Governance, Organization, and Democracy on the Internet: The Iron Law and the Evolution of Wikipedia

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"The problem about Wikipedia is, that it just works in reality, not in theory."
- attributed to Stephen Colbert

Abstract

This study examines whether the Iron Law of Oligarchy exists in Wikipedia by analyzing how a key policy of the website regarding verifiability evolved into its current form. The study describes the decision making processes of Wikipedia and shows that there are many factors preventing or slowing the development of oligarchy on Wikipedia. The study provides data advancing theoretical concepts related to the Iron Law of Oligarchy and the evolution of virtual communities and organizations; results and knowledge gained can also improve Wikipedia policies related to verifiability.

Keywords: Wikipedia, organization, community, oligarchy, democracy, Internet

Introduction: *governance, organization and democracy on the Internet*

The problem: challenge for organizations in the 21st century

We are witnessing the spread of a new communication network, the Internet. Barely 35 years since its invention, it is used by over a billion people worldwide. It has changed the way we carry out many routine tasks, and it has changed our culture as well. Many communities and social movements have adopted the Internet as a tool (Lessig 2004); some of them exist predominantly online (Harwood and McIntosh 2004).

The rise of the blog community, the "blogosphere"[1], and the growing popularity of wikis[2], are substantially adding to the existing forms of public discourse already changed by such Internet-based technologies as the Usenet[3] or discussion forum[4]. This phenomenon has not gone unnoticed as predictions have been made that those changes may create a better public sphere and revitalize participatory democracy (Kollock and Smith 1999, Roberts 1999; Sosteric 1996; Guillen 2005; Latters 2004; Shulman et al. 2006). Robert Putnam (Putnam 2000) noted that Internet, booming with new types of communities and organizations, is an important trend going against the erosion of social capital and civil society, especially when used in new, innovative ways.

The solution: look to an encyclopedia

Wikipedia, the Free Encyclopedia (wikipedia.org), dedicated to providing free and unbiased

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1   A blog is a website where entries are written in chronological order; blogosphere refers to the community of blog writers (bloggers)
2   A wiki is an easy-to-edit, collaborative website
3   Usenet is a global, distributed Internet discussion system, a still popular precursor to modern discussion forum or mailing list (listserv).
4   A discussion forum is a web application for holding discussions and posting user generated content

information to everyone is a perfect example of this new type of organization. The project numbers over four million registered contributors (Wikipedia 2007a), more than the population of some countries. It allows all of its editors to vote and voice their opinions, and it empowers them to change content of articles and organizational policies to an extent unthinkable in traditional organizations (Kolbitsch and Mauer 2006). This innovative model has succeeded in creating the world's largest encyclopedia in 5 years and shows no signs of losing its momentum.

Since its humble beginnings in 2001, Wikipedia project has generated many documents, almost all of them freely accessible online. I analyze documents related to the "Wikipedia: Verifiability" (WP:V) policy, from its creation on 2 August 2003 until the end of December, 2006.

In this study I concentrate on one recurring aspect in the field of organizational studies: Michels' Iron Law of Oligarchy (Michels 1915). Generations of researchers have concluded that with few exceptions (Lipset 1956), all organizations evolve an oligarchy which eventually takes control of the organization. With the explanation of how WP:V policy begun and how it changed in the absence of well-defined work roles and responsibilities I show to what extent Michels' Iron Law affects an extremely open virtual community like Wikipedia.

This study should contribute to understanding if Michels' Iron Law holds true for the new organizational models developing on the Internet. It should also shed light upon new ways of decision making in the collaborative, open source projects using the increasingly popular wikis and particularly explain the decision making processes of Wikipedia itself. The study also answers the questions: was this policy a brainchild of several individuals, or thousands? Was it accepted by the community through a debated consensus, was it an unchallenged and eventually codified tradition, or was it imposed by certain editors or groups?

Theory: *Literature review and major concepts*

Wikipedia governance

Wikipedia's evolution surprised even its own creator, Jimbo Wales, (Wales 2005a) who admitted that the site has become more than just an encyclopedia, and is now a "grand social experiment". Viégas et al. (2007) comment on the process of growth of Wikipedia's governance structure, noting that the "Wikipedia namespace" – pages where discussions on the Wikipedia policies take place – have been the second most significantly growing part of Wikipedia (after the encyclopedic articles), with an increase from 1211 policy pages in 2003 to 81738 in 2005. They conclude that policies are familiar to and actively relied upon by the Wikipedia community.

Wikipedia's model of governance is difficult to categorize. Characterizations range from anarchy (Sagner 2005) through democracy (Lorenzen 2006; Caldarelli et al. 2006) to dictatorship (Gillmor 2004, Reagle 2005); Holloway et al. (2005) call it a hybrid of democracy, meritocracy, aristocracy and monarchy. In the study of the organization of Dutch Wikipedia, Spek et al. (2005) conclude that Wikipedia can be seen as an ultimate self-managing team; indeed in many ways its structure resembles another elusive but increasingly popular -cracy – the "adhocracy", a self-evolved organization structure and an antagonist of bureaucracy (Kolbitsch and Mauer 2006).

This confusion about Wikipedia's governance can be explained by the nature of a "wiki". Wikipedia's policy pages are no different from normal articles: they all can be edited and changed by any editor, reflecting either "a consensus" among them, "a slow evolution of convention and common practice eventually codified as a policy" or a decision by "Jimbo Wales, the Board, or the

Developers"[1]. The prerogatives of Jimbo Wales, the Board or the Developers are not defined clearly on Wikipedia; they are, however, defined in legally binding terms in the Wikimedia Foundation Bylaws (Wikipedia 2006a; Wikimedia Bylaws 2007) .

Wales commands great authority and respect within the project; for many Wikipedians he is a "living legend" and has what Weber would call charismatic authority (Weber 1947). Former Bylaws of the Foundation, changed in December 2006, went as far as declaring him a lifelong member of the Wikimedia Board of Trustees "in recognition of his role as Founder of Wikipedia". Current Bylaws however make no mention of Wales' special status (Wikimedia Bylaws 2007).

The Board officially holds "the power" on Wikipedia. The "at least seven" member Board have the "ultimate corporate authority in the Wikimedia Foundation Inc." (Board of Trustees 2007) including the power to amend the Wikimedia Foundation Bylaws (Wikimedia Bylaws 2007). The Bylaws state that "the majority of the Board shall be elected or appointed from within the community" for the period of two years, while the rest "appointed to the Board [by a majority vote of the full Board] shall serve for a term of one year" (Wikimedia Bylaws 2007). The change of Bylaws in December 2006 seems to make the Foundation more democratic, lessening any oligarchic power of the Board by increasing the number of members elected from the community of editors from below to over half of the Board, and giving them control over the elections of the Board members from outside the community.

