

Making More Miles: Automating Load Selection, Truck Dispatch, and Backhaul Activation in Outbound Logistics Operations

LFMcapital

BUSINESS PROBLEM

IronCraft has achieved explosive growth over the past several years. The company's backlog has increased substantially as demand exceeds both production and shipping capacity. Organically grown processes that were effective at small volumes are creating operational challenges and lost revenue as the operation's scale increases. Specifically, it uses several short-term heuristics and locally optimal policies that conflict with their greater business objectives. In order to recognize the revenue contained in its backlog and meet growth goals, IronCraft must double its shipping capacity and determine the best logistical strategies to magnify the benefit of any additional capacity created through optimization.

DATA SOURCES

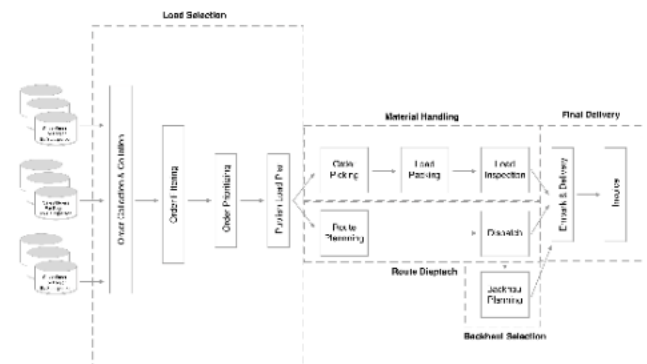
The data used in this investigation was collected manually from observing processes and digitizing manufacturing/logistics records. The methods developed in this investigation require minimal internal data collection and rely on large external data sources available through APIs like Google Maps and the Old Dominion Pricing Tool.

Data Types and Format

Time series, spreadsheets, API enabled graph databases.

APPROACH

The investigation began with preliminary analyses of operationally relevant departments; resulting in capacity, utilization, and cost benchmarks. Compelling opportunities were then identified in each relevant department, creating case studies to develop and test proposed automation/simulation methods. Each of these methods are compounding and contribute individually to solving the business problem.



IMPACT

This project aims to deliver increased operational profitability, improved dealer/customer experiences to fuel further growth, and maximized shipping/logistics capacity without additional capital expenditure. Specifically, this will be accomplished through the development of a logistics software suite dashboard that will allow users to interact with logistics planning algorithms and view relevant inbound/outbound logistics metrics. Key modules of the dashboard will also be delivered as part of this project. These modules include an automated modality planner, a dispatch module, a trailer-load optimization module, and a production scheduling module. In addition to the software tools, the project will deliver a logistics data reporting pipeline and several operational logistic key performance indicators (KPIs). These deliverables will ensure that the software dashboard and its accompanying modules have the data required to function optimally while allowing the company's leadership access to the latest relevant information to certify that the logistic capability is being utilized appropriately. The project is expected to impact IronCraft by increasing its shipping capacity by 25% and improve its on-time delivery KPI to 60- 80%.

DRIVERS

The major driver of this project was the need to identify process improvements for the outbound logistics department that would allow it to scale to meet future growth goals and unlock synergies across the brand portfolio.

BARRIERS

Small sample sizes for available historical data. Multiple confounding variables. Hesitation from organization around automation and algorithmic implementation. No ongoing optimization or data efforts or projects at the company.

ENABLERS

This project was enabled by strong support from the partner company and its management. Additionally, the size of the company allowed the project to reach the appropriate depth and breadth within the company to access data and implement test cases.

ACTIONS



Spoke with subject matter experts about current process and potential improvements. Performed analysis to identify relevant KPIs and ground truth performance. Built software to implement algorithmic decision making, process automation, and process evaluation dashboards.

INNOVATION

The use of automation and optimization algorithms to aide employees as they make decisions about what orders to fulfill, how to fulfill them, and how profitable their decisions are in real time.

IMPROVEMENT

By applying algorithmic search methods, this project demonstrated how automating various capacity management strategies and tasks for employees could potentially save up to \$873,396, generate an additional revenue of \$1,193,618, and lead to higher employee and customer satisfaction in a small manufacturing operation.

BEST PRACTICES

Be sure to enlist a project champion from the management team, as a sense of urgency from management removes barriers and enables broader access to potentially useful and valuable resources.

OTHER APPLICATIONS

The final software platform would be applicable to any manufacturing organization that has to decide which orders to fulfill and on what modality within business