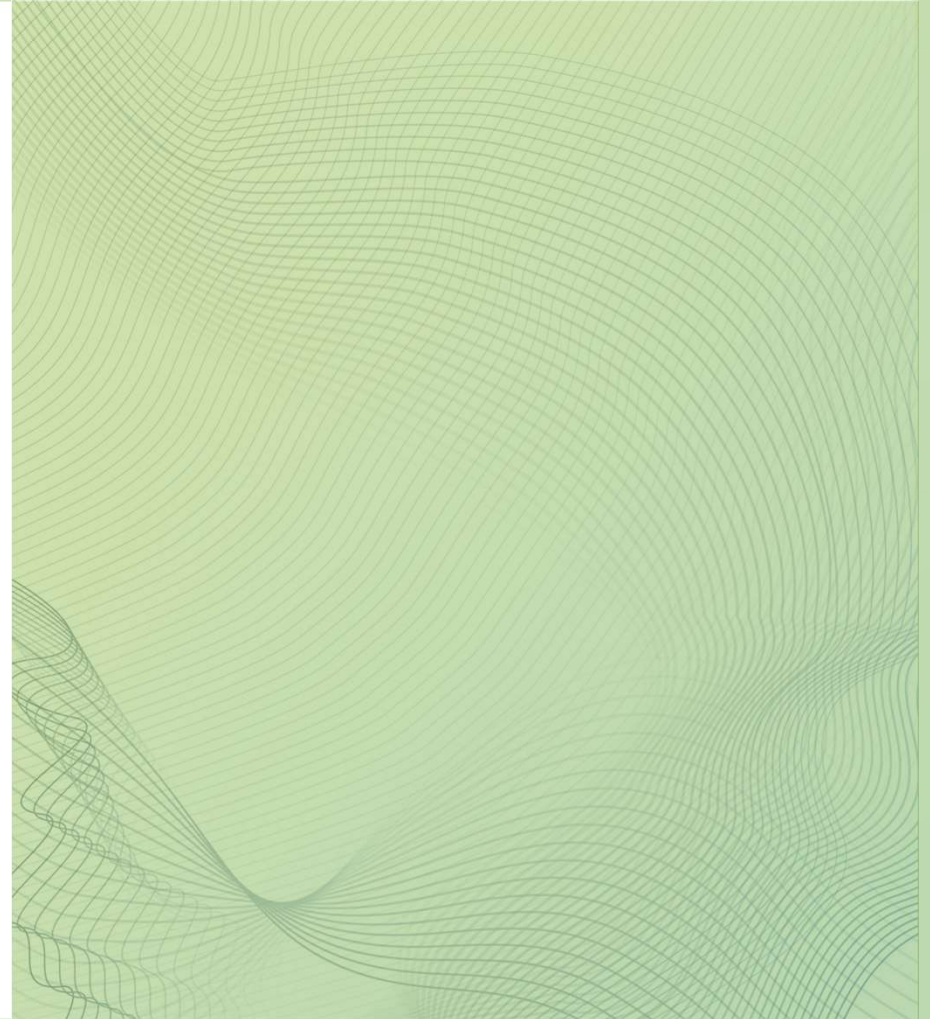


# Steel DSS Project

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# Introduction



This program allows the user (SteelTime) to input information about the upcoming orders and jobs.



