

Impact of Advertising Intensity on Customer Churn for Web-Mail Services: Insights from a Customer Survey in Germany

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Abstract—Many services on the Internet are offered free of charge to users. These include web-mail services, which allow access to e-mails via the browser without the installation of an e-mail client. Companies offer free web-mail services, for example, as a complementary service to a paid service or as an introductory or try-out offer. Advertisements are often placed on the portals of web-mail services as a revenue model or to help cover costs. Advertisements may not only contain interesting advertising messages for users, but may also be perceived as annoying depending on the content and extent of the advertising. Too much advertising can lead to a churn of users. Providers, therefore, find themselves in an area of conflict between pushing advertising to increase advertising revenues and limiting advertising to prevent customer churn. This study examines the impact of advertising intensity and the change intention of web-mail users. The study was conducted among the customers of the Telekom E-Mail Center, one of the popular web-mail offerings in Germany. A total of 2,228 customers were surveyed, and the significance of the reasons for switching was evaluated by means of discriminant analysis. After privacy concerns, the most important reason for changing web-mail providers was found to be too high advertising intensity.

Keywords—web-mail services; customer churn; advertising intensity; discriminant analysis.

I. INTRODUCTION

Advertising is of great importance to Internet service providers, as their business models often depend on this revenue stream. Online advertising can also contain valuable information about products and services for Internet users. Currently, there are more and more sophisticated technologies supporting the process of selecting advertising messages relevant to users and deliver them with the lowest possible dispersion losses. However, the placement of advertisements may be perceived as annoying or undesirable by users [1]. Internet service providers are thus in a constant balancing act between realizing advertising revenue potentials and maintaining customer satisfaction. Existing studies on e-mail marketing and online advertising [2] focus, for example, on the opportunities for Internet service providers to increase awareness of their service portfolios, to attract attention, and to arouse buying interest among potential customers. Moreover, there are plenty of approaches to measuring customer satisfaction [3]. However, to the knowledge of the authors, there is a research gap on investigating the negative effects of online advertising

on customer satisfaction as well as analyzing customer churn as a result of excessive use of advertising by Internet service providers. Additionally, while existing studies analyzed the effects of online advertising from the perspective of Internet service providers or customers (e.g. [4][5]), there is a lack of studies that try to combine both perspectives.

The main research objective of our paper is, therefore, the analysis of the effects of advertising on the web-mail portal of Deutsche Telekom on customer churn. Theoretical principles from the field of operationalizing and measuring customer satisfaction (e.g., confirmation-disconfirmation paradigm, [6]) were included in the design of the customer study. In addition to the users' perception of advertising, the study investigated influences on customer satisfaction and the intention to churn. Moreover, various advertising formats and contents (e.g., personalization of advertising content) and the parallel use of e-mail service offerings from competitors have been considered in the study. The online survey focused on the usage of the e-mail portal on the desktop browser and was conducted in May and June 2019. Customers were randomly selected among the visitors of the web-mail portal during a twelve-day survey period. Since this is still a preliminary study, the analysis is mainly exploratory, and no explicit research model, e.g., for validating cause-effect relationships, has been formulated. A discriminant analysis to identify distinguishing features and the significance of advertising intensity in the groups of users with and without the intention to churn was carried out.

Against this background, our study is structured as follows: In Section II, we first discuss the use of web-mail in Germany and describe important advertising content and formats. In the following, related research on the impact of advertising on the use of online services is examined and the research objectives of the paper are presented. Section III then covers the methodology and approach of the customer study. Important results and implications are presented in Section IV before this paper closes with the conclusions in Section VI as well as limitations and an outlook on further research in Section VII.

II. RESEARCH BACKGROUND

A. Web-mail Services and Usage in Germany

The number of users in Germany who use the Internet to send and receive e-mails has risen sharply in recent years

from 38 percent in 2002 to 86 percent in 2019 [7]. Thirty-five percent of the customers surveyed also use an additional e-mail service in parallel. According to this, there is no monopoly among German e-mail providers, which means that customer loyalty is becoming increasingly important.

