

# Pinterest: A Unicorn Among Social Media? An Investigation of the Platform's Quality and Specifications

Regina Kasakowskij, Thomas Kasakowskij and Kaja Fietkiewicz

Heinrich-Heine University, Düsseldorf, Germany

[Regina.Kasakowskij@hhu.de](mailto:Regina.Kasakowskij@hhu.de)

[Thomas.Kasakowskij@hhu.de](mailto:Thomas.Kasakowskij@hhu.de)

[Kaja.Fietkiewicz@hhu.de](mailto:Kaja.Fietkiewicz@hhu.de)

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**Abstract:** Information services play an important role in a knowledge-based society. Due to the constant change in technology and its possibilities, more and more new information services are emerging with different focuses and contents. One of the most popular top 10 social media is Pinterest. With a steadily increasing course of success, Pinterest has received a lot of attention in recent years. In the scientific research, many studies label Pinterest differently, for example, it is known as a curation platform, bookmarking service, search engine and social media. Pinterest introduces itself as a search engine for inspiration. The definition of Pinterest is, therefore, rather fuzzy and it is unclear on which application of the service the focus is being set (?). The following study focused on the aspects of the perceived and objective quality as well as the classification of the information service. For this purpose an online survey with 365 participants (to examine the perceived service quality), a literature research (to compare different platform specifics and definitions with the ones of Pinterest) and sample analyses (to measure the objective quality of the service) were conducted. It has been found that to some extent both, the perceived and the objective quality of the information service, are very good. It was also found that Pinterest is a kind of visual hybrid media and is, therefore, a unicorn among social media.

**Keywords:** Pinterest, specification of service, Social Media, information service, perceived and objective quality

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## 1. Introduction

Social media are becoming more and more popular because they are increasingly satisfying their users' information needs. Due to the constant change of information needs as well as the technology and its possibilities, more and more new information services are emerging with different focuses and contents. This is especially true for social media. In the past, these were more text-based. Now, however, they are increasingly changing into image-based social media co-created by their users, the so-called social media 2.0 (Carpenter, 2012; Mittal et al., 2013; Büscher, 2018). Now, the focus is set on visual contents in any form. On the one hand, this trend was promoted by the progressive technology, which allows costs and effort to be reduced even further. On the other hand, the popularity and the change in this trend can best be explained with the saying "A picture is worth a thousand words", because an image can be taken and processed (by the brain) faster. This enables lightning-fast understanding, regardless of the language you speak. The perceptiveness of images is also much higher. For example, a situation can be represented more clearly by an image than by a text. Also, certain emotional moods can be better conveyed through pictures (Lester, 2013; Reissmann, 2015; Lester, 2006; Brinkmann, 2014).

Pinterest is one of the most popular social media 2.0 and currently ranks sixth among the most popular social networking sites (eBizMBA Rank, September 2019). It is an online information service that acts as a virtual pin board. The special feature of Pinterest is that it is not focused on self-portrayal like other social media, but rather puts the user's own passion for collecting visual content in the foreground. This differentiates it from other conventional social media such as Instagram, Facebook or Twitter (Mittal et al., 2013; Kim et al., 2017; Phillips et al., 2014).

Pinterest is composed of the English terms "pin" and "interest," which in the figurative sense means as much as to pin one's interests. The idea is to transfer and expand the concept of a pin board from the physical world into the virtual one. On Pinterest, relevant information can be noted and sorted on pin boards in the form of pins. Pinboards can be created and named as desired. The marked content is referred to as pins in the form of pictures or thumbnails and contains various other information such as links, comments or descriptions. Users can also search for images and topics on Pinterest and memorize relevant content found on a virtual pin board. The special thing is that not only content that is on Pinterest can be pinned, but also content from external websites.

