

Identification of professional players in an online community – A case study

Tobias Fritsch
Freie Universität Berlin
Berlin, Germany
T.Fritsch@gmx.net

Frederik Kerssenfischer
Bonn, Germany
ozodis@gmail.com

Julian Steinfeld
Berlin, Germany
julian.steinfeld@yahoo.de

Benjamin Schuch
Frankfurt, Germany
benjamin.schuch@ebs.de

1. Abstract

In this paper we analyze different kinds of World of Warcraft players – normal, professional and high ELO player - and evaluate their behavior in online gaming communities in an experimental environment. The experiment points out a linkage between the group of professional players and the group of high ELO players. We created an online community for the massive multiplayer online game World of Warcraft. The main findings of the experiment are a lower login rate of the high ELO players, higher count of posts for the online community by high ELO players and an overall higher game experience by these players. Some of these results are counter-intuitive to the picture of a professional player. The gathered data during the experiment does not support the hypotheses that high ELO users have a higher number of logins in the community. This implies that high ELO players tend rather to visit less and be more active in the community in this time or that they be active over a extend period of time within one login at the community site.

2. Introduction

With the increased influence of online gaming communities, their members become a part of the scientific analysis over the last years. Especially in the entertainment section, the virtual environment that is offered by the online communities is closely related to the content of the games themselves. Active participation in these communities is a key factor driving the attractiveness of online communities. One striking phenomenon is the existence of professional users, who have been noticed to drive attractiveness in online-gaming. Like in real sports, professional e-gamers are gaining financial profits and sometimes star-status. For this paper we choose to create an in-official gaming community for the game World of Warcraft (WoW). The webpage created for the experiment contains information about one aspect of the game: the “Player vs. Player” (describes the part of the game where players can fight against each other and not against the AI) game content. The online community contains a public and a restricted area, which is only accessible for the high ELO users. These users have achieved a rating beyond 2000 ELO points in WoW and are therefore considered “high ELO” players.

The remaining paper structures as following: Section 3 features the background information about the online gaming communities and the definition of professionalism in computer gaming. Section 4 describes the approach, with a focus on the research structure, the relevant influence factors and the hypotheses. Section 5 covers the experimental measurement and the design of the experiment. Afterwards section 6 includes a statistical analysis of the hypothesis using a logistic regression and a description of the results. In section 7 these results are discussed, finally section 8 concludes the main findings and gives an outlook about further research potential.

3. Background - Professional Users and their Impact on Online Communities

Since the accelerated diffusion of internet use in the 1990's marketing professionals have sought to exploit the potential of digital customer relationships (e.g. Hagel 1999, Kotler/ Achrol 1999, Kozinets 2002). In that regard virtual communities provide companies with the potential for efficient, direct feedback, the support of positive electronic word of mouth and the maintenance of co-creation relationships with their customers. Thus, attracting and committing participants to online communities is a necessary condition for their profitable use (Bart 2000/ Koh et al. 2007).

However, companies report mixed evidence with regard to the use of online communication and virtual social networks (Economist 2007, Koh et al. 2007, Ren et al. 2007). One issue for many online communities and social network sites seems to reside on the maintenance of participation of users and the stimulation of lively interaction between users (Ren et al. 2007). Thus, marketing researchers have started to investigate tools and concepts that attract participation in online communities.

Several studies document the role of so-called lead users or community leaders (Hippel 1988) in stimulating community interaction and providing insights for community operators (Ren et al. 2007). Thus, an improved understanding of the motivations and characteristics of community leaders is likely to expand the understanding of community dynamics and provide insights into the management of virtual communities. Social Capital theory has identified a specific role of pioneering users within communities: Proficient networkers act as knowledge entrepreneurs by bridging structural holes within a network: They gain knowledge in one part of the network in order to strengthen their position in hitherto unconnected areas. (Burt 1992, Van Den Bulte and Wuyts 2007).

Professional users can be considered as such entrepreneurs who are likely to invest time, expertise and knowledge in maintaining relationship within the community, while providing suppliers with ideas and acting as value-co-creators (Van Den Bulte and Wuyts 2007, p. 33, Kirzner 1979).

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Due to their expert knowledge, the lead user potential (and early insights) can be leveraged by the producer to generate innovations, which (in the long run) will be beneficial for all users. Online communities in general act as platforms for discussions to identify those needs.

