



BRIN

BADAN RISET
DAN INOVASI NASIONAL



5-7 October 2021
Virtual Conference

THE 2021 INTERNATIONAL CONFERENCE ON COMPUTER, CONTROL, INFORMATICS AND ITS APPLICATIONS

Learning Experience:

Raising and Leveraging the Digital Technologies During the COVID-19 Pandemic

Evaluating Excellence Webometric's Criteria Weight using Consistent Fuzzy Preference Relation Method

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Introduction

There are several world university ranking institutions such as the Academic Ranking World Universities (**ARWU**) from China, **QS** from the Quacquarely Symonds Limited institution, Times Higher Education (**THE**) World Academic Ranking, Center of Science and Technology Studies (**CWTS**) from the Netherlands, **Unirank** from Australia, **Webometrics** from Spain, **EduRoute** from Georgia.



Introduction

Among the university rankings, Webometrics focuses on **quantitative studies** related to website and content phenomena, including links, search engine performance, and technical analysis from an information science perspective [4].



Webometrics are widely used by universities to measure their qualities because the method is quite easy to measure. Since 2021, the Webometrics ranking method only consists of 3 criteria, namely **visibility**, **transparency (or openness)**, and **excellence (or scholar)**, with weights of 50%, 10%, and 40%, respectively [5]. The increase in the percentage of weight on the excellence criteria makes universities pay attention to achieve this score.

Introduction

MCDM

Several strategies were made to increase the acquisition of excellence scores based on several sub-criteria. Various criteria can be solved by using a **multi-criteria decision making (MCDM) approach**

