

Development of a Structure of User Rights in a Knowledge-sharing Environment

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Abstract: The issue of knowledge sharing in projects connected to the free-culture movement is linked to egalitarianism and the lack of formal social roles. This should distinguish them from bureaucratic organizations, where the source of authority is position, not knowledge. However, on Wikipedia, the most recognizable project of this movement, the initially flat user-rights structure has become greater over time. This article presents the variation within the user-rights structure in the largest language versions of Wikipedia. Previous research into the power structure within the Wikipedia community has focused on the effectiveness of teamwork, the formation of network structures and the influence of cultural factors on the activity of individuals in administrative roles. This article compares the user-rights structure across 42 language versions of Wikipedia. For this purpose, publicly available statistical data were analysed concerning the number of user groups (UGs) with different types of user rights and the activity of administrators. The next stage of the research involved comparing the relationships between these variables and the Power-Distance Index, as defined by Hofstede. Analysis of statistical data has shown that larger language versions of Wikipedia with a high number of administrators tend to have a tall organizational structure. Both the number of bureaucrats — individuals formally responsible for assigning Wikipedians to specific UGs — and the number of UGs were increasing. A comparison of variables relating to a power structure with Hofstede's Power-Distance Index (PDI) allowed to accept the hypotheses that a higher PDI correlates with 1) less frequent use of blocking and 2) less frequent removal of user pages by administrators. Furthermore, a weak negative correlation was observed between the PDI score and the number of users with administrator rights, though only in the case of smaller Wikipedia communities. This may imply that a greater power distance limits interference in people's actions, or that in cultures with a higher PDI, behaviour requiring intervention by those with the power to exclude are less common.

Keywords: Wikipedia user rights, Knowledge-sharing environment, Hierarchical structure, Online communities, Power distance

1. Introduction

In the late 20th century, it was assumed that the dynamics of new social movements were shaped by the values and needs of the middle class who preferred anti-hierarchical attitudes (Klandermans and Tarrow, 1988). Perhaps a legacy of this approach is the focus of researchers on the emergence of a new axiological order. This was the case when Wikipedia began to gain success as a project initially created by communities associated with the free-software movement. From the mid-2000s, studies began to emerge focusing primarily on the sharing of knowledge in a decentralized volunteer community (see: Lessig, 2008; Levinson, 2009). Tapscott and Williams (2008) indicated that such communities self-organize and that it is sufficient to create the right conditions for them to develop their own projects.

The social structure of these communities was usually not the focus of attention. The community of users creating Wikipedia was often reduced to the notion of an amorphous collectivity or crowd (Feldstein, 2011). However, collaborating on a project such as Wikipedia requires agreeing on and sometimes negotiating rules, thus seeking to establish a certain framework for how things are done. This in turn, contributes to relatively frequent interactions between users and to the formation of ties between them. Therefore, the users who contribute to Wikipedia should be treated as a community, not as a crowd. When communities create their own social networks, they demand transparency, and a number of options for dealing with key issues begin to emerge (Dobusch and Kapeller, 2018).

Previous research into the structural aspects of how the Wikipedia community functions has focused primarily on the coordination of team efforts (Kittur, Lee and Kraut, 2009; Morgan et al., 2013; Rezgui and Crowston, 2018) and on the analysis of elements of the network structure (Iba et al., 2010; Park et al., 2015; Qin, Cunningham and Salter-Townshend, 2015). The hierarchical structure and power relations were discussed in relation to issues concerning reputation and the role of authority figures in motivating volunteers to take action (Klapper and Reitzig, 2018), while attention was also drawn to the cultural factors influencing Wikipedians' activity, including the power distance (Pfeil, Zaphiris and Ang, 2006; Hara, Shachaf and Hew, 2010; Chandra and Maiti, 2018; Konieczny, 2020). However, these studies neglected the processes by which the hierarchical order took shape.

This article aims to examine how the hierarchical structure is shaped in the largest language versions of Wikipedia, while taking cultural diversity into account. Drawing on the findings of previous research, the author at hand sought to answer the following questions: (1) What is the structure of user permissions in the largest language versions of Wikipedia? (2) Does the power to exclude users depend on the Power-Distance Index (PDI) as defined by Hofstede (Hofstede, Hofstede and Minkov, 2010)? To answer these questions, a quantitative analysis was carried out on data concerning user-rights groups, as well as the frequency of particular administrative actions, in 42 of the largest language versions of Wikipedia.

