Customers’ Retention on Freemium Platforms – An Empirical Analysis of the Factors Influencing the Termination Rate

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Abstract

In light of increasing digitization and monetization of digital goods, the freemium business model is being used more often. The reasons for the use as well as for the termination of a paid full version have only been rudimentarily researched so far. In this study, factors influencing the termination rate on freemium platforms are derived from literature and analyzed empirically. The empirical investigation is based on data from a freemium platform that offers users various information on sport and breeding horses. The data basis covers the extensive period from February 2015 to March 2021. The factors influencing the terminations of premium members are aggregated to calendar weeks. For the investigation, a linear regression is used to measure the influence of different factors on the termination rate.

Our analysis shows that a shorter contract term leads to a lower termination rate. Furthermore, increasing involvement of premium users leads to a reduction in the termination rate. The results also indicate that a lot of new platform-specific content has a negative impact on the termination rate. Therefore, freemium providers should ensure that the provided content is highly up-to-date. Special attention should be paid to the combined effect of the number of video views (only possible for premium users) and the number of last logins of premium users. Surprisingly, the factors considered individually do not exhibit the respective expected effect relationship with the termination rate. Only the interaction of both factors leads to an increase in the termination rate. For the freemium providers this finding leads to a dilemma. They do not know in the short term (within a week) whether a premium user has logged in for the last time and is therefore at high risk of termination or will log in again in the next week.

Keywords: Freemium, Premium, Termination Rate, Online Platform, Customers’ Retention
1. Introduction and Objectives

A number of companies with digital business models, such as Deezer, Dropbox, or Spotify, are built on the freemium concept (Mäntymäki, Najmul Islam, & Benbasat 2020; Wagner, Benlian, & Hess 2014). In this concept, a paid premium version that offers users exclusive services is offered in addition to a free basic version (Liu, Au, & Choi 2014). Revenues are generated in particular through the subscriptions of premium users and through advertising (Osipov, Volinsky, & Grishin 2015). Continuous and plannable revenues are primarily generated by the premium users (Gu, Kannan, & Ma 2018). For this reason, it is important for companies to retain premium users, because revenue can be significantly reduced by terminating premium memberships. From the perspective of the freemium providers, the analysis and influence of the termination can be a crucial factor for the success or failure of such business models. In addition, the relevance of terminations on freemium platforms can be illustrated with a view to customer loyalty. According to Ross (2018), there is a positive correlation between customer loyalty and the monetization of freemium platforms. Beyond this, the importance of termination management or customer retention will increase further because of a new law in Germany starting in 2022. According to this, contracts will have to be terminable on a monthly basis after expiry of the minimum term in the future. In addition, contracts signed online must also be cancellable online via a clearly recognizable cancellation button on the website (Deutscher Bundestag 2021).

The reasons for terminating a premium membership are often unclear and can be manifold (Ahn, Han, & Lee 2006; Mäntymäki, Najmul Islam, & Benbasat 2020; Wagner, Benlian, & Hess 2014). On the one hand, the need for using the freemium platform may cease, e.g., due to the end of a corresponding activity. In this case, from the perspective of the platform providers, there are hardly any possibilities to influence the decision of the users. On the other hand, dissatisfaction with the service or with the platform itself can be a reason for terminating the contract. In this context user can be successfully influenced by customer retention strategies (Lee et al. 2011). In order to be able to exert an appropriate influence, relevant influencing factors have to be identified and empirically analyzed. With that in mind, the following research question is formulated:

*Which factors influence the termination of premium users of a freemium platform in which way?*

The aim of this study is to answer the research question mentioned above. After a brief literature review, hypotheses concerning the effect of potential influencing factors on the termination rate of premium users will be derived and subsequently empirically tested. For this purpose, we adopt an overarching perspective in which the factors influencing the termination rate of premium users are aggregated into calendar weeks and the termination rate is used as the dependent variable. This procedure enables us to derive measures that can fundamentally influence and maybe predict the churn of paying customers on a freemium platform.