AHP

$$c_2^n = n(n-1)/2$$

CFPR

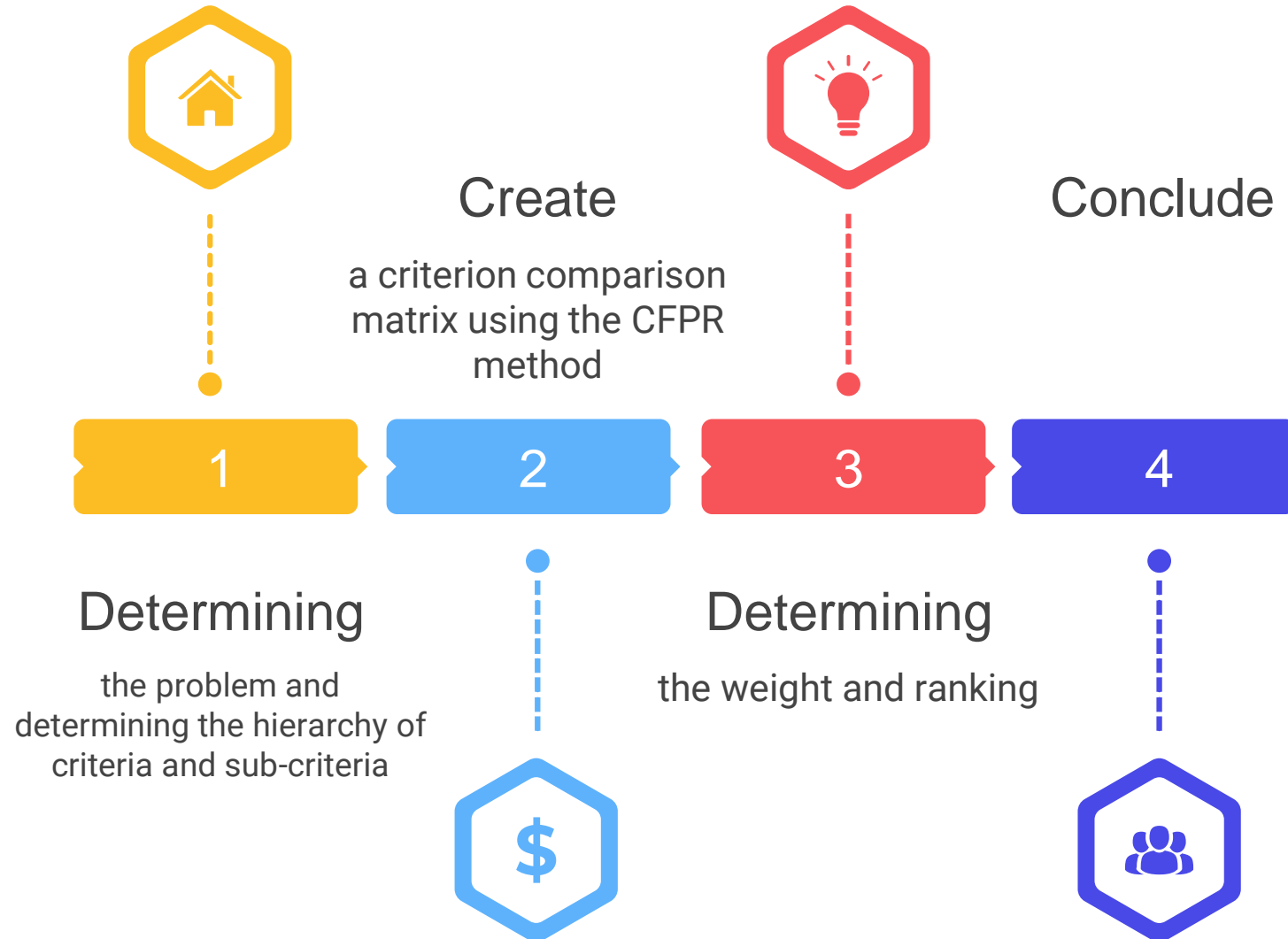
$$n-1$$

Criteria	C_1	C_2	C_3
C_1	(1, 1, 1)	x	z
C_2	z	(1, 1, 1)	x
C_3	z	z	(1, 1, 1)

AHP = $3(3-1)/2 = 3$ times
 CFPR = $3-1 = 2$ times

Consistent Fuzzy Preference Relation (CFPR) to reduce the amount of DM assessment steps, only