2. Literature Review

Although Wikipedia does not have a formal structure based on the division of labour, a hierarchical structure is evident, stemming from the fact that some users have exclusionary power. Users who are granted administrator (sysop) rights can, among other things, block other users from editing, delete content, or prevent pages from being edited by users without the appropriate user rights. A significant proportion of earlier studies drew attention to the connection between certain aspects of power, mainly exclusionary power and organizational culture. One of the first studies to use Hofstede's cultural dimensions theory found that the higher the PDI score, the less frequently content was removed from articles. However, these studies were limited to four language versions and analysed changes in a small number of articles (Pfeil, Zaphiris and Ang, 2006). The findings were attributed to the fact that, in cultures with a high PDI, people are less likely to interfere with the work of others. Later studies on a larger sample of language versions showed that "bold editing" of popular articles is not dependent on the user's editing experience. New users, who typically have fewer user rights, tend to be more daring in this regard in the Polish, Russian, Chinese and Swedish versions (Chandra and Maiti, 2018), yet the countries they come from vary significantly in terms of PDI scores (*Country Comparison Tool*, 2026).

However, PDI proved to be a variable whose impact on the Wikipedia community can be considered to be limited. For example, studies of Wikipedia communities in East Asian countries have found no correlation between user activity and the distance to power. The study analysed 15 language versions of Wikipedia (Konieczny, 2020). Research into the relationship between PDI and the removal of administrators' rights found that no such relationship is apparent when the issue is examined using a single model. However, in Western and Asian cultures, as the PDI score increases, the proportion of current administrators relative to former administrators rises, whereas in Orthodox and Islamic cultures it falls (Skolik & Karczewska, 2021). In contrast, Park et al. (2015), who analysed 12 language versions, found only a partial correlation between PDI and egalitarianism.

Some of the research into administrator rights focused on emotional responses. Blocking users from editing Wikipedia pages is sometimes a measure to prevent conflicts. Hara, Shachaf and Hew (2010) noted that more polite comments from participants on article talk pages are found in cultures with a higher PDI. They analysed 120 talk pages in four language version. The issue of conflict resolution may be particularly relevant in cultures with a lower PDI, where such conflicts may arise more frequently. Extensive research analysing more than 640,000 talk pages on the English Wikipedia showed that less experienced users are more likely to intervene in conflicts, especially when those conflicts become heated. At the same time, interventions are desirable when the person intervening has legitimacy to act based on competence (Klapper and Reitzig, 2018).

The size and structure of a team can affect the effectiveness of teamwork. It has been suggested that larger teams can provide greater benefits when the work is routine, whereas smaller benefits when teamwork requires a high degree of coordination. Such coordination may, for example, be necessary when onboarding new users who are still learning the basics while editing articles supervised by experienced users (see Kittur, Lee and Kraut, 2009). Coordination is also important when collaborating on WikiProjects, which are internal Wikipedia projects dedicated to specific subject areas. Some of them require users to work together relatively closely. In most cases, however, there is a clear division between the centre and the periphery: the most active Wikipedians coordinate the work of peripheral users, thereby limiting their own contribution to content development (Morgan et al., 2013). Later studies found that the existence of central hubs (leaders) who coordinate activities over a long period of time enables WikiProjects to function effectively (Qin, Cunningham and Salter-Townshend, 2015).

Descriptions of how new users become involved in editing assume that they gradually adopt the principles of collaboration and later take on roles of greater importance to the community, such as that of an administrator. This approach was consistent with the general characteristics of online communities from a netnographic perspective (Kozinets, 2015). On Wikipedia, in order to be granted administrator rights, a user must be trusted,

as these rights are awarded through a vote by the community of active Wikipedians. It is generally accepted that, in order to foster greater commitment to new roles, identifying with the values of the Wikipedia community is more important than the reputation gained through contributions to the project (Goldspink, 2009). A different approach to this issue is presented by authors who analyse variations in contributions to articles selected based on quality. Usually, in such cases, there are a small number of editors who contribute the most content to these articles and make the most edits. They are referred to as coolfarmers. They are in contrast with egoboosters, who spend a great deal of time developing their own user page (Iba et al., 2010).

