Comparison of Preprint Publication Server Using Analytical Hierarchy Process

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Abstract. Publishing a scientific paper has many alternatives. One of them is to publish in preprint servers. In this work, we aim to compare available preprint servers by using several assessment criteria such as ease of citation and online accessibility. Based on the comparison, we recommend osf.io as a more convenient place to publish preprint articles. Osf.io meets the criteria of ease of citation and index on Google Scholar. Osf.io also fulfills several other assessment criteria.

1. Introduction
To make publications that are open and easily accessible, some researchers are encouraged to start publishing their work on several Preprint Servers. The preprint also serves as an initial stage for publishing scientific papers before they are published in journals or proceedings. This early-stage publication allows the author to get input and suggestions for improvements to the paper before the paper is published in a reputable journal.

There are various types of server preprint alternatives. Comparison and comparison between the preprint servers are needed so that researchers can choose which preprint server is suitable for them. This comparison, for preprint server managers, can be input and improvement. From these improvements will provide benefits for stakeholders

Several studies have been conducted that focus on examining the preprint. Some of them are exploring the new model of preprint [1], studying the relationship between preprint and some field of research [2] [3], exploring the importance of preprint [4], studying the relationship between preprint and plagiarism [5], and several other topics. However, we have not succeeded in finding a paper that tries to compare the preprint servers to compare one with a certain criterion. This needs to be done for the reasons as stated in the previous paragraph.

Through this article, we will review the quality of those preprint server. Through this paper, we will examine whether it has the features needed by researchers. Specifically, researchers who are interested in publicly and freely publishing their work for the advancement of science

2. Method
The method to be used, as shown in Figure 1, is using comparison and analytical Hierarchy Process \cite{6} \cite{7} \cite{8}. In the first phase, we will do a comparison between several preprint servers. From this comparison, several preprint servers will be studied in more depth. After that, the evaluation criteria will be made from each of the preprint servers. Each assessment criteria has a way to measure it. The final step is to build an additional guide to using the selected preprint server.
3. Result and Discussion
The first step is to establish preliminary criteria for the preferred preprint server. The criteria that we use is the preprint server which is quite general and not specific to certain scientific fields. This is because it will give the author the freedom to give thoughts and results of any research that he feels needs to be published without worrying about restricted topics. Some web pages have featured discussions and presentations on preprint alternatives. One comprehensive discussion process is on the Q&A menu of researchgate. Some of the list presented on that page, including the following:

1. Research Preprint Server List
2. Rising tide Preprint Server

Based on the alternatives presented there, we made a selection of preprint servers that were in accordance with the initial criteria of having a broad, general, and general range of knowledge. Some of the preprint servers are

1. PeerJ Preprints
2. Preprints (MDPI)
3. Figshare
4. Zenodo
5. F1000Research
6. Authorea / Winnower
7. HaL
8. Researchgate
9. Osf.io

Of the several alternatives, it is necessary to choose a server that has the expected features. Previously will be determined in advance the criteria used to choose. The main criteria in selecting a server are as follows:

1. Cover general knowledge
2. Indexed to Google Scholar
3. The indexing process on Google Scholar is quite fast
4. Allows writing in several Languages
5. Articles uploaded in the preprint can be cited
6. Citation done on the preprint paper is expected to be counted as a sum of citations
7. Have DOI
8. Have a link
9. There is sufficient freedom to make publications without being limited by long moderation and review processes

These criteria are measured by directly testing each preprint server. We use the hierarchy of analytical hierarchy process as shown in Figure 2. One method used is to test one piece of paper in the preprint and then see if there is also a paper on Google Scholar. Some servers apparently cannot fulfill these criteria. Citation criteria are also seen on Google Scholar. Some preprints also cannot be cited. Researchgate, for example, preprints can cite other papers outside Researchgate, but it turns out that citing researchgate preprints itself will not be counted. We conducted this trial in our paper [9] [10]. One analysis of the causes we found was possible because the researchgate paper on Google Scholar did not contain information on the year of publication. We evaluate the index speed criteria by seeing whether the paper published on today's date has been indexed on Google Scholar. Some preprints actually take longer, even up to several weeks. The moderation and review process is evaluated by looking at the submission procedures raised by the preprint website.

Based on these criteria, the best preprint server so far is the osf.io. preprint server. Osf.io has several important features that are reviewed in the criteria list. Paper published on Osf.io with a fast time soon appeared on Google Scholar. For example, the main paper takes five days from the first upload on osf.io until then recorded in Google Scholar [11]. The written upload date is May 11, 2020, on osf.io, when we checked Google Scholar on May 16, 2020, the paper was already listed in Google Scholar. Paper uploaded on osf.io can also be cited and the citation is recorded on Google Scholar. For
example, the paper titled “FBXL8 is differentially expressed and transcriptionally induced in MERS coronavirus infection” [12] published only on osf.io. The paper was cited by another paper which was also published in osf.io titled “IL6 and IL1RN is differentially expressed and transcriptionally induced in models of SARS coronavirus infection” [13] By the same author, in the same year. This allows the development of research networks more quickly. The citation can also be done not only by fellow osf.io but by papers from other journals, for example, a paper entitled The Scholarly Commons-principles and practices to guide research communication [14], also cited by a paper in another journal. The citations are counted and accumulated in the paper and also in the author's profile. The citation needs to write a link paper in the bibliography. For example, it can be written in an alternative form among the following or all three at once:

1. DOI code “doi: 10.31219/osf.io/g564w”
2. Access link that contains DOI https://doi.org/10.3897/rio.2.e9340
3. Access link to website https://osf.io/preprints/wcqsf/

So far we have not been able to find a citation process that displays without a link or DOI. It also needs to be tested on researchgate preprints using links. Osf.io also does not require a moderation that takes a long time during the upload process of the paper. Osf.io also allows publishing processes using any language [11]. We found several osf.io papers using Arabic and Italian.

4. Conclusion
Based on the process that has been carried out, we get the conclusion that we recommend OSF.IO to be used as a means to publish writing. Osf.io meets the established criteria. Further analysis can be performed after uploading experiments on the osf.io server. In addition, further analysis can be done using other criteria.

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