Since its official launch in 2010, the service has received a lot of attention from the general public, business and science. This is particularly noticeable through the steadily increasing number of users and the growing number of reports and studies on Pinterest. However, the definition of Pinterest as a service remains fuzzy and it is unclear what its perceived and objective quality is. These are important research gaps that need to be closed in order to better understand what possibilities the service creates for users and other stakeholders and what its future prospects are. Today, not only the newer social media platforms like Pinterest, Instagram or TikTok put visual content in the foreground, but also the more “traditional” large text-based social media like Facebook and Twitter (Carpenter, 2012) increasingly incorporate features for sharing new visual formats. So what makes Pinterest so unique? The aim of this work is to obtain a comprehensive evaluation and acceptance analysis of Pinterest based on the Information Service Evaluation (ISE) model. For this purpose, the following research questions are examined in more detail:

**RQ1:** What kind of Service is Pinterest?

**RQ2:** What is the perceived and objective quality of Pinterest?

### 1.1 Research background

Pinterest has been on the market for ten years now. During this time, many studies have examined the influence of Pinterest in different ways. There are roughly three research areas for Pinterest:

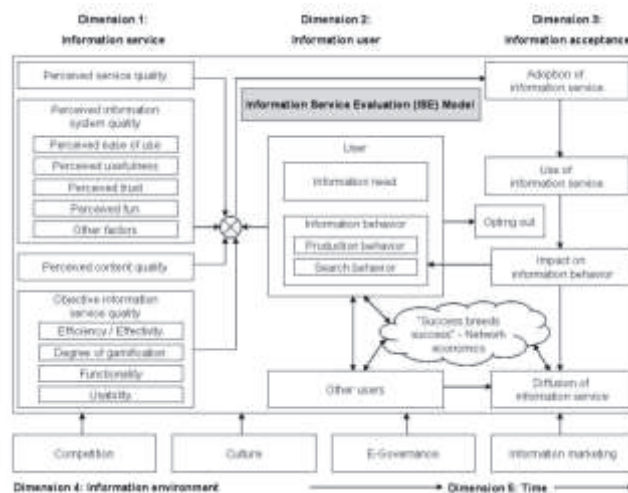
- 1. The impact of gender on the use of Pinterest (Chang et al., 2014; Gilbert et al., 2013; Ottoni et al., 2013; Alperstein, 2015; Han et al., 2014; Phillips et al. 2014)
- 2. Pinterest as a social curation and information literacy tool (Linder et al., 2014; Hall & Zarro, 2012; Dudenhoffer, 2012; Robertson, 2012; Carpenter et al., 2018; Kaminski, 2018)
- 3. User motives to use Pinterest (Wang et al., 2016; Han et al., 2014; Mittal et al., 2014; Miller et al., 2015; Sashittal & Jassawalla, 2015; Mull & Lee, 2014; Schmidt & Evans, 2018)

The main focus of these studies is laid on social, economic, socio-economic or technical as well as psychological aspects relating to Pinterest (Lewallen & Behm-Morawitz, 2016). Furthermore, most seem to view Pinterest only as a kind of social media platform, but no one has considered it as an information retrieval (IR) system. Objective quality research is an important research area in retrieval systems to determine the correct functioning of a system (Schumann & Stock, 2014). With regard to Pinterest, this research area has not yet been sufficiently investigated. So it is unclear how well the text and image-based retrieval system performs on Pinterest.

## 2. Method

In order to evaluate the perceived and objective quality of the service, a quantitative as well as a qualitative investigation was carried out. The research design is based on the Information Service Evaluation (ISE) model from Schumann & Stock (2014).

### 2.1 Research design and ISE model theory



**Figure 1:** The Information Service Evaluation (ISE) model. [GRAPHICS] (Source: Schumann L. & Stock W.G., 2014)

The ISE model was conceptualized by Schumann & Sock (2014) and is used to holistically evaluate an information services and to assess its quality. The ISE model combines different theories and models for evaluation and technology acceptance research and is composed of five dimensions that can be examined in more detail. The dimensions include the quality of the information service, the users, the information acceptance, the information environment and the change over time.