2. Literature Review

Over the past years, business models based on the freemium concept have become more and more widespread. The expression “freemium” is a combination of “free” and “premium” and describes two different versions of a product: a free version with a limited scope of use and a paid full version (Osipov, Volinsky, & Grishin 2015). A freemium business model can only become successfully established if revenue is generated from the paid premium version in particular (Gu, Kannan, & Ma 2018). Accordingly, increasing termination rates or customer churn of premium users can jeopardize the entire business model and also the company’s existence. Both churn and customer retention are two key metrics that can be used to analyze
the user behavior on freemium platforms. Customer churn from the existing customer base can be measured by the termination of a contract or, in some cases, by the decrease in demand for a company's products (Buckinx & Van den Poel 2005). In addition, churn forecasting describes the prediction of customer churn. This involves predicting the imminent churn of customers in order to be able to initiate preventive measures (Baesens 2014). In this context, customer retention management is used to achieve precisely this progressive prevention of customer churn (Ascarza et al. 2018). Both customer churn and customer retention can be attributed to Customer Relationship Marketing (CRM). To predict customer behavior and derive the probability of customer churn, customer data can be collected and analyzed (De Haan & Menichelli 2020; Lemmens & Croux 2006; Neslin et al. 2006).

Overall, it can be stated that hardly any knowledge exists to date about factors influencing the terminations of premium members on online freemium platforms. Furthermore, there is a lack of empirical analyses over a long period of time with current and comprehensive data. The present study aims to close this research gap by identifying fundamental influencing factors on the termination of premium users.

3. Hypotheses Development and Research Model

For the customer decision to subscribe to a premium version or to use it for a further period, the expected risk is important, similar to purchase decisions for physical goods (see on the relationship between expected risk and purchase decisions, e.g., Kaplan, Szybillo, & Jacoby 1974; Ariffin, Mohan, & Goh 2018). With respect to the premium version of a freemium platform, it can be assumed that the users’ expected risk increases the longer the length of the subscription, since the total amount to be paid is generally higher even with, for example, lower monthly contributions. Various studies on subscriptions have already proven that the expected risk has a strong negative influence on the attitude toward the offer and that users expect flexibility (e.g., Bischof, Boettger, & Rudolph 2020; Descloux & Rumo 2020). Against this backdrop, we assume that a 6-month subscription, compared to a 12-month subscription, implies a higher flexibility concerning the exit as well as a lower risk, so that the following hypothesis is formulated.

\[ H1: \text{The higher the share of 6-month subscriptions in a week, the lower the termination rate in this week.} \]

An additional potential influencing factor in the context of freemium business models is the users' involvement (Gainsbury et al. 2016). The involvement of a user can be seen as an indicator of personal interest and the perceived relevance of the content of the premium version (Niemand et al. 2015). A positive influence of users’ involvement has been identified in previous research, for example, with regard to satisfaction with the premium offering (McDonald 2010). This argumentation leads to the following hypothesis.

\[ H2: \text{The higher the share of premium users with high engagement in a week, the lower the cancellation rate in this week.} \]

Another important incentive for the paid use of a premium version is the content available in contrast to the free version (Kim & Kim 2020; Määntymäki, Najmul Islam, & Benbasat 2020). We assume that the termination rate is lower if the online platform provides a lot of new content for premium users. This leads to the following third hypothesis.

\[ H3: \text{The more new content is provided on the platform in a week, the lower the termination rate in this week.} \]
To benefit from a premium membership, users must actively use the content of the online platform. The literature has drawn attention to the relevance of users’ activity, for example, in the context of online freemium games and music platforms with a freemium approach (Banerjee et al. 2018; Yu, Wang, & Yu 2017). In this research, relevant indicators of premium users’ activity are the number of profiles they visited and the number of videos they viewed. With these two indicators in mind, the following hypotheses are made.

**H4a:** The higher the number of visited profiles per premium user in a week, the lower the termination rate in this week.