In the works cited above, the decentralized generation of knowledge, the networked structure and the absence of a top-down hierarchy were highlighted as strengths and as an alternative to traditional organizational models. Nevertheless, Wikipedia shows a tendency towards the formation of increasingly complex structures, within which dozens of user groups with corresponding bundles of user rights can be identified. The created user rights levels led to the lengthening of the “advancement progression pathway”. Over time, the different language versions began to diverge in how they implemented new user rights. However, these processes have not been systematically studied to date.

3. Materials and Methods

This study was conducted across 42 language versions of Wikipedia, the largest in terms of the number of active users. Some analyses included versions in the official languages of individual countries, which enabled comparisons of variables with Hofstede’s cultural dimensions theory. The sample included the following language versions: Arabic (arwiki), Azerbaijani (azwiki), Bulgarian (bgwiki), Bengali (bnwiki), Czech (cswiki), Danish (dawiki), German (dewiki), Greek (elwiki), English (enwiki), Spanish (eswiki), Estonian (etwiki), Persian (fawiki), Finnish (fiwiki), French (frwiki), Hebrew (hewiki), Croatian (hrwiki), Hungarian (huwiki), Armenian (hywiki), Indonesian (idwiki), Italian (itwiki), Japanese (jawiki), Georgian (kawiki), Kazakh (kkwiki), Korean (kowiki), Lithuanian (ltwiki), Latvian (lvwiki), Malay (mswiki), Dutch (nlwiki), Norwegian (nowiki), Polish (plwiki), Portuguese (ptwiki), Romanian (rowiki), Russian (ruwiki), Slovak (skwiki), Slovenian (slwiki), Serbian (srwiki), Swedish (svwiki), Thai (thwiki), Turkish (trwiki), Ukrainian (ukwiki), Vietnamese (viwiki), Chinese (zh wiki).

For each language version, data was collected on the number of members of individual user groups (UGs) with specific bundles of user rights, while using a dedicated special page (*User Group Rights*). This data was related to the early period of 2026. This made it possible to identify the diversity of the power structure within the Wikipedia community. To identify variation in the use of power to exclude, data was first collected for each of the language versions studied on the number of administrators, the number of new users (new accounts making edits in that version) and the number of pages created. For this purpose, publicly available data was used from a page on Wikimedia Commons (*Data:Wikipedia statistics*, 2026) and from a special statistical data page maintained by the Wikimedia Foundation (*Wikimedia Statistics*). Subsequently, using the XTools (*Admin Stats*), data was collected on the frequency with which particular administrator tools were used, including the frequency of page deletions and the blocking of other users. The data used for the analysis covered the whole of 2025.

The PDI data for individual countries was obtained from a dedicated website containing up-to-date Hofstede’s cultural dimensions indices (*Country Comparison Tool*, 2026). Data collection and analysis were carried out in January and February 2026.

The first stage of the data analysis involved the examination of the structural relationships between variables relating to UGs. Earlier studies showed that community size (active users) clearly correlates with the number of administrators (Skolik and Karczewska, 2021). Similarly, the number of active users correlates with the size of contributions (number of bytes added) and the number of edits made (Skolik, 2025). This study posits two hypotheses regarding the relationship between exclusionary power (of administrators) and the structure of user rights:

H1: The greater the number of administrators in Wikipedia language versions, the greater the number of user groups.

H2: The more administrators there are in a given language version, the more pronounced the tendency for more users to be granted bureaucrat rights, which allow them to grant administrator rights.

Confirmation of H1 could indicate that a greater number of supervising administrators is required to ensure greater diversity of user rights. Furthermore, this could also mean that more administrators could delegate some of their rights to other users more efficiently. Conversely, a larger number of bureaucrats translates into

significantly greater potential for granting user rights, including administrator rights. The community usually approves the granting of such rights: administrators are elected by vote, and the granting of bot flags requires the approval of other bot operators. Therefore, the tasks usually performed by bureaucrats involve formally assigning a user account to the appropriate category and only a small number of individuals are needed for this. If H2 were to be confirmed, this could also signal a trend towards expansion the organizational structure.

To investigate the relationship between cultural factors and the power of exclusion, the following research hypotheses were formulated:

H3: As the Power-Distance Index (PDI) increases, fewer users may be granted administrator rights.

H4: The higher the PDI, the less likely administrators are to block users.

H5: The higher the PDI, the less likely administrators are to delete pages.

Confirmation of H3 would indicate that a high PDI can limit access to exclusionary power. Conversely, accepting H4 and H5 would confirm previous research by Pfeil, Zaphiris and Ang, which suggested that a higher PDI is associated with less willingness to interfere in the actions of others (2006). Since PDI relates to individual countries, language versions whose communities originate from more than one country were omitted from the analyses: enwiki, dewiki, eswiki and arwiki.

