



Optimizing Ports through Intelligence

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Current Problems



Excess Inventory

- Too many containers stacked up
- Companies are using the ports as warehouse
- Limited land



Truck Congestion

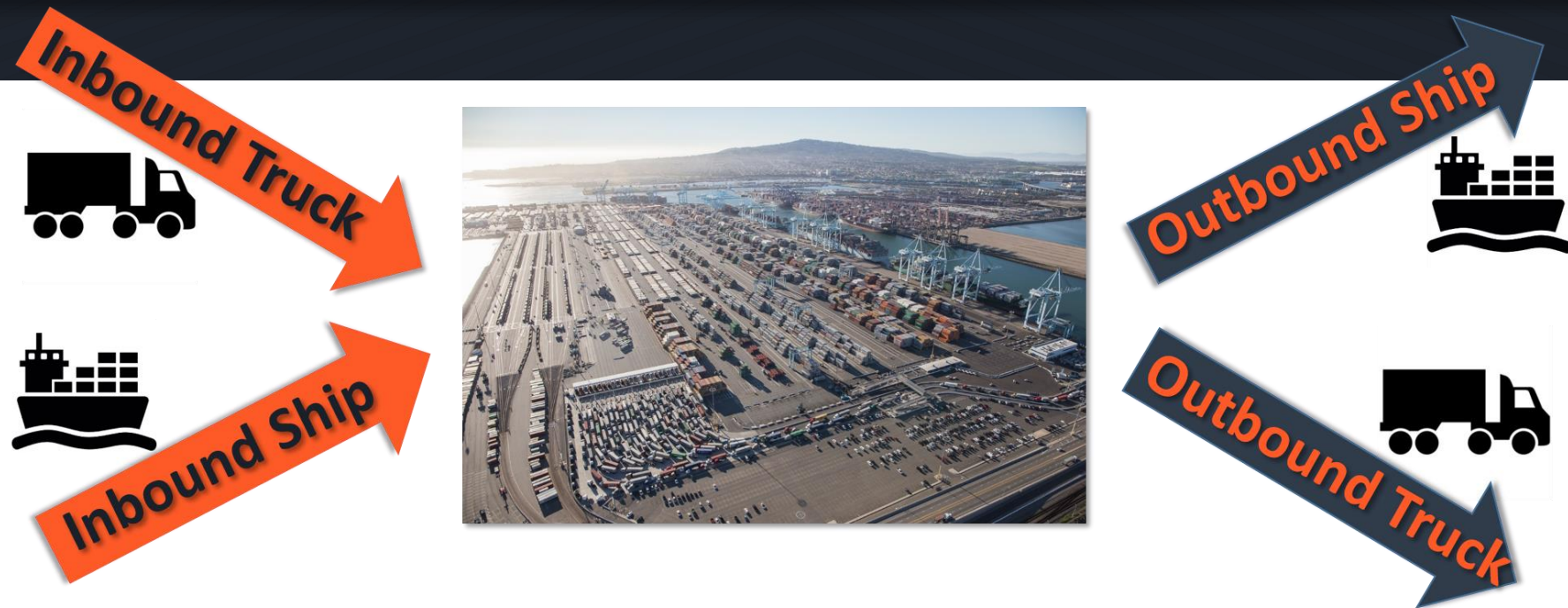
- Long queue on the gates for trucks
- Appointment system can't work properly, some terminals even don't have one
- Uneven appointment time distribution



Information Silo

- Low efficiency communication
- Competitors won't cooperate
- Different regulation and limits of authority

Flow of Containers

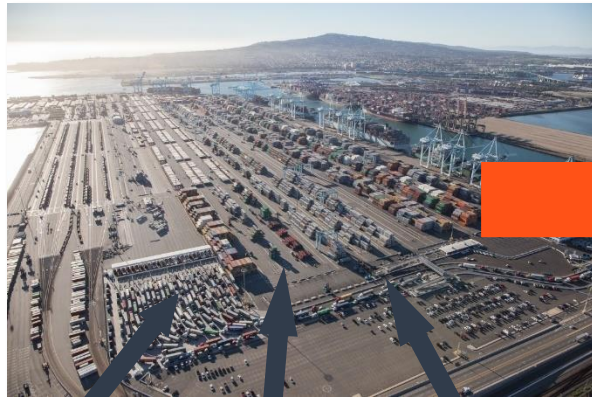


Our main target is to **balance** the outflow and inflow of containers on the terminal so that there is minimal accumulation of inventory to boost our supply chain **efficiency**.
It's **hard** to control over the arrival and departure of the **ships**

However we can control the arrival and departure of goods coming in through **trucks**.