Jimbo Wales and the Board are not officially responsible to the community but they can legally overrule the community's decisions. However if they would ever use this power for anything other then resolving a legal issue in need of immediate attention, this would likely do irreparable damage

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1   Jimbo Wales is the founder of Wikipedia project. Wikimedia Board of Trustees manage the nonprofit Wikimedia Foundation which operates the Wikipedia project. Developers are people who write MediaWiki wiki software which is used by the Wikipedia site.

to the community. Ciffolilli (2003) noted that while Wales has – in theory – the ultimate power over Wikipedia, as a benevolent dictator he is severely limited by a powerful set of checks and balances: the Wikipedia "GFDL[2]" open content license which covers both the content and the software used by the project. If the editors of the project would feel unhappy with Wales (or Wikimedia Foundation), they can copy the database and the software and set up a competing project (called "a fork"). In fact, this is exactly what has happened already several times, with the most notable of such forks being the "Citizendium" project (Bergstein, 2007), created by Larry Sanger, a dissatisfied co-founder of the Wikipedia project. Citiziendium aims to promote quality by forbidding anonymous contributions and giving more power to the experts. Citizendium represents only a tip of the iceberg – the Wikipedia list of forks (Wikipedia 2007b) has over a hundred entries. None, however, approaches the Wikipedia project either in size or popularity.[3]

This helps to explain why both Jimbo Wales and the Board only rarely intervene in the working of Wikipedia and its community (Waldman 2004, Reagle 2005, Leadbeater 2006), acting only in situations requiring immediate action – such as during the John Seigenthaler Sr. biography controversy, when Wales deleted the slanderous information not only from the article but also from its affected archival revisions (Rosenzweig 2006). Currently such procedures are standarized by the "Office Actions" policy which states: "Sometimes the Wikimedia Foundation may have to delete, protect or blank a page without going through the normal site/community process(es) to do so. These edits are temporary measures to prevent legal trouble or personal harm and *should not be undone* by any user" (Wikipedia 2007e). In another example of exercising his power, in May 2005, Wales forbade a use of non-commercial and permission-only images (Wales 2005b; Wikipedia 2007c).

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2   GFDL stands for the GNU Free Documentation License
3   As of October 2007, Wikipedia was the 8th most popular website on the Internet. No other encyclopedia is ranked in the Top 100 most popular websites (Alexa 2007)

There is also another notable group on Wikipedia: editors who are respected and recognized above the level of an ordinary editor. There are thousands of editors who hold electable positions ("esteemed editors") and are recognized with various titles, from relatively unknown ones limited to specific projects like the military history project coordinators, to project-wide developers or administrators (admins), each of whom have access to special tools, like the ability to delete a page or protect it from being edited by others (Wikipedia 2007d).

However while such powers could intimidate new editors, Forte (2006) notes that "administrators are not meant to hold privileged positions (...) obtaining administrator status is not difficult". Many Wikipedians refer to being an administrator as "no big deal"; the official award to excellent administrators, a stylized "mop and bucket", likens them to janitors. In various discussions I observed it is rare for an editor to "pull rank". On the other hand, administrators are expected to hold higher standards. Instances when an administrator threatens others with his or her power are likely to end up being reviewed on public "Administrator's Noticeboard" or even by the Wikipedia's court, called the "Arbitration Committee". Overall, the Wikipedia community operates effectively with little managerial intervention (Malone 2004).

It appears that despite the ambiguity of Wikipedia policies, and the evident power disparity between the Wikimedia foundation and the Wikipedia editors, all sides realize that they are operating in the state of symbiosis: neither can exist alone, and all are working towards the same goal. Such philosophy is also reflected in another key Wikipedia policy: "Wikipedia: Assume good faith": "we assume that most people who work on the project are trying to help it, not hurt it " (Wikipedia 2007f).

Virtual community and a new type of organization

On a certain level, Wikipedia is certainly an encyclopedia; on another, it is an organization working

on creating the encyclopedia. However it is also a social institution, a part-community and a part-social movement. We can look at the encyclopedia-creation function as the intended result – a Mertonian manifest function of the Wikipedia organization, and at the development of the community as its unintended byproduct (a latent function) (Merton 1968). The terms "community" and "organization", like many other basic social constructs, have evolved to have multiple meanings (Harwood and McIntosh 2004). It is difficult to draw a clear line between the Wikipedia's community and its organizational structure, as both are a conglomerate of many smaller projects created by editors, projects that fit common definitions of both an organization and a community.

Over 41.5% of Americans aged 18-24 find a "sense of community" online, and it is likely that this number is going to increase (Harwood and McIntosh 2004). Although Wikipedia is a recent addition to cyberspace, with over four million members it is among the most vibrant virtual communities (Lebkovsky and Ratcliffe 2005; Kolbitsch and Maurer 2006). In his Statements of Principle Jimbo Wales (Wales 2006b) recognized that Wikipedia was a community. Self-awareness and collective identity are important for a sense of belonging to a community (Weber 1978), and indeed, many editors identify themselves as members of the Wikipedia community (Kolbitsch and Maurer 2006). Bryant et al. (2005) note that a crucial step in becoming an active editor – a Wikipedian – is one's realization that a Wikipedia community exists, and that one is now a part of it. The "Community Portal" is accessible from every page. The development of specialized language (with words like "to wikify" or "wikiholiday") or products (T-Shirts, mugs) that allow editors to display their allegiances to the project, and increasing number of face-to-face gatherings of Wikipedians, both on a local, national and international scale, are other indicators of a community.

Kolbitsch and Maurer (2006) in their study of emerging online communities note the relevance of a "Dunbar's number": if a group is larger than approximately 150 individuals, it will become less

individualistic and will require more restrictive regulations to exist. They note that frequently in large projects like Wikipedia, sub-communities – or sub-organizations – covering more specific topics or smaller groups of friends are established. On Wikipedia hundreds of formal, semi-formal and informal organizations gather Wikipedians to perform various tasks. Examples of such organizations vary from "Wikipedia: Esperanza" ('an association of Wikipedians dedicated to strengthening Wikipedia's sense of community') through "Wikipedia: Signpost" ('a community-written and community-edited newspaper, covering events and stories related to the English Wikipedia') to "Wikiproject Fact and Reference Check" ('the bold purpose of this project is nothing less than having facts in Wikipedia verified by multiple independent sources'). Understanding such communities and organizations that dominate Wikipedia's internal landscape is crucial for understanding possible groups that may vie for control of Wikipedia's governance.

In the study of organizational cultures, Hofstede (2004) argued that people carry "mental programs", gained in early childhood and strengthened later. His theoretical concepts have been used to study Wikipedia by Pfeil et al (2006) and I found several of them helpful in explaining certain aspects of Wikipedia's organizational culture related to the Iron Law. They are: the power distance – the degree to which the less powerful members expect the differences in the levels of power; the uncertainty avoidance – which reflects the extent to which a group copes with anxiety; and the contrasting concepts of individualism and collectivism – the extent to which people are expected to be assertive, or alternatively act predominantly as members of a collective.

Iron law of oligarchy

In his landmark study in 1915, Robert Michels has pointed out that all organizations are faced with problems of coordination that can be solved only by developing a bureaucratic oligarchy, incompatible with democracy (Michels 1915:28). Michels (1915) founded his argument on the simple yet elegant observation that everyday operations of an organization cannot be run by mass

membership and the effective functioning of an organization requires the concentration of power in the hands of the few (Michels 1915:114). His findings have been often confirmed by others (Rogers 2005, Mersel, 2006).

