Classifying altmetrics by level of impact

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Introduction

In the light of current knowledge we can conclude that altmetrics do not present an alternative for traditional citation-based analysis of research impact (e.g., Haustein *et al*., 2014). Altmetrics have instead the potential to show some other aspects of research activities and provide a more nuanced view of the impact research has made on various audiences (Liu & Adie, 2013; Piwowar, 2013). Altmetrics come in many forms and from many different sources, all of which can represent different aspects of the online activity or of the different levels of impact that various research products have made on different audiences. What exactly the different altmetrics represent we do not yet know, but the greatest advantage of altmetrics may be exactly in this diversity.

Aggregating all altmetrics to a single indicator would remove this advantage. With aggregation of different altmetrics we are just creating another impact factor, another indicator that in the worst case is used for something that it is neither designed for nor capable of indicating. However, because of the wide variety of different sources for altmetrics, some form of aggregation or classification is needed and different types of classifications are already used by some service providers. Here we present another approach, one based on the level of impact. With this we hope to stimulate further discussion about the actual meaning of altmetrics.

Diversity of altmetrics

The diversity of altmetrics has two interesting dimensions; the diversity of people creating the altmetrics, and the diversity of the impact they indicate. In any research assessment what we want to measure is value or quality of research. Quality is of course very subjective and difficult to quantify. Because we cannot evaluate quality directly, particularly not at large scale, we use volume of impact as a proxy for value (i.e. number of citations or more recently number of online mentions).

The different data sources and different data types collected from the mentions of research products in various social media sites can represent a wide spectrum of different levels of impact. For instance, while a tweet does not necessarily hold any indication of impact other than awareness, a blog entry or a Wikipedia citation reflect some level of influence or impact. The people creating the altmetrics then again range from researchers and practitioners to the public.

Aggregating altmetrics

In social media analytics the mentions of brands and products in various social media are often placed and grouped together on a spectrum according to level of engagement, ranging from visibility to influence and finally reaching engagement as the most desired level of reaction. In the context of altmetrics, Piwowar and Priem (2013) write about the different "flavours" of impact that altmetrics could potentially reflect, referring to the diversity of altmetrics and possibility to group similar metrics into these "flavours". This is in line with the ideas presented at PLoS too, with different sources and different timings of altmetrics reflecting engagement from different audiences and possibly also that of different purposes for the engagement (Lin & Fenner, 2013).

This approach has already been taken by some of the altmetrics service providers as they group the data collected from various sources into what reflects different types of activities. PLoS for instance groups the metrics they use into views, saves, mentions, and citations. These do roughly translate to what we can assume to be different levels of impact, reflecting the variety of actions and interactions that one can have with the research products. Saving a research product suggests that the research product have made a bigger impact than just viewing it suggests, mentioning it suggests additionally increased level of impact, and citing it suggests what could perhaps be considered as the ultimate level of impact, at least when the goal is to investigate scientific impact.

Aggregation by the level of impact

Indicators of impact come in many diverse forms on the web and in social media and the different social media sites and the different activities within them can provide various metrics of different levels of impact. A potential approach to aggregating altmetrics would be to use these different levels of impact as they are and to not try to combine them according to source or type of activity they represent.

When the metrics indicate low impact we cannot really be sure whether the research has made any impact at all as evidence of it is usually not clear; a page view, clicking on a tweet button next to the article, or sharing a research article on Facebook, all indicate that the user has seen what they are sharing but nothing indicates that it has made any

impact on them, that they would have been influenced by it, or that they would have changed their behaviour because of it. Metrics indicating a medium level of impact would already come attached with at least some information that the research has made an impact, that it has in some way influenced the user. Whether the research product has been mentioned somewhere online or been bookmarked with the intent to use it later, the metrics generated from the activities at this level suggest that the users have been influenced some way, that the research has made at least some impact. Metrics indicating a high level of impact usually come attached with some additional, perhaps more qualitative data that we can use to investigate how the research has influenced the user and confirm what kind of impact it has made. A rough classification of different types of altmetrics that indicate different levels of impact could follow the one presented in Table 1. Besides impact, we can also measure reach with altmetrics; how many people have become aware of the research and how many of them have been influenced by it in some way.

Table 1. Levels of impact.

	Altmetrics		
Level of impact	Low	Medium	High
Reach	High	Medium	Low
Example activities	Awareness, visibility	Influence, interaction	Usage
Example metrics	Tweets, 'likes', shares, …	Mentions, downloads, bookmarks, …	Blog posts, …

More research is needed and both quantitative and qualitative methods are needed to confirm what level of impact different types of actions in different social media reflect and how they relate to each other.

Benefits of the proposed approach

Focusing future research on the level of impact has a couple of benefits compared to other approaches. First of all, impact is what we want to measure, hence grouping different metrics based on the level of impact they reflect makes sense. Second, using all the unique metrics (e.g., tweets, retweets, blog mentions, link in blogroll, Facebook shares, "likes", and mentions) would create a massive number of different metrics that would be difficult to a) keep track of, b) present, and c) control. Third, aggregating the different metrics by type of activity they represent may not give an accurate picture of the impact they represent, as similar types of activities on for instance different social media sites may be reflecting different levels of impact and/or different types of users. And fourth, aggregating all

the metrics into a single indicator would just be creating another impact factor, but this time from a much wider diversity of different metrics indicating different aspects and which probably should not be aggregated at all because of that. And finally, focusing on the different indicators for different levels of impact instead of some specific sites would not be such a vulnerable approach relying on the continued existence and goodwill of the social media sites to allow access to their data.

Conclusions

We propose the classification of altmetrics based on the level of impact reflected by the specific altmetrics. This approach would have some clear benefits compared to aggregations based on activity or source of altmetrics. More research is, however, needed to establish the different levels. The key challenges for future altmetric research are a) identifying the groups of people that create different altmetrics, and b) mapping the different levels of impact the different metrics reflect. This line of research would bring us again one step closer to fully understand what altmetrics indicate, and with that, the meaning of altmetrics. It is nevertheless important to recognize that the true meaning of any altmetrics lies in the stories behind the numbers. Hence it is important that any altmetrics are presented together with the accompanied stories to give the full context in which they have been generated.

References

Haustein, S., Peters, I., Sugimoto, C. R., Thelwall, M., & Larivière, V. (2014). Tweeting biomedicine: An analysis of tweets and citations in the biomedical literature. *Journal of the American Society for Information Science and Technology*, *65*(4), 656-669.

Lin, J. & Fenner, M. (2013). Altmetrics in evolution: defining and redefining the ontology of article-level metrics. *Information Standards Quarterly*, *25*(2), 20-26. http://dx.doi.org/10.3789/isqv25no2.2013.04.

Liu, J. & Adie, E. (2013). New perspectives on article-level metrics: developing ways to assess research uptake and impact online. *Insights: the UKSG Journal*, *26*(2), 153-158.

Piwowar, H. (2013). Altmetrics: what, why and where? *Bulletin of the Association for Information Science and Technology*, 39(4).

Piwowar, H. & Priem, J. (2013). The power of altmetrics on a CV. *Bulletin of the Association for Information Science and Technology*, 39(4).