Flow of Containers

**Original
Appointment
System
(Pull System)**



(Push System!!!)

Our solution “PORT.IQ” is not a truck appointment system but an **intelligent scheduling system** through artificial intelligence and transparent data flow.

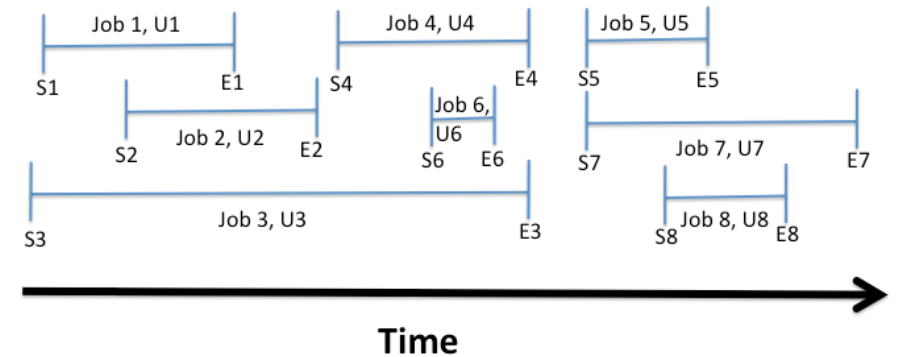
Detailed Algorithm

Core of the Algorithm:

Weighted interval scheduling

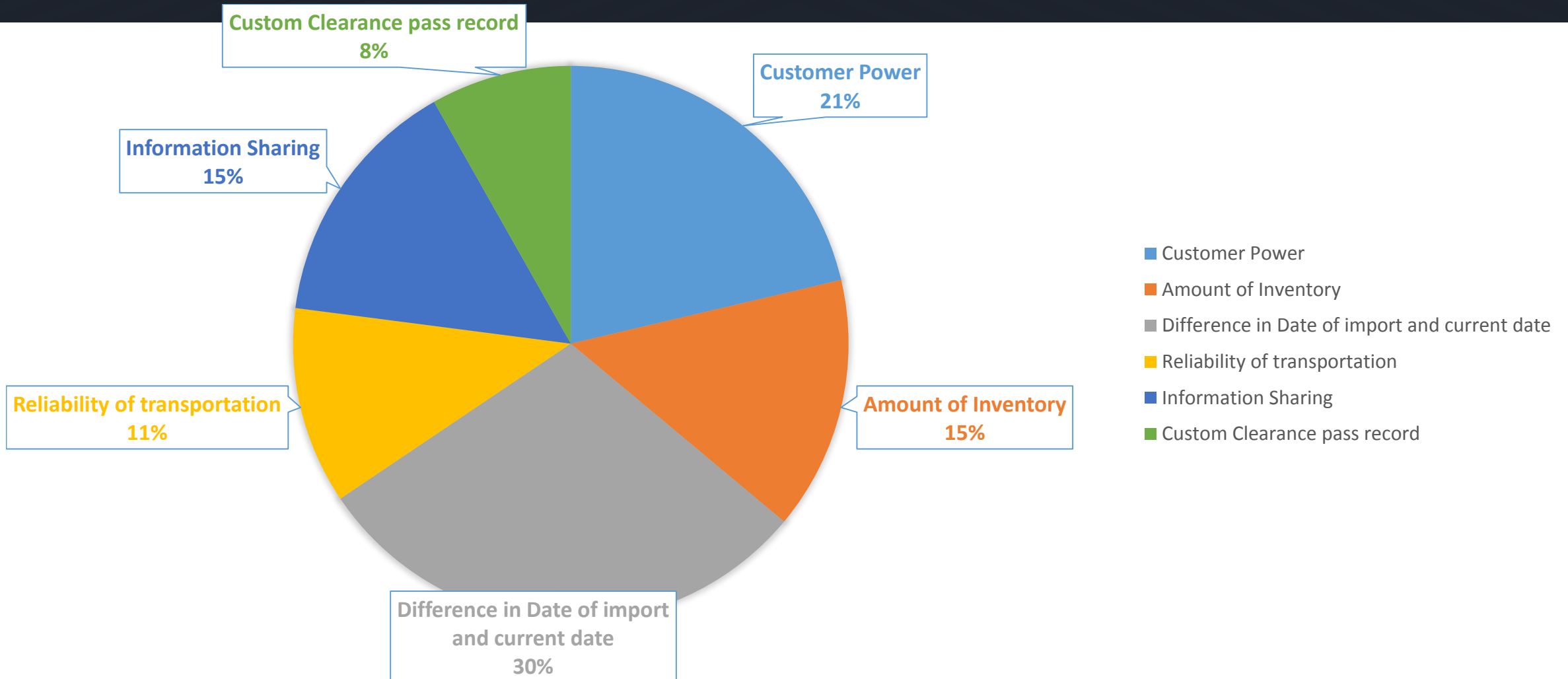
Using the backend **process variables** (Factors such as Time containers spend on yard or Customer's importance, described in the slide 5) to determine the weighting.