Technological limitations play an important role here: "How would it be possible to assemble [ten thousands or more people] in a given place, at a stated time, and with the frequency demanded by [the needs of an organization]?" How can "even for the most powerful orator" be heard by such a crowd? (Michels 1915:22) This once impassable problem was solved with the invention of the Internet. Yet there are other important factors allowing an oligarchy to develop: the technical indispensability of leadership, the tendency of the leaders to organize themselves, the gratitude of the led towards the leaders, and the general passivity of the masses (Michels 1915:240).

Even if we gather any number of people in one (virtual) place and allow them simultaneous or asynchronous communication, the needs of organization may require a quick decision not easily reached by a collective. Therefore the need for leaders arises, and is further strengthened by what Michels argued is a basic psychological need for people to be led (Michels 1915:240). Originally the leader is one of the masses, their delegated servant (Michels 1915:22). Soon, however, the leaders escape from their control and become the "most equal among equals". Their power, prestige and expertise ("technical competence") grow (Michels 1915:33,55). Experienced leaders can be beneficial for the organization, but replacing them is often seen as inadvisable. They start to desire leadership and its rewards over their original commitment to goals. They seek to preserve and enhance their position within the organization (Michels 1925:218). The leaders control the means of communication, making it increasingly difficult for the mass membership to oppose to the leaders. Even if regular members are unhappy with their leaders, they are often unwilling to take the risk and effort to enforce a change in leadership (Michels 1915:56). Michels stresses that "for

democracy, the first appearance of professional leadership marks the beginning of the end." (Michels 1925:28)

Certainly the Iron Law has been extensively applied: it has allowed insights into subjects as diverse as ancient Athenian democracy (Alford 1985), social movements (Rucht 1999) and of course modern political parties (Rogers 2005, Mersel, 2006). However the Iron Law has not been universally accepted. Leach (2005) stressed that one of the crucial problems with discussing Michel's Iron Law are vague definitions and presented an interesting discussion of the concept of oligarchy and criticism of the Iron Law. Whether increasing bureaucracy means increased power for the bureaucrats has been challenged. The assumption on whether "the power always corrupts" and the leadership becomes unaccountable to the masses has been questioned. It is has been argued that small nonbureaucratically structured organizations should be able to avoid the Iron Law, which Michels claimed is unavoidable (Michels 1915:241). Indeed, exceptions to the Iron Law have been found (Lipset 1956, Edelstein 1979). There is also one area – the Internet – in the context of which the Iron Law has not been extensively discussed. What's more, that area is preeminent in its rhetoric of democratic and organizational values.

There is some evidence to illustrate Iron Law processes on Wikipedia. One can cite the reasons given by some former members, who left complaining about the letter of the law taking over the spirit of the law, and well-established contributors penalized for stepping over rules which they saw as restricting their ability to create encyclopedic content. The accusations of a "cabal" running Wikipedia are common, and some of the groups and organizations are accused of living in their own little bureaucratic world, creating hardly any useful encyclopedic content.

However there are many factors which are new or uniquely combined in this organization, factors

that may make it difficult for Iron Law to prevail. Hence the central consideration of this paper: is Michels' prediction true for this new form of organizations – the "hard-to-define", part democratic, part autocratic Wikipedia and the increasing numerous similar wiki-based projects?

As Michels noted in his final considerations, "like all other scientific laws, sociological laws are derived from empirical observation" (Michels 1915:240). When reality supports a hypothesis, a theory is born. It is also possible that observed reality will contradict parts or entirety of the established theory; thus all sciences evolve. An observation and analysis of Wikipedia's Verifiability policy should provide us with clues about the relevance of the Iron Law to the new organizations of the Internet Age; it should allow us to determine how the Wikipedia community made decisions over the period of several years, and to what extent Iron Law is affecting this new form of Internet virtual communities and organizations.

Methodology: *Data collection and analysis*

Disclaimer: being a complete member

As an participant of the Wikipedia project since December 2003 and an administrator (since January 2005), I adopted the stance of a complete member and eliminated possible bias as advised by Adler (1995). This approach has been taken by others in similar research; for example Markham (1998) in the studies of online virtual community and particularly Lorenzen (2006) in his ethnographic study of Wikipedia, who noted that research based on the content analysis has no influence whatsoever on Wikipedia, since the researcher is completely invisible to the community and his presence cannot influence any activities. Thus my familiarity with the project should be more of a benefit than a hindrance.

Selection of the case

I chose "Wikipedia:Verifiability" (WP:V) policy for this study as it is one of the key policies of Wikipedia, stating that "Information on Wikipedia must be reliable. Facts, viewpoints, theories, and arguments may only be included in articles if they have <u>already been published by reliable and reputable sources</u>. Articles should <u>cite these sources</u> whenever possible. Any unsourced material may be challenged and removed" (Wikipedia 2006c). Edited by over half a thousand editors since it was created in February 2003, it is one of the oldest of Wikipedia policies, as well as one of the most often referred to (on at least 100,000 different pages). It thus provides enough data to allow an analysis of how the Iron Law has affected Wikipedia over most of the project's existence.

Hypothesis

Leach (2005) defines oligarchy as a concentration of illegitimate power in the hands of an entrenched minority – but what is the "power" on Wikipedia? Since Wikipedia organization allows its members to create and shape its rules – policies – through edits, it is only logical that having his or her edits undisputed and preserved on the pages represents that editor's power.

Based on the above operationalization of power, the seven specific hypotheses were designed to facilitate researching whether Wikipedia is becoming more bureaucratic and oligarchic. Those hypotheses are as follows:

1) A small group of editors consistently win disputes on Wikipedia: Verifiability (WP:V) page. This is the primary hypothesis which if confirmed would indicate that the Iron Law holds on Wikipedia. This hypothesis will be confirmed if the following hypotheses are proven true:

2) Editors who win disputes on WP:V page are more likely to be engaged in other aspects of Wikipedia decision making policies than other editors.

3) Editors who win disputes on WP:V page are more likely to be a part of some Wikipedia

organization than other editors.

4) Editors who win disputes on WP:V page are more likely to have an officially recognized "esteemed" position (like administrator) than other editors.

5) Editors who win disputes on WP:V page are more likely to have been active in the project longer than other editors.

6) Editors who win disputes on WP:V page are more likely to be more active editors than other editors.

7) Editors who win disputes on WP:V page are more likely to be among the most active editors to WP:V than other editors.

Variables

In order to test the above hypotheses I carried out an analysis of "Wikipedia: Verifiability" page. I created a list of editors who edited the WP:V page and gathered information on how often they edited it, when they edited it, what was the scope of their edits and what was the fate of their edits (whether it was disputed or not, and who won the resulting dispute).

The following independent variables were used in my model:

1) The total number of edits an editor made, operationalized as the number of times the text of the Wikipedia page was changed and saved on the server.

2) The scope of editor's interest, operationalized as a number of distinct (unique) pages edited.

3) The length of editors' participation in the project, operationalized as the number of days since the editor registered[1] with the project.

4) Whether the editor holds an "esteemed" position.

5) Whether the editor is a member of any Wikipedia organizations, operationalized as the

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1 Registering with the project or creating an account gives an editor a personalized nickname and access to additional editing tools. Unregistered editors are considered "anonymous".

editors' self-declaration of such membership on their userpage[2].

6) Editor's dedication to project goal (creating encyclopedic content), operationalized as a ratio of edits to encyclopedic articles to edits to policies.

