Crowley Maritime is a marine solutions, energy, and logistics service company that dispatch office monitors and allocates tugboats to both assist and escort ships as they come into the harbor in the PNW: Pacific Northwest or LA/LB: Los Angeles/Long Beach, and San Diego areas.

The dispatchers consider numerous factors to optimize the allocation of tugboats and minimize the overall cost for Crowley Maritime.

Current State

- Scheduling jobs is based on experience and intuition, resulting in vastly different solutions from one dispatcher to the next.
- There is little documentation on how to make dispatching decisions, and a lack of performance metrics to evaluate the success of a dispatcher.

Project Goal Statement

Define a standard set of rules for dispatchers to follow in all scheduling scenarios based off of their current best practices.

Use this to create a foundation for a scheduling tool that can be used in the future to minimize scheduling conflicts, maximize profits for Crowley, and keep Crowley's customers happy.

Objectives

- Document current dispatcher behavior
- Provide future recommendations
- Provide future recommendations
- Dispatch feedback survey
- New dispatcher training program
- Job time estimations
- Rules tables
- Functional diagrams

Introduction and Background

- Crowley Maritime is a marine solutions, energy, and logistics service company.
- Dispatch office monitors and allocates tugboats to both assist and escort ships as they come into the harbor in the PNW: Pacific Northwest or LA/LB: Los Angeles/Long Beach, and San Diego areas.

In order to create the foundation for a scheduling tool for Crowley, we had to learn how to dispatch, and understand all factors that go into scheduling a job. Accomplished by:

- Collecting Initial Information
  - On site observations
  - Q&A sessions
  - Dispatch survey

Analyzing the Results

- Ishikawa diagram
  - Job time analysis
  - Quantifying survey responses
  - This uncovered 3 requirements essential to the success of a scheduling tool, defining what our deliverables needed to be:
    1. A documented process to indicate when decisions must be made
    2. A standard set of best decisions, and their exceptions for every scheduling scenario
    3. Historical data to back up decisions and reduce variability in dispatcher's judgement

Methodology

1. Collect Data/Info
   - On site observations
   - Q&A sessions
   - Survey results
2. Build on Deliverables
   - 1. Functional diagrams
   - 2. Rule tables
   - 3. Job time estimations
   - 4. Training Package
3. Validate Deliverables
   - Discuss current state of deliverables with dispatchers and test if information accurately depicts their best practices
4. Deliverable Development Cycle
   - Hand Off Deliverables
   - New dispatcher training package

Results

- Functional diagrams
  - Provides overview of all aspects of dispatch job
  - Clearly outlines all steps of the job scheduling process

- Rule tables
  - A detailed compilation of best practices when dispatching
  - Provides order to what is most important when scheduling, executing, and strategizing jobs

- Job time estimations
  - References to historical information offering data driven solutions
  - Provides easy way to identify travel time for all jobs, taking multiple factors into consideration

- Training package
  - Provides all tools (deliverables 1-4) along with detailed documentation
  - Enables proficiency in best dispatching practices at Crowley

Immediate Benefits:

- Reduced dispatch learning curve
- Creates basis for performance
- Enables continual improvement
- Long-term benefits:
  - Job delays down
  - Sub outs down
  - Tug utilization up

Conclusion

Recommendations to Crowley:

- Add new rules to the rules table as novel scenarios arise
- Update the functional diagrams as Crowley's dispatching process changes
- Train new hires using the rules tables and functional diagrams
- Develop a software tool to assist the dispatch team using our deliverables and data

Potential Software Products:

- Travel time calculator
  - Generates tug travel time considering:
    - Speed, weather, tide direction, traffic, tug type
- Job time estimator
  - Generates job time based on:
    - Job type, harbor or berth, ship, tug type
- Scenario suggestions
  - Offers different suggestions for tug allocation
  - Ranks suggestions
- Potential job finder
  - Analysis of competitors tug positions and future commitments
  - Alert when a sub-in is possible

Acknowledgements

Thank you to our professor, Patty Buchanan, our sponsor, Doron Feuer, Crowley's dispatch manager, Derrick White, and the entire Dispatch Team, for providing a huge amount of support, knowledge, and feedback for our project. Thank you to Crowley for providing a wonderful project opportunity!