In general, the model can be adapted in a flexible way, so that it is possible to restrict the investigation to an individual aspects of an information service or to take a closer look at individual dimension. In this study, we focus on a specific part of the model, namely the dimension 1, which incorporates the perceived and objective quality of the service. The first dimension can be divided into four parts: assessment of the service, perceived quality of the information system, perceived quality of the content and objective quality of the information system. Figure 1 also shows the relationships between the individual dimensions and various evaluation criteria that are assigned to the respective category. It can be seen that each dimension can have an influence on other dimensions.

## **2.2 Data collection and analysis**

For the purpose of data collection, internet and literature research was carried out in order to compare different platform specifics and definitions with Pinterest's platform specifics. The empirical investigation of the perceived service quality was based on an online survey, whereas the investigation of the objective service quality was grounded on sample analyses.

### *2.2.1 The online survey*

The survey was carried out between April 5, 2019 and July 5, 2019 and was distributed across various platforms (e.g., Surveycircle, Bottles, Pollpool). In order to investigate the perceived quality of Pinterest, the survey participants were asked about the simplicity, the usefulness, the trust in the system, the fun with the system, the topicality and the design of the system. These questions could be answered using a 7-point Likert scale (1932) (1 = "completely disagree" and 7 = "completely agree"), where all answer options were equidistant. The perceived quality of the content was examined in the same way. Accordingly, the users were asked about the information content, clarity, usefulness, relevance, uniqueness and image quality of the content.

### *2.2.2 Sampling and analysis of objective quality*

In order to investigate the objective quality of the system and the (user-generated) content of Pinterest different samples were collected. In order to investigate the effectiveness of the system, a sample of 100 pins with four different search queries, each with different level of difficulty (length of the word chain), was collected. Then, the relevant posts for each search query listed in the search results were counted (average precision). Only unique items were taken into account when counting and duplicates and advertising pins (marked as such) were excluded. The search queries included:

- Haustier [pet]
- Golden Retriever
- Golden Retriever Tattoo
- Golden Retriever Halsband pink [Golden Retriever collar pink]

The effectiveness was then calculated using precision and mAP (Mean Average Precision) (Croft et al., 2010). The focus was set on the mAP, which was calculated by assigning a weighted value to relevant pins depending on their position in the search result. These values were then summed up and divided by the number of counted pins.

### **Mean Average Precision (mAP)**

The mAP is used to evaluate an IR system. This method was developed by Croft et al. (2010) to get a more accurate evaluation criterion using a relevance ranking. For this purpose, the precision of an IR system is determined by the number of found relevant search results and their position in the search result list. The position in the search result represents a weighting for the quality analysis of the IR system. The weighted precision values are summed up and divided by the number of results found.

The mAP method was chosen because the general precision requires an examination of all the values found. Since visual search results have to be analysed intellectually for relevance and the number of results found for more general search terms includes several thousand images, such an analysis was not feasible. In general, most search engines only look at the first 15 search results (Stock & Stock, 2013). In this investigation, however, a larger sample was chosen because, according to Churchill (2018), Pinterest members view an average of approximately 60 pins in the search results. The same also applies to the examination of the image-based IR system. Here too, four images that match the search queries were selected and the mAP was calculated.