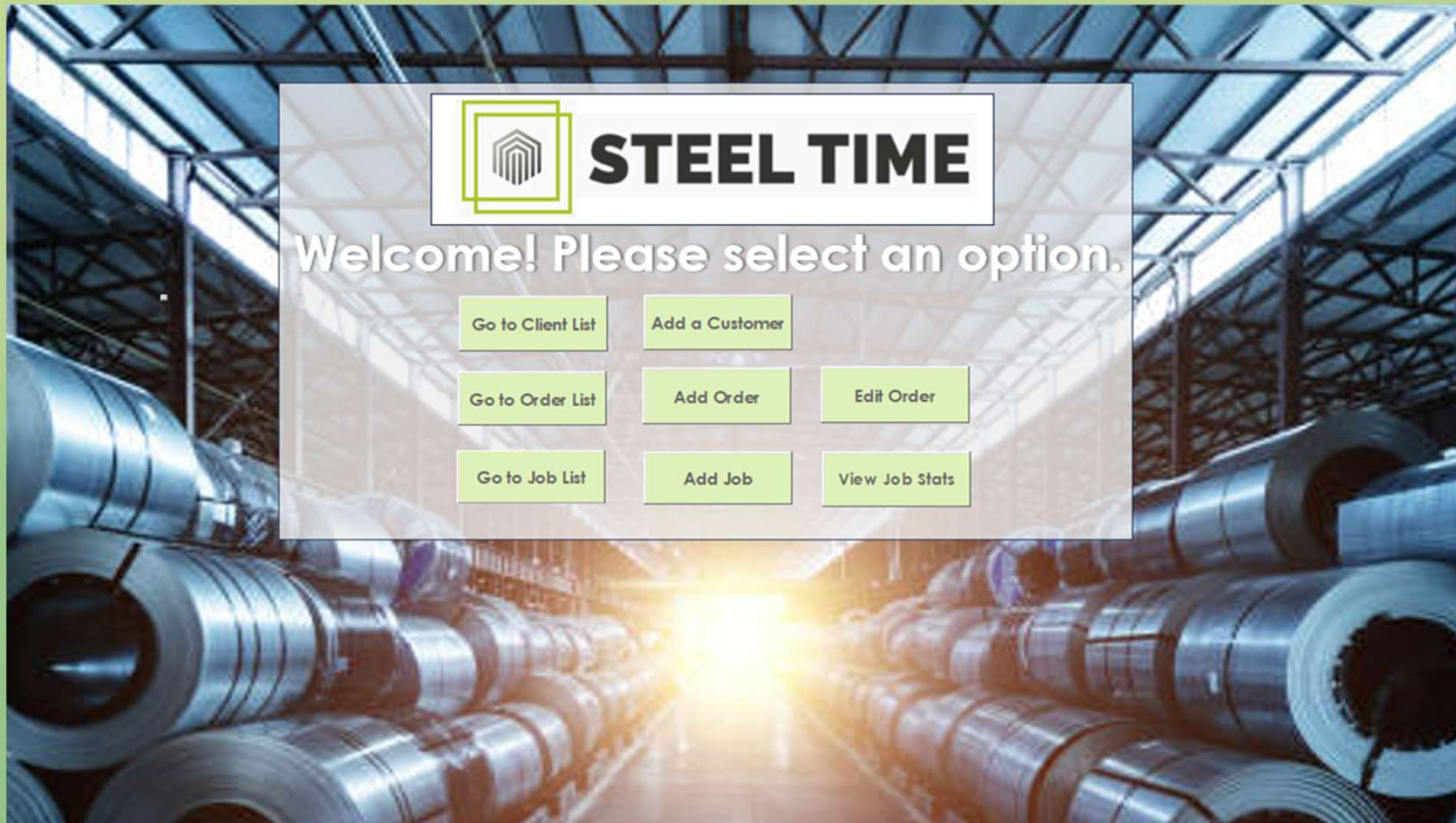
SteelTime will be able to customize the amount of steel per order to keep track of total cost for each project.



The program will assist SteelTime in making the best decision on which facility to choose for production.



Additionally, the program will provide SteelTime with a centralized location to view information on vendor, client and order information.



Step 1: Add A Customer.

# Homepage

# Add a Customer

This page allows you to add a customer into the system.