**H4b:** The higher the number of video views per premium user in a week, the lower the termination rate in this week.

Additionally, in view of the activity of the users, we assume that the benefit of the premium membership ceases when the active use of the online platform ends. We expect the termination rate to increase in a calendar week if the number of last logins per premium users increases in this week. This leads to the following hypothesis H5.

**H5:** The higher the share of last logins in relation to all premium users in a week, the higher the termination rate in this week.

Furthermore, we assume that the advantages of the premium membership will be used more intensively before a termination. This means that some videos may be watched again during the last login, since this is no longer possible after termination. That suggests that there is an interaction effect between the number of video views per premium user and the share of last logins. Thus, the higher the product of both values in a week, the higher the termination rate in this week. The relevance of interaction effects with regard to customer loyalty for premium offers has been proven by Hagen et al. (2021), for example. With this in mind, the following hypothesis is:

**H6:** The higher the number of video views per premium user and the share of last logins in a week, the higher the termination rate in this week.

These hypotheses result in the research model shown in Figure 1.

![Figure 1: Research Model](image-url)
4. Data and Method

The object in this study is an online platform providing users with various information on horses for sport and breeding. The online platform is part of the digital offering of a publishing company operating all over Europe (based in Germany). The information includes pedigrees of horses, results of horse shows and videos of sport and breeding events. The platform operates on a freemium principle, which means that it can only be used to a limited extent without a user fee. Only premium users get full access to videos and tournament results. The underlying data of this online platform was collected from February 2015 to March 2021. The data was aggregated into weeks. To measure customer churn, the termination rate per calendar week is operationalized. Table 1 provides an overview and description of the dependent variable \(d\) and the independent variables \(i\).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>termination rate ((d))</td>
<td>Number of terminations in relation to all premium users per week.</td>
</tr>
<tr>
<td>share of 6-month subscription ((i))</td>
<td>Share of premium memberships with a contract term of 6 months versus a contract term of 12 months per week.</td>
</tr>
<tr>
<td>share of premium users with high involvement ((i))</td>
<td>Share of premium users per week who are directly assigned to a horse (owner, rider, breeder), so that a high level of involvement can be assumed.</td>
</tr>
<tr>
<td>new content ((i))</td>
<td>Tournament results entered by the platform provider per week. These are only available for premium users.</td>
</tr>
<tr>
<td>profile visits per premium user ((i))</td>
<td>Number of visited horse profiles per premium user per week.</td>
</tr>
<tr>
<td>video views per premium user ((i))</td>
<td>Number of videos viewed per premium user per week.</td>
</tr>
<tr>
<td>last logins ((i))</td>
<td>Share of last logins in relation to all premium users per week.</td>
</tr>
</tbody>
</table>

Table 1: Variables and descriptions

The empirical analysis is conducted with a linear regression analysis using Mplus6. Since a violation of the assumption of normal distribution cannot be excluded in some cases, the robust maximum likelihood estimation is used (Satorra 2000).

5. Findings and Discussion

Before the results of the empirical analysis are presented and discussed, the goodness-of-fit parameters have to be checked. The cutoff value of 10 for the VIF required in the literature is not exceeded for any variable (Wooldridge 2013; Hair et al. 2014). The VIF values range from 2.278 to 5.790. The Durban Watson value of 1.966 does not indicate any autocorrelation. The coefficient of determinations \((R^2)\) of 0.190 provides an acceptable explanation of the dependent variable.