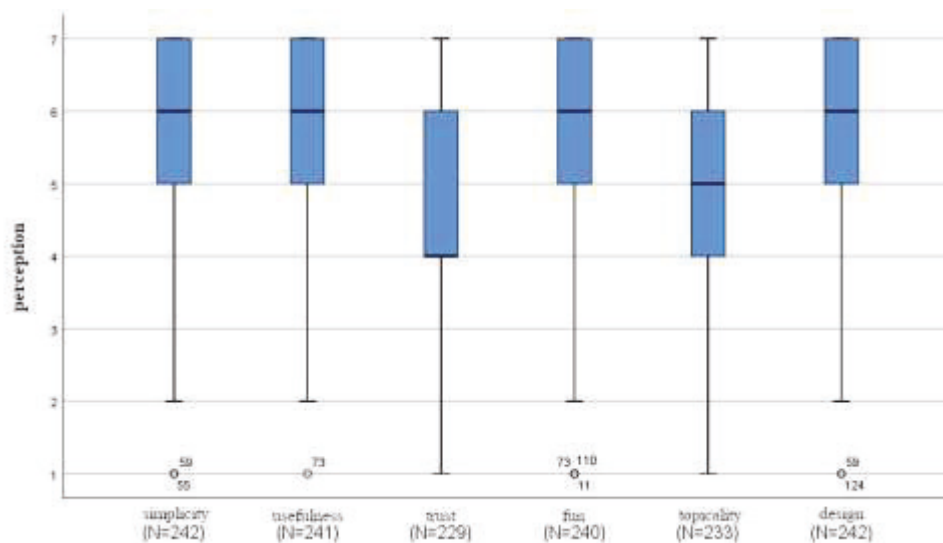
In order to be able to measure the quality of the images adequately, the subjective image measurement method with Double Stimulus (Thung & Raveendran, 2009) was used. For this, 10 different images from Pinterest were viewed as well as the equivalent originals. When viewing the images, a value of 1 to 5 was assigned to each image. 1 was synonymous with “poor quality” and 5 with “excellent quality”. The distance between the values was equal. The MOS (Mean Opinion Score) was then computed by calculating the average of the rating for the image quality on Pinterest and the average of the rating for the image quality of the original. Finally, the difference in the deviation was calculated.

### 3. Results

A total of 365 participants took part in the online survey. Of these, 267 (73.2%) were female, 90 (24.7%) male and 8 (2.2%) assigned to a different gender. The age structure of the participants is between 18 and 60 years (from 1959 to 2001). Thus, the participants are on average 26 years old (born in 1993). The survey reached participants from 41 countries. 258 participants were living on the European continent, 20 in the Asian region, 45 in the American region (North and South), 12 on the Australian continent, three in the Middle East and one participant from the African region.

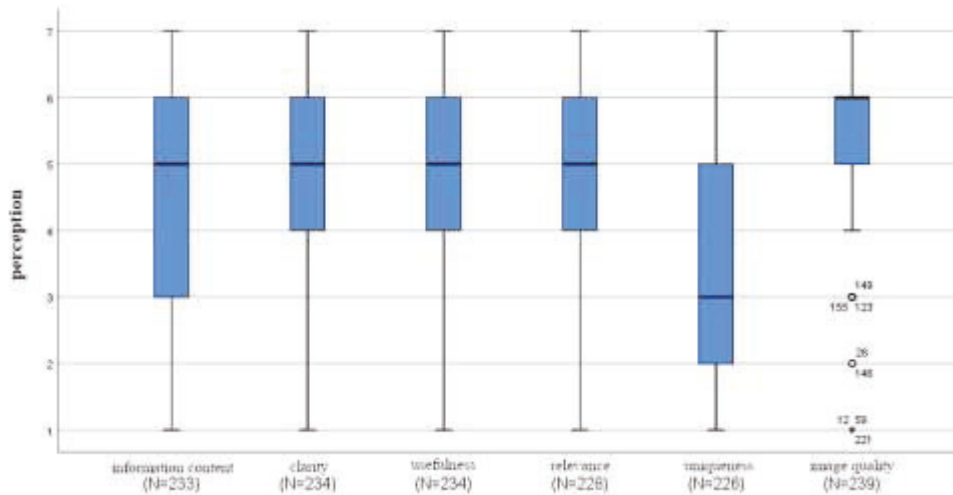
#### 3.1 Quality of the Pinterest information service

##### 3.1.1 Perceived quality



**Figure 2:** Perceived quality of the information service system in general

Figure 2 reflects the perceived quality of the Pinterest system by the survey participants. In summary, it was assessed as very positive. The system is perceived as simple (“simplicity”) with a median of 6 and an IQR (interquartile range) of 2. The “usefulness” was also rated as useful with a median of 6 and an IQR of 2. With a median of 4 and an IQR of 2, “trust” in the system is fairly neutral, but with a positive trend. The factor “fun” on Pinterest is rated high with a median of 6 and an IQR of 2. The “topicality” of the system seems to have been perceived as relatively up-to-date by the respondents with a median of 5 and an IQR of 2. The “design” is considered user-friendly, similar to simplicity, usefulness, and fun, with a median of 6 and an IQR of 2. In general, no aspect of the perceived quality was perceived negatively.



