

Andrew M. Demetriou, Amy van der Meijden, Jos Sloof, Matteo de Wit, Emiel Witting, Andreea Zlei and Cynthia C. S. Liem (Delft University of Technology) - Alexandria: a Proof-of-Concept Publication Platform that Treats Academic Outputs like Software Artifacts

What should scientific publication look like in the 21st century? Discussions abound with regards to the lack of wide-spread adoption of contemporary standards, such as open peer review, materials and data, adherence to pre-registration, interoperability of materials, the length of time from submission to publication, etc. We take a 'fail-loudly' approach to crowdsource a solution that will meet contemporary meta-science standards: specifically, we are building an online platform as a proof-of-concept, designed to inspire a response either in the form of collaborative efforts to design and build it, or alternative solutions.

Our proposed solution is inspired by best practices in software engineering, more specifically by the git versioning system, in two ways. Firstly, by open-sourcing and documenting every aspect of our process, we allow for easy cloning, forking and adjustment. The aim is to make it as simple as possible for others to either build on, or completely re-think our work in the case that our solution fails. The more individuals working on a solution, the more potential solutions offered, the greater the chances of finding a sustainable solution. As part of this effort, we aim to inform as many potentially interested parties as possible so that, should we fail, we will fail 'loudly'. Secondly, our git-inspired suggestion is an alternative form of scientific publication: we treat academic outputs similarly to software artifacts, as collective contributions to a 'living article'. An entire software team collaborates by working on components of a single piece of software, making continuous improvements, trying out new functionalities in separate branches, that will be merged upon approval.

Furthermore, at certain points in time, the software artifact may be deemed mature enough for an explicit release with a version number, while development can still continue thereafter. Similarly, we treat publications like software artifacts by providing a platform that allows for continuous collaboration on the components of scientific products. Using the functionality of git we allow for complete transparency of all reviews and contributions, massive online collaboration and replication, deconstruction of the whole into parts so that specific expertise can be applied to specific components, all in a single reproducible digital notebook submission format (quarto). Thus we present Alexandria: an open-source proof-of-concept online platform being developed by second-year bachelor students at Delft University of Technology.