7) Editor's engagement in other aspect of Wikipedia decision making policy, operationalized as the number of edits that editor has made to pages in Wikipedia namespace.

8) Number of edits to WP:V talk (discussion)[3] page where editors are discussing policy.

9) Number of edits to WP:V page itself. This is another measure for hypothesis 7.

Those independent variables in turn affect dependent variables:

1) Percentage of undisputed major content edits to WP:V page ("changeability"). An undisputed major content edit is operationalized as undisputed in a week following it.

2) Percentage of disputes won in the short term. A won short term dispute is operationalized for a defending editor as a dispute which ended with the edit <u>staying</u> in the article and being undisputed for a week following last dispute, and for the disputing editor as a dispute which ended with the edit <u>not staying</u> in the article after a week following last dispute.

3) Percentage of disputes won in the long term. It was operationalized in a way analogical to the preceding variable, but with remark "visible on 1st January 2007" replacing the remark "staying in the article after a week following last dispute".

Data collection

I collected data from the publicly available WP:V page and its archives (page history) in the period of December 2006 to February 2007. When needed, I sampled other public pages for additional data, such as editors' userpages or the WP:V talk (discussion) page and relevant archives. Both quantitative and qualitative content analysis methods have been used.

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2 Each registered editor has their own userpage where they often describe themselves and their interests.
3 Most pages on a wiki are accompanied by the talk (or discussion) pages where editors can discuss the issues they consider relevant in a fashion similar to that of an Internet discussion forum.

Data analysis and results

Coding

Edits

The WP:V page has over three and a half years of history. It was created on August 2, 2003. Until the end of December 2006 (when it was in existence for 1251 days) it has been edited by about 255 different registered editors in 1112 separate edits, each producing a different version.

In addition to registered editors, 134 anonymous editors were also involved in editing the WP:V page. They made 168 edit in total (thus on average each editor made 1.2 edits). 71.5% of those were classified as obvious vandalism. In my analysis of major content and disputes I found less than 10 edits that could fall into 'adding major content' or 'reverts' categories; all of them were quickly disputed and reverted by registered editors. Therefore it can be concluded that unregistered editors have no influence on Wikipedia policy and thus are not relevant to this study.

My first task was to distinguish edits that would be relevant to this research. I adopted an approach similar to content analysis strategy used by Pfeil et al (2006). I divided the edits into: 1) vandalism and its reverting 2) minor edits 3) content change and 4) disputes. As neither vandalism-related edits nor minor edits (style, typos, etc.) contribute significantly to evolution of the policies, only major content edits and reverts were of interest to this study (see Figure 1).

Editor-events

(Figure 1 about here)

It often happens that an editor may decide to adjust his or her edit several times in a major or minor way, within seconds to even days after the first edit. As long as those edits concern the same issue,

they would have identical outcome (disputed or undisputed, dispute won or lost). Further, a dispute may involve numerous editors supporting or arguing against that edit, but the fate of the edit is not directly related to the number of editors engaged in the argument. Therefore I grouped the 311 edits into "editor-events" operationalized as a series of all edits related to the same issue (or set of issues), that may involve more than one editor.

Editor-events were split into three overlapping categories to facilitate calculation of dependent variables for individual editors: "changeability" and "percentage of disputes won" (see Variables section for specific operationalizations of those dependent variables, and Figure 2 for a graphical representation of those splits).

A concept of a dispute was refined and split based on editor's perception of whether they would be defending their major content edit or disputing another editor's edit. Victory in a dispute was coded as 1, defeat as 0, consensus as 0.5 for both sides.

The above categories can overlap as an editor-event may belong both to major content edits and dispute groups (see Figure 2).

Limiting the study to only major content edits, disputes, or any other subgroup thereof would be inadvisable as it would obscure a significant part of evolution of the WP:V policy. For example, there is a significant group of "conservative" editors (19 individuals, approximately 23.5% of total analyzed) whose only activity is disputing and reverting others edits; they "maintain the status quo" but never introduce a change themselves. On the other hand there are also 16 editors, approximately 20% of the total analyzed, who only introduce major content changes but never take part in disputes, regardless of whether others dispute their edit. Therefore while edits and editor-events

remain a crucial concept in this study, the primary unit of the analysis are the editors – particularly considering that the Iron Law of Oligarchy affects humans, not edits.

(Figure 2 about here)

Findings

Descriptives

Certain statistics related to edits offer valuable insight into interactions between editors:

(Table 1 about here)

About a half of the edits (57%) were disputed; a half of those challenges were made by admins. Most of the disputes ended with no change to the policy page – i.e. the editor disputing the edit won, and the editor who wanted to introduce the change was defeated (only 14% of disputed edits were retained in short term); in the long term that chance increased to approximately one third (35-36%). Admins were much more likely to challenge other admin reverts (67%) than their major content edits (17%). There was a noticeable if weak rift between edits by admins and non-admins: admin edits were less likely to be challenged than those of non-admins (41% to 67%); their success rates in retaining their disputed major content was not much different from non-admins (18% to 13%); but their success rate in retaining disputed revert edits was noticeably higher (31% to 11%).

81 editors were identified as responsible for the "editor-events". 64 of them contributed major content edits; 38 took part in disputes. 311 "editor-events" were split into 134 major content edits and 117 disputes (see also Figure 2).

(Table 2 about here)

Table 2 indicates that 40% of the editors who edited the WP:V page were esteemed editors (mainly administrators). 45% of those editors declared that they belong to at least one wiki organization.

(Table 3 about here)

In terms of activity and editing patterns (see Table 3), the majority of editors involved in creating the WP:V policy were working in the Wikipedia project for about a year before their first edit to the WP:V page and for about two years before the data for this study was collected. They did between seven and eleven thousands edits projectwide, editing over two thousand different pages. However they made only several edits to the WP:V page and zero to few edits to the WP:V talk page. An average editor also contributed over twice and a half as much time to creating content than to editing Wikipedia's policy pages. However we should note that there were extreme cases – outliers – in all of those statistics; and with the exception of length of participation, variables had relatively significant standard deviation either equal to or greater than the mean.

(Table 4 about here)

The statistics in Table 4 shows that there was an over 50% chance that any editor introducing a content edit would find his or her edit disputed. In over 90% of the cases the subsequent dispute would end with the change being rejected (only 9.41% of major content disputes are won by defenders in short term). The median skew from Table 4 indicates that there was a small group of editors with no disputed edits (there were 18 such editors, see Figure 2). The majority of the other editors had most of their edits disputed. In the long term one third of editors' major content edits remained in the article. When an edit was disputed, the disputing party won in approximately seven out of ten cases. The analysis shows that the editor won only about a third of short term disputes. In the long term editors found that about two fifths of their edits remained in the article. For dependent variables there were noticeable outliers similarly as in the case of independent variables.

Both Tables 3 and Table 4 indicate that a ratio of the standard deviation to the mean is high, varying from about 0.5 to 2. However this study is based not on a sample, but on the analysis of total population of editors and their edits to the WP:V page, and thus there is no possibility of increasing the sample size in order to decrease that ratio.

Correlations

Pearson correlation was used to determin whether variables are significantly correlated among themselves.