**Figure 3:** Perceived quality of the content of the information service in general

The perceived quality of the content on Pinterest was examined with the factors information content, clarity, usefulness, relevance, uniqueness and image quality. As can be seen in Figure 3, the “information content” was assessed as slightly positive by the participants with a median of 5 and an IQR of 3. The same applies to the “clarity” of the content, the “usefulness” and the “relevance.” These three factors were all perceived identically positively with a median of 5 and an IQR on 2. The “uniqueness” was perceived negatively with a median of 3 and an IQR of 3. The image quality with a median of 6 and an IQR of 1 was perceived as very good. In summary, it can be said that there is a positive perception of the quality of the content, in particular the information content, the clarity, the usefulness, the relevance and the image quality. However, the content on Pinterest is not considered to be unique.

3.1.2 Objective quality of the information system

As already described in the method section, the evaluation of the quality of the images was carried out using the subjective image measurement method with double stimulus (Thung & Raveendran, 2009). A MOS value of 4.1 for Pinterest and a MOS of 4.4 for the original images were achieved (Table 1). The average deviation is therefore 0.3. This value is very good, measured by the maximum mean difference of 4 and the desired minimum mean difference of 0. It can thus be stated that Pinterest has an average image quality of 93.5% of the original image quality.

**Table 1:** Image quality analysis. Subjective image measurement method with double stimulus

MOS - Pinterest	MOS - Original	Mean Difference
4.1	4.4	0.3
Likert scale from 1 (“poor quality”) to 5 (“excellent quality”).		

**Table 2:** Precision of text-based search





Search Query (SQ)	Average precision	Rank-based average precision	mAP
Haustier [pet]	0.96	0.97	0.67
Golden Retriever	1.0	1.0	
Golden Retriever Tattoo	0.43	0.68	
Golden Retriever Halsband pink [Golden Retriever collar pink]	0.04	0.04	

Table 2 shows the result of the mAP analysis of the text-based search. The text-based search performed well with a mAP value of 0.67. Overall, it can be seen that the precision of the search with short word strings is much better than the search with longer word strings. If one differentiates between the rank-based average precision and the average precision, it can be seen that these are almost identical except for the third search query (“Golden Retriever Tattoo”). In the third search query, the weighting is particularly noticeable, since the relevant results were displayed earlier in the list of search results.

Similar to the text-based search, the image-based search on Pinterest was examined using the mAP analysis. Table 3 shows the images used for the search queries and the results of the analysis. With a mAP value of 0.66,

