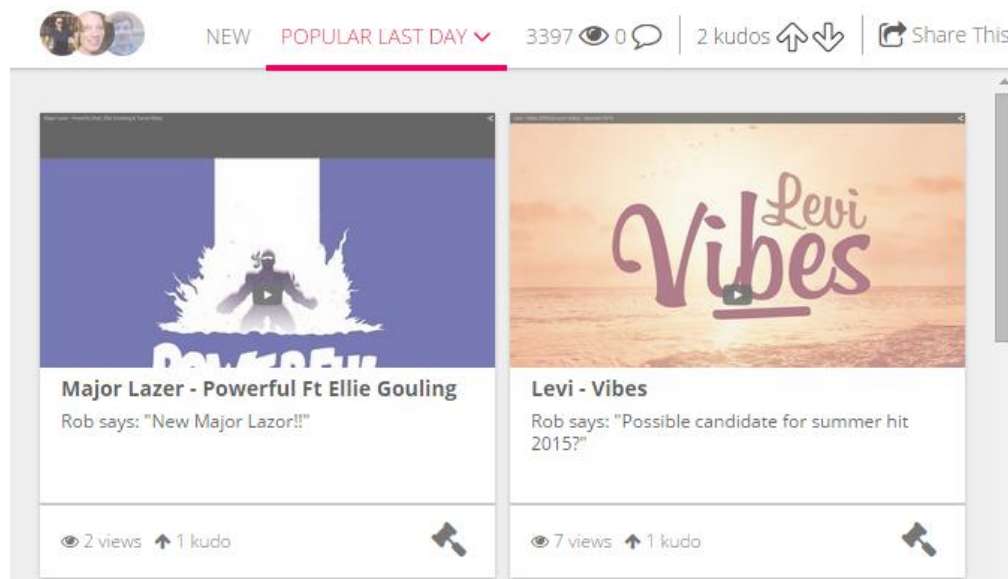**Improving content gratification and perceived complementarity**: By creating, and contributing to, categories which are found to be unique and interesting for Student.world users

> As McClure (2007) emphasizes, it is important to lead users as fast as you can to the "aha moment" of your system. Although it is hard to determine what that moment is on StructWeb for every user, StructWeb assumes that for the average user finding a category or content page that grasps the interest of the user and is unique, can be such a moment. For instance a category called "Today I learned" is found on StructWeb with different kinds of short informational videos like a five minute video on how the Dutch pension system works or a 6 minute video that explains what big data is and how it already influences our daily life. This could be such a category because, for as far as StructWeb knows, no well known alternative is available and a lot of people are expected to like this content.

This is just a selection of all the continuous developments StructWeb has made since its launch. A lot of small improvements have been made to the interface to improve usability, like faster navigation to a users profile and easier navigation between items and newsfeeds. A lot of features have been designed as well to improve the usability, like the multi copying function. Finally, the interface itself has been under constant development as well. User feedback often guided StructWeb to improve the user experience and ultimately the performance on the AARRR metrics.

6 CONCLUSIONS, LIMITATIONS, RECOMMENDATIONS, AND FURTHER RESEARCH

In this chapter the conclusions of this research are presented. The research questions are answered and the main contributions are presented. The limitations of this research are discussed as well as directions for further research.

6.1. CONCLUSIONS

With a growing amount of websites every day, StructWeb saw the need for more structure in this overflow of web information. This motivated the company to start their development of "StructWeb". An online platform where users can discover, connect and share whatever they think is interesting. With the launch of their first platform, Student.world, the need grew to better monitor and understand the lifecycle of their users. In this research their platform is classified as a social networking site (SNS); a web-service where you can create and see (semi) public profiles, that provide a new method of communicating, employing computers as a collaborative tool to accelerate group formation and escalate group scope and influence (Boyd & Ellison, 2007; Lin & Lu, 2011). To improve the understanding of the lifecycle of a SNS user, CLC models are reviewed. After a discussion of the literature, the AARRR model is chosen to fit best with StructWeb's needs and is therefore used in the rest of this research to evaluate the user lifecycle.

