

RINGKASAN

Sektor pertanian berkembang dan berinovasi seiring zaman dimulai dari usaha tani tradisional hingga penggunaan teknologi modern. Perkembangan sektor pertanian menghasilkan berbagai jenis teknologi yang dapat diterapkan pada kehidupan nyata yang mana penerapan tersebut secara global seringkali tampak tidak terstruktur tetapi memiliki pola tersembunyi apabila dihubungkan. Pola tersebut direpresentasikan ke dalam graf yang menunjukkan interaksi penerapan teknologi pertanian presisi. Penelitian ini menelusuri teknologi yang banyak digunakan pada pertanian presisi yang dapat dimanfaatkan sebagai sumber informasi dalam peningkatan teknologi.

Penelitian ini dilaksanakan pada Februari hingga Mei 2023 di pusat kegiatan mahasiswa Universitas Jenderal Soedirman menggunakan metode *social network analysis*. Data yang digunakan pada penelitian adalah paten terkait pertanian presisi yang ditelusuri menggunakan *International Patent Classification (IPC)* dan kata kunci tertentu, kemudian paten yang telah terkumpul dianalisis menggunakan *software Gephi 0.9.7*. Penelitian ini menganalisis karakteristik jaringan sosial serta hubungan antarklasifikasi paten. Jaringan sosial diketahui melalui perhitungan *density*, *average path length*, dan *modularity*, sedangkan hubungan antarklasifikasi diketahui melalui perhitungan *degree centrality*, *eigenvector centrality*, dan *betweenness centrality*.

Berdasarkan analisis pada 1000 paten pertanian presisi, jaringan sosial klasifikasi paten tergolong memiliki hubungan yang lemah. Satu sama lain tidak terikat kuat dan cenderung membentuk komunitas yang berbeda. Hal ini dibuktikan dari nilai *density* yang rendah, yaitu 0,001 dan nilai *average path length* relatif tinggi, yakni sebesar 5,999. Nilai *modularity* jaringan sosial mencapai 0,720 yang cenderung tinggi, menandakan terdapat komunitas yang terpisah dengan jelas di dalam jaringan. Sementara itu, berdasarkan *centrality* tertinggi, hubungan antarklasifikasi banyak dipengaruhi oleh metode pengerjaan tanah, adaptasi, dan visualisasi. Ketiganya memberikan pengaruh dalam kemajuan teknologi pertanian presisi selama 2020 – 2023.

SUMMARY

The agricultural sector develops and innovates with the times starting from traditional farming to the use of modern technology. The development of the agricultural sector produces various types of technologies that can be applied to real life where the application globally often appears unstructured but has a hidden pattern when connected. The pattern is represented in a graph showing the interaction of the application of precision agriculture technology. This research traces the technology that is widely used in precision agriculture that can be utilized as a source of information in improving technology.

This research was carried out from February to May 2023 at the Jenderal Soedirman University Student Activity Center using the social network analysis method. The Data used in the study were patents related to precision agriculture which were traced using International Patent Classification (IPC) and certain keywords, then the patents that had been collected were analyzed using Gephi 0.9.7. This study analyzes the characteristics of social networks as well as the relationship between patent classification. Social networks are known through the calculation of density, average path length, and modularity, while the relationship between classification is known through the calculation of degree centrality, eigenvector centrality, and betweenness centrality.

Based on the analysis on 1000 precision agriculture patents, social network patent classification classified as having a weak relationship. Each other is not strongly attached and tends to form different communities. This is evidenced by the low-density value, which is 0.001 and the average path length value is relatively high, which is 5.999. The modularity value of the social network reaches 0.720 which tends to be high, indicating that there are clearly separate communities in the network. Meanwhile, based on the highest centrality, the relationship between classifications is much influenced by the method of earthwork, adaptation, and visualization. All three have an influence on the progress of precision agriculture technology during 2020 – 2023.