<center>(Table 5 about here)</center>

Variables that were not significantly correlated with any of the dependent variables – they did not contribute to editor's victory (or defeat) in disputes – were omitted from primary models (Table 6, Model series 1 through 4) but they were included in the secondary models (Table 6, Model series 5). The following independent variables were found weakly correlated: being an esteemed editor (SYS); being a member of wiki organization (MB); number of edits to WP:V page (VE); and ratio of edits to article (RT). Two dependent variables (percentage of major content disputes won in long term (%4) and percentage of all disputes won in long term (%6)) which were not correlated with any independent variables were also omitted from further research.

The total number of edits (TE) variable was left out from the model due to collinearity problems. This process yielded four variables which were used in the regression models 1 through 4 and eight that were used in regression models 5 (see Table 5 and Table 6).

The length of participation in the project was negatively correlated (-.386**) with a chance of having one's edits disputed. Being an editor with a larger number of distinct pages edited was positively correlated (.316*) with winning a content dispute and defending one's major content edit in the short term. Being an editors active on the WP:V talk page was positively correlated (.529**) with winning a revert dispute and ensuring a defeat of the disputed edit in the short term. Both being an editor with a large number of edits to Wikipedia namespace and being an editor with many distinct pages edited were positively correlated (.293* and .295*, respectively) with winning all disputes in the short term.

The factor analysis was carried out to identify underlying factors related to oligarchy. Two factors were identified; one related to activity variables (number of edits; number of edits to Wikipedia namespace, number of distinct pages edited) and second related to the length of participation in the project. The calculated z-variables were less significantly correlated with dependent variables than individual independent variables and therefore discarded from the model.

Regressions

Six regression models were analyzed. Variables were subjected to logarithmic and square root transformations to eliminate problems with normality. Linear regression models were selected (y=a*x+b) as the analysis of residuals and predicted variables showed no signs of significant problems with homoscedascity and linearity. Six models are presented. Models 1, 2 and 3 shows regressions of cases where single independent variable was significantly correlated with a dependent variable (length of participation to a chance of a major content edit being disputed in the short term in Model 1; number of distinct pages edited to a chance of winning a content dispute and defending one's major content edit in the short term in Model 2; number of edits to the WP:V talk page to a chance of winning a revert dispute and ensuring a defeat of the disputed edit in the short term in Model 3). Models 4.1, 4.2 and 4.3 analyze the three possible combinations for the case where two independent variables (number of edits to Wikipedia namespace and number of distinct pages edited) were significantly correlated with one dependent variable (chance of winning all disputes in the short term).

(Table 6 about here)

Regression Models 1-4 with explanatory power from 9% to 28% indicate that editors' victory in Wikipedia's disputes (and their "challengeability") was explained only to a certain extent using the analyzed variables. Regression Models 5.1, 5.2, 5.3, 5.4, while having higher R squared, contain no significant relations (with a single exception in Model 5.2) and their R square change when

compared to Models 1-4 is statistically insignificant, indicating that its higher value is a simple inflation that occurs with higher number of variables.

The best model is the Model 3, explaining over a quarter of the variance. It indicates that for each increase of the factor of ten in the editor's number of edits to the WP:V talk page, the editor's chance of winning a revert dispute and ensuring the defeat of the disputed edit in short term increase by 23.734 on a log scale. The remaining models are much weaker, explaining only about 10% of the observed variance. Model 1 indicates that as the editor's logged length of participation increases, his or hers major content edits are less likely to be disputed in the short term; Model 2 indicates that as an editor's logged number of distinct edits increases, his or her chances of winning a content dispute and defending their major content edit in the short term increase and Models 4.1, 4.2 and 4.3 indicate that as editor's number of total edits and distinct pages edited increased, his or her chance of wining dispute increased.

Discussion: *Anti-oligarchic organizational culture*

Interpretation of the findings

An oligarchy that would want to "run" Wikipedia should have the power to shape the project's policies[1]. However the collected data indicates that if such an oligarchy exists, it is either relatively powerless, not interested in changing WP:V policy (one of key Wikipedia's policies), or organized around different factors than those hypothesized and analyzed in this research.

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1 One could argue that a powerful oligarchy should be able to influence the encyclopedic content itself – however there are several specific policies dealing with the content designed to prevent such development. In addition to Wikipedia:Verifiability they include "Wikipedia:Neutral point of view" (All Wikipedia articles and other encyclopedic content must be written from a *neutral point of view*, representing views fairly, proportionately and without bias) and "Wikipedia:Ownership of articles" (If you create or edit an article, know that others will edit it, and within reason you should not prevent them from doing so). Hence an oligarchy aiming to change the encyclopedic content would first need to change those and related policies.

A popular myth on Wikipedia states that a "rogue (admin) cabal" is ruling the organization. Indeed, out of the 81 editors of WP:V, 33 (40.7%) are administrators or have become administrators some time after their first edit (see Table 2). That is a much higher ratio than that of administrators to the total number of editors on Wikipedia project (0.28% – 1182 administrators out of over 4 millions editors as on April, 2007) (Wikipedia 2007i). However the cases of admins disagreeing with one another are not rare (about 1 in every 5 disputes analyzed involves admins on both sides, see Table 1). Admins are almost as likely to have their edit disputed and be defeated in a resulting dispute as a non-admin editor (see Table 1). There is also no significant relation between being an administrator and having one's edits undisputed or winning disputes (see Table 5). Therefore it appears that the "rogue admin cabal" myth is just that and the hypothesis that administrators are more likely to influence WP:V page has to be discarded. The comparison of administrators with janitors or security guards comes to mind – undoubtedly, they have certain theoretical powers over the inhabitants of the building, but in the end they are more like servants than any (oligarchic) rulers.

But what about the scores of possibly oligarchic wiki-organizations? Close to a half of WP:V editors are members of such organization (see Table 2) but being their member seems even less related to the ability to preserve one's point of view than being an administrator (see Table 5). No successful cabal seems to originate from wiki organizations, therefore the hypothesis that members of wiki-organizations can significantly influence WP:V page is also proven false.

However a powerful elite may operate outside the formal structure (Leach 2005). The hypothesis that more experienced and active members have a higher chance of winning a dispute has some support (see Tables 5 and 7). Six models have been presented, showing that a high number of edits to Wikipedia namespace, editing many distinct pages and being engaged with the project for a long time does increase the editors' chances of not having their edit disputed or winning a dispute.

However, the underlying relationships seem to be rather weak. A chance of having one's edits undisputed and winning disputes is increased only slightly by the independent variables – five models (Model 1, 2, 4.1, 4.2 and 4.3) explain only about 10% of the observed variance, only Model 3 explains nearly 30% of variance in wining a dispute when disputing another editor's edit (see Table 5). No independent variable is correlated with all of the dependent variables (see Table 5). Model 4 shows that their effects are significant only individually, not in a group (see Table 6).

The reasons for activity on talk page helping win revert disputes can be explained by the fact many editors edit the WP:V page rarely, most only once (see Table 2), and they likely do not come back to check on the status of their edits. On the other hand editors who are disputing the edits are probably monitoring the page and thus are more aware of each others activity on that page and its corresponding talk page. The remaining relationships can be also easily explained. As editors become more familiar with Wikipedia, its policies and discussions, they are also more aware of what type of edits may be challenged and thus are not worth making. It would indeed be much more surprising to find that more active and experienced editors are less successful in winning disputes.

