

USING UNSUPERVISED LEARNING FOR DATA-DRIVEN PROCUREMENT DEMAND AGGREGATION

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SOLUTION DESCRIPTION

- Demand Aggregation to Bi-clique clustering**
Construct vendor - item bipartite graph
- Problem re-definition**
Find max bi-cliques is equivalent to biggest potential Demand Aggregation (DA) patterns
- Procurement specific customisations**
Requirements for parameters such as min/max purchasing value, volume, trends over time etc.
- Work in realistic production scenario**
Bi-clique clustering is NP-complete but DART is polynomial complexity!

WHAT IS DART ?

Efficient engine for discovery of opportunities to **aggregate multiple similar purchases by independent buyers** fractured across organization.

DART is based on a probabilistic bi-clique clustering algorithm that runs in polynomial time.

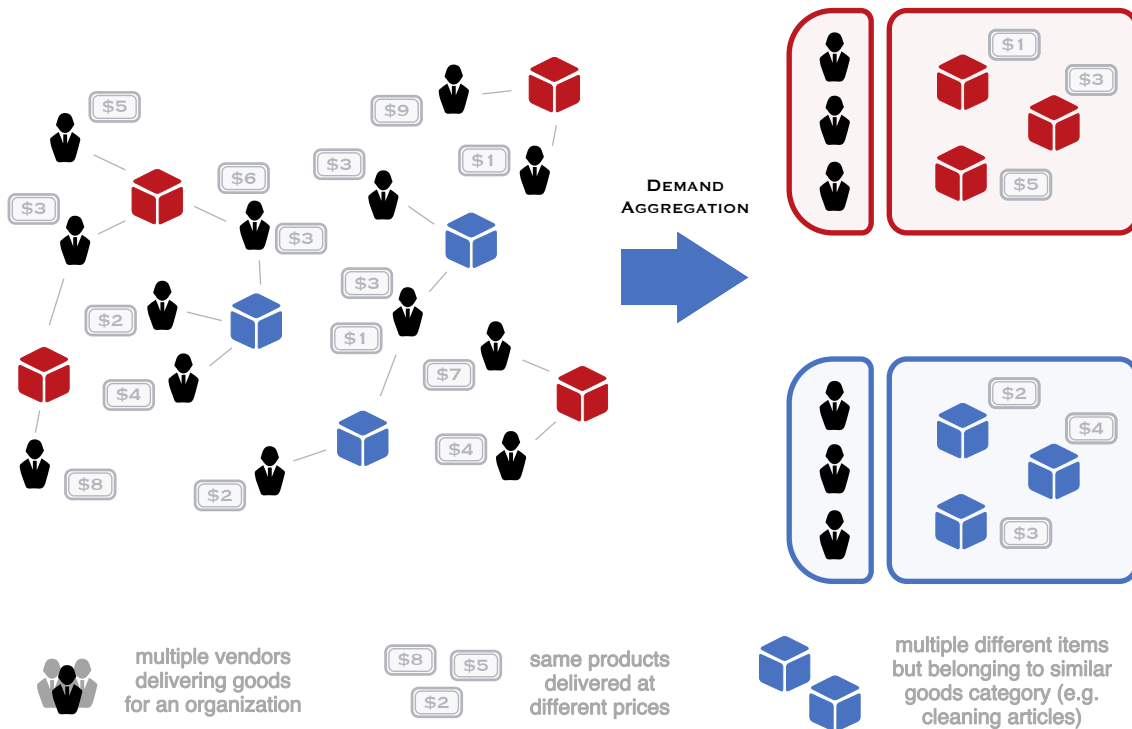
BENEFITS OF DEMAND AGGREGATION?

- Lower prices in bulk purchasing contracts
- Larger vendor tendering
- Lower shipping and handling fees
- Reduced legal and admin overhead

EVALUATION AND DEPLOYMENT

- Evaluated on 3 year procurement database**
271,219 items x 7,319 vendors [1,032,275 POs]
- 3 rounds of evaluation**
Modifications to bi-clique clustering algorithm and adding procurement post-processing filters
- Deployed in A*STAR Procurement Office**
Decision support system for annual reports

HOW DOES DEMAND AGGREGATION WORK IN AN ORGANIZATION?

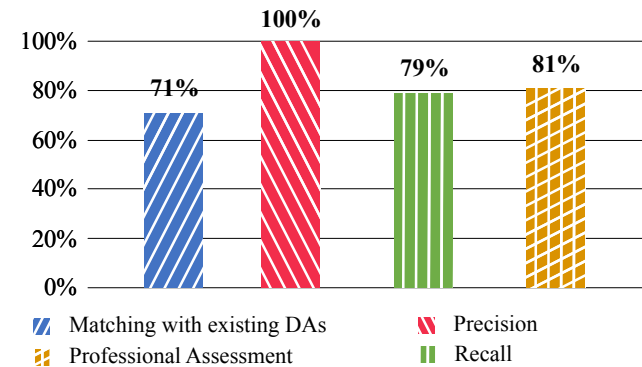


UNDERSTAND THE PROCESS

- **Collate and combine** requirements of multiple buys
- **Contract** suppliers based on combined demand
- **Standardise and establish** best-buy strategy

KNOW THE PROBLEM

- **Fractured purchasing process** done individually by departments and units results in similar buys for different prices from multiple suppliers
- **Big amount** of data makes it difficult to understand best options for cost savings
- **Complex network** of suppliers, items they provide, prices and demand over time makes it difficult to solve this multi-variate problem with standard approaches



TECHNOLOGY USAGE

- **Language** | JAVA 8
- **3rd Party Libraries** | Apache 2.0 + LGPL
- **Commercialisation and Use** | Semantist startup