4. Results

Among the 42 language versions examined, 60 different UGs were identified, with the following present in each version: users (people with registered accounts in the project); administrators; interface administrators and bots. Interface administrators are a relatively new user group added in 2018, for users with sufficient technical expertise to edit system JS and CSS files. The 40 language versions also included the following groups: bureaucrats (users authorized to assign other users to a specific user group) and "IP block exemptions" (users authorized to log in and edit content from IP addresses that have been blocked). Although a bureaucrat is needed to grant user rights, two versions (rowiki and hywiki) had no users with this role. Ten established user groups had no members in any language version.

The highest number of UGs (28) occurred in enwiki, while the lowest (6) in hywiki. Some UGs had only one right, e.g. the extended confirmed users could only edit pages protected as "Require extended confirmed access", while the file movers could only rename media files. By contrast, the administrators have the largest number of user rights in every language version, although the number assigned to this group varies: at the time of the study, it was 81 in plwiki, 79 in ewiki and 76 in eswiki. In addition, anyone with a Wikipedia account has around 20 user rights, depending on the version.

Some language versions include UGs that permit delegation of user rights. This means that the user does not need to obtain administrator rights in order to carry out some tasks freely. These additional rights lengthen the "career progression pathway". For example, the reviewer role has been introduced in eight language versions, allowing articles to be designated "free from vandalism". Administrators, who can grant and revoke this right, monitor the quality of the work of the editors who hold it.

This study assumes that a larger number of UGs requires a larger number of administrators. Statistical tests carried out on 42 language versions of Wikipedia revealed that there is a clear correlation between the two variables in this case. For $p < 0.000001$, Spearman's rho correlation is 0.689786. Thus, H1 can be accepted. These relationships are shown in Figure 1. This result suggests that as the community seeks to have more administrators, there is a tendency to create new bundles of user rights.

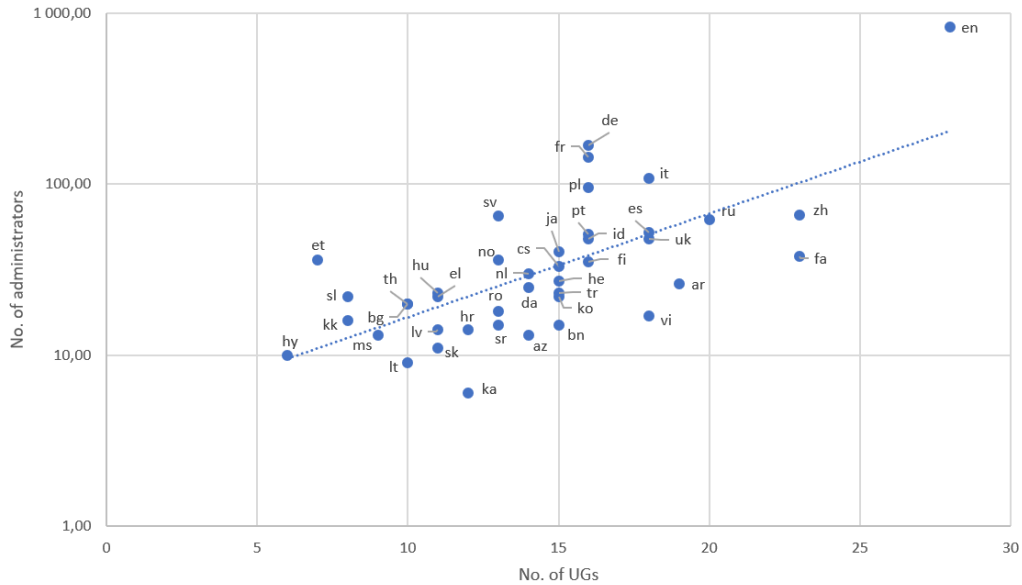


Figure 1: The relationship between the number of administrators and the number of user groups; N = 42

The relationship between the basic UGs may also indicate the expansion of the hierarchical structure. H2 posits that as the number of administrators increases, so too will the number of bureaucrats. The statistical test carried out also supported its acceptance. At $p = 0.000036$, Spearman's rho correlation is 0.604903; therefore, there is a relatively strong statistical relationship between the variables, which is presented in Figure 2. It is worth noting some exceptions to the trend in the case of Itwiki and skwiki, where there was only one bureaucrat. Another exception to this trend is the eswiki, where anyone granted administrator rights is automatically granted bureaucrat rights as well, which sets this language version apart in terms of the trust it places in its users.