as much as **$n-1$** to ensure consistency at the level with n criteria

Research Method



Research Method

CFPR

Criteria	C_1	C_2	C_3
C_1	(1, 1, 1)	x	z
C_2	z	(1, 1, 1)	x
C_3	z	z	(1, 1, 1)

Proposition 1

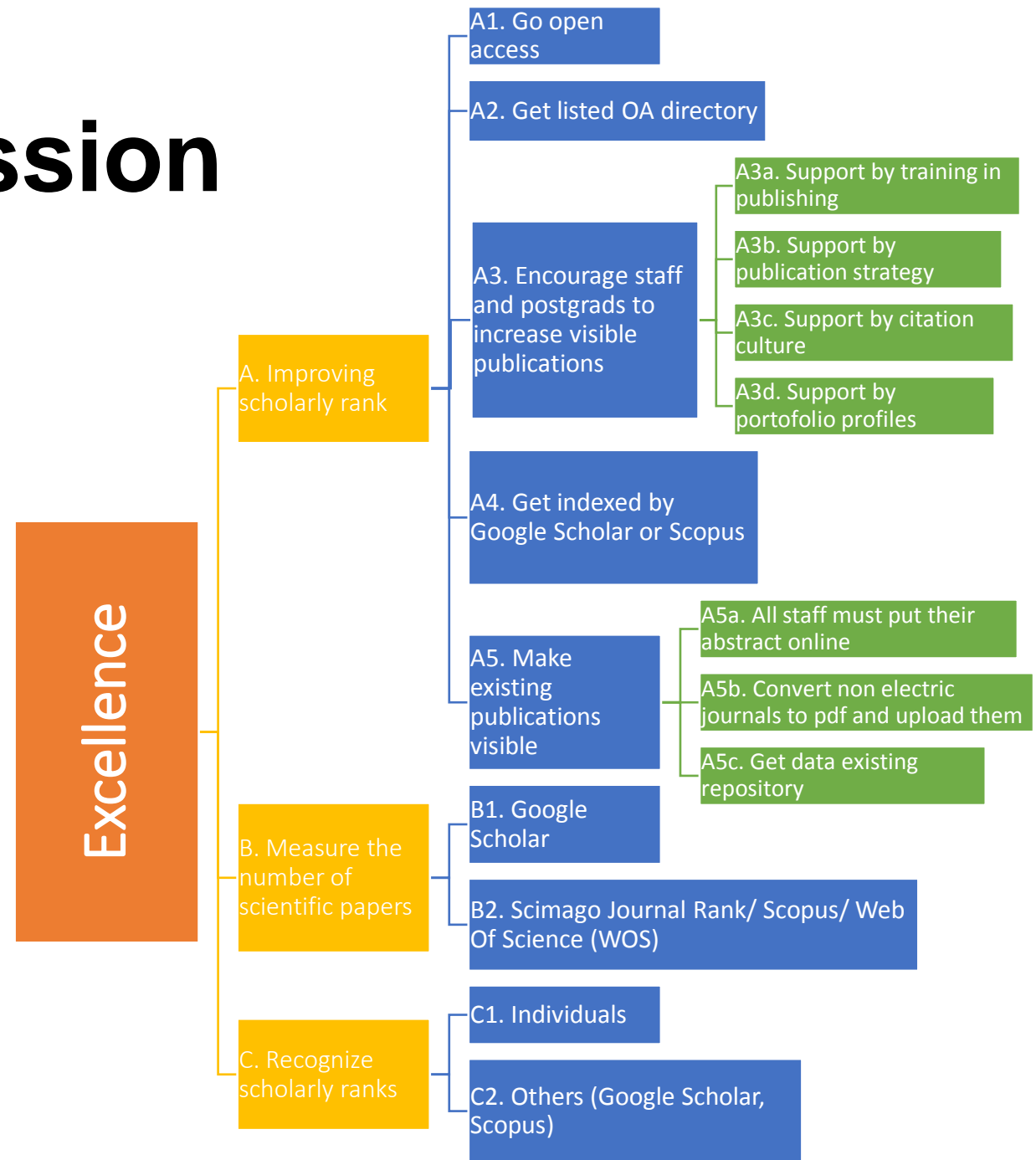
$$P_{ij} = g(a_{ij}) = \frac{1}{2}(1 + \log_9 a_{ij})$$