One interesting fact of professional players is that they invest a significant share of their time in order to gain financial returns and/ or social capital. Therefore, professional players show decisive characteristics of lead-users: They act in many instances as sources of new ideas and early feedback providers for the gaming industry. As active seekers of gaming expertise they are a vital element in the diffusion process of games to more consumptive-behaving, passive gamers. Professional players are characterized by two further aspects:

- “1) *Professional players aim to receive an information advantage over the other users in order to gain a competitive advantage in the online game, and*
- 2) *Professional players are dedicated to show their gaming skills in order to receive social capital.*”

Figure 1 concludes the four traits of professional players in a diagram.



Figure 1: Illustration of the professional player traits

Both characteristics are differences between the professional players and the common lead user definition. This paper investigates the similarities of professionalism and a high ELO rating within online-gaming communities with an experimental setting. Although gaming communities are a separate class of online communities in the classification of Lechner and Hummel (2002), yet they lack the required in-depth analysis. Therefore this paper aims to create a valid experimental environment to document the characteristics of professional players in these communities.

4. Approach – Measuring the Influence of Professional Players in an Experimental Environment

The growing importance of the online gaming communities is documented both in their increase in numbers and the game-features of the current video games. The aspect of multiplayer options as well as a community to support the necessary game information documents the current game development trend. According to Gamespot.com, nearly all recent top-selling games feature both at least a variant of multiplayer support as well as a user community for feedback, patches and game information. Yet these communities need to be evaluated, by understanding the influence factors for a successful online gaming community, it is possible to gain an advantage over competitors.

One possible influence factor is the existence of professional players. This chapter describes the research structure of the experiment, pinpoints the main influence factors to consider and features the hypotheses about their influence.

4.1 Research Structure

The analysis of a possible influence from professional players on online gaming communities uses an experimental environment. An existing top-selling online game was chosen to be representative for the current online gaming scene. The alternative would be programming a game for the experiment, although the (online-) game design has become to complex over the last decade that current top selling games require a huge amount of capital and time. Examples for current programming efforts are Grand Theft Auto 4 and Everquest 2, both cost more than 100 million Dollars, mainly due to the massive amount of game content, the high graphical performance and the complexity of the games. Therefore the decision felt on an existing online game: World of Warcraft, which is currently the number 1 massive multiplayer online game.

Online Community Decision: In order to offer the community of players a motivation to join the online community, its design needed to be up-to-date and the content needs to focus on a particular aspect of the game. In our case, the new online community (Gamersid.eu) focuses on the player-vs-player aspect of World of Warcraft. The reason for this specialization relies on two main aspects. First, the player-vs-player community in World of Warcraft offers the necessary potential for new communities, since the strategies are changing frequently and players discuss the latest game changes. These changes influence the distribution of power amongst them, since the game itself features different classes with unique abilities, which makes balancing them for player-vs-player combat difficult. The other main reason for choosing the player-vs-player section in World of Warcraft is the ladder system that the game uses.

Quantification of “Professionalism” in World of Warcraft: The internal ladder is based on an ELO-system, which is originally used for the world-ranking in chess. The ELO rating system is a method for calculating the relative skill levels of players in two-player games such as chess and Go.

By addressing a representative number for the “skill” of a player, World of Warcraft offers a method to quantify the sub-group of players.

The professional players in World of Warcraft do not only play better compared to others, they also share the described traits, such as early needs, information advantage and a need for social capital. To quantify professionalism, we define the “high ELO player” as a user in World of Warcraft with 2000 or more rating, whereas the average player has around 1500-1700 rating. These numbers are based on the experience from previous pvp-seasons (season 1-4) and from the personal rating system of Blizzard Entertainment (the producer of World of Warcraft). The game uses around 2000 rating as the requirement for the most valuable player-vs-player equipment – the idea behind this requirement is that only a few, very skilled players shall reach this level and

obtain this equipment as a reward (which is similar to the earlier definition of professional players).

The Online Community: The experimental environment is an online gaming platform, mainly focusing on the PvP-aspect of WoW. The online gaming community was launched at www.gamersid.eu – the decision for the target group fell on the WoW-server “Theradras” in the server-cluster “Raserei”. Both the server and the Cluster are German, therefore the language of the online community is chosen appropriately. Theradras was an optimal decision, since it is a full-PvP server (which usually attracts many players, who favor this kind of play-style). Another aspect is the personal contact to professional players from this server, making it easier to find appropriate community members.