An "interval" is considered to be the period during which **a particular container is going to be at that port**. For a given container space slot, companies with a **higher weighting** are prioritized to be scheduled.



Weighted Interval Scheduling finds the set of non-overlapping jobs that maximizes the sum of utility.

Our Current Back End Process Variables (Assumptions)



Detailed Algorithm

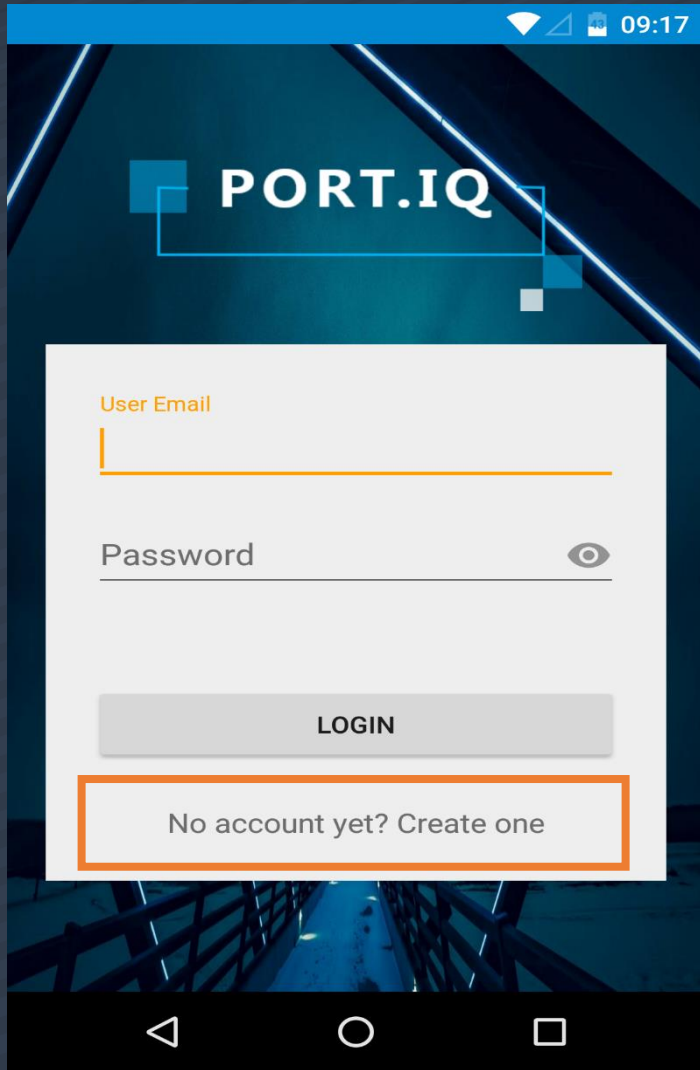
On a Port Terminal level:

Since we know the **desired times and schedules** of the different companies at the port in full detail, we can optimize the **assigned pickup times to the truckers**. Given that we know the stacking of the packages at the gate (the queuing), assign the notifications for the truckers to meet at the gates in the conflict-free order according to the stacking.

For example, with an order of A,B,C we could assign trucker A to come at 10am, B to come at 11:00am, C at 12:00pm (if they all wanted to pickup on the same day).

If company has to cancel, suggest a **new time slot** (based on **expediate vs delay options** in the app) to reduce the amount of rearrangements that have to be made.

