

**SUPPLIER SELECTION USING FUZZY ANALYTICAL  
HIERARCHY PROCESS APPROACH  
(CASE STUDY AT PT NUSANTARA BETA FARMA)**

**FINAL PROJECT**

**By :  
PUTRI AULIA OKTRIANI  
1510932010**

**Supervisor:  
Ir. Insannul Kamil, Ph.D, IPM, ASEAN Eng.**



**DEPARTMENT OF INDUSTRIAL ENGINEERING  
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of Bachelor in Departement of Industrial Engineering, Faculty of Engineering,  
Andalas University*

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## ABSTRACT

A supply chain itself is a network of facilities that procure raw materials, transform them into final products, and deliver the products to customers through a distribution system that involves several stages, such as suppliers, manufacturers, distributors, retailers, and customers. Supply chain management is one aspect that has been considered important in the company. The concept that is developing in the current supply chain issue is the lean concept. Application of lean concepts in supply chain management can reduce or eliminate non-added value activities or waste along the supply chain flow, so that the level of productivity will increase. One of the chains in the supply chain is supplier. The relationship between companies and suppliers is very important. This is because the relationship between the company and its suppliers can affect the overall performance of the company. Application of lean concepts to suppliers will help companies to work with suppliers that really fit the company's needs.

PT Nusantara Beta Farma has many suppliers to supply raw materials for the production processes. Among the many raw materials, PT Nusantara Beta Farma has several exist raw materials that are needed in large quantities and are routinely used. PT Nusantara Beta Farma wants to keep this exist raw material stock in a safe stock range, where these exist raw materials are alcohol 95% and salicyl acid. Along with that, PT Nusantara Beta Farma also wants to maximize efficiency by minimizing or eliminating the problem of finding others supplier and being late in coming or rejecting raw materials. To achieve this goal, the lean supplier approach is used in finding key suppliers. The key supplier is selected from a supplier that supplies exist chemical raw materials. Selection of key suppliers can be done by various methods, one of which is the Fuzzy Analytical Hierarchy Process (Fuzzy-AHP).

Based on research that has been done, there are 8 criteria with 22 sub-criteria that have been obtained. These criteria were then weighted and the results obtained were quality (0,3433), service (0,2025), flexibility (0,2025), delivery (0,0695), cost (0,0570), quantity (0,1216), reliability (0,0035), and financial condition (0,0000). The weight of these criteria will affect the choice of suppliers. The supplier selection is carried out on two exist raw materials, namely alcohol 95% and salicyl acid. Based on the calculation results, it was found that CV Budiarta is ranked first for the selection of alcohol 95% suppliers. While PT Tirta Buana Kemindo is ranked first in the selection of salicyl acid suppliers.

**Keywords:** Exist Raw Material, Lean, Key Supplier, Fuzzy-AHP

## ABSTRAK

Rantai pasok adalah jaringan fasilitas yang melakukan pengadaan bahan baku, mengubahnya menjadi produk akhir, dan mengirimkan produk ke pelanggan melalui sistem distribusi yang melibatkan beberapa tahapan, seperti pemasok, produsen, distributor, pengecer, dan pelanggan. Supply chain management merupakan salah satu aspek yang dianggap penting dalam perusahaan. Konsep yang berkembang dalam isu rantai pasok saat ini adalah konsep lean. Penerapan konsep lean dalam manajemen rantai pasok dapat mengurangi atau menghilangkan aktivitas atau pemborosan yang tidak bernilai tambah di sepanjang aliran rantai pasok, sehingga tingkat produktivitas akan meningkat. Salah satu mata rantai dalam rantai pasok adalah pemasok. Hubungan antara perusahaan dan pemasok sangat penting. Hal ini dikarenakan hubungan antara perusahaan dengan pemasoknya dapat mempengaruhi kinerja perusahaan secara keseluruhan. Penerapan konsep lean kepada pemasok akan membantu perusahaan untuk bekerja sama dengan pemasok yang benar-benar sesuai dengan kebutuhan perusahaan.

PT Nusantara Beta Farma memiliki banyak pemasok untuk memasok bahan baku untuk proses produksi. Dari sekian banyak bahan baku tersebut, PT Nusantara Beta Farma memiliki beberapa bahan baku yang dibutuhkan dalam jumlah banyak dan rutin digunakan. PT Nusantara Beta Farma ingin menjaga stok bahan baku exist ini dalam kisaran safety stock, dimana bahan baku exist adalah alkohol 95% dan asam salisilat. Bersamaan dengan itu, PT Nusantara Beta Farma juga ingin memaksimalkan efisiensi dengan meminimalkan atau menghilangkan masalah mencari pemasok lain dan terlambat datang atau menolak bahan baku. Untuk mencapai tujuan ini, pendekatan lean supplier digunakan dalam menemukan pemasok utama. Pemasok utama dipilih dari pemasok yang memasok bahan baku kimia exist. Pemilihan key supplier dapat dilakukan dengan berbagai metode, salah satunya adalah Fuzzy Analytical Hierarchy Process (Fuzzy-AHP).

Berdasarkan penelitian yang telah dilakukan, didapatkan 8 kriteria dengan 22 subkriteria. Kriteria tersebut kemudian dibobot dan didapatkan hasil yaitu kualitas (0,3433), pelayanan (0,2025), fleksibilitas (0,2025), pengiriman (0,0695), biaya (0,0570), kuantitas (0,1216), keandalan (0,0035), dan kondisi keuangan (0,0000). Bobot kriteria ini akan mempengaruhi pilihan pemasok. Pemilihan pemasok dilakukan pada dua bahan baku exist, yaitu alkohol 95% dan asam salisilat. Berdasarkan hasil perhitungan, ditemukan bahwa CV Budiarta menduduki peringkat pertama untuk pemilihan pemasok alkohol 95%. Sedangkan PT Tirta Buana Kemindo menduduki peringkat pertama dalam pemilihan pemasok asam salisilat.

**Kata Kunci:** Bahan Baku Exist, Lean, Key Supplier, Fuzzy-AHP