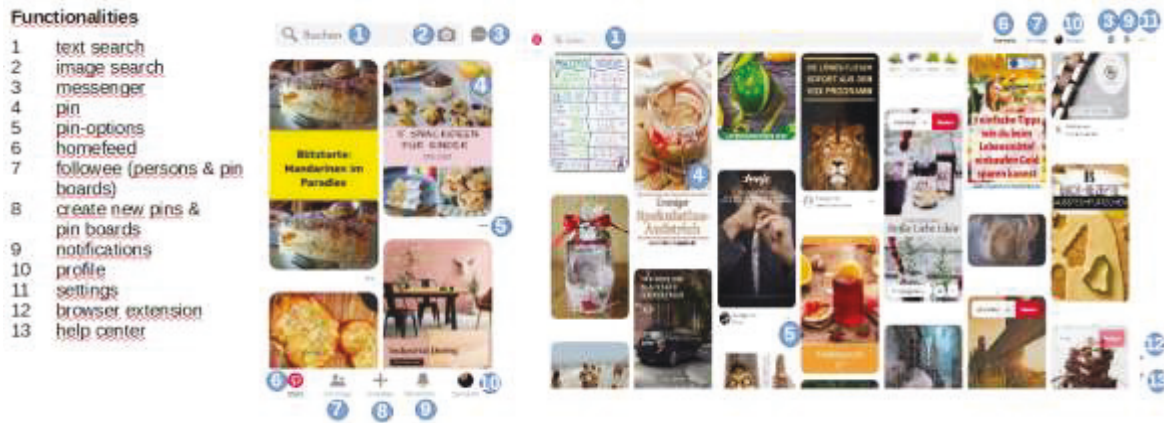
the image-based search performed well, similar to the text-based search. The image-based search also shows that the difficulty of the image searched has an impact on the precision. A more general search (SQ1 and SQ2) achieves 100% precision, whereas more specific searches (SQ3 and SQ4) turn out to be significantly worse. In the third and fourth search query, the comparison of the average precision and the rank-based average precision also shows that the relevant results are at the top of the search results list.

**Table 3:** Precision of image-based search

Search Query (SQ)	Average precision	Rank-based average precision	mAP
 SQ1: Haustier [pet]	1.0	1.0	0.66
 SQ2: Golden Retriever	1.0	1.0	
 SQ3: Golden Retriever Tattoo	0.12	0.38	
 SQ4: Golden Retriever Halsband pink [Golden Retriever collar pink]	0.09	0.25	

### 3.1.3 Functionality of the information system

Pinterest consists of various functions that can be divided into main and additional functions as well as functions for a specific group of users. The main functions include pin boards and pins, search functions, the home feed function, the messenger function, notifications, profile, and follow functions. Tutorial and help functions as well as spellcheck, trending and filter functions are additional functions that Pinterest offers its users for support. The functions for a specific group of users include the widget builder, API and SDKs for developers as well as an analytics function for companies.



**Figure 4:** Functionalities at a glance. Pinterest's app & desktop web homepage as of November 14, 2019

The functionalities for information production and information search are shown in Figure 4 divided between the app and desktop web home page of Pinterest. It can be seen that the most important functions of Pinterest are represented on the app (left) directly on the home page (6). Points 1 and 2 are the search functions. Together with the messenger function (3), these form the head of the home page. The content is shown in the form of pins (4) in the middle. Pin options (5) can be called up for each pin. The footer is formed by the functions Home feed (6), Follow Me (7), Create (8), Notification (9) and your own profile (10). The desktop website view (right-hand side) differs in some respects from the app view. For example, the functions image search and creation of new pins and pinboards are not offered on the Home feed (6), however other functions such as settings (11), browser extension (12) and help center (13) can be found there. Points 1, 3, 6, 7, 9, 10 and 11 form the header of the Pinterest website. In the centre of the page the content is shown in form of pins (4) and their options (5). There is no footer, but there is a sidebar (bottom right) with functions 12 and 13.

### 3.2 Pinterest platform specifics

Pinterest has described itself as a search engine for a longer period of time (Xu, 2014). However, many users and scientists saw it differently and assigned Pinterest to different types of information services, including social media (Mittal et al., 2014; Mull & Lee, 2014; Miller et al. 2015; Büscher, 2018; Carpenter, 2012). One reason for these different classifications could be the variety of possible uses of Pinterest, which makes it difficult to define it as one specific system type. In order to obtain a more precise definition of the information service, the functionalities and special features of different information services were considered. It is already known which functionalities Pinterest has to offer. Now, it has to be determined which functionalities make up the various systems with which Pinterest is being associated. By comparing the matches, it is possible to determine what kind of system Pinterest is.