Thus we can conclude that there is some – albeit weak – evidence that an informal and unconscious oligarchy is being formed by active and experienced editors; however the powers of that oligarchy are very limited. In other words, processes that might reasonably be expected to produce an oligarchy in traditional organizations, on Wikipedia are at most giving some editors a small boost.

Implications for the Iron Law

With few small exceptions, it would appear that the Iron Law has – so far – not shaped the structure of Wikipedia. This can be explained with the analysis of certain factors, found on Wikipedia, that are known to be a good "vaccine" against Michels' predictions.

Technology – the communication vaccine

Michels stresses that one of the primary factors responsible for the inevitability of the Iron Law is the technological inefficiency. When he published his book in 1915 it was indeed impossible for millions to participate in any discourse in one place and time. However with the Internet creating the "global village" and the cyberspace eliminating constrains of distance and physical space (Harwood and McIntosh 2004), there are predictions that this technological inefficiency is becoming a thing of the past (Kollock and Smith 1999). Internet seems well suited for the renaissance of participatory democracy, by challenging one of Michels' key argument: millions of people can indeed meet in one – virtual – place and create an efficient organization.

It is no accident that the wikis allow people to communicate more effectively, democratize the decision making and reduce impact of oligarchies. They were designed from bottom up with the very purpose of improving collaboration between masses, and hence their structure – their "code" – affects the behavior of agents – the individual "wikipedians" – influencing the creation of rules and norms (Cunningham and Leuf 2001, Lessig 2006).

Shared decision making and open lines of communication between the leaders and the "rank and file" are a significant hindrance for oligarchy. We can see much transparency on Wikipedia and accountability of Wikipedia members going far beyond the publicly available budget of the Wikimedia Foundation. The recent introduction of the WikiScanner tool which allows to track anonymous edits of unregistered contributors to originating business or governmental organizations have significantly lessened chance for any outside group of interests to influence Wikipedia's content. It has been welcomed by many Wikipedians, with Wales commenting: "It's awesome. I love it. It brings an additional level of transparency to what's going on at Wikipedia" (Noyes 2007). Registered oligarchic wannabes face a great difficulty, with inability to control information flow on

Wikipedia, as all policy changes are discussed and archived in the publicly accessible pages. While there is always a possibility for various groups to discuss their strategies "off-wiki", in the end they have to present their arguments to all interested editors and compete on the transparent playing field of wiki-pages. While such high transparency might be less suited for a more traditional organizations, faced with competition in the world of business (or politics), and in need of some degree of secrecy, as Tapscott and Williams (2007) show, businesses too are both adopting wikis and benefiting from increased transparency, which promotes efficiency and trust. On a larger scale, similar argument is presented in the recent work by F. Allan Hanson (2007), who describes how changes brought upon by information technology – including increased transparency – are indirectly but steadily influencing the behavior of individuals throughout our society.

The ease and transparency of communications also affects many ongoing debates about Wikipedia itself. Those debates in turn raise the awareness of the Iron Law-related issues among the editors. Jonsson and Zakrissonan (2005) indicate that an organization whose members are aware of the problem is more likely to deal with it; their analysis specifically concerned awareness of the tendency towards oligarchization. Thus wiki technology creates a powerful anti-oligarchic deterrent, putting all of the members on the level playing ground, and allowing the idealistic anti-oligarchic majority, aware of the Iron Law, to screen out possible pro-oligarchy proposals.

The unassuming leaders

If Wikipedia is indeed an exception to the Iron Law, it would not be the only one. The International Typographic Union (ITU) described by Seymour Lipset in 1956 is the most often cited of those relatively rare exceptions. Several factors which were found to act against the Iron Law and preserved the democratic nature of the ITU, maintaining its democratic self-government, also exist in Wikipedia. For example, independently founded local branches of the ITU resemble the local wiki-organization of English Wikipedia, as well as the non-English Wikipedias, now numbering

over a hundred.

Lipset also noted that the ITU was helped by its "occupational community" which significantly affected another crucial factor in Michels' thesis: the leadership. This "occupational community" facilitated both the political participation and the emergence of leaders, but also led to high identification with occupation among the leaders and reinforced their dedication to job ideals. This made it easy for leaders to return to non-political jobs within the community and prevent them to ever consider themselves significantly superior and distant from rank and file members.

Such an "occupational community" is found on Wikipedia, where editors highly value altruistic motivations and project ideals (Bryant et al. 2005, Schroer and Hertel 2007). Leaders – be it administrators or active members of wiki organizations – are engaged in writing and maintaining articles, their primary reason for joining the community. An average editor also contributes over twice and a half as much time to creating content than to editing Wikipedia's policy pages (see Table 3) which reinforces the findings that to an average editor Wikipedia's goal of creating encyclopedic articles is more important than internal organization and power struggles. Nobody, after all, actually becomes a Wikipedian to "join the oligarchy" – few editors are aware of how Wikipedia is organized before they start editing it. Further, *all* Wikipedia volunteers are unpaid, thus there is no incentive to raise through ranks to get a bigger paycheck. This dedication to ideals ensures that the rank and file remain constantly active in the organization and that both the leaders and the junior members constantly "brush shoulders" doing similar tasks. Michels stressed that usually those in positions of responsibility and power often come to believe that they are more knowledgeable, and thus indispensable, compared to those they serve. As time goes on, they become further removed from the rank and file (Michels 1915:55). On Wikipedia this alienation is prevented by the ideal-fueled "occupational community", which significantly contributes to

eliminating the barriers between more and less experienced editors, and lessens the chance for leaders to develop into a "closed caste", distinct from less active and involved editors.

By applying Hofstede's concept of organizational culture (Hofsteede 2004) several other intriguing organizational characteristics, important to the "occupational culture", become visible. The most-likely potential oligarchs (old, experienced or esteemed editors) share the same goal (building an encyclopedia) as the newcomers or infrequent editors; they also follow the "assume good faith" and "do not bite the newcomers" policies (Bryant et al. 2005). Those policies require editors to be civil and to resolve disputes in a friendly manner, and are even more binding of the older editors who should be more familiar with them. Because of such policies and attitudes the Wikipedians are often very informal; and the division between "mass and rank" and "leaders" is not obvious. Hence the power distance is much smaller than in traditional, more hierarchical organizations. This blurred hierarchy, based on associational activity of millions of individuals and thousands of groups, constantly creates social capital, and facilitates decentralization and distribution of authority among all participants, leading to formation of a civil society, as pointed out by scholars from Alexis de Tocqueville through Robert Putnam (Putnam 2000, Lebkowsky and Ratcliffe. 2005). After all, one can simply recall the famous quote of Tocqueville's: "Americans of all ages, all stations in life, and all types of disposition are forever forming associations. There are…a thousand different types – religious, moral serious, futile, very general and very limited, immensely large and very minute", and replace the "Americans" with "Wikipedians" to realize the depth of democratic civil society that has developed on the site over the past few years (Tocqueville 1969).

