IPRO 305: Trailer Loading Optimization Group

Advisor: Herb Shields

Sponsor: DSC Logistics
DSC Logistics

- Founded 1960 in Chicago
- Current CEO: Ann Drake
- Logistics and Supply Chain Management
- About 2000 Employees
- Warehouses Nationwide
Problem Statement

Incoming Inventory Storage

Transportation Planning

Staging the Loading Area

Trailer Loading
Our Goal

- To provide an efficient software solution for DSC Logistics.

Main Factors:

- Order Stops
- Weight Distribution
- Orientation/Stack-ability
Team Structure

**Research Team**
- Xingshuo Liu (Sub Team Leader)
- Nixalkumar Patel
- Nuntana Buakong
- Parth Shah
- Tom Pekalski

**Technical Team**
- Donald Taylor (Sub Team Leader)
- Robert Veitch (Team Leader)
- Benjamin Hinshaw
- Prashanthan Surendran
- Sean McKeever
Documentation

- Team minutes
- Igroups
- Conference calls
- Regular meeting
- Sub-team meeting
Ethical Issues

- Privacy of the Company
- Non-Disclosure Agreement
- Legal Legislation vs. Customer Satisfaction
Obstacles & Challenges

- Converting intuition into rules
- Adaptability of the software
- Constant upcoming problems
- Time constraint
Initial Research

- Reviewing existing technologies.
  - How they operate
  - Their functions/features

- Built software from ground up
  - Requirements/specifications
  - Easy user interface
  - Cost-efficient
  - Customization
  - Integrate with DSC’s WMS and TMS systems
Problem Solving

- Conference calls
- Sub-group meetings
- Online Resources
Warehouse Visit

- Visiting DSC
- Start working on the algorithm
Start application in 30 minutes.

Retrieve a list of CSV files within Network Directory.

Files exist in Network Directory.

All three files were moved successfully.

Find outbound file with oldest time-stamp.

Check if this outbound has an associated shipment file and comment file.

Exit Application.

Normal Termination

Import data from the three files in CSV Directory to the MySQL database.

Import was successful.

Delete all three files within CSV Directory.

Move oldest outbound and associated shipment file.

Import data from all three files in CSV Directory to the MySQL database.

Output Error to Error-Log.

DSC will provide three CSV files that contain pallet Information, in a Network Directory. Outbound file, Shipment file and Comments file.

DSC will continuously purge data into the Network Directory.

In order to prevent collisions, this software (Importer) will move the completed CSV files to a different directory (CSV Directory).

Once this has been done the importer will import data from the CSV files into the MySQL database.
This TLOS application is written in JSP. It is designed to run on the Tomcat Server.

The two web-pages show in the diagram are the only visible components of the software.

The processing is done in the background by using JAVA classes and is not visible to the user.

Page-1 (Form page) is the home page. Page-2 (Results page) displays the pallet positions.

MySQL Database

The database contains pallet information (weight, height, Pallet-ID, etc).

A group of pallets contain the same Outbound number. I.e: They are to be loaded into the same trailer.

CSV File Format

The application also outputs a CSV file as shown. The CSV file includes the same pallet positions displayed on page-2 for future use by DSC.
Algorithm

- HTML, JavaScript, CSS
- Background Script
- Processor Script
- Installer Script

...And that, in simple terms, is how you increase your ranking on search engines.”
Web Based User Interface

Trailer Load-Optimization System

Enter an outbound number, choose a trailer size, and click "Optimize."
Added Value

- Avoid overweight fines and associated costs
- Minimize labor time
- Axle weight calculation help minimize transient damage
- Minimize cargo damages
- Reduce transportation costs
Future Applications

- Increase Adaptability
- Secure Login
- Dynamic Sorting Algorithm
Conclusion

- A more efficient way to operate
- Reduce waste
- Increase productivity and speed of delivery
- Provide a better working environment