Add A Customer

×



**STEEL TIME**



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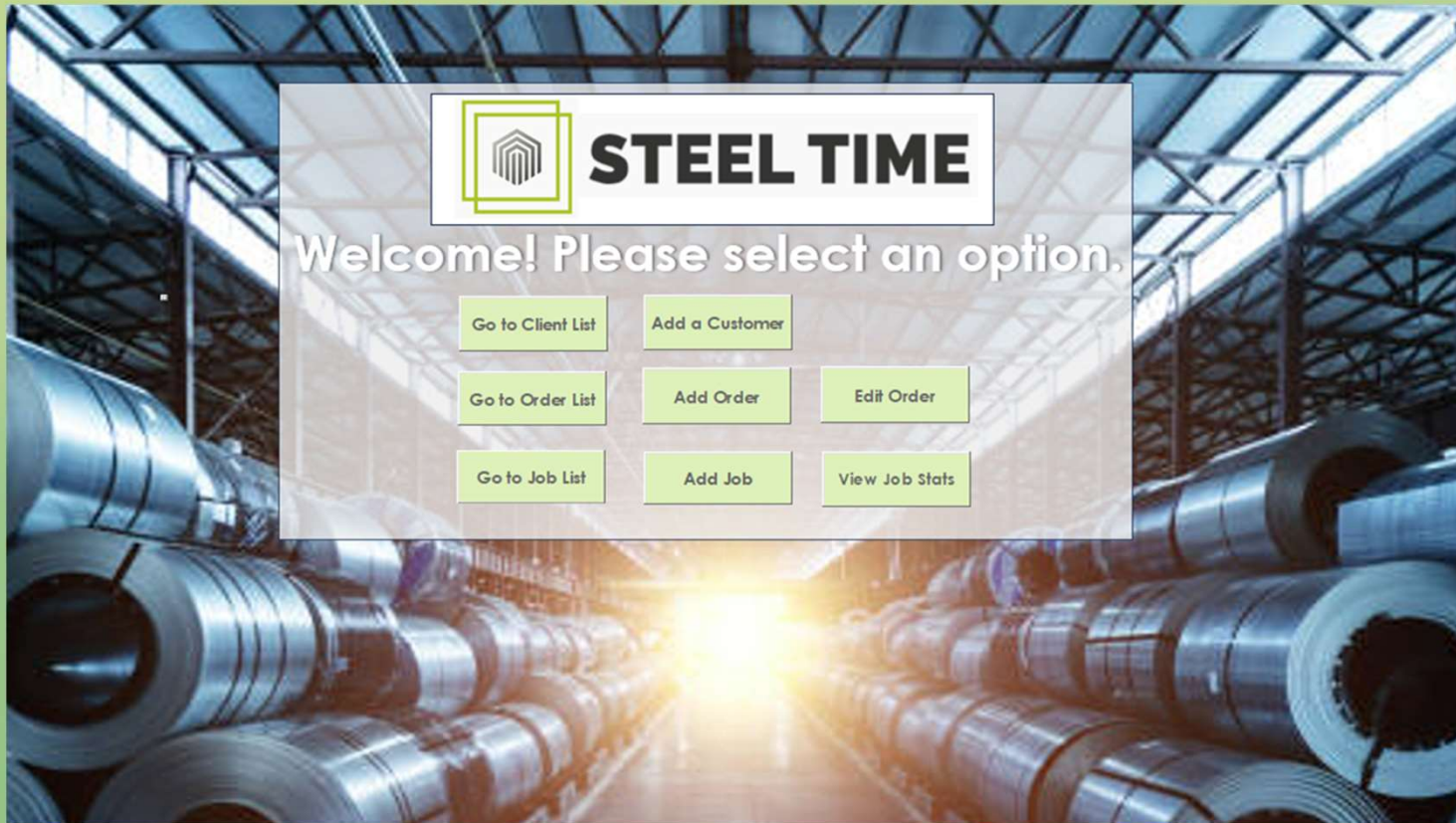
## STEEL TIME

[Return Home](#)

# Client List

- Acts as a contact list for the user so that they can quickly access common customer's information.





Step 1: Add A Customer.

Step 2: Add An Order.

# Homepage

Start New Order

Customer: Andres Espinosa

Order Name: Office Building

Due Date: 12/03/2023

Date entered has already passed

Set Steel for Order

Start New Order

Customer: Andres Espinosa

Order Name: Office Building

Due Date: 12/20/2023

Set Steel for Order


# Start New Order

Starts an order with an existing customer and set a valid date and name.

# Set Order Steel Amount

Allows user to customize the amount of steel in the order.

Set Order Steel Amount

**STEEL TIME**

Order Name: Office Building  
Customer Name: Andres Espinosa

Create Order

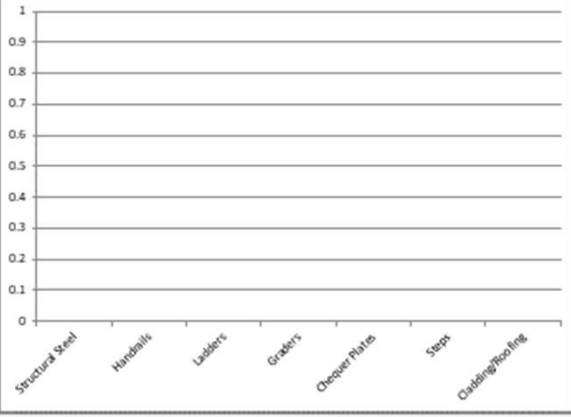
**Product Families**

Structural Steel	Handrails	Ladders	Graders	Chequer Plates	Steps	Cladding/Roofing
0	0	0	0	0	0	0

Double click any of the textboxes to open an assisted product selection form. THIS MAY ERASE CURRENT VALUES.