By featuring more than just a forum, the online community represents a comparable online environment to other professional online gaming communities. The sites’ content ranges from informational articles, such as the build of the week up to media impressions (like current videos from PvP content) and of course a forum, which will be the main source of information for our experiment.

In order to participate in the forum (which is also designed in German for a higher adoption rate amongst participations) the user needs to create an account. The advantage of user accounts is that they are individualized and each activity within the forum can be traced directly. This allows to gather data like number of logins, number of posts, activity, persona messages to other members, each user also has an individual link to attract new members.

The forum itself is divided into two parts – one that is available for all subscribers. It contains information about the so called “arena”, a part of the WoW player-vs-player mechanisms, where opponents can face each other under standardized conditions (this uses the ELO system). Also a part for Battlegrounds, which are basically open areas for player-vs-player interaction without restrictions and a section for Looking for Team(member)s, where players could look for others to form new teams.

Additionally an exclusive area was created, called the “2k+ lobby”, an area where only a few users have access to. These users needed to proof that their characters have achieved at least a rating of 2000+ within the game, which would qualify them as “professionals” in terms of PvP-skills for WoW. The purpose of this area is to evaluate the dynamic of a purely professional player driven online community. Mainly giving them the opportunity to look for equally skilled team-mates or make up arrangements for game sessions.

The Online Gaming Community Approach: In order to measure the influence of high ELO players within a gaming online community, an experimental approach is chosen. This is the first part of the overall research and this paper will thus focus on its description and analysis.

The treatment for this experimental setting implies that one of the community areas observes the whole sample (all users of the online community). In the other section only a very limited sub-sample of high ELO players is observed in their interaction. Due to the technical design of the online community, each user-activity can be traced and stored in a database to be statistically analyzed afterwards.

This approach is a quantification of the player’s behavior within a given experimental setting. One important aspect is the motivation of professional players’ to participate. The separation into the two sections (normal and “2k+

lobby”) offers a way to measure their perception of the importance of information exchange vs. social capital. Leading research-questions for this setting are: “To which extend do high ELO players differ in their behavior compared to the other users (professional and normal player)

4.2. Hypotheses

To receive a deeper understanding of the high ELO player behavior in online gaming communities it is necessary to observe it in an experimental environment. A special community called “gamersid.eu” is created for this purpose. The technical implementation is based on a CMS (content management system) to store the necessary user related data in a database. This data can be evaluated in order to find evidence for differences between high ELO players and normal members of the community.

If a difference exists, which examples illustrate it? In order to answer that question, a two step approach is chosen. First the influence of high ELO players on the community is shown. Afterwards the analogy between high ELO scores and professionalism is indicated.

Hypothesis A1: High ELO players show a higher login rate due to their need of up-to-date information.

This Hypothesis corresponds to the first aspect of a high ELO player who strives to get an competitive advantage in the online game. A higher login rate reflect this need, because the player uses the platform more often to always be informed about the most up-to-date game trends and developments. In a game like WoW with almost weekly patch phases, a first mover advantage can be created by players, who use certain game mechanisms before the remaining population does. Thereby large in-game “value add” can be created for the (professional) player’s character.

Hypothesis A2: High ELO players have an increased number of posts in the community.

Because of their increased interest in new information high ELO players tend to participate more actively in online communities. They use their critical game knowledge to exchange ideas with other players more frequently and try to boost specific game tactics by explaining them to the player community. Additionally one should not underestimate the social status of a high post count in online communities, which often represents a players expert reputation and acts as a further incentive for high ELO players to actively participate in communities and share their game insights. This accords to the taxonomy of professional players mentioned in the background information.

Hypothesis A3: High ELO players playing the game for a longer period of time than normal players.

To reach a level of profession in something requires training. In the case of WoW it is a mixture of game knowledge, coordination skills, social skills and a constant period of time playing the game to develop the character. A high amount of invested time is therefore a clear aspect of professionalism in this game. Different time distributions between developing the character, gaining game knowledge or maintaining social contacts are imaginable. All of them have in common, that the invested amount of time leads to a higher level of playing the game.