Because there was little scientific literature available on this particular CLC model, the aim of this thesis is to identify the key motivational factors for users to start using a SNS (acquisition), become an active user (activation), come back on a regular basis (retention) and tell their friends (referral).

This led to the formulation of research questions which are answered in previous chapters and summarized below.

- **What are, based on a literature study, the key motivations of users in the first four stages of the AARRR model?**

  In Chapter 2 the different key motivators of users in the first four stages of the AARRR were discussed. The key motivators for retention were also tested in a quantitative analysis. Based on previous literature, the top two factors predicting retention on Student.world were expected to be *enjoyment* and *usefulness*.

- **Do the motivators for retention predict retention at Student.world?**

  As shown in Chapter 4, the results of this research did not find a significant relationship between the two expected predictors of retention and the retention quality. However, this does not mean that there is no relationship. The low number of respondents is expected to have played a role in this. If the same tests are repeated, with a higher number of respondents, a significant relation might be found, but this will be further discussed in the next section on the limitations of this research.

- **How does StructWeb's first platform perform on the different variables of motivation for retention?**

  As seen in Chapter 4, especially on the motivational factors "building social capital" and "communication" Student.world scores very low. This was expected because, first Student.world is in beta phase, and therefore network externalities as discussed in Section 2.4.6 can have a negative effect on this and second, it is not expected that users will use Student.world much for communication and building social capital.

  The numbers additionally indicate Student.world users do not perceive Student.world as very mobile. A reason can be that the platform is only accessible from laptop and desktop, and therefore have lead to the lower score on the perceived mobility.

  The low score on positive challenges can be explained by the impact of the user level on the usage of Student.world. The level up system was designed to let more experienced users, influence more categories, yet the system was not needed because users created a valuable and clear structure. Therefore there were little positive challenges present.

  The users perceived their web-skills, the security, connectedness and the content gratification as positive. The high score on perceived security indicates that users feel their data is secure at StructWeb. That users experience a positive content gratification is also a positive indication for StructWeb, because the focus of StructWeb on the content. The fact that the users of StructWeb perceive their web-skills as positive, is important for StructWeb to know, because other user groups, might not be skilled at using the web. For instance if StructWeb would be very useful for people who have trouble finding information on Google, the overall score on usefulness might be higher amongst this group, and therefore be more suited for this group.

- **How can StructWeb change their product, community or organizational strategy to improve AARRR performance, with an emphasis on user retention?**

  As the statistical data in Chapter 4 suggests, a lot of users give very low scores on the communication and building social capital variables. Furthermore the users give lower scores on perceived mobility and positive challenges. StructWeb B.V. can improve their product by addressing these lower scores. This is further discussed in the suggestions to StructWeb B.V., in section 6.4.

During this research, StructWeb B.V. was constantly developing their platform, to improve its AARRR performance. In some cases, the motivations for acquisition, activation, retention and referral identified in this research were used to steer the development as discussed in Chapter 5. Examples of improvements that were realized during this research were:

- Improving the ease of use. This was mainly done by constantly lowering the threshold for user to sign up and improving the usability of the system by making functionalities easier to find and to use.
- Improving word of mouth marketing. This was mainly done by inviting boards, creating a quiz with photos of users, and making sharing content on other SNSs easier.
- Improving the user interface by constantly improving the position of buttons, the functionalities and design.
- Improving building social capital by meeting up with the top contributors of Student.world.
- Improving positive challenges by showing the top contributors of categories.
- Improving mobility by launching apps for iOS and Android.
- Improve content gratification and perceived complementarity by creating and contributing to categories which are found to be unique and interesting for Student.world users

Since the StructWeb B.V. finds itself in a fast changing environment, it does not end with the discussed improvements, improving their product will be a constant process.

This research contributed to the current knowledge on the AARRR model. It provided insights in the motivations of users of SNSs to start using a SNS, to become active on it, to come back on a regular basis and what motivates them to refer to a SNS. Furthermore it helped StructWeb get an insight in their performance on the different variables of enjoyment and usefulness. Although the quantitative analysis could not confirm enjoyment and usefulness as predictors of retention, the methods used in this research can be used again when there is a larger group of users to further investigate this relationship with a larger sample size.

