Many organisations are developing open platforms to create, store and share knowledge. **Aleksi Aaltonen** and **Stephan Seiler** analyse editing data by Wikipedia users to show how content creation by individuals generates significant ‘spillover’ benefits, encouraging others to contribute to the collective process of knowledge production.

### Wikipedia: the value of open content production

Facebook, YouTube, Twitter and Wikipedia are among the world’s most popular websites – and all of them are based on user-generated content. While some platforms of this kind are primarily used to share individually produced content, others are based on a more direct interaction between users in the production of content.

Wikipedia is the leading example of this type of joint production. The online encyclopaedia contains almost 4.4 million individual articles in the English language version alone, which have been edited by more than 20 million users since its inception in 2001. Wikipedia has largely displaced the former market leader, Encyclopaedia Britannica, which is based on a more traditional process of content production (Devereux and Greenstein, 2009).

Wikipedia (and open source production more generally) constitutes a marked departure from traditional modes of production within organisations. Rather than using a fixed set of procedures to arrive at a pre-specified output goal, open source is characterised by commons-based peer production, a process that is ‘decentralized, collaborative, and non-proprietary; based on sharing resources and outputs among widely distributed, loosely connected individuals’ (Benkler, 2006).

Despite a rising number of products and online platforms relying on this type of production process, we still have relatively little understanding of what drives the growth of content in such environments. Lessons from what makes Wikipedia successful can inform open source projects and ‘wiki’-style platforms in a wide range of public and private sector organisations involved in research, education and innovation.

Without ‘spillover effects’, the growth in Wikipedia editing activity between 2002 and 2010 would have been halved.
Spillovers in content creation

Our study analyses a central question in the context of open content production: does individual content creation ‘spill over’ onto subsequent content creation by other users on the platform? In contrast with traditional modes of production, it is in the nature of the Wikipedia production process for spillovers between users to occur. Having a large pool of potential editors allows individual contributors to add small pieces of information to an article and rely on subsequent users to develop the content further. How important such effects are quantitatively is the empirical question that our research aims to address.

In contrast to a more traditional editorial process, a Wikipedia user does not need to provide the entire content on a particular topic. Relying on a managerial structure explicitly to organise and coordinate the editing activity is also unnecessary. Instead, a large set of anonymous users interacts in the creation of content. A change in article content might influence other users by providing new information about a topic or by making potential areas for further contributions salient to them, thereby inspiring them to contribute further to the article.

In our research, we estimate the magnitude of these spillover effects and quantify their role in the growth process of Wikipedia content. We are able to do this because of the availability of very detailed information on editing behaviour on Wikipedia. The platform stores the entire history of edits on every article, which allows us to track the evolution of content over time.

We focus our attention on Wikipedia articles that mirror the efforts of more traditional encyclopaedias, namely the incorporation of a given level of knowledge into online content. To this end, we analyse the subset of Wikipedia articles in the ‘Roman Empire’ category, for which knowledge is presumably relatively stable over time.

Analysing Wikipedia edits

Analysing these data over an eight-year period, we look at how weekly editing activity, measured by the number of weekly users, is influenced by cumulative past editing activity, measured by article length at the beginning of the respective week. We find a positive effect of article length on editing activity that is statistically significant and economically important.

Using the predictions implied by our framework, we quantify growth in editing activity in the absence of the spillover effect to assess its role in the overall growth process. Removing the spillover, we find that the growth in editing activity between 2002 and 2010 would have been halved (see Figure 1, which shows increases in the number of users relative to the first week in the sample in 2002).

More specifically, articles created in 2002 (the only ones that experienced the full growth process) would have had a substantially lower number of weekly users per article in the absence of the spillover. The difference in the growth trends becomes more pronounced over time as articles grow longer and it is strongest at the end of our sample period.

Moreover, article length leads to more editing activity by increasing the number of users editing a particular article. But we find no evidence that the length of edits changes as articles grow. Edits on longer articles are more likely to involve deletion of content and they are more likely to be

Figure 1: Growth in the number of weekly Wikipedia users with and without the ‘spillover’

![Graph showing growth in the number of weekly Wikipedia users with and without the spillover effect.](image-url)
This article summarises ‘Quantifying Spillovers in Open Source Content Production: Evidence from Wikipedia’ by Aleksi Aaltonen and Stephan Seiler, CEP Discussion Paper No. 1275 (http://cep.lse.ac.uk/pubs/download/dp1275.pdf).

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Further reading


Providing incentives for early users to contribute content will trigger further contributions