Empowering Supply Chain

Al-Driven Supplier Indexing and Recommendation

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Problem Statement

Understanding the structure and dynamics of the supply chain enables businesses to optimize their production and distribution flows and to prepare for potential disruptions.

Who are the critical suppliers? What are their characteristics?
Where does a client company stand relative to its competitors?
Who are the best suppliers for the client company given industry patterns and client-specific needs?

Objective

Developing an indexing method to identify key suppliers in a supply chain
Building a recommendation system that recommends the set of best potential suppliers for any company of interest

Dataset

Factset Supply Chain Relationships
- name, country, industry, partnership type, start/end date for each supplier-customer relationship.

Factset Relevance Rank
- Relevance grade assigned to suppliers in each customer-supplier relationship.

Arabesque
- Company-specific sustainability scores, rated based on Environmental, social and governance (ESG) indices

Pilot Industry: Mining and Mineral
- 4065 Reported Relationships
- 2052 Unique Companies
- 538 Unique Suppliers
- 74 Unique Countries

Methodology

Phase 1 – Supplier Indexing
Goal: Obtain a score representing the relative importance for each supplier

- Ranking
- Uniqueness
- Centrality Measures

- How valuable is the supplier to its downstream customers?
- How replaceable is the supplier?
- How important is the supplier from a network perspective?

Phase 2 – Supplier Recommendation
Goal: For a target company, recommend the set of best suppliers given industry patterns and client-specific needs

- Company Segmentation
- Rating Construction
- Recommendation Algorithm

- Ex. “I want the TOP 5 suppliers that are in Mining and Mineral and have sustainability scores above 50 in Canada”

Results

Phase 1 – Supplier Indexing
Top-10 suppliers in Metals and Mining are:
- Franco-Nevada Corp (100)
- Pennar Industries Ltd. (98)
- Sand-Storm Gold Ltd. (92)
- Assa Abloy AB (85)
- TOCALO CO., Ltd. (84)
- ArcelorMittal SA (84)
- KCP Ltd. (76)
- POSCO. (74)
- Prism Johnson (73)
- Alrosa PJSC (63)

Phase 2 – Supplier Recommendation

Ex. “I want the TOP 5 suppliers that are in Mining and Mineral and have sustainability scores above 50 in Canada”

Future Works

Short Term:
- Expand drivers in previous analysis
- Improve on interactive user interface

Long Term:
- Simulation

Business Impact

- 21.4% improvement in RMSE compared to the baseline
- Expected to save over 21,000 work hours if applied to all companies in Mining and Mineral
- Customizable recommendation results from Web Interface
- Highly adaptable to other industries