Proposition 3

$$P_{i(i+1)} + P_{(i+1)(i+2)} + \dots + P_{(i+k-1)(i+k)} + P_{(i+k)i} = \frac{k+1}{2}, \forall i < k,$$

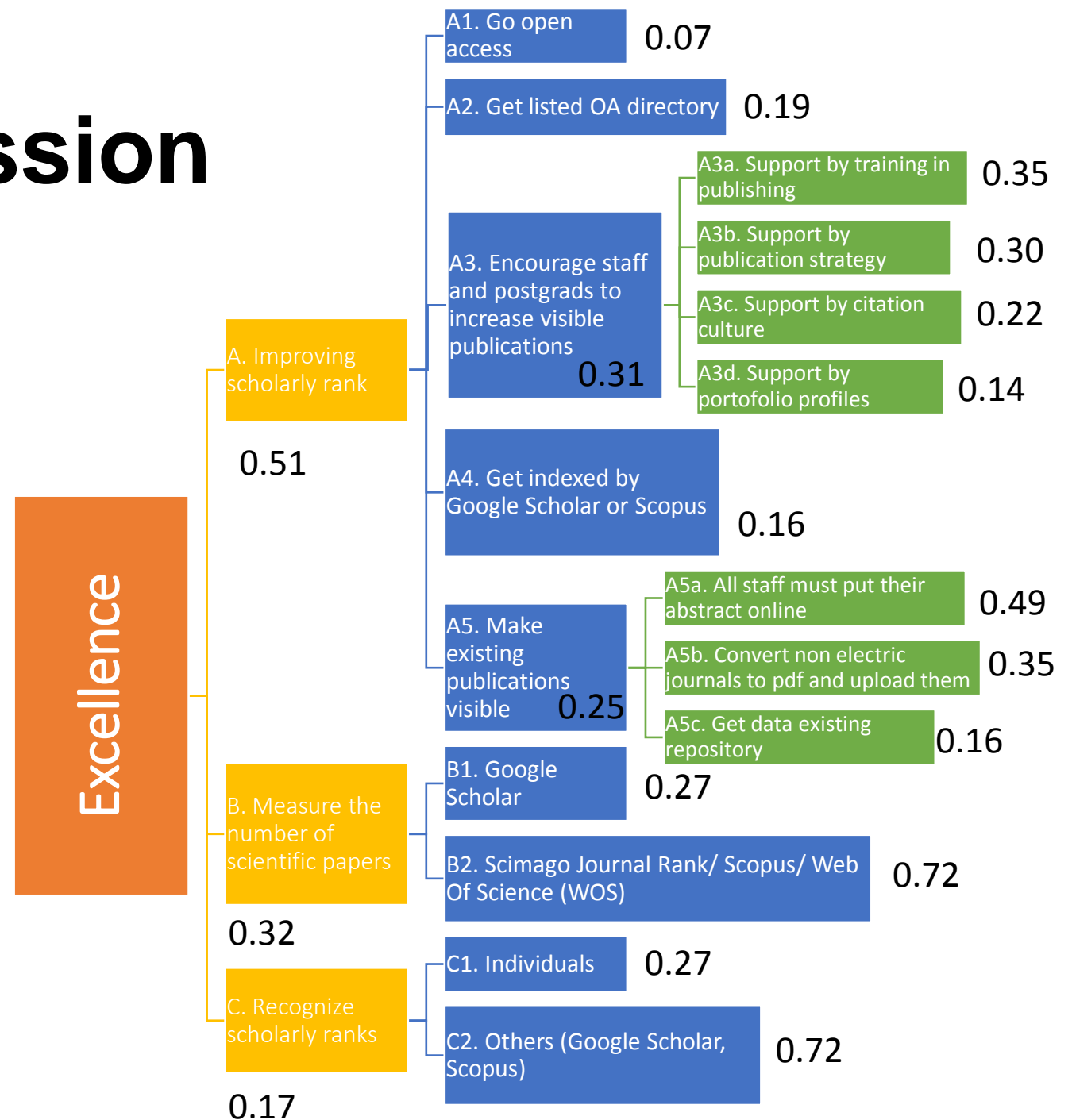
Result and discussion

The first stage in the research is to determine the problem and criteria. We have summarized the criteria and sub-criteria used to improve the excellence indicator in Webometrics. The main criteria consist **of improving scholarly rank, measuring the number of scientific papers, and recognizing scholarly ranks**. In contrast, the sub-criteria are used to detail the problems further to be solved. The goal is to determine the best **strategy to increase the excellence score** in Webometrics ranking.



Result and discussion

- Based on the results, it explains that the ranking on the main criteria is A>B>C. This shows that improving scholarly rank (A) is the **essential factor in improving the excellence** score on Webometrics. The following criterion measures the number of scientific papers (B), and the last is to recognize scholarly ranks (C).
- For sub-criteria A results, it can be seen that the highest ranking in the sub-criteria of improving scholarly rank is encourage staff and postgrads to increase visible publications (A3). In contrast, the lowest ranking is going to open access (A1). In general, the ranking in sub-criteria A can be written as A3>A5>A2>A4>A1.
- Referring to sub-criteria B results, it can be seen that the criterion of measure the number of scientific papers prioritizes measurements on ScimagoJournal rank/Scopus/WOS (B2) than Google Scholar (B1).
- Based on sub-criteria C results, it can be seen that the weights on the criteria (Google Scholar, Scopus) are higher than for individuals.



Conclusion

In this study, we investigate the factors/criteria to determine what strategy universities will take to improve the webometrics ranking on the excellence side. Based on the calculation results, it can be seen that the strategy for improving the excellence score is prioritized on three main criteria in sequence, namely improving scholarly rank (A), measuring the number of scientific papers (B), recognizing scholarly ranks (C). The sub-criteria for increasing scholar ranking can be prioritized on activities that support an increase in the number of citations, and the existing publications are undoubtedly visible.

Future Work

- Will be analyzed the improvement strategy in each university (case study)
- To oversee the activity of increasing webometrics scores in universities, this study considers the analysis of Strength, Weakness, Opportunity, and Threat (SWOT) so that strategic planning can run efficiently and effectively.
- The SWOT analysis is based on internal and external evaluation criteria. Internal factors are used to analyze the strengths and weaknesses of the organization. While external factors are used to identify opportunities and threats.
- The CFPR method that was built to determine the priority of each criterion combined with a SWOT analysis is proposed to see how far the readiness of three universities in Indonesia in the webometrics improvement strategy, by comparing performance excellence



**THANK
YOU**

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