6.2. RECOMMENDATIONS TO STRUCTWEB B.V.

As discussed in Chapter 4, the findings of the questionnaire indicate that Student.world scores low on the variables *communication, building social capital, perceived mobility and positive challenges*. Since the low scores on building social capital and communication can be explained partially by the low number of users, and partially by the strategic choice of StructWeb B.V. to focus on sharing content instead of personal messages, I would recommend to start with improving perceived mobility and positive challenges. Perceived mobility is partially explained by the moment of releasing the mobile app, which was done weeks after the launch of the desktop version. This resulted in only a small percentage of the users who have installed the app. The mobility of Student.world is already at the top of the agenda at StructWeb B.V. right now, with the developers working on many developments related to the apps and mobile websites. This is just one step in improving the perceived mobility. Because only a small number of users use the mobile app now, this could also be a problem in the future. Therefore not only the mobile environment itself needs to be improved, but the way the app is distributed to users as well.

The results in Chapter 4 indicated that the positive challenges require attention as well. At this moment there are only a small amount of features that provide positive challenges for the users. Users are challenged to

become a top contributor on Student.world, and users are challenged to improve their user level. Therefore I recommend StructWeb B.V. to work on the gamification of their products. For instance medals can be awarded for different kinds of desired behavior, or fun achievements can be unlocked, and shared on other SNSs like this is done sometimes with quizzes where you can share your score.

The recommendation of the other 3 evaluated stages of the AARRR model are not based on a findings of the questionnaire, but on the literature studied in Chapter 2, starting with the acquisition stage. During this research, we received feedback that users did not become active, because they did not perceive added value in using Student.world. StructWeb B.V. can improve this by sending out a more clear marketing message and by making adjustments to the system to make it more clear. A proposed improvement is to lead user quickly to a unique category which they are expected to like. For instance by presenting 5 unique categories where most people will be triggered by at least one category. This directs users immediately to a category that cannot easily be replaced by another service and therefore show the added value of Student.world.

A second recommendation on acquisition is opening up for more users. Rogers (2010) investigated how innovations spread through a social system. He defines 5 different stages in this spreading process in which the innovators are the first group. This is only 2.5 percent of the total social system (Rogers, 2010). With this in mind, the total number of students who are likely to accept this new technology is much lower than previous expected numbers, even if the percentage of "Innovators" is higher under students. Therefore it is recommended to allow more users to become a member and therefore start with the transformation from Student.world to StructWeb.

To improve the activation of new users, the open version can be a disadvantage. As Burke et al. (2009) noted, the amount of contributions made by friends, is positively correlated with the amount of contributions users make themselves. Because in the open version, users don't need to log in anymore, it is hard to determine who their friends are and therefore hard to let users see the contributions of their friends. On the other hand, the open version, in combination with search engine optimization, will lead to a higher number of users who can see your contributions. Since this makes it possible to help more people, users are expected to become more active (Oreg & Nov, 2008). Therefore I do not recommend to stop the development of the open version, but I do recommend to look for possibilities to make peer produced content visible. For instance by using IP addresses to show a local recommendation instead of a general recommendation.

A final improvement StructWeb B.V. could do to activate people is by lowering the time being active consumes. For instance a browser plug-in can make it easier to share items. Furthermore, StructWeb could think about allowing not logged in users to contribute as well, and use the Wikipedia way of making sure content remains a high quality. They let users edit and add lower level pages, but not the higher level pages (wikipedia.org). Furthermore, these additions can be revoked by higher power members and easily changed by others. I recommend StructWeb B.V. to implement a model like this in a later stadium, when there are enough signed up

users to make quick detection of wrongfully added items possible, or when StructWeb B.V. is in need of contributions, because it is expected that this will boost contributions.

The referral phase is something that has not been reached by many more users than those who were at the launch event. The first improvement that can be made has to do with the reasons Phelps et al. (2004) identified to be important for people to pass along information. Amusement and enjoyment were two top reasons for people to pass along information, implying users will sooner share information they think is amusing. Therefore I suggest that StructWeb uses the moment when a users given an item a like, to notify users of the possibility to share it with their friends every once and a while.