This industry study was conducted among customers of the web-mail offering of Deutsche Telekom. Deutsche Telekom emerged from the former state-owned national telecommunications network operator in Germany and is now a leading European telecommunications company with headquarters in Germany. With around 184 million mobile customers, 27.5 million fixed-network lines, and 21 million broadband lines, the Deutsche Telekom Group is one of the world's leading integrated telecommunications companies [8]. The company launched the first mail service for the German mass market under the T-Online brand in the summer 1995. As one of the most used e-mail providers in Germany, more than 2.5 billion e-mails were received via T-Online e-mail addresses in 2019 daily [9].

B. Advertising Content and Formats

In 2017, the Internet replaced classic television as the world's most popular advertising medium and this growth has continued unabated ever since: [10], for example, forecasts that the share of Internet advertising in total global spending will rise from 39 percent in 2017 to 49 percent by 2021. Global spending on online advertising is expected to increase from USD 273 billion in 2018 to USD 427 billion by 2022 [11]. In terms of online advertising formats, the biggest growth is expected to be in display advertising (banners, online videos), which is primarily due to high-quality content, better screens and Internet connections, but also to the creative and personalized approach to target groups [4] thanks to "programmatic buying" [10]. Programmatic buying or programmatic advertising refers to "... the automated purchase and sale of advertising space" [12]. In the USA, where digital advertising generates the highest revenues worldwide, programmatic advertising is predicted to grow from 73 percent in 2017 to 78 percent by 2023 [13]. Also, since 2017, global spending on mobile advertising has been 109 billion USD, exceeding desktop advertising spending of 104 billion USD [10]. In Germany, the picture so far is still reversed: In 2018, gross advertising expenditure totaled nearly EUR 12.6 billion, with desktop advertising accounting for EUR 0.97 billion and mobile advertising for EUR 0.36 billion [14]. Nevertheless, the global development of mobile advertising media is also becoming increasingly visible in Germany: If we look at the growth of mobile advertising in 2019 (from January to May) compared to 2018, an increase of 26 percent is apparent [14]. At the same time, gross expenditure on desktop advertising in 2019 rose by only two percent compared to 2018. As a result, the focus of online advertising concepts should be increasingly directed towards mobile in the future, as the use of mobile devices and thus mobile access to Internet offerings will increase significantly [15]. Table I lists the common advertising formats within web-mail services.

III. RELATED WORK AND RESEARCH OBJECTIVES

A. Related Work on Customer Churn at Online Services

The telecommunications industry, in particular, is interested in predicting customer churn [16] because the telecommunications sector is a rapidly growing and highly competitive

TABLE I. OVERVIEW OF IMPORTANT WEB-ADVERTISING FORMATS

<i>Format</i>	<i>Description</i>
Skyscraper	Vertical ad, static, animated or rotating
Text Link	Single-line ad text incl. hyperlink
Inbox Ad	Ad which is integrated into the message list
Transmission Confirmation	Pop-up appearing after an e-mail has been sent

market [17] and it has a direct impact on the competitiveness of a service provider [18]. Consequently, telecommunications companies often use customer churn as an important KPI to make forecasts [19]. The high intensity of competition makes it more difficult for telecommunications companies to bind customers to their services in the long term, as it is easy for customers to switch between providers [17].

B. Related Work on User Impact of Advertising

In the past, the two research areas e-mail marketing and online advertising have already been discussed in detail [1][2][5]. The focus was, for example, on the opportunities offered to Internet service providers to increase the awareness of their service portfolio through external communication in order to attract attention and arouse the buying interest of potential customers [1][2]. However, this approach neglects when the opposite could be achieved and customers churn due to excessive advertising intensity. In addition, the personalization of advertising has been intensively considered. According to [5], for example, the intrusiveness of advertising increases when it is personalized by the name of the recipient. Furthermore, there are also data protection concerns in connection with personalized advertising. In addition, penetrating Internet advertising has a negative impact on customers' purchase intentions, even if it includes discounts. In contrast, personalized online advertising can still be successful, depending on the industry of the provider. As far as the telecommunications industry is concerned, however, no correlation between personalized advertising and revenue growth could be established in the past [5].