#### 3.2.1 Pinterest as a search engine

A search engine is a web-based program that collects and organizes content from across the Internet (Kimmons, 2019). Search engines include services such as Google.com, Bing.com, Baidu.com, Yahoo.com, Yandex.ru, WolframAlpha.com and many more. A search engine refers to information services that use crawling to find information in a network. The search for the information is defined by input from the user. The quality of a search engine is measured on the basis of the output. If both, recall and precision of the search result, is very high, then it is a good search engine (Stock & Stock, 2013). Pinterest provides its users with two search functions, text and image-based search. The text-based search function delivers suitable pins as a search result based on the user's input word. However, these are only pins from its own database. Pinterest does not include data from other websites. The value of the recall decreases in the sense of a search engine, since not "all" results could be found. With functions such as "Guided Search", Pinterest can improve its precision as a concept-oriented retrieval system to meet the information needs. Pinterest has two search operators that allow more advanced searches:

- colon (:), which is an operator that allows any suffix. So when entering "dress:" the terms dress, dresses and similar are searched for and retrieved.
- phrase search, i.e., when searching for a phrase, a string placed in quotation marks (""), is searched for as a whole input word and not the individual words within the string.

The image-based search function on Pinterest takes an image selected by the user as input and delivers similar image pins as the search result. This search function only lists results from Pinterest's own database as well.

### *3.2.2 Pinterest as a social networking service*

Pinterest is considered by many scientists to be a Social Networking Service (SNS) (Mittal et al., 2014; Mull & Lee, 2014; Miller et al. 2015; Büscher, 2018; Carpenter, 2012). Social media or SNSs are web and app services on which users can create and share content, as well as communicate and network with other users. Interactivity is therefore a key feature (Mack & Vilberger, 2016). Obar and Wildman (2015) identified four main features of social media:

- 1. Social media are web 2.0 based internet applications.
- 2. The main content of social media is user-generated.
- 3. Individuals and groups create user-specific profiles for an app or website that is managed by a social media service provider.
- 4. Social media services facilitate the development of social networks online by linking a profile to that of other people or groups.

Pinterest is a Web 2.0 application and has networking features such as user tracking and messenger function. Creating pin boards together with several users is also a networking function. The main content of Pinterest is often created by companies and website owners (business users). About 75% of the pins on Pinterest come from company websites (Pinterest Engineering, 2015). Private users rarely create "new" content, but use content from the Internet (content found based) (Mittal et al., 2013). The Pinterest profile is a very meagre feature because it can contain only little information about the user (profile picture, user name, tooltip, location, and website). Except for the user name, all information is optional and does not have to be specified. The connections on Pinterest are very special because often people are not connected to each other, but to content. Mittal et al. (2013) found that on Pinterest the content is more in the foreground and the networking is only strong for a few profiles, while it is hardly available for others.

### *3.2.3 Pinterest as a curation platform*

A curation platform is a service that collects and presents content from other websites in a structured manner (Hall, 2012; Hall, 2014; Ulbricht, 2015). Pinterest enables this function for its users by creating, remembering and structuring website pins. With many curation platforms, such as Scoop.it or Paper.li, the content is integrated by the provider and presented based on the topic. Thus, the user can quickly record the already processed and structured topics. This possibility is only very limited on Pinterest. Pinterest offers its own structured topics for its users, but focuses on user-generated or user-found content.

### *3.2.4 Pinterest as a (social) bookmarking service*

Social bookmarking services enable their users to create bookmarks alone or in groups and to share them with other members of the service (Gray et al., 2011). These bookmarks can be presented in a visually attractive way, or can be arranged in a logical structure similar to a curation platform. Pinterest allows its users to memorize pins on pin boards alone or in a group, which can serve as bookmarks to the original websites. These pin boards can be made public (for other members of the service) or private. Pinterest thus fulfils all the criteria of a social bookmarking service, but its functions and the complexity of the service go a lot further.

