The Social Roles of Bots and Assisted Editing Programs

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ABSTRACT

This paper investigates software programs as non-human social actors in Wikipedia, arguing that influence must not be overlooked in social scientific research of the on-line encyclopedia project. Using statistical and archival methods, the roles of assisted editing programs and bots are examined. The proportion of edits made by these non-human actors is shown to be significantly more than previously described in earlier research.

Categories and Subject Descriptors

H.5.3:n. [Information Interfaces]: Group and Organization Interfaces – Collaborative computing, Web-based interaction, Computer-supported cooperative work; K.4.3 [Computers and Society]: Organizational Impacts – Computer-supported collaborative work.

Keywords

Wikipedia, wiki, bots, automation, governance, collaboration

1. INTRODUCTION

The first set of technological artifacts examined in this paper – autonomous programs that can analyze articles and make algorithmically-defined edits, called bots – have been frequently disregarded in social scientific research of Wikipedia. Researchers that have discussed the social significance of bots in and of themselves have only made tangential or speculative clams, as such work generally has not focused on the role of such computerized editors. Although some researchers have theorized that bots are responsible for the massive observed decline in spam and vandalism [3], most research ignores these non-humans. This is based either for no stated rationale at all, or on findings made from 2005 and 2006 data that, at their highest levels, they only comprise about 2 to 4 percent of all edits to the site [2], and that they are largely involved in single-use tasks like importing public domain material. As such, when they are discussed, they are treated mere force-multipliers which do not change the kinds of work that editors perform. In contrast, this research quantitatively reveals the growing significance of bots in Wikipedia.

In addition, this research project has revealed a new kind of technological actor that has emerged in the past few years: assisted editing tools. Software programs in this second category include user-interface enhancements designed to automate routine tasks. As these tools are rather new in the Wikipedian community, there has been little previous research in this area. However, these tools are growing in use dramatically, and as qualitative analysis of logging data indicates, they are dramatically changing Wikipedia's administrative processes.

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2. EDIT COUNTS

In order to determine the relative prevalence of these software agents and tools, a record of all edits was first obtained using a bot written using the SxWiki PHP framework. This bot, which made no edits and was operated anonymously, gathered a list of all recent changes made to the project and ran on an hourly basis for two months. In this way, data was collected for every edit made to Wikipedia between 4 February 2009 and 1 April 2009 – 12,352,612 edits in total. The edits were then coded by username to determine bot status. Assisted editing programs were detected by the presence of various indicators inserted by assisted editing programs into edit summaries.

The results are striking, especially compared to findings made in 2005 and 2006 [2] that bots only make 2 to 4 percent of all edits. In the observed period, bot edits comprised 16.33% of all edits, while assisted editing programs were used in approximately 12.16% of all edits. Combined, such users make 28.49% of all edits to Wikipedia. This is more than all anonymous users, who comprise 24.03% of all edits. Graphing the edits made in each user category each day (Figure 1) shows that assisted editing is relatively constant on a daily basis, while bot operation is more variable. The breakdown of assisted edits by program (Figure 2) reveals many different tools in active use, with a few core programs comprising the vast majority of assisted edits. This indicates that bots and assisted editing tools play a significant portion of the editorial process.

Furthermore, bots and assisted editing tools have seen a dramatic increase in use among administrative spaces, specifically those dedicated to vandal fighting. This phenomenon was analyzed by using a similar bot to collect all edits made to the page "Wikipedia: Administrator intervention against vandalism" (AIV), used by editors to request administrative blocks of identified vandals. The breakdown of edits by automated/assisted editing programs (Figure 3) shows that these software actors have become the predominant mechanism for contributing to this process. User interface enhancements like Huggle and Twinkle are used the most by editors, as they automate and standardize the creation and submission of vandalism reports. The most dramatic jump is in bots: the AIV Helperbots sort out vandalism reports and ensuring that administrators do not have to review duplicate requests at AIV. Further analysis shows that the vast majority of users who add new reports of vandalism to AIV using assisted editing tools are not administrators. In all, these findings indicate the growing

significance of these software tools and agents in both the editorial and administrative process.

3. CONCLUSION AND FURTHER WORK

Technological tools like bots and assisted editing programs have a significant effect on the kinds of activities that are made possible in Wikipedia. Particularly, administration is heavily mediated by non-standard user interface extensions and software agents. In future research, bots must be examined as more than mere force-multipliers or irrelevant users. Bots can reshape the social world by enabling a specialized space for the coordination of administrative tasks [1]. The AIV Helperbots, for example, turn an ordinary wiki page into a queuing system. Assisted editing programs must also be studied for their social effects, given the way in which they automatically operationalize normative enforcement. This is a particularly interesting opportunity for study, especially regarding the way in which such tools transform the nature of editing and user interaction.