5. Measurement and Instruments – Ensuring the Validity of the Results

This chapter describes the measurement methodology of the approach. In order to ensure a high validity, the measurement instruments are chosen carefully. The section contains information about the statistical measurement of the online community. This includes a description of the database, the number of datasets and the data quality.

5.1 Experimental Measurement in the Online Community – A statistical database-related Approach

The online community offers a virtual environment for an experimental approach for evaluation of online gaming communities. After the launch, the URL was announced in the official WoW-Realmforum, a particular sub-forum of the WoW-community from Theradras. The overall time span for data gathering was two weeks (from release to the stop of gathering).

This short time span was chosen, since a possible influence of high ELO players would be best documented in a) a completely new environment and b) during the building phase of an online community. The observation focused on the forum section of the online community, because whoever wanted to participate or read the forum needed to register first.

Based on the content management system of the online platform (gamersid.eu), the webpage has a continuous connection to the underlying database. This database receives information about all user activities (such as posts, logins, views, private messages) and stores them with timestamps.

Overall 116 participants signed up during the two weeks. Figure 2 illustrates the distribution of subscriptions during this period, beginning with a relative high number of 14 subscriptions per day; the curve shows a strong diminishing after the first week. During word of mouth and intense discussions more members (compared to the end of week1) subscribed afterwards in week 2. The average membership time of the overall sample was 7.8 days (out of 14).

The quantification of professionalism can be achieved through various methods. For this experiment we choose to stick to the ELO score, since it accurately reflects the success of a player in the game and gives a comparable number.

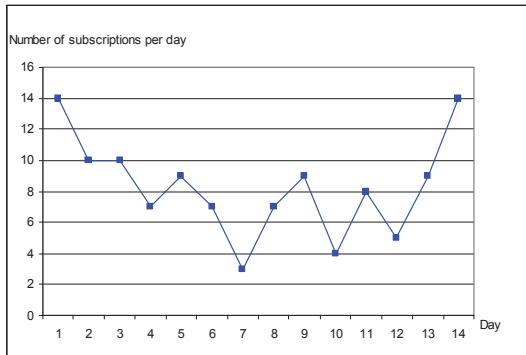


Figure 2: Timegraph: Number of subscriptions per day during the experiment period

Each of the high ELO players needed to contact us directly in order to proof his success in the game (an ELO score of 2000+) and to receive the access to the 2k+

lobby area. Within the first three days, most of the requests for professional status were received. Overall 33 players applied for the 2k+ lobby, 19 of them could proof the necessary score of 2000+. Hence the 19 out of 116 participants (16.4%) formed the sample group of high ELO players.

The posts in the forum are differentiated between posts in the “ordinary” forum sections, which include the arena-PvP, battleground-PvP and looking for member-PvP section, and the posts in the lobby section. Overall 315 posts are made in the normal section and 18 posts in the lobby section of the forum. Both the overall posts in the forum and the daily posts show a tendency towards the normal section.

The sample for the ordinary section are all registered users with 94.5% of the total posts in this section, meanwhile only 5.5% of the total posts are made in the 2k+lobby. Compared to the difference in daily posts per person, the ordinary section received 0.82 posts per day on average, meanwhile the sample of high ELO players who are appropriate to post in the lobby section only had 0.44 posts in this section per subscription day per user.

The login rate also greatly differs between the players. Overall 1486 logins in the forum section are counted, the minimum number of logins is 1 in a few cases, whereas the maximum number of login during the test period is 26, which is nearly twice a day. On average, the users logged in 12.8 times during their average 7.8 days of membership.

The private message function was used in different intensity also, some members were frequently asking questions with private messages, meanwhile others did not use the system at all. Overall 63 private messages were sent during the two weeks, many users did not send a single message, and the maximum messages from a single user during this period were 12. On average each user sent 0.5 private messages during the two weeks.

Due to the registration, each user received an individual ID in the database, which made the allocation of all actions distinct. In terms of scalability, the approach offers a great flexibility, with a high-performing database; the content management system is also capable of supporting much larger forums (like 1000+ users).

