

ABSTRAK

Proses monitoring termin pembayaran pada PT Karya Amaury Nusantara masih dilakukan menggunakan spreadsheet dan pemeriksaan manual sehingga berpotensi menyebabkan kesalahan dalam validasi urutan pembayaran. Setiap termin pembayaran memiliki hubungan ketergantungan (*dependency*) yang mengharuskan termin sebelumnya diselesaikan terlebih dahulu sebelum termin berikutnya dapat diproses. Penelitian ini bertujuan mengimplementasikan algoritma Kahn pada proses *topological sorting* untuk memvalidasi urutan termin pembayaran dalam aplikasi pengadaan berbasis web. *Dependency* antar termin direpresentasikan dalam bentuk *Directed Acyclic Graph* (DAG), di mana setiap termin dinyatakan sebagai simpul dan hubungan ketergantungan dinyatakan sebagai sisi berarah. Aplikasi dikembangkan menggunakan framework CodeIgniter dan basis data MySQL. Algoritma Kahn diterapkan untuk menghasilkan urutan termin yang valid berdasarkan nilai indegree setiap simpul sehingga sistem dapat menentukan termin yang dapat diproses sesuai *dependency* yang telah ditetapkan. Hasil penelitian menunjukkan bahwa algoritma Kahn berhasil diimplementasikan pada aplikasi pengadaan dan mampu melakukan validasi urutan termin pembayaran secara otomatis. Sistem dapat mencegah pemrosesan termin yang belum memenuhi ketergantungan terhadap termin sebelumnya serta membantu proses monitoring pembayaran menjadi lebih terstruktur, akurat, dan efisien.

Kata Kunci: Algoritma Kahn, *Topological Sorting*, *Directed Acyclic Graph*, *Dependency*, Termin Pembayaran.

ABSTRACT

The monitoring process of payment terms at PT Karya Amaury Nusantara is still conducted using spreadsheets and manual checks, which potentially leads to errors in validating the payment sequence. Each payment term has a dependency relationship that requires the previous term to be completed first before the next term can be processed. This research aims to implement Kahn's algorithm in the topological sorting process to validate the order of payment terms in a web-based procurement application. Dependencies between terms are represented in the form of a Directed Acyclic Graph (DAG), where each term is represented as a node and the dependency relationships are represented as directed edges. The application is developed using the CodeIgniter framework and MySQL database. The Kahn algorithm is applied to generate a valid sequence of terms based on the indegree value of each node, allowing the system to determine which terms can be processed according to the established dependencies. The research results show that Kahn's algorithm was successfully implemented in the procurement application and was able to automatically validate the sequence of payment terms. The system can prevent the processing of terms that do not meet the dependency on the previous term and help the payment monitoring process become more structured, accurate, and efficient.

Keywords: Kahn's Algorithm, Topological Sorting, Directed Acyclic Graph, Dependency, Payment Term.