The final recommendation is to create benefits from a referral. This could be done by awarding users with a medal or level up when they have invited x friends, or share x message with their friends. StructWeb B.V. could also think of system benefits after inviting friends or sharing content like Dropbox does. For instance a private part in the system could be created, and the number of users or items that can be joining that private part, depends on how much people you have invited to the system and how much you share with others. This can especially be beneficial for sport clubs for instance. They invite all their members, and in return they get their own private part where only their members can log in to for free.

6.3. LIMITATIONS

6.3.1. LIMITATIONS DUE TO THE SCOPE

In Chapter 2 it is discussed why the choice was made to classify Student.world as a SNS. This has had an impact on the literature study and therefore on the outcomes of this research. This means that the in Chapter 2 presented motivators for acquisition, activation, retention and referral are specifically found to influence SNS users. Furthermore, it is possible that previous SNS research didn't focus on all the user motivations yet, and therefore the literature search of this research is missing these motivations as well, for instance spiritual motivation is not defined in this research.

A second limitation as a result of the scope is that of the choice for the AARRR model as discussed in Chapter 2. The five steps of the AARRR model were used to identify motivations in the user lifecycle of a SNS user. Because other models identify different stages in the CLC, other user motivations might also play a role in the SNS user lifecycle. For example the stage described by Stauss et al. (2007) as the revitalization stage, in which users might have uninvestigated motivations to re-enter a relationship with a SNS.

6.3.2. LIMITATIONS OF THE QUANTITATIVE ANLYSIS

This research consisted of two parts. First, a literature study was performed on the motivations of users in the first 4 stages of the AARRR model. Second a quantitative analysis was performed. While the literature study´s results are generalizable over the SNS user population in general since the literature study itself focused on the general SNS user population, the quantitative analysis was performed to test whether the proposed factors of retention, are a good representation of retention at Student.world. Therefore this part of this research limits to the users of Student.world. The sample of the quantitative analysis consisted of 29 Student.world user. The small size of the group results in a large margin of error of over 17%. This makes it hard to say whether the results of the statistical analysis are a good representation of the whole Student.world community. Second, the small number of respondents makes it difficult to find a significant relationship. The quantitative analysis did not confirm that usefulness and enjoyment are 2 predictors of retention at Student.world. Both factors did have a positive regression coefficient, hinting towards a positive relationship, especially Enjoyment, which was almost significant.

A threat to the validity of the research is ¨proposed by Wijnhoven & Bloemen (2014), who note that events like new product versions or the maintenance and revision of a service can influence the sentiment of a person. The fact that StructWeb has been constantly improved can therefore play a role in the generalizability of the results. Two users who have visited just as often, but on a different time in the development process, might therefore have a different experience. For instance when evaluating the perceived mobility. While one user might have used Student.world while the mobile app was not available yet, another could have used Student.world with the mobile app. One could imagine that this would influence the way these users perceive the mobility. This is a general problem in conducting such studies for online platforms, which are continuously updated in line with popular trends like 'continuous deployment'.

Another limitation of the quantitative analysis is that it only tested the retention stage. Based on the literature, it is assumed that different motivations for users in the acquisition, activation and retention stage are also applicable to Student.world users. But because this is not tested through a quantitative analysis, this is not confirmed for Student.world users.

The final limitation as a result of the quantitative analysis is that there was a to small sample to perform the factor analysis. The factor analysis could have indicated that certain variable were not a variable of enjoyment or usefulness and therefore the lack of the factor analysis could muddle the results of the regression analysis.

6.3.3. LIMITATIONS DUE TO MADE ASSUMPTIONS

An assumption that influences the quantitative analysis is the assumed low effect of translating the questionnaire. The translation of the questionnaire might have influenced the way users perceive the questions. But because the questions were only translated and not changed other than replacing Facebook (terms) with StructWeb (terms), this assumption is not expected to have had a large effect, but it needs to be kept in mind when evaluating the results of this research.

The assumption that Likert scales can be seen as a interval scale instead of an ordinal scale, can have influenced the results of this research. Although other studies have used this technique often, and different studies showed the usage of Likert scales as interval scales is justified (Boone & Boone, 2012; Norman, 2010), it still is an assumption that could have an influence on the outcomes of this research and therefore needs to be taken into account when evaluating the results of this research.