4. WORKS CITED

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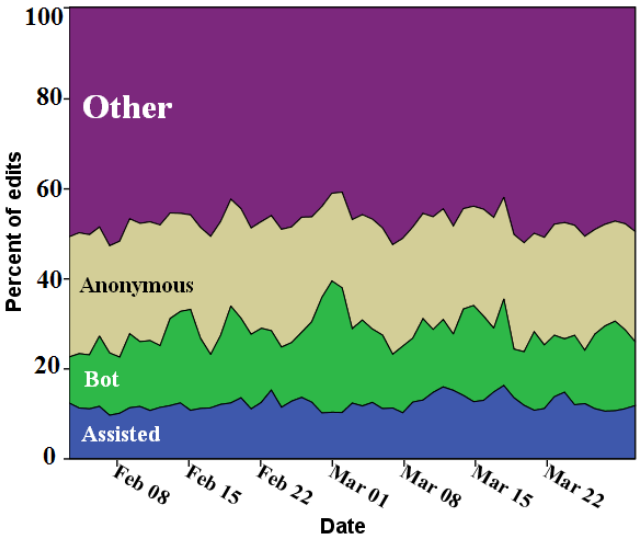

Figure 1. Proportion of all edits by user type

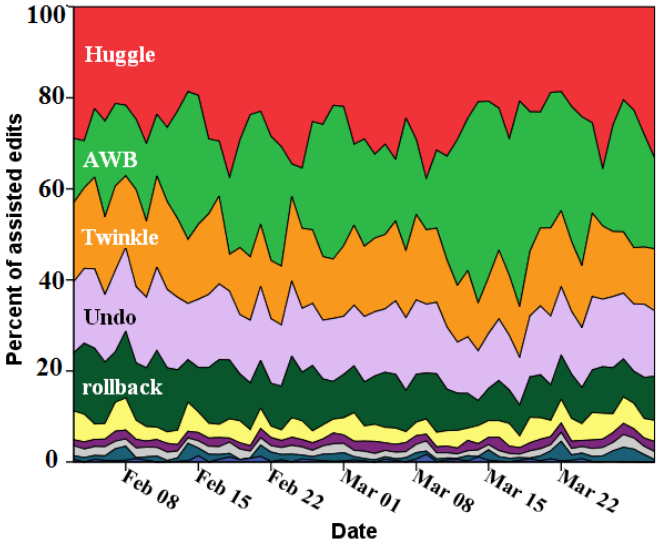

Figure 2: Proportion of assisted edits by program used

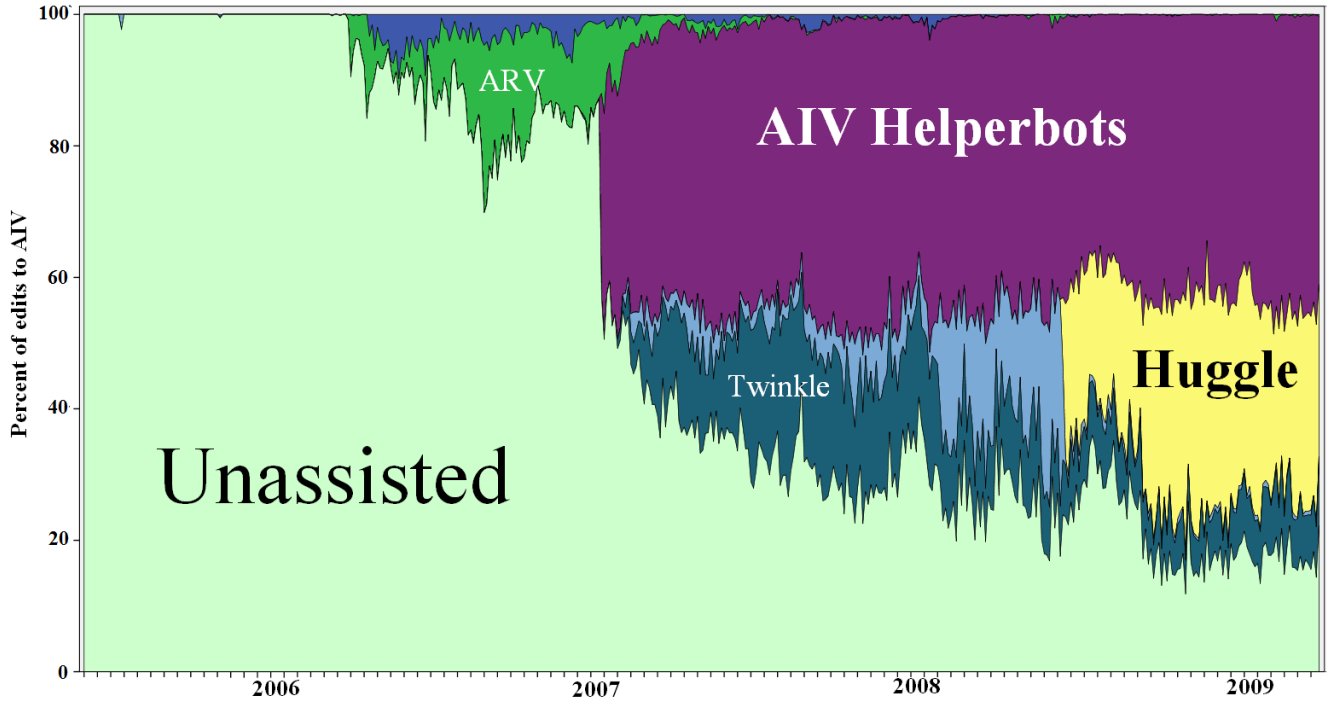

Figure 3: Proportion of edits made to Administrator Intervention against Vandalism (AIV) by tool used