Michels notes the great power of the elected leaders over the electors, creating "dominion of the elected over the electors, of the mandatories over the mandators, of the delegates over the delegators" (Michels 1915:241). This observation, however, when applied to Wikipedia, raises the

simple question – what power? Schroer and Hertel (2007) in analyzing motivations of Wikipedia contributors fail to find any indicators that they value power. This can be explained as on Wikipedia, there is surprisingly little power to go around. Unless they identify themselves, or one takes the effort to research them, esteemed or experienced editors are indistinguishable from the new ones; thus there is no immediate intimidation during interactions. Administrators' powers are subject to much scrutiny, and administrators found abusing their power are subject to public proceedings that can end up with losing their position. Finally, experienced editors and community leaders have no power beyond except a moral authority they may have gained among their colleagues – and even that is limited. With tens of thousands editors, one's moral authority based on being recognized by only a hundred and fifty individuals (the "Dunbar's number") is quite limited (Kolbitsch and Maurer 2006). Even the unelected "king Wales" has severely limited powers and needs to balance each of his decision so that he doesn't cause an "uprising" where most of the editors would simply take the free software and content and create a "Walesless" Wikipedia clone.

Michels further warns that a small group of members should not be allowed to control a centralized administration. Yet what little power there is on Wikipedia, it has to be shared by the project's thousands of leaders – hardly a small group, and with no upper cap on their number. Any editor willing to contribute time and edit can become an active editor, gain experience, join any organizations and run for adminship. With the notable exceptions of Wikimedia Foundation Board and the Wikipedia judiciary – with a limited number of electable positions – there is a precious little "central administration" pie to go around. One's competences depend significantly on what one is willing to do. Leaders of various projects are usually unofficial and hold this position solely because they are wiling to do repetitive or technical tasks others find less enjoyable. There is also nearly infinite room to expand and create new organizations, competences and leadership positions.

Members of wiki-organizations who are dissatisfied with them can easily work outside them, either as individuals, or by creating new organizations. It is likely that due to the ease of creating new organizations on Wiki, if older organizations get too "oligarchized", they will simply be replaced by new, more vital and egalitarian ones.

The importance of being able to design and create organizations at will should not be underestimated. Alford (1985), while showing how ancient Athens avoided the Iron Law, stressed the importance of organization members' confidence in their ability to plan, design and animate their new organizations. Such high confidence can be seen on English Wikipedia with the growing number of both internal wiki-organizations, and the entirely new wikis. The ease with which one gains that confidence in the online world of wikis, the confidence that prevents possible oligarchies from cowing members of rank and file into obedience, is one of the crucial lessons that we can draw from studying Wikipedia.

There is little professionalization of the leadership on Wikipedia. While Wikimedia Foundation is hiring some salaried professionals to run the legal side of being an non-governmental organization, Wikipedia has a tradition of having its content and rules created only by unpaid volunteers. The existing leaders on Wikipedia are gaining experience – but as there is no barrier on increasing their number, little power to go around, little tangible benefit in being a leader on Wikipedia, and few factors differentiating leaders from rank and file members, it is difficult for an oligarchy to arise from the ranks of leaders.

Michels' wrote: "who says organization, says oligarchy" (Michels 1915:214). Perhaps we should follow this with a caveat "who says wiki-organization, says no to oligarchy".

Playing devil's advocate

There are nonetheless a few indicators that Wikipedia is slowly following some of Michels' predictions. Certainly the organization seems to be developing extensive bureaucracy – as seen in extensive growth of various policy pages, which are growing much quicker than articles (Viégas et al. 2007). The number of rules is increasing, a sign of the growing uncertainty avoidance factor as Wikipedians attempts to cope with anxiety by minimizing uncertainty. Viégas et al. (2007) note that conversations on talk pages are increasingly formalized and policy driven. Special etiquette has evolved, and explicit references to policies are frequently invoked. This may make it difficult for new editors to understand "old timers" and may lead to bureaucratic depersonalization and increased power distance. Over time this may result in increased power being concentrated in the hands of the experienced minority: the 10% difference in a chance to be challenged and win disputes, found in this study (see Table 6), may be considered insignificant in the time being – but what if this difference is cumulative, and the power of experienced editors will increase by 10% every five years? However such assumption is contradicted by recent findings (Kittur et al. 2007), which indicate that elite's influence has been constantly diminishing since the project was founded.

An example of a move towards avoidance of uncertainly and the resulting conflict on Wikipedia is the case of the "copyright paranoia". Wikipedia policy stipulating what images can be used on its site is becoming increasingly restrictive, with the goal (strongly supported by Jimbo Wales and the Board – Wales 2005b) of preventing Wikipedia from being sued for copyright violations. This is one of the few areas where Jimbo Wales and the Board are firm in ignoring a large number or editors arguing for less restrictive policies – a sign, perhaps, that this small group is in fact a benevolent, but powerful oligarchy – and also a sign that legal policies, touching the financial issues, are not the most popular avenue for democratic experiments.

Further, we can certainly find evidence of creation of leadership groups on Wikipedia. Administrators, in particular, are increasingly singled out as a specific group – hence the "rogue admin cabal" myth (and even if it is not true today, one should not forget the power of a self-fulfilling prophecy). Indeed it is difficult to dismiss administrators – there is no easy recall procedure, and only the Arbitration Committee has the power to order such an action. It is even more difficult to force a wiki-organization leader, usually unofficial, to resign from such a post.

It is also intriguing that out of 4,000,000 Wiki editors, and the core group of 50,000 most active, only 81 significantly contributed to the WP:V page. Combined with the fact that most Wikipedians prefer to contribute to encyclopedic articles rather than to policy pages (see table 1), and the fact that Jimbo Wales has a substantial fan-like following, this clearly reinforces Michels' conclusion that most members are happy that they do not have to "lead" or take part in policy making, and are confident in leaving that in the hands of a small minority (Michels 1915:35). If a minority can organize itself and become more conscious of its power, an oligarchy could form, simply due to unwillingness of the majority to deal with leadership issues (Michels 1915:56).

Currently among the millions of editors and hundreds of wiki organizations there is too much diversity for the formation of a conscious oligarchy. However this may not be true in the future. For example, the Arbitration Committee, an organization with significant competences, limited membership and sanctioned nonpublic communication channels may in the long run professionalize and became a government, a "juristocracy", with experienced judges holding the power.

Conclusion

There are few indicators of an oligarchy having power on Wikipedia, and few trends suggesting this situation can change. The high level of empowerment of individual Wikipedia editors with regards

to policymaking, and factors such as ease of communication and high dedication of contributors to ideals succeed in making Wikipedia an atypical organization, quite resilient to the Iron Law.

Although Wikipedia seems to be affected by the Iron Law in some respects, it has evolved crucial characteristics in its organizational culture – such as the small power distance and dedication of all its members to the project's goal – that steer it away from the "inevitable destiny" of becoming an oligarchy. Growing bureaucracy is balanced by extensive enfranchisement of editors in policymaking. Subconsciously, Wikipedia's editors are constantly tweaking the site's policies, so far successfully coping with the site's growing popularity, retain their idealistic goal and prevent a rise of any noticeable oligarchy.

While the WP:V is one of the cores of Wikipedia, study of how other policies and encyclopedic content itself developed and whether they are affected by the Iron Law, would certainly prove valuable. Analysis of the Wikipedia's governance (how democratic the site really is?), the quality of public discourse, similarities to a social movement, importance of the networks in the Wikipedia community or even a throughout analysis of Wikipedia editors demographics – all offer an ample room for further studies.