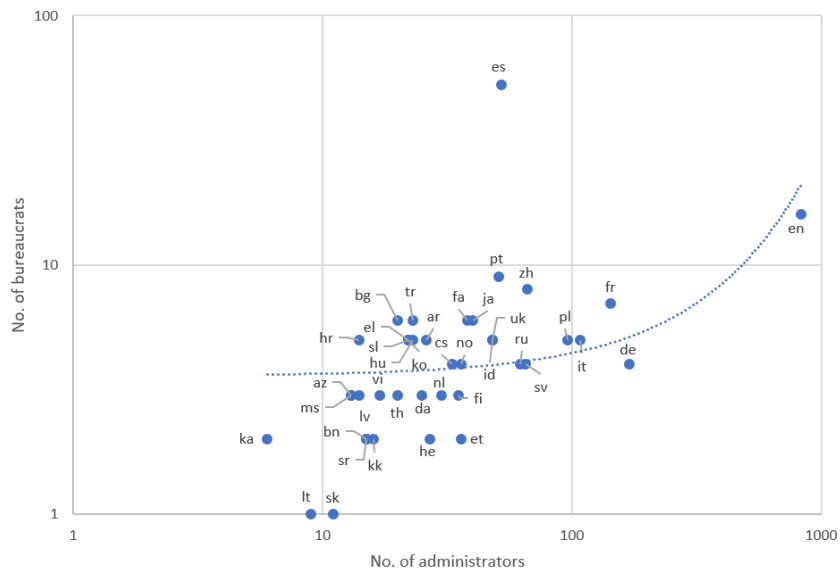


Figure 2: The relationship between the number of administrators and the number of bureaucrats; N = 40

In the subsequent part of the study, variables relating to exclusionary power in selected language versions of Wikipedia were compared with the PDI scores for individual countries. After excluding four language versions (edited by communities from a larger number of countries with different PDIs), no statistically significant correlation was found between these variables. Considerable dispersion was particularly evident in the case of the largest of the language versions analysed. Accordingly, hypothesis testing was carried out for Wikipedia language versions involving fewer than 10,000 users. Following this adjustment, it was found that there was a weak negative correlation: for $p = 0.042674$, Spearman's rho correlation was -0.360499 . Therefore, H3 can be

accepted for populations with fewer than 10,000 active Wikipedians. Interestingly, in this case, it was the total number of administrators that correlated with the PDI score, rather than their percentage. These relationships are illustrated in Figure 3.

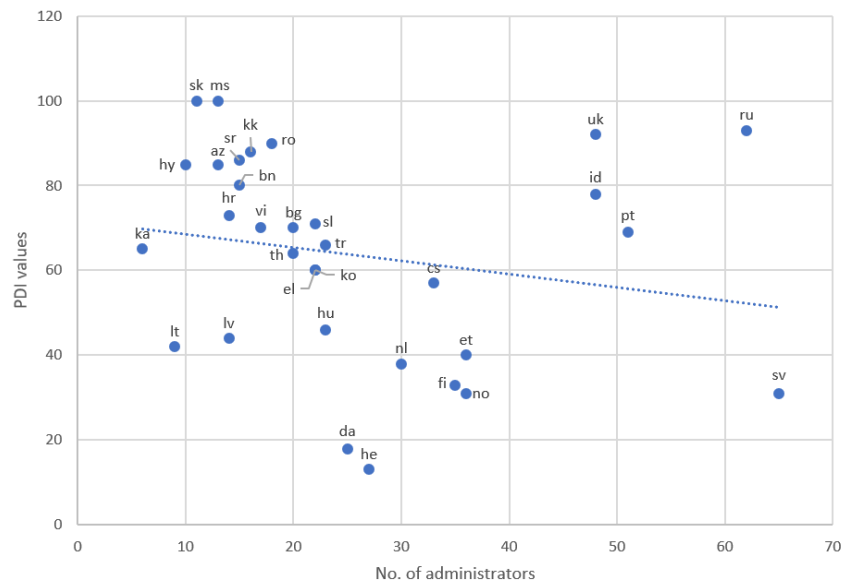


Figure 3: The relationship between the number of administrators and PDI values; N = 32

Additionally, a considerable deviation from the trend line can be observed, among others, in the case of ruwiki. If this version was excluded, the relationship might be stronger. Since 2025, there has been a significant decline in the number of active users on ruwiki, resulting from restrictions on online activity in Russia. This community used to be much larger.