The last assumption of this research is that the use of a 1 tail distribution is justified. Because the literature suggests that certain factors have a positive relation on retention, and that different variables have a positive effect on the factors of retention the statistical analysis assumed that the use of one tail is justified. Because the literature suggests this positive relationship, this assumptions is expected to have, if any, a little effect on the outcomes of this research.

6.4. FURTHER RESEARCH

Because of the low number of respondents of this research, the first suggestion for further research would be to test the factors of retention with a larger, more diverse sample. According to Shadish et al. (2002) external validity is about whether the cause-effect relationship holds over variations in persons, settings, treatments, and outcomes. A more comprehensive study with more respondents can test whether enjoyment and usefulness are significant predictors of retention. A more diverse and larger sample could make these findings generalizable to a larger audience.

Another interesting follow up study would be the quantitative validation of the other stages of the AARRR model. Because the quantitative part of this study explored only the retention stage, it is interesting to further investigate the factors of acquisition, activation, referral and revenues. The same research design can be used for these factors to lead to a theoretical foundation for the AARRR model. This research can form the basis for such a follow-up study.

Another direction for further research could be exploring other web services that use the AARRR model and look at what motivates users at these webservices. It is interesting to see what motivators are unique for a SNS, and what motivators work for other classes of webservices.

Finally, it would be interesting to do a more longitudinal study into the AARRR model. A longer monitoring of the AARRR metrics at StructWeb B.V. gives more insight in the effects of the different developments. Despite it should be noted that it is hard to evaluate the exact effects of developments at a constantly changing organization like StructWeb B.V. Due to the constant process of improving and developing the product, marketing and user management, it is difficult the measure the exact effects of one action because these often cannot be isolated from the other changes.

Although this research did not find enjoyment and usefulness as significant (at α=0.05) predictors of retention at Student.world, the results hint toward a positive relationship between enjoyment and retention quality with the relationship being significant at the 0,10 level.

The motivations presented in the literature study in Chapter 2 form a valuable scientific foundation for the further scientific research into the AARRR model. Furthermore this literature study can be used as a basis for further quantitative analysis into the motivations of SNS users. Finally, the performed literature study formed the basis for the advice given to StructWeb to further improve their product, marketing campaigns, community management and organizational strategy.

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8 APPENDICES

Appendix A: Evaluation of Student.world, based on the literature presented in Chapter 2

Motivator for acquisition	StructWeb	Comparison competitor	Improvement
Referral / recommendation of a friend	Possibility to invite friends by email, or share StructWeb content on SNSs.	Easy invite by importing FB friends list or e-mail address book. Best programs have rewards like premium account or free credits.	Ask to refer after a happy moment and since StructWeb is a less known brand, only reward the referrer. StructWeb could import a user's FB friendslist to make it more convenient.
Convenience/ease of use	After registration easy log-in. Easy registration without to many needed personal data. Introduction can be improved.	Also easy log-ins and registration and tutorials.	Open version is an improvent, but also there could be more explained in the system during the use to make it more clear.
Peer pressure/conformity	In the beginning StructWeb won't produce a lot peer pressure.	"I'll share it with you on Dropbox", "Facebook-less Rick" and "Just Google it".	StructWeb needs users, but also needs to provide users a feeling that they tell their friends "why aren't you on StructWeb". This can be done by viral videos they will talk about in the pub (did you see the video of…. On StructWeb) or by making them invite friends to vote on their photo/frat/….
User interface	Beautiful design and nsive interface	Facebook and LinkedIn are very responsive and well designed as well, but successful websites like 9gag or Reddit are much less beautiful and user friendly.	In the future StructWeb should have more analytics to evaluate the user interface to further improve. Also sometimes the comment still is that users don't understand the interface. Simplifying the interface could help. To do so, looking at known, popular interfaces might be helpful because users already understand these.
Attitude towards SNSs	Unknown SNS, but there are people who look for a replacement for Facebook due to various reasons.	Differs for the different SNSs, but the growing resistance to Facebook can be a help to	Statement or manifest that focuses on what StructWeb is, and what not, and what StructWeb is doing better than Facebook. (No: Advertisements,