Mode: Guided

Total Tons of Steel: 0



Guided Mode



Steel Material multipliers were decided using [this website](#), and range from 0.75 (Low Carbon) to 1.05 (D-Grade)

# Guided Steel Editor

Allows the user to have the ability to fully customized based on the material, style, and size.

The screenshot shows the 'Guided Steel Editor' window with a close button (X) in the top right corner. The interface has a tabbed menu at the top with 'Structural Steel' selected, and other tabs for 'Handrails', 'Ladders', 'Graders', 'Chequer Plates', 'Steps', and 'Cladding/Roofing'. Below the tabs is a form with six input fields: 'Material' (set to 'O-Grade Tool'), 'Style' (set to 'Flat Plate'), 'Quantity' (200), 'Length' (50), 'Width' (3), and 'Height' (0.5). An 'Add' button is to the right of these fields. Below the form is a list box containing three items: '4 Medium Carbon 30x 2x 2 T-Bar(s) ( .0271968 tons)', '50 Austenitic Alloy 15x 1x 1 H-Beam(s) ( .079678125 tons)', and '200 O-Grade Tool 50x 3x .5 Flat Plate(s) ( 2.20974 tons)'. At the bottom left is a 'Back' button. At the bottom right, it says 'Subtotal of Structural Steel (tons):' followed by a text box containing '2.3166'.

Material	Style	Quantity	Length	Width	Height
O-Grade Tool	Flat Plate	200	50	3	0.5

4 Medium Carbon 30x 2x 2 T-Bar(s) ( .0271968 tons)  
50 Austenitic Alloy 15x 1x 1 H-Beam(s) ( .079678125 tons)  
200 O-Grade Tool 50x 3x .5 Flat Plate(s) ( 2.20974 tons)


Back

Subtotal of Structural Steel (tons): 2.3166

# Set Order Steel Amount

Allows user to customize the amount of steel in the order.

Set Order Steel Amount

**STEEL TIME**

Order Name: Office Building  
Customer Name: Andres Espinosa

Create Order

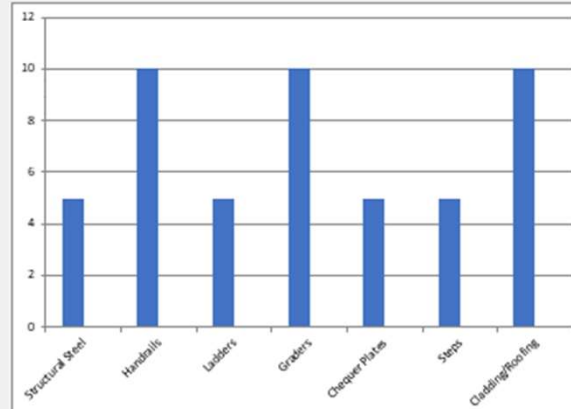
**Product Families**

Structural Steel	Handrails	Ladders	Graders	Chequer Plates	Steps	Cladding/Roofing
5	10	5	10	5	5	10

Write in the textboxes or use the spin buttons to change to the desired steel tonnage per product

Mode: Free Edit

Total Tons of Steel: 50



Product Family	Tonnage
Structural Steel	5
Handrails	10
Ladders	5
Graders	10
Chequer Plates	5
Steps	5
Cladding/Roofing	10