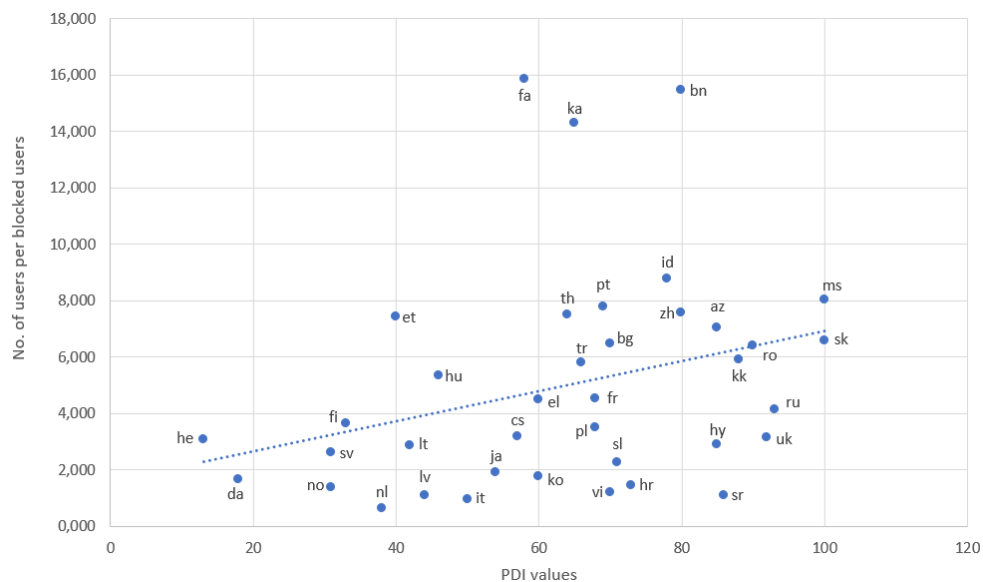


Figure 4: The relationship between the ratio of new users to blocked users and PDI values; N = 38

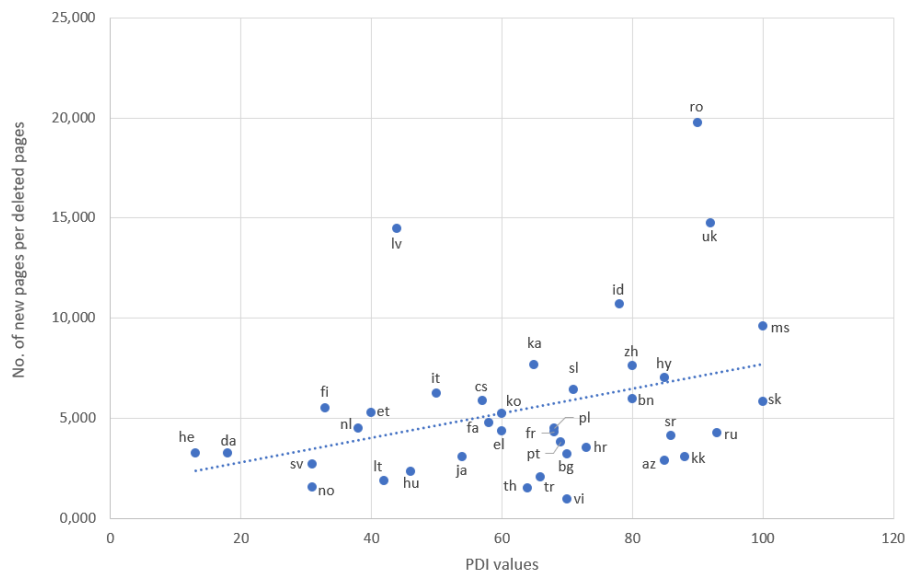


Figure 5: The relationship between the ratio of new pages to deleted pages and PDI values; N = 38