The results of this study are shown in table 2 and are explained below. As expected, there is a negative relationship between the share of 6-month subscriptions and the termination rate. Consequently, the hypothesis H1 is supported. A higher share of premium users with a high level of involvement leads to a reduction in the termination rate. Thus, it can be concluded that a high level of user involvement is associated with a low probability of termination. Hypothesis H2 is supported. The more new content is available for premium users, the lower the termination rate. This leads to a preliminary confirmation of hypothesis H3. Contrary to our expectations, a high number of visited profiles leads to a significant increase in the termination rate, so that hypothesis H4a must be rejected. A possible explanation for this relationship is that profiles can be visited also without a premium membership. Even if not all information is visible, some premium users may find that the limited information is sufficient for them and that they no longer need the subscription. This result should be taken as an opportunity to critically examine the structure of the profiles and, in particular, the communication of the benefits for premium users. With regard to the relationship between video views per premium
user and the termination rate, the empirical results do not provide a significant result. Thus, hypothesis H4b has to be rejected as well. Contrary to expectations, the termination rate per week decreases the more premium users log in for the last time in that week. Therefore, hypothesis H5 has to be rejected. However, the joint effect of video views per premium user and last-time logins in a week leads to a significant increase in the termination rate in this week. Thus, there is an interaction effect between these two independent variables and hypothesis H5 is supported.

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>Hypotheses</th>
<th>Std. Path Estimate</th>
<th>p-value</th>
<th>Hypotheses Review</th>
</tr>
</thead>
<tbody>
<tr>
<td>share of 6-month subscription</td>
<td>H1 (-)</td>
<td>-0.337</td>
<td>&lt; .001</td>
<td>Yes</td>
</tr>
<tr>
<td>share of premium users with high involvement</td>
<td>H2 (-)</td>
<td>-0.396</td>
<td>&lt; .001</td>
<td>Yes</td>
</tr>
<tr>
<td>new content</td>
<td>H3 (-)</td>
<td>-0.165</td>
<td>= 0.033</td>
<td>Yes</td>
</tr>
<tr>
<td>profile visits per premium user</td>
<td>H4a (-)</td>
<td>0.501</td>
<td>&lt; .001</td>
<td>No</td>
</tr>
<tr>
<td>video views per premium user</td>
<td>H4b (-)</td>
<td>0.138</td>
<td>= .114</td>
<td>No</td>
</tr>
<tr>
<td>last logins</td>
<td>H5 (+)</td>
<td>-0.186</td>
<td>= 0.030</td>
<td>No</td>
</tr>
<tr>
<td>video views per premium user X last logins</td>
<td>H6 (+)</td>
<td>0.325</td>
<td>= .004</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Table 2: Empirical results

6. Conclusion, Limitations, and Further Research

The results of this study provide valuable and new insights for both researchers and practitioners in terms of premium member churn on freemium platforms. Through the theory-derived hypotheses, a research model was derived that contributes to a better understanding of termination rates. Both the directly influencing factors derived and the interaction effect contribute to an expansion of the theoretical basis for freemium business models. Freemium providers should take advantage of the fact that a shorter contract term leads to a fundamentally lower termination rate. In addition, these providers can try to increase the involvement of their premium users through specific offers. Another finding suggests that platform-specific content can help reduce termination rates. Thus, freemium providers should ensure that the provided content is highly up-to-date. Furthermore, special attention should be paid to the joint effect of the number of video views (only possible for premium users) and the last logins of premium users. Both factors do not indicate the expected relationship with the termination rate. Indeed, it is the interaction of the two factors that leads to an increase in the termination rate. For freemium providers, this finding leads to a dilemma, since they do not know in the short term (within a week) whether a premium user has logged in for the last time and is therefore at high risk of cancellation or will later log in again.

Even though the results provide new insights into fundamental and comprehensive factors influencing the termination rate of premium users, the study has some limitations. For example, an individual forecast of the termination probability per premium user is not possible based on the aggregated data. In the context of further research, this individual user level should be considered, especially with the aim of creating individual termination forecasts. Furthermore, the empirical results are based on data from a single freemium platform. While generalizability of the data is obvious, it should nevertheless be verified with further data – also from other sectors. In addition, other influencing factors, such as the remaining contract term, could be added. A differentiation and comparative analysis of specific user groups should also be considered. In view of the dilemma regarding the interaction effect between the number of video views per premium user and the last logins, there is a need for further research. The login behavior of premium users in recent weeks could also be considered as well. If a premium user
logs in regularly, but this regularity then drops sharply and his activity in terms of video views increases at the same time, this could be an indicator of impending termination.

**Bibliography**