6. Statistical Analysis

To test the given hypotheses, the binary logistic regression is a useful statistical model. Based on this model we are able to predict the probability of occurrence of the event that an observed user of the online community is a high ELO player. Thus the binary dependent variable in this model is “HighELOPlayer”. The independent predictor variables were chosen accordingly to the hypotheses and reflect the anticipated influence factors. Therefore the three variables are “LoginPerDay”, “PostsNormal” and “WoW.Experience”. The results of the estimation are given in figure 3: the exponential regression parameters, the standardized exponential regression parameters and the p-values.

Variable	e^{β_k}	$S - e^{\beta_k}$	p-Value
Intercept	-	-	0.0013
LoginPerDay	0.57	0.07	0.1000
PostsNormal	1.40	3.39	0.0004
WoW.Experience	6.13	15.43	0.0042

Figure 3: Logistic regression values for the experiment

Regarding the factor “LoginPerDay”, we observe a negatively significant impact for an alpha of 0.1 that an user of the online community is a high ELO player ($e^{\beta}=0.57$, $p\text{-value}=0.1018$). Thus if an user has a low login rate, he is more probably a high ELO player. The other predictors “PostsNormal” ($e^{\beta}=1.40$, $p\text{-value}=0.0004$) and “WoW.Experience” ($e^{\beta}=6.14$, $p\text{-value}=0.0042$) show a highly significant contrarily impact (for an alpha of 0.5) on the probability of occurrence for the regarding event (high ELO Player). There is a positive relation between these independent variables and the dichotomous variable “HighELOPlayer”. The fit of the estimated model is very high. The Nagelkerkes-R-Squared has a value of 0.55. Thus we can conclude that this model is well applicable to explain the event: “User is a high ELO player”.

To validate the logistic regression results, we test with a different method the fit of prediction of our model by calculating a classification table. By using the model with the identified influence factors we predict the affiliation of the community members. With this insight we can decide whether they are normal or high ELO players. To approximately maximize both, the sensitivity (true positive rate) and specificity (true negative rate), the cut-off point was set at a level of 0.25 for this case. In figure 4, the results of the prediction are listed.

Figure 4: Results of the classification test.

For the normal players we achieved a correct prediction of 82.47 percent and a correct prediction of high ELO player of 78.94 percent. Overall 81.90 percent of players could be identified correctly by the model.

To further test the results a ROC-Curve (Figure 5) was created, in which the results for the specificity and sensitivity values are drawn for different Cut-off values.

Classification Cut-off= 0.25		Predicted		truth predicted (in %)
		High ELO- Players = 0	High ELO- Players = 1	
Observed	High ELO- Players = 0	80	17	82.47
	High ELO- Players = 1	4	15	78.94
	Total	95	21	81.90

We found a good ROC-Curve, which starts vertically to a specificity level of around 0.6 and then slowly starts to rise in the sensitivity.

To the specificity value of 0.6, our model perfectly predicts the player type. It then gradually increases the sensitivity level, which stands for a higher error rate in the prediction of the player type. At a sensitivity level of 0.4, nearly 100 percent of players could be identified correctly. We found the optimal mixture of sensitivity and specificity at the values 0.25/81.90. The “area under the curve” (AUC), also an indicator for the goodness of prediction, is very high. The value of the AUC is 0.92 for an interval from 0 to 1.

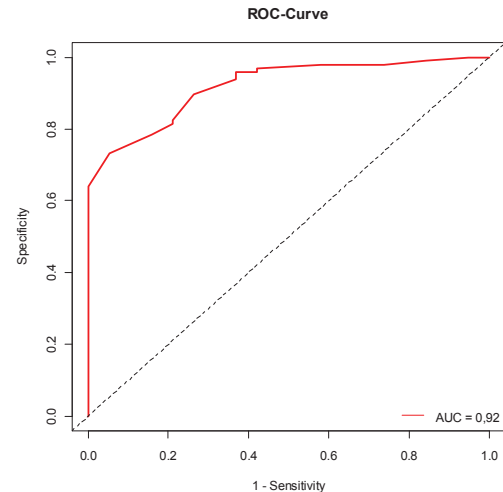


Figure 5: ROC-Curve for professional Player prediction

7. Discussion

Do the prior findings necessarily indicate a “value add” effect for online communities by high ELO players? Generally the more user independent content is already available within the online community, the lower the additional value of further active users will be. On the other side, the more a community relies on user generated content, the higher a potential gain from an active member will be. The high ELO players are therefore welcomed players in an online community.