The final part of the study involved testing H4 and H5 across 38 language versions (excluding enwiki, dewiki, eswiki and arwiki). When exercising power to exclude, the most common practice is to remove new pages and block new users. Consequently, for H4, the PDI values were compared with the ratio of new users to blocked users, and for H5, the PDI values were compared with the ratio of new pages to deleted pages. Both hypotheses were accepted. For the former hypothesis, Spearman's rho correlation is 0.373160 with $p = 0.021026$; whereas in the case of the latter, Spearman's rho correlation is 0.339883 with $p = 0.036816$. These relationships are presented in Figure 4 and Figure 5. Importantly, the PDI values did not correlate with the components of these variables: new pages, deleted pages, new users or blocked users, nor with other tasks performed by administrators. It was also noted that page deletions occurred most frequently on thwiki, kkwiki, trwiki, kawiki, ltwiki, arwiki and nowiki (accounting for over 85% of administrator actions), while user blocks occurred relatively most frequently on nlwiki, itwiki, lvwiki, dawiki, cswiki, jawiki and eswiki (accounting for over 20% of administrator actions). No similarity was observed between Hofstede's cultural dimensions within either of the two groups.

5. Discussion and Conclusions

Although the structure of user rights in the studied language versions of Wikipedia includes 60 different UGs, the prevailing discourse on the exercise of power within Wikipedia is usually limited to administrator accounts. Becoming an administrator was supposed to be "no big deal". However, it became clear even in the early years that this posed a serious challenge for Wikipedians (Burke and Kraut, 2008). As the rights assigned to administrators grew, candidates were required to know how to use them. This also led to the creation of further user groups that could only use some of the administrator rights. Research suggests that the number of UGs increases when a particular version already has a large number of administrators. Therefore, delegating user rights to specially created groups helps to reduce the workload of administrators.

This is also the case with the granting of user rights, which was previously the prerogative of bureaucrats, as administrators can now assign users to specific UGs. Consequently, on the one hand, the structure of user rights is more tall, while on the other hand, the base of the hierarchical pyramid is broadened. As more UGs are formed, there is a need for a broader understanding of how to monitor the quality of the work carried out by the users assigned to such groups. Having more administrators may allow for greater specialization in this area.

However, the number of administrator groups in the various language versions has not increased when looking at trends following the year 2010, when the number of UGs began to rise. Although their rights primarily relate to the elimination of inappropriate content and behaviour, they are also expected to contribute to the creation of the encyclopedia's content. A significant proportion of administrators are actively involved in coordinating operations within smaller collaborative networks, as noted in previous studies (Morgan et al., 2013; Qin, Cunningham and Salter-Townshend, 2015). This involvement is important enough that Wikipedia communities

call for resignation from the function of an administrator when administrators become insufficiently active in the project. Further research could make it possible to capture the relationship between informal collaboration networks and the hierarchical user-rights structure.

Although PDI would seem to be a cultural dimension that should affect the power structure, capturing the relationship in this respect proved difficult. A particularly interesting case was the negative correlation between PDI and the number of administrators in Wikipedia versions with fewer than 10,000 active Wikipedians. It can be presumed that if communities do not reach a certain critical size, the considerable power distance limits the number of users who are granted administrator rights. In turn, the relationships between PDI and the less frequent use of exclusionary power may confirm the earlier suppositions of researchers that a higher PDI favours weaker tendencies to interfere in the actions of others. However, this may also be the effect of less frequent destructive behaviour in communities recruited from countries with a higher PDI, if greater politeness is indeed present in them (Hara, Shachaf and Hew, 2010). Therefore this would probably also lead to greater respect for someone else's work.

The weak relationships between PDI and the developed user-rights structure may result from Wikipedia's organizational culture becoming stronger than the national cultures from which Wikipedians originate. As Park et al. (2015) emphasized, online cultures may differ significantly from offline cultures. This indicates that further research into cultural diversity should focus more on endogenous factors. This study identified a fairly clear distinction between instances where administrators focus largely on deleting pages and those where they more frequently block other users. These could be two philosophies of dealing with the problem of undesirable content: focusing on deleting articles or focusing on blocking the users who publish it.

One limitation of the present study is that the analysis focused on the current structure of user rights. The correlations observed could therefore result from temporary fluctuations. An analysis of data from previous years would make it possible to determine whether such a suspicion should be ruled out. Conversely, replacing the traditional cultural dimensions used in subject-related literature with dimensions based on Wikipedia's system of norms and values would make it possible to describe the diversity across a larger number of projects.

Ethics Declaration: I declare that the study is based on publicly available data and open-source data and, as such, the nature of this study did not warrant review by an ethics committee.

AI Declaration: I declare that I did not use AI in this article; the entire text was written manually.

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