The situation is similar to the research topic of customer satisfaction. With regard to the offline presence of companies, it has already been shown that the design of salesrooms has an influence on customer satisfaction [4]. Even just seeing the landing page of an e-commerce store can trigger emotions in users that influence their behavior [20]. Although various models and procedures for measuring customer satisfaction already exist in the literature [3], they are essentially only concerned with the evaluation of a product or service, customer service, or the company in general. This fact justifies the aim of the following study to gain insights into the influence of online advertising on customer satisfaction.

In summary, this results in two central research gaps which are closed by this scientific work: On the one hand, within the research fields of e-mail marketing and online advertising, the customer perspective has so far receded into the background, especially with regard to the extent to which the use of advertising has negative consequences. On the other hand, there is insufficient research knowledge about customer satisfaction with regard to the advertising financing necessary from the provider perspective.

C. Research Objectives of the Customer Survey

The aim of the analysis was to find out how strongly online advertising within web-mail services influences customer satisfaction and can even harm the providers in the form of customer churn in the long term. For this purpose, the perception and impact of different online advertising formats within the Telekom E-Mail Center were measured. Specifically, the current use of advertising in the browser application of the Telekom e-mail service was investigated. The research questions were:

- How can advertising within the e-mail portal be used sensibly without causing negative consequences on customer satisfaction, e.g., customer churn?
- How are different advertising formats evaluated from the customer's perspective?
- Does the acceptance of personalized and non-personalized advertising differ?
- What is the maximum advertising intensity that can be expected of users?
- How is the current advertising volume within the e-mail portal perceived in comparison to competing web mail services?

IV. METHODOLOGY AND STUDY APPROACH

In order to find out to what extent the respondents would change their main provider, i.e., not only the Telekom E-Mail Center, due to excessive advertising intensity, a discriminant analysis was applied. The aim of this method was to find out whether online advertising has a "discriminatory significance" [21] with regard to the customer churn rate; in other words, to what extent advertising acts as a disruptive factor so that customers would consider changing providers as a result. According to the method, customers were initially divided into two groups, which are distinguished by a no-minus characteristic [21]. The "discrimination criterion" represents the customers' willingness to switch. This results in two groups: the churners and the non-churners.

The so-called churners are characterized by the fact that they consider changing their main provider within the next six months. In contrast, the non-churners estimated their willingness to change the provider within the next six months as unlikely. In a broader sense, the group of churners can be considered more dissatisfied than the group of non-churners. Of course, there are also customers who are not willing to change despite their dissatisfaction. Reasons for this can be the convenience, barriers to change, or loyalty [22]. The primary initial question of the discriminant analysis on the topic of willingness to switch was followed by ordinal scaled questions in order to determine which motives are most likely to be behind a possible change of provider by the users. Accordingly, the group of churners was asked to indicate those motives for a probable change. In contrast, the group of non-churners was asked from which motive they would change if this were hypothetically the case, contrary to their previous answer on the probability of switching within the next six months. Possible reasons for the change are given as possible answers to which the respondents could individually agree using the ordinal scale. The following reasons for switching were available [23][24]: Recommendation of a friend or acquaintance, too much advertising, too few functional and

configuration options, poor usability, data protection concerns, slow update speed or data transfer, as well as the desire for change/new things to try out.

The questionnaire was played out randomly at a frequency of 1/400 per login to the browser-based Telekom E-Mail Center. In order to consider all usage rituals, all weekdays, including weekends, were considered with regard to the duration of the survey. Specifically, the survey was put online for around 12 days between Friday, May 31, and Tuesday, June 11, 2019. The test persons came from the existing customer pool of web-mail service of Deutsche Telekom, which means that the population was made up of real customers. According to a previous study, there was also an overlap between the users of the Telekom E-Mail Center and alternative providers: 44 percent of them also use a competitor's web-mail offering. In general, e-mail services are a highly competitive industry [25]. Therefore, a comparison of competitors was implemented in the questionnaire.

V. STUDY FINDINGS AND IMPLICATIONS

In total, 2,228 users took part in the survey. Table II shows some selected characteristics of the sample. The average customer who completed the online questionnaire is male, between 61 and 65 years old, who lives in a two-person household and has a monthly net income between 2,500 and 2,999 euros. The sample size shows a possible bias as the results are not representative for the total population.