System Description

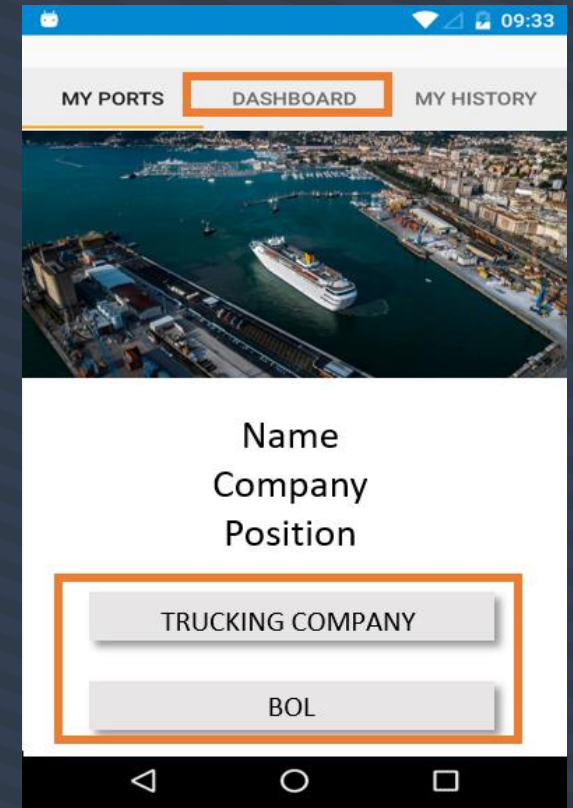


For first time users, their

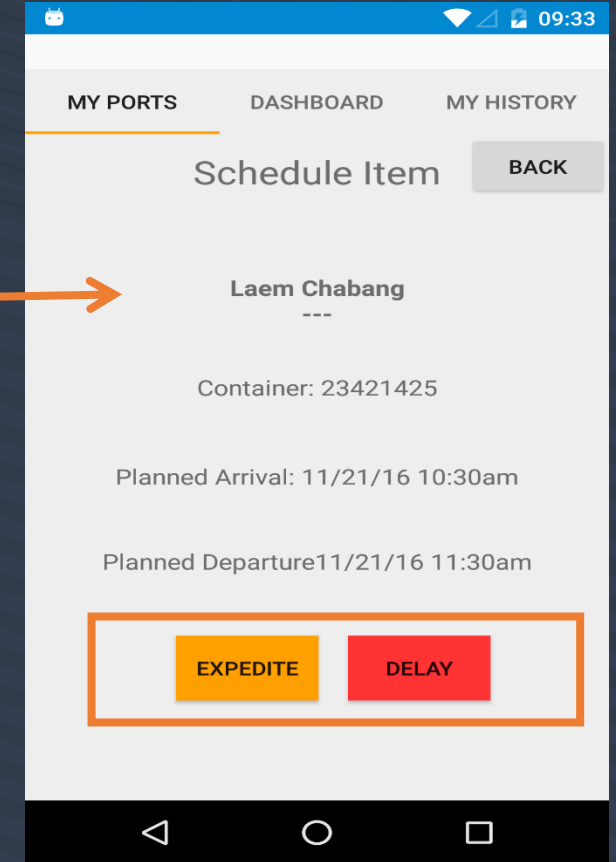
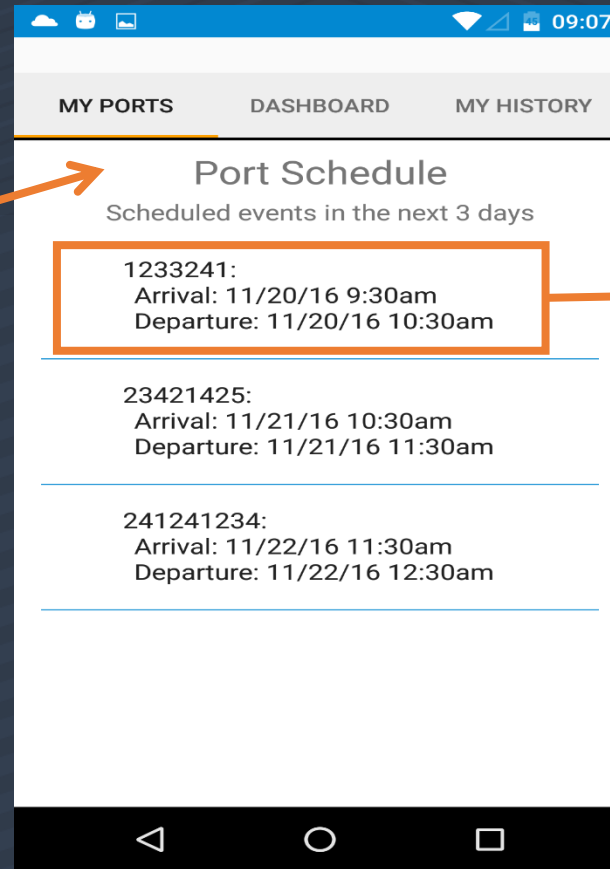
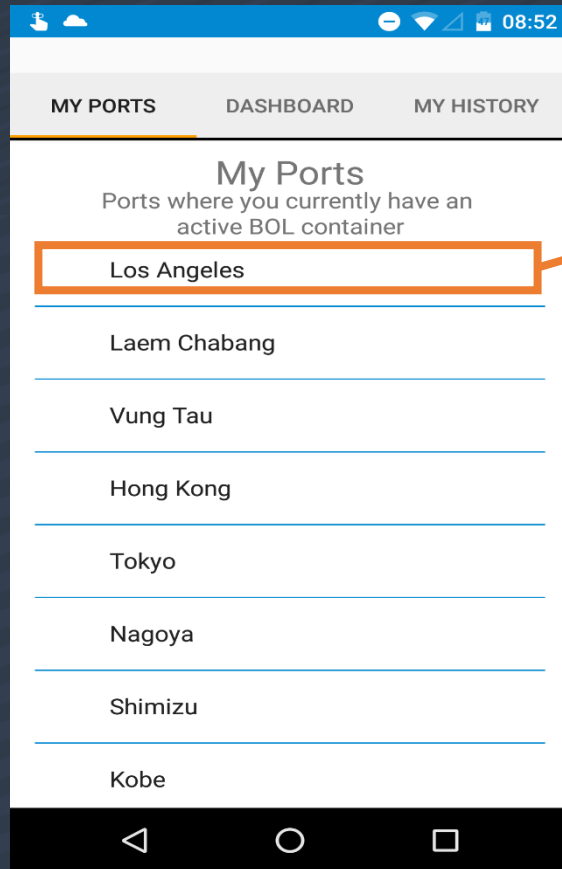
“Name,
User Email,
Company,
Position”