There can be no guarantee that in the future wikis will not mature and evolve into a more classical and oligarchic organizational form. However if anti-oligarchic forces as seen on Wikipedia can be found throughout other wiki-organizations, and will not weaken with time, it might indeed signal the rise of a significant challenge to the Iron Law and a beginning of a democratic renaissance.

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Tables

Table 1. Descriptive statistics for edit analysis. Mean values only. N=251

% of content edits disputed	57
% of non-admin content edits disputed	67
% of admin content edits disputed	41
% of content edits disputed by an admin	53
% of admin content edits disputed by an admin	65
% of disputes with administrators on both sides in content edits	17
% of disputed content edits retained in short period	14
% of non-admin disputed content edits retained in short period	13
% of admin disputed content edits retained in short period	18
% of non-admin content edits visible in long term	27
% of admin content edits visible in long term	43
% of non-admin disputed revert edits retained in short period	12
% of admin disputed revert edits retained in short period	32
% of non-admin disputed revert edits retained in long period	35
% of admin disputed revert edits retained in long period	36
% of disputes with administrators on both sides in revert disputes	67

Table 2. Descriptive statistics for models; nominal data. N=81

	Esteemed position (SYS*)	Member of organizations (MB*)
Yes	33 (40.7%)	37 (45.7%)
No	48 (59.3%)	44 (54.3%)

*abbreviations – see Table 5

Table 3. Descriptive statistics for models; independent ratio data. N=81

	Total number of edits (TE)	Number of edits to WP:V (WE)	Number of edits to WP:V talk (WT)	Distinct pages edited (DP)	Number of edits to Wikipedia policy pages	Length of editors' participation (in days) (L1)	Length of editors' participation before first edit (L2)	Ratio of edited articles to policy (RT)
Mean	11090	8.27	35.68	3844	2344.54	800	474	4.97
Median	7748	3	10	2539	1349	731	356	2.5
Range (min-max)	59-57336	1-160	0-467	35-19995	4-17605	52-2015	0-1742	0.01-47.57
Standard deviation	11454	19.17	72.9	4015	3072.62	450	407	8.37

To facilitate interpretation the data were not transformed.

Table 4. Descriptive statistics for models; dependent ratio data. See also Figure 3.

	% of disputed major content edits (%1)	% of major content disputes won by defenders in short term (%2)	% of major content disputes won by defenders in long term[b]	% of revert disputes won by disputing editors in short term (%3)	% of revert disputes won by disputing editors in long term (%4)	% of all disputes won in short term (%5)	% of all disputes won in long term (%6)
N	64	42	8	36	23	71	81
Mean	57.63	9.41	30.94	70.52	68.17	32.57	43.56
Median[a]	72.38	0	25	100	79.17	25.00	50.00
Mode[a]	100	0	0	100	100	0	0
Range (min-max)[a]	0-100	0-50	0-100	0-100	0-100	0-100	0-100
Standard deviation	46	17	34	39	37	36	38

To facilitate interpretation data were not transformed.

[a] Because majority of editors have done between one to three edits, their victory/defeat rates are either 0, 33, 50, 66 or 100%.

[b] Because of insufficient number of cases (8), this dependent variable was not included in further analysis.

Table 5. Regressions. Standard errors shown in parenthesis. See table note for legend.

	Model									
	1 (%1)	2 (%2)	3 (%3)	4.1 (%5)	4.2 (%5)	4.3 (%5)	5.1 (%1)	5.2 (%2)	5.3 (%3)	5.4 (%5)
Constant	5.32*** (.76)	-17.45 (13.01)	-2.04 (10.05)	.258 (.67)	.14 (.86)	.31 (.86)	7.56*** (1.78)	-4.95 (19.74)	6.71 (47.40)	.45 (1.36)
Length of participation (L1)	-.07** (.03)						-.09* (.04)	-.76 (.60)	-1.23 (.94)	-.015 (.03)
Number of distinct paged edited (DP)		8.33* (3.96)			.67* (.26)	-.05 (.48)	.58 (1.3)	12.28 (14.50)	-11.81 (26.11)	-.30 (.96)
Number of edits to Wikipedia namespace (WE)				.69* (.22)		.73 (.42)	-1.43 (1.21)	-5.22 (14.19)	15.38 (31.03)	1.14 (.93)
Number of edits on WP:V talk (VT)			23.73** (7.32)				.41 (.54)	-7.05 (7.85)	24.96 (13.02)	.19 (.42)
Being an esteemed editor (SYS)							.94 (.76)	7.39 (10.49)	6.34 (20.95)	-.16 (.56)
Being a member of wiki organization (MB)							1.01 (1.15)	4.81 (15.81)	22.18 (27.98)	.39 (.90)
Number of edits to WP:V page (VE)							-.25 (.69)	21.45* (10.17)	3.27 (19.15)	-.55 (.54)
Ratio of edits to article (RT)							-.36 (.93)	2.75 (12.53)	14.77 (26.76)	.15 (.74)
R squared	.108	.100	.280	.127	.087	.127	.267	.293	.401	.128

*$p<.05$, **$p<.01$, and ***$p<.001$

%1 – percentage of major content edits disputed; %2 – percentage of major content disputes won by defender in short term; %3 – percentage of revert disputes won by disputing editor in short term, %5 – percentage of all disputes won in short term;

Figures

Figure 1: *Process of elimination of vandalism-related edits and minor edits*
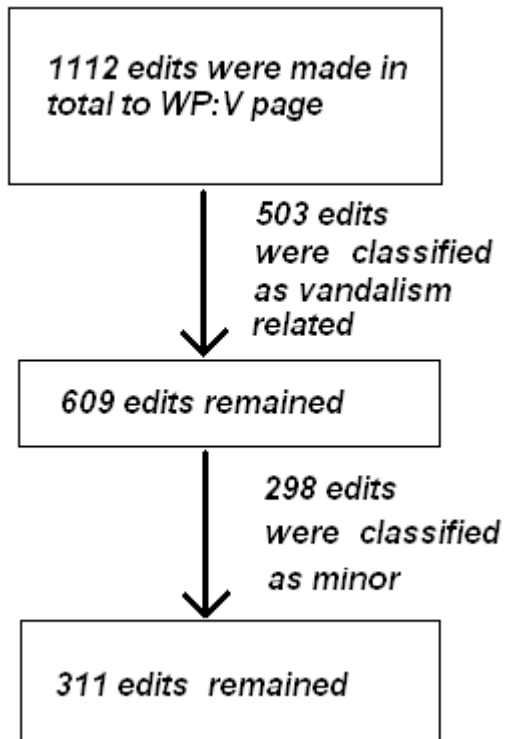
Figure 2. *"Editor-events" divided into 1) disputed and undisputed edits 2) disputing content and disputing disputes and 3) major content changes and disputes.*

77 disputed major content edits
for defending editors
=
77 revert disputes over
major content edits
for disputing editors

60 undisputed major
content edits

40 disputing another
disputing edit

18 editors
undisputed

46 editors
disputed

by 29   disputing
editors

311 edits
by
81 editors

251 editor
events

64 editors
do major content
edits
(16 exclusively)

38 editors dispute others
(19 exclusively)

134 major content edits

117 disputes (reverts)