TABLE II. OVERVIEW OF SAMPLE CHARACTERISTICS

Sample Characteristics	Percentage
Male	74.0%
Female	21.0%
71 years or older	27.0%
Two-person household	52.0%
Monthly net income between 2,500-2,999 euro	9.0%

Table III shows that a majority of the respondents reject more ads in return for more functionality within the web-mail offering. Moreover, the analysis showed that 84 percent generally reject an increase in online advertising, regardless of whether it is in line with their interests (personalized content) or not. This anti-attitude of users towards the intensification of advertising makes the starting position more difficult, both for providers of web-mail services and for advertisers, since both parties are dependent on advertising or indirectly on advertising revenue or click rates. Even a functional enhancement, such as increased storage space or spam protection in return for a higher advertising volume would only be accepted by twelve percent of the respondents. As far as this practical example is concerned, it is becoming apparent that many of the customers surveyed also use the products of alternative web-mail providers.

As mentioned above, there is strong competition between web-mail offerings in Germany. Against this background, it can be assumed that the perceived advertising intensity also has an influence on customer loyalty compared to competitors. Nevertheless, there is a large discrepancy between the subjective customer opinions regarding the perception of advertising intensity. This inconsistency in the customer perspective is expressed in the fact that there is a disagreement between the researched telecommunications company Deutsche Telekom

TABLE III. ADVERTISING PREFERENCES OF THE STUDY PARTICIPANTS

<i>Advertising Preferences</i>	<i>Percentage</i>
No acceptance for more ads in return for more functionality	87.0%
Generally, not more ads, even if personalized	84.0%
Static instead of animated advertising	83.0%
Acceptance of a higher ad volume in return for unlimited storage space	73.0%
Acceptance of a higher advertising volume in return for more spam protection	71.0%
No personalized ads for data protection reasons	58.0%

and competing providers in the assessment of the extent of advertising. According to the survey, 41 percent of the respondents who actually use the services of other web-mail providers were convinced that there are differences in the intensity of advertising between web-mail providers.

Paradoxically, at the same time, 32 percent felt that the advertising volume at the Deutsche Telekom portal in contrast to other web-mail services they use is more or less the same. This result changed insignificantly if one looks specifically at the relationship between Deutsche Telekom and its largest competitor with regard to differences in the perception of advertising volume. In addition, it is not possible to generalize as to whether personalized or non-personalized advertising, in general, scored better in terms of usefulness. However, customers in Germany are particularly sensitive when their privacy is invaded in order to personalize advertising. Fifty-eight percent of the users expressed data protection concerns about personalized advertising content. In terms of advertising format, especially with regard to the examined Telekom E-Mail Center, simple text links, which redirect the user to the advertiser via hyperlink if they are interested, performed best. Only 23 percent found them very annoying. At 37 percent, respondents felt slightly more disturbed by advertisements in the form of skyscrapers. The greatest disruption was attributed to advertising banners integrated into the transmission confirmation (55 percent), closely followed by advertisements that are located within the e-mail list of a mailbox and appear in the same design as regular e-mails (52 percent).

Nonetheless, critical customer opinions about online advertising were not necessarily reflected in their actual behavior, as shown in Table IV. Forty-two percent of the respondents would just reduce usage, while 35 percent would simply ignore annoying advertising without resorting to further measures, such as complaints or changing providers. Only 20 percent of the respondents considered changing the provider in case of too much advertising.

TABLE IV. IMPACT OF WEB-MAIL ADVERTISING ON WEB-MAIL USERS

<i>Impacts</i>	<i>Percentage</i>
Reduction of usage in case of too many ads	42.0%
Accept the higher ad volume without a reaction	35.0%
Change of provider in case of too many ads	20.0%

Table V shows that only seven percent of customers intend to change their main web-mail provider within the next six months. For 39 percent of the customers, too much advertising was the reason, while 23 percent had performance problems with the portal currently in use.

TABLE V. INTENTION TO SWITCH AND CHURN REASONS

<i>Intention to Switch and Churn Reasons</i>	<i>Percentage</i>
Probability of changing the main provider within the next six months	7.0%
Too many ads as a reason for changing the main provider	39.0%
Slow update speed/data transfer as a reason for the change	23.0%

In a further analysis step, the reasons for a change of provider were examined in the group of respondents who had indicated that they would change provider within the next six months (churners). Table VI shows the ranking of the most frequent motives for switching for the web-mail provider mainly used as a result of the discriminant analysis conducted. The motive of too much advertising (57 percent) was in second place after the leading data protection concerns (74 percent).