are needed during the first registration,
depending on their different characters,
system will sign different authority to
the new account and determine
different information they can see.

For customers, they could also add or
dispatch their trucking companies or
BOL from the dashboard page.



System Description

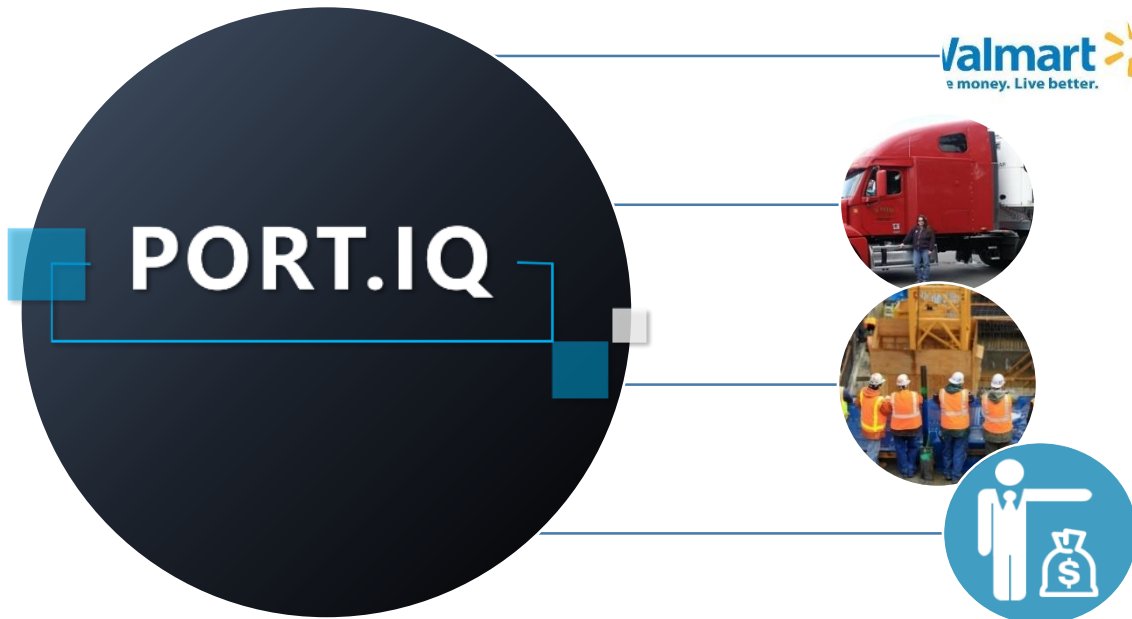


From Customer's account, they could check all the containers on different ports through "MY PORTS"

By simply clicking any of these ports, they can see the detailed schedule of all the containers made by our backend

If they want to change the time depending on their needs, just simply choose "expedite" or "delay", we will suggest a new time slot from backend through recalculation

Scalability and Users



Not only for customers, PORT.IQ is designed for different users with different functions and interfaces.