## **4. Discussion**

The number and variety of digital information services has been increasing steadily for years. One reason for this is the enormous economic potential. The challenge, however, is to meet the changing user needs. As a result, information services are also changing. This is particularly noticeable with SNSs. Previously, these were predominantly text-based, with progressive techniques, newer implementation options are conceivable and so SNSs are increasingly becoming social media 2.0. One of the most popular services is Pinterest, a virtual pin board for collecting content, ideas and inspirations found online. It differs from other information services and forms a kind of hybrid platform. It has a steadily increasing number of users and receives a high level of attention from business and science. Although there are already some studies dealing with user behaviour, gender roles and information behaviour on Pinterest, some important insights are still missing to receive a holistic view of the service, such as its perceived and the objective quality. Therefore, the aim of this work was to determine



with the help of the ISE model, what the perceived and objective quality of the service is (RQ1) and as what kind of service can be Pinterest classified (RQ2).

The quality of the service was generally perceived and rated very positively by the participants of the online survey. The quality of the system was consistently well rated in terms of its simplicity, usefulness and fun. This does not apply to trust in the system. Trust has been rated as acceptable with a neutral value. The content was also perceived very positively in terms of information content, clarity, usefulness, relevance and image quality. However, the content was not perceived as unique. This is not surprising since Pinterest's system is based on the fact that identical pins can be collected on many different pin boards. As a result, users may perceive identical pins (repinned pins) as duplicates, although technically they are not duplicates (Weiner, 2015). In objective quality analysis, similarly positive tendencies can be identified. Both, the search in the form of a text search (mAP value of 0.67) and the image search (mAP value of 0.66), deliver good and relevant results. According to Stock & Stock (2013), these two values are above-average for an IR system. Pinterest invests in the research on IR systems and continues to expand its search functions. According to Churchill (2018), the search is a key part of the discovery. Other social media also have search functions, but in contrast to the search function on Pinterest, these are not in the foreground. Looking for information or inspiration is a key function of Pinterest. Against this background, Pinterest's own assignment as a search engine and the expansion of the IR system are obvious. It is therefore important for Pinterest to have a good IR system in order to satisfy the (search) needs of its users. The challenge here is the image-based content, because it is difficult to develop a good content-based IR system (Mahajan & Chaudhary, 2018). However, the results indicate that Pinterest was able to do this very well. According to Zhang et al. (2019), Pinterest endeavours to ensure and improve the quality of the content by checking the quality of the pages to which the pins are linked. But the quality of the content in the form of image quality also shows a very good result with an average image quality of 93.5% of the original image quality. Thus, despite adjustments made to the pictures by Pinterest, there are hardly any losses in the quality of the original picture. This is an important factor because the pictures in the form of pins are the main feature of Pinterest. Other key features of Pinterest are, as already mentioned, the search, the various pin boards, the messenger, pin interactions, followee feed and own profile. All of these functions can be found directly on the home feed of the app and on the website. In summary, it can be said that both, the system and the content on Pinterest, are of high quality.

In addition, it can be said that Pinterest itself is a fusion of various services and their main functions. It is a kind of visual hybrid media, which has components of an SNS, a search engine, a curation service and a bookmarking service. These functions are always associated with restrictions or extensions. It is therefore not to 100% a search engine, since search results can only be found from the internal database, not to 100% a SNS, since the networking component is not in the foreground, and not a 100% curation tool, since the content can also be created by the users (user-generated content) and not a 100% bookmarking service, since the functionalities of Pinterest far surpass one. In summary, Pinterest is actually a unicorn among social media.

#### **4.1 Limitations and further research**

Pinterest is an ever-changing "organism" made up of many different people and technologies. For this reason, it is very difficult to get a general picture of the system. During the investigation, it was already found that many functions and the design of the user interface have changed continuously. As a result, there is a continuing need for research in this area. This study is therefore only a snapshot of the current status.

There are many more research options on Pinterest. For example, Pinterest could be compared with other alternatives, such as social bookmarking services, social curation tools, social search engines or payment services (which are very similar to Pinterest), in terms of their functionality or performance.

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