This would propose that official gaming communities are receiving a lower “value add” on average from high ELO users compared to the in-official online communities, since the official online communities already feature a large amount of publisher driven content (like technical support, patches, forum support, etc.).

The analysis of the statistical data provides several findings, some hypotheses are proven, others are rejected and counter-intuitive findings occurred. Overall we could create a model which allows to predict the number of high ELO players in a gaming community. Based on their number of logins, their increased posting count in the community and their user generated contributions (in form of guides), and lastly in their higher experience rate concerning the game WoW, several aspects show that high ELO players show similarities to the group of professional players.

The most counter-intuitive finding is that the high ELO users do not show a higher rate of logins at the gaming community. In opposition to hypothesis 1 high ELO players show a reduced number of login activity. We therefore believe that a high ELO player either focuses his community activity (making many posts in a small session compared to a normal player) or that they have very large session times (logging in and keep doing other things, while always be simultaneously logged at the community platform). Additionally the high ELO players need for information exchange and social capital show a differentiated result. Neither of the sections is used more intensively, according to the recorded data both the normal and the internal section of the forum show a similar activity of high ELO players.

Regarding the sample size and the information gathering due to the CMS system provide a high quality level of data. Except the quality assessment of the posts in the

forum, all of the other relevant data can be directly quantified and is non-biased.

Although the measurement also has its limitations: A session timer, which counts the total login time would allow a more specific analysis of our first hypothesis. The overall sample size ensures statistical validity; the low percentage of members using the invite mechanism on the other hand reduces the transparency of a possible lead user influence on direct member acquisition. This feature could have been a strong indicator for the identification of a professional player.

Overall these findings support the initial hypotheses of an equality between the groups of professional players and high ELO players. Based on their number of logins, their increased posting rate in the community and their user generated contributions (in form of guides), and lastly in their higher experience rate concerning the game WoW, several aspects show that in the end, high ELO player and professional players share many characteristics. We can assume that both conceptualizations share a large subset of player. High ELO player therefore have a value add for the community (through the logical argumentation chain of a value add from professional players for the community and an equality of the groups "high ELO players" and "professional players").

8. Conclusion

This paper evaluates the high ELO player and compares him to the role of professional users in online gaming communities. Since online gaming communities have their own class in the taxonomy of online communities from Lechner and Hummel (2002), this evaluation describes the first approach to analyze them. High ELO players share common traits with typical lead users, yet they differ with regard to their higher needs of current game information and social capital from others, therefore we use the term professional player for them.

The approach of this paper introduces the online gaming community "gamersid.eu", which is a pvp-oriented World of Warcraft community, focusing mainly on users of the official game server Theradras.

During the 2 week period of this experiment, overall 116 users participated in the community, contributing five game-related guides, over 300 forum posts and over 100 private messages. This data was stored in the typo 3 CMS system of the online community and statistically analyzed covering descriptive and explorative methods to identify coherences.

The findings of the experiment are differentiated. Some initial hypothesis could be statistically proven. Such as a higher activity of the high ELO players in terms of posts, a higher value add for the online community (for example more guides provided). Other results are counter-intuitive on the other hand. The data does not support the hypotheses that high ELO users have a higher login rate, they instead show a lower overall login rate.

The study distinctly shows that high ELO users differ significantly with respect of their invested time to gather game relevant information and their motivation to actively contribute to online communities. Professional users are striving to build advantageous knowledge in the course of their interaction with both, game designers (in official online communities) and passive users (majority of other users). Professionalism describes one important motivation underlying the lead-user or community phenomena identified and described in published research. As professionalism seems to reside on personal investments it is a decisive force of community dynamics. While many researchers have highlighted the

role of social bonds in communities (for an overview see Ren et al. 2007), limited insight into dynamic factors exists. The motivation of high ELO players to bridge structural holes seems to be the driving force of community dynamics.

Professionalism qualifies as one decisive dynamic factor that is possibly effective also in other types of communities beyond online-gaming. One implication for community operators is that they should prioritize needs of professional users in the design of communities. E.g. to date most online-gaming communities are structured around games or general interests. Our study helps to identify professionalism in a community as one factor affecting lead-user characteristics and player behavior. This helps us to provide a deeper understanding of the factors which lead to a professional way of playing online games.

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