		StructWeb.	misspellings, shout outs for attention like "What a day", useless updates like "on my way to work", and so on.)
Social presence	Showing friends' names when they re-share something instead of original contributor, notifying users of likes of their friends, making items shareable on Facebook.	Providing users with updates of their friends.	Digest mails could have recommendations of friends instead of users as well. The userprofiles could also be made more attractive to make social aspects more important. Tagging in content might also help this.
Extroversion	Users can express their extroversion by building a profile wall and picture, add content and create categories in which they are interested.	Ability of uploading content and creating personal profile.	StructWeb can make profiles visible for everyone and let it become a way of expressing themselves on the internet. The open version already helps a lot for this.
Trust	No intention to let money decide what information is most relevant for users of sell user information to third parties.	Very long and unclear privacy statements and in the case of FB personal information is used for marketing gains of FB.	Make a clear privacy statement that tells users what information is visible for others and what not and what is done with what information of users.
Looking for information	After a short time already a value of finding instead of searching information	Not one SNS is as good in finding information as Google, FB excels in finding people.	The open version improves this already, but SEO can help optimizing this even more. When the category "Cool restaurants in Enschede" is the top result on Google when searching for a restaurant in Enschede, this is improved a lot. Also more uniqueness could be created in categories, so users must come to StructWeb to find the information.

Motivator for activation	StructWeb	Competitor	Improvement
Content produced by peers.	Emphasize on the contributions produced by peers in newsfeed. Ability to share items with peers and follow peers.	FB only focuses on peers/people you like. LinkedIn sends updates of peers and twitter does that as well.	Even more focus on peers. Make e-mails show recommendations of peers as well and maybe even totally about peers. Give more information about actions of peers.
Feedback given by others on a user's items.	Possibility to give feedback on an open action and on items.	FB makes it very easy to react on shared items. LinkedIn and twitter as well. Wikipedia has a large discussion page as well.	Keep comments on an action visible for the owner of that action, make commenting even more easy. Also comments on an item someone shared can be directed to the sharer.
Other users who share a user's items	Almost direct share after liking an item, easy shareable on twitter and Facebook and StructWeb as well. Possibility to share an item with selected peers.	FB, Twitter and LinkedIn make sharing easy as well. Tweets can be auto-shared to FB also. FB is the king with sharing by making a like, comment or share visible on the wall of all friends an let people tag each other which all creates a larger audience for the original contributor.	Comments of user can be visible too, and the possibility to tag someone is a possibility to alert a friend of some content. The possibility to select more friends to share information with, is also of value. Finally a notification helps when a peer shares an item I shared (but not created).
Personal documentation	Items can be favored to keep track of an item and make it easy to find. Also the "follows" are stored to make them easy findable. Although nothing is stored for sure, because everyone can propose to delete an item.	For FB and Twitter it is very easy to document events like holidays and pictures of that. Wikipedia and LinkedIn are not so well suited for this.	Not much. I don't think StructWeb is appropriate for the storage of personal documents like pictures. The interesting stories, pictures and movies from the web can off-course be stored for personal goals, but StructWeb does that already. The only improvement here is that added items are easier to find for users themselves.
Privacy concerns (Negative)	StructWeb won't sell gathered date of a person and won't use it for commercial activities. But they do let other people see the actions of a user	Especially FB is discussed lately about the privacy concerns and the usage of personal information for commercial activities.	Improve privacy statement and make clear what is, and what is not public information. Make clear no personal data is gathered for commercial activities.