For **Trucking Companies**, they will see their orders on different ports, their schedule for different containers, and if customers give the authority, they could make expedite or delay to assignments too.

For **Port Terminals**, they could check all the containers status and schedule on the terminal, thus they can stack the containers in an optimized sequence.

For **Shareholders** from each companies, they can check the charts and analysis conclusion for time period, which will help their decision making.

Why Choose Port IQ?



Highly Flexible



Cost Effective



Highly Secure



Interoperability



User Friendly



Robust

Why Choose Port IQ?



- Work globally for different users
- Easy to realize on website or ios
- Easy to adjust



- Cheap to apply
- Cheap to maintenance
- Cheap to update



- Registration needed & Password protected
- Different authority, only right information to right user



- Create different charts for different users, easy to communicate with different databases



- Simple interfaces easy to use and understand, interactive with users
- Timeliness & Simultaneousness



- Quick response to failure
- Quick recalculation ability
- Highly integration

Why Choose Port IQ?

```
11 def _request_from_get(url):
12     """Request from GET"""
13     data = conn.recv(1024)
14     conn.close()
15     return data
16
17 def _request_from_post(url, data):
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```

```
SELECT * FROM portiq_data
WHERE url LIKE '%http%'
```

Secure Software Development

- SSL-TLS on all server request
- Eliminate GET request
- API Security Keys after authorization

Secure Data

- Use trusted vendors
- Decentralize servers
- Back Data Off Site

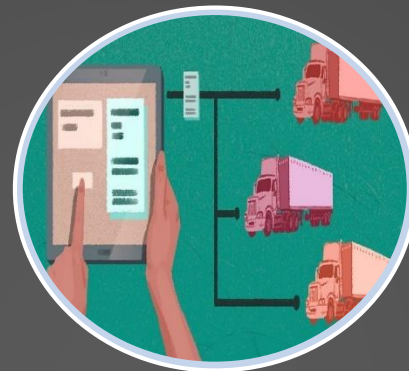
Secure Servers

- Setup good firewall rules
 - Keep unneeded ports closed
 - Use port knocking to open need ports
 - Change default ports for some services
- Mandate Two-Step Authorization for administrators
- Login only over SSH encrypted connections
- Vulnerability Management
 - Change unneeded file permissions
 - Malware Protection
- Intrusion Detection/Monitor Activity
- Centralized Logging
- Physical Protection
 - Check vendor and employee security clearance

Building the future of Port solutions



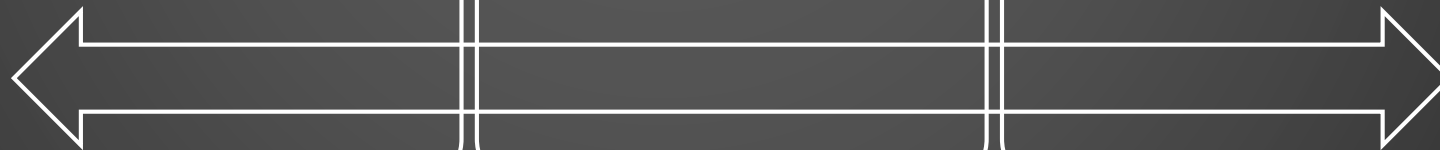
Optimizing
Container
Placement



Undertaking
internal logistics



KPI's for
Stakeholder





PORT.IQ

By this intelligent scheduling system, we change the pull system on the port to push system, balance the inflow and outflow of containers through terminals and improve total efficiency by reducing time loss during entire procedure.

PORT.IQ provides valuable information to different users which will generate more value in the future, on the same time, in a safe and economy way.

A nighttime photograph of the New York City skyline, featuring the Manhattan skyline and the Manhattan Bridge. The city lights are reflected in the water, and the sky is dark. A white vertical line runs down the center of the image.

Thank you

Team PORT.IQ
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