TABLE VI. RESULTS OF THE DISCRIMINANT ANALYSIS

<i>Rank</i>	<i>Discriminants</i>	<i>Discriminant Value</i>
1	Privacy concerns	74.3%
2	Too much advertising	57.3%
3	Poor usability	54.6%
4	Recommendation of a friend/acquaintance	12.7%
5	A desire for change/new things to try	9.7%
6	Too few functional and configuration options	5.5%
7	Update speed/data transfer too slow	2.0%

In contrast, when asked explicitly about their risk of switching to a competitor due to the current advertising use regarding the Telekom E-Mail Center, 36 percent of customers said that switching to the competition was very unlikely, and only two percent considered it very probable. In addition, a correlation was found between customers' willingness to switch and their age. Accordingly, to a certain extent: The older researched customers are, the more likely they are to consider switching to another provider due to the advertising intensity of the considered supplier. This means that 28 percent of the interviewed users are most willing to switch providers at the age of 71 or older. In comparison, the average customer churn measured at Deutsche Telekom was only seven percent.

VI. CONCLUSIONS

The present study examined the extent to which online advertising in web-mail services affects customer satisfaction. At the core of the analysis was not only the question of how online advertising can be used optimally without triggering negative effects on customer satisfaction or even customer churn. Furthermore, empirical research was also conducted on how different advertising formats and content were evaluated from the consumer's point of view and what level of advertising intensity the users accepted. To answer the research questions, an online survey was conducted among the customers of the web-mail service of Deutsche Telekom, in which a total of 2,228 respondents took part.

In conclusion, it can be summarized that online advertising is certainly criticized by users. The extent to which customer satisfaction ultimately has an effect on negative changes in user behavior, such as customer migration to competitors, depends on the respective provider. Consequently, in addition to advertising, other factors influencing customer satisfaction should also be considered. This concerns above all the trust of the customers in the provider with regard to the handling of sensitive, personal data. Thus, a negative influence of high

advertising volume on the willingness of customers to switch to web-mail services could be proven (57 percent), but played a secondary role in addition to other factors, such as data protection concerns (74 percent) or poor usability (55 percent).

VII. LIMITATIONS AND OUTLOOK

In order to be able to derive long-term benefits from the results of a customer satisfaction survey, repeated measurements at regular intervals will be required in the future [4]. The more intangible the service is, the more often satisfaction measurements or complaint statistics should be analyzed [6]. In this context, the sample could generally be enlarged to prevent possible bias and to represent the total population. Moreover, a sample involving other web-mail services (e.g. from several countries) could increase the generalization of the results. Furthermore, according to the presented results, a significant percentage of customers believe that the volume of advertising on the Deutsche Telekom portal is about the same as that of other web-mail services they use. Therefore, it would be interesting to find out what causes a homogeneous increase in advertising volume for most services. It might be possible that the churn rate does not change for the same advertising volume of competitors.

The connection between the topics of the influence of online advertising on customer satisfaction and the pressure to monetize for advertising-financed Internet service providers is outside the focus of the research but is, therefore, no less important. The researched telecommunications provider Deutsche Telekom will remain indirectly dependent on the active advertising consumption of its users in the future if a free version continues to be offered, which is ultimately financed by advertising revenue. As a result, Deutsche Telekom might not only continue to depend on advertising partnerships but also on achieving satisfactory click-through rates for its web-mail customers on advertisements displayed in the researched front-end of the Telekom E-Mail Center. Conversely, Deutsche Telekom would lose revenue if the number of bookings of online advertising spaces within the Telekom E-Mail Center was to decline as a result of falling click rates.

In order to build on the insights gained, it is advisable to additionally determine how strongly the placed advertising is generally perceived by the customers. In addition, research into the willingness to pay for web-mail services of customers would be conceivable. On the basis of the current state of research [26], it could, therefore, be investigated to what extent customer satisfaction affects their willingness to pay for web-mail services.

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