	and show their names as creator of items they create. On the other hand, StructWeb does let users determine what is visible on their wall and what not and also never post anything on their wall without their admission.	Also the fact that FB notifies others in their feed if you like something is a privacy concern for others.	
Possibility to help others	Helping creating a community on every subject you like or think is interesting, filled with information about that subject. Adding information as well as helping building a clear structure are ways in which users can help others. Also they can comment on open actions to educate others. Finally certain categories are very good for helping others. Restaurants for instance are voted up and down and be commented on to help others in making their decisions.	Especially Wikipedia is a good example of this. Furthermore websites like Quora are designed to help others. Other popular SNSs like FB and LinkedIn focus less on this helping others.	Maybe StructWeb provides more satisfaction in this motivation than Wikipedia. People can contribute serious content (text in wiki) but also structure and funny content. Furthermore the discussion pages are covered at StructWeb as well. The advantage of Wikipedia however, is that they have a larger "crowd" and therefore you help more people at Wikipedia than on StructWeb.
Self improvement	Feedback in the form of likes and comments will help improving proposals and content. Also factors as reaching a next user-level or becoming a top-contributor in a certain category is improving one's status.	Again very strong at Wikipedia where all facts are checked sooner or later and users get feedback on their contributions. Less focus on self improvement on FB, LinkedIn and Twitter.	Make sure people who vote against something are stimulated to give feedback so people learn from their mistakes.

Motivator for retention	StructWeb	Competitor	Improvement
Enjoyment	Funny new viral videos from the web	Facebook and twitter also score high on this by providing a lot of funny stuff from friends. LinkedIn and Wikipedia a lot less.	-
Perceived web-skills	Easy user status growth, unlock new features, fast, ability to become a top contributor.	Followers on twitter or friends/likes on FB are a bit alike. Wikipedia works with user ranking as well.	-
Value added search mechanisms	Big part of StructWeb's system is adding value in search. When you click on an item, you see other items that are in the same category and therefore are items you probably will like if you like what you clicked on.	FB does this by advising you what to follow or filling your feed with stuff you probably will like. Also they suggest friends. Twitter and LinkedIn do this as well.	StructWeb doesn't have anything that makes suggestions. In the future they can build something that looks at what you like and uses that to advice you on other stuff you probably will like.
Positive challenges	All actions, the ranking system and becoming a top-contributor are examples of challenges offered.	Collecting friends and followers can be seen as a challenge, but less than to be found on StructWeb. Stackoverflow is very good at this by rewarding users with a lot of different medals for achievements.	StructWeb can think of some challenges that they reward with medal like things. Also certain achievements can be rewarded with a fun reward that people can share on FB.
Perceived complementarity	The users should provide that content that is seen as complementary by others. StructWeb's system then should make it better findable for everyone.	FB with friend updates, Twitter with short updates, LinkedIn for networking…..	---
Number of peer users	Low	High	Invite peers and make sure users connect with them.
Content gratification	StructWeb's job is to make sure users see what is interesting for them by learning what to follow and provide good algorithms to calculate what is trending.	FB lets friend take care of this and provides good algorithms as well, but is limited by the friends you follow. Same for Twitter and LinkedIn.	Make better algorithms to predict what users will like.
Usefulness	Easy finding of relevant	Quick updates of what	

	information through my feed and the tree navigation.	friends are doing on FB or twitter. LinkedIn focuses on the network and their work related activities.	
Perceived mobility	Mobile version and desktop version to be mobile. No software needed to install on a computer, so easy access on every computer.	FB, twitter, LinkedIn and all others have mobile apps and sites as well.	The App could be further developed so the app has more features like in the web version.
Perceived connectedness	Able to send friends messages and see what content they share/ create. Also focus on peers in the feed.	Strong connectedness on most SNSs. Easy information sharing en message sending.	Maybe personal messages need to be developed better.
Perceived security	Due to the strict rules against nudity, racism and foul language, the system is very secure to visit. Furthermore we will never sell any data to third parties. Furthermore everyone determines for themselves what information they link to their profile.	On other SNSs people can be tagged in posts or something which can lower the perceived security. Also certain content as hate and racism is seen on these other SNSs.	
Number of members	Low	High	Grow as fast as possible!
Building social capital	Status can grow, as well as the audience and the top contributor status in categories. Helping with content or structure provides status in the community.	Fiends or followers build status and can be seen as social capital.	-
Communication	Post messages on someone's wall or items or send items to other persons.	Wall + private messages.	Private messages improve this.
Surveillance	Profile walls, pictures, names and follows are visible.	FB is very good at this with a lot of pictures and personal updates. Twitter	Can be enhanced by making more room for a personal touch like a tagline or room for a

		with their tweets, LinkedIn with their career path.	personal description.
Curiosity	Focused on content	Other SNSs focus more on personal information.	In my opinion we made a choice to focus on content instead of people. We can see what content people like and what they contributed, not what they did yesterday.
Social network surfing	Focus on content surfing and what content people like.	Other SNSs focus more on personal information.	Again I think this is a strategic choice of StructWeb.

Motivator for referral	StructWeb	Competitor	Improvement
Enjoying content	Users are responsible for the content itself, StructWeb provides an easy, structured way to share this with each other.	A lot of organizations have joined FB and twitter. Also people post funny stories. Many sites have easy sharing buttons to stimulate this.	Use algorithms to better predict what information would be found enjoying. Focus on viral content on the trending feed.
Informing content	Users are responsible for the content itself, StructWeb provides an easy, structured way to share this with each other.	Especially Twitter is often used for re-sharing an informing tweet like "police control at school" or something like that, because it is very easy to re-tweet information. Main advantage of other SNSs is the possibility to post messages for all your friends to see.	Possibility to post messages.
Important content	Users are responsible for the content itself, StructWeb provides an easy, structured way to share this with each other.	Easy sharing by uploading content as well as messages.	Use algorithms to better predict what information would be found important.
Content that is expected to be liked by peers	Sharing through various SNSs made possible as well as the ability to invite a friend for a certain item or category. In this way users can invite friend on the subject that is most likely for a peer to be found interesting.	Possibility to tag a friend to point out certain activities as well as sharing items directly on their wall.	Maybe advise to share items when StructWeb thinks that an item is going to be liked by peers or let users see which peers already liked an item, to further ensure them peers will like it.
Benefit from a referral	More friends to share items with, network externalities.	Especially Dropbox was very good at this.	Find something that StructWeb has that can be seen as a benefit. For instance, due to its closed community in the beginning, being able to introduce a friend to StructWeb, could be seen as valuable. Therefore StructWeb can give everyone who reaches level x an invite. When the invitee uses that invite or gets to a certain level, the inviter regains his invite.

Easiness of an invite	Not so easy yet, users must fill in an email address and name of the invitee.	Easy invite by inviting all FB friends or a complete email contact list	Make it easier to invite by importing FB friends and email contacts.

Appendix B: Questionnaire

Factor of retention	Variables of that factor	Items of these variables
Usefulness	Perceived mobility	The immediate, easy, and global access to StructWeb via wireless networks is one of the most outstanding advantages of StructWeb
		It is convenient to use StructWeb anytime-anywhere.
		The immediate, easy, and global access to StructWeb via wireless networks makes convenient use possible.
	Perceived connectedness	I feel nice when I can access StructWeb at my convenience.
		I feel like being connected to the real world because I can see and search for information that I want.
		I feel emotionally comforted because I can do something interesting with StructWeb at my convenience.
	Perceived security	I am confident that the private information I provide on StructWeb is secure.
		I believe the information I provide on StructWeb will not be manipulated by inappropriate groups.
		I believe that the information I provide on StructWeb will not be released without my consent.
	Building social capital +communication	Reconnecting with people you've lost contact with
		Connecting with people you otherwise would have lost contact with
		Receiving a friend request
	I use StructWeb for	Finding people you haven't seen for a while
		Maintaining relationships with people you may not get to see very often
		Contacting friends who are away from home

Factor of retention	Variables of that factor	Items of these variables
Enjoyment	Perceived web-skills	I am very skilled at using the Web.
		I know how to find what I want on the Web.
		i know more about using the Web than most users.
	Positive challenges	Using StructWeb challenged me to perform to the best of my ability.
		Using StructWeb provided a good test of my skills.
		Using StructWeb stretched my capabilities to the limits.
	Content gratification	Content within StructWeb
		Playing games
		Discovering content because you see friends have added it

Number of peer users (evt toepassen op de UT gemeenschap)	I think many friends around me use StructWeb.
	I think most of my friends are using StructWeb.
	I anticipate many friends will use StructWeb in the future.
Perceived complementarity	A wide range of applications is available on StructWeb.
	A wide range of supporting tools is available on StructWeb (e.g., photo sharing, message sharing, video sharing).
	A wide range of social activities on StructWeb can be joined (e.g., fan pages).
	A wide range of friend-finding tools is available on StructWeb.