Free Edit Mode

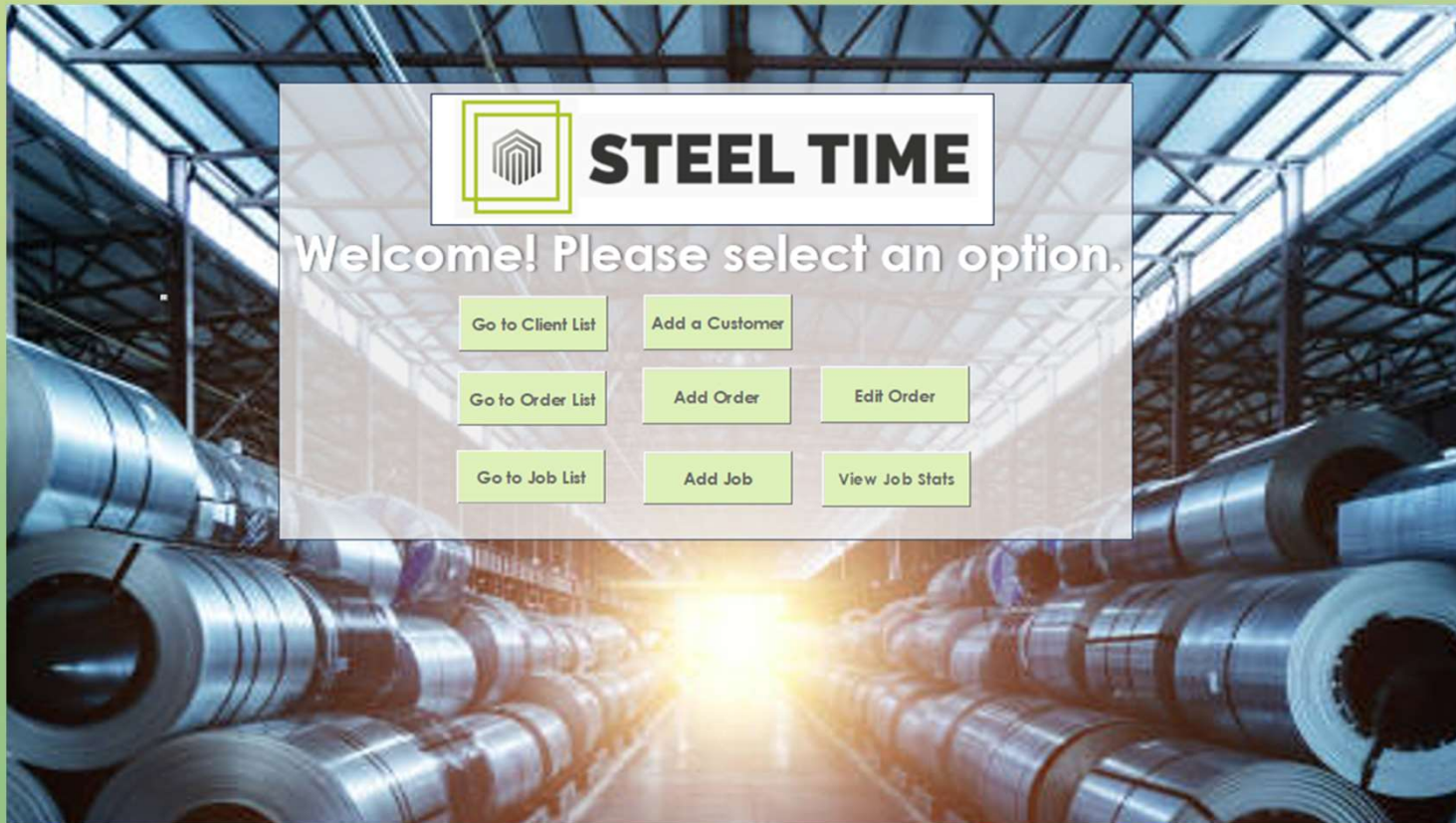
# Order List

Allows the user to view all orders in one succinct list.

[illegible]

## STEEL TIME

[Return Home](#)



# Homepage

Step 1: Add A Customer.

Step 2: Add An Order.

Step 2.5: Edit An Order (optional).

# Edit Existing Order

Allows the user to easily change any previous orders to update due date and/or steel values.

×

Customer:

Rodolfo

Order Name:

House

New Due Date:

1/25/2024

The due date for this order is

1/24/2024

☒

Check to edit due


Continue



# Set Order Steel Amount

Brings user to the set order steel amount form to edit any values they would like.

Set Order Steel Amount

**STEEL TIME**

Order Name: House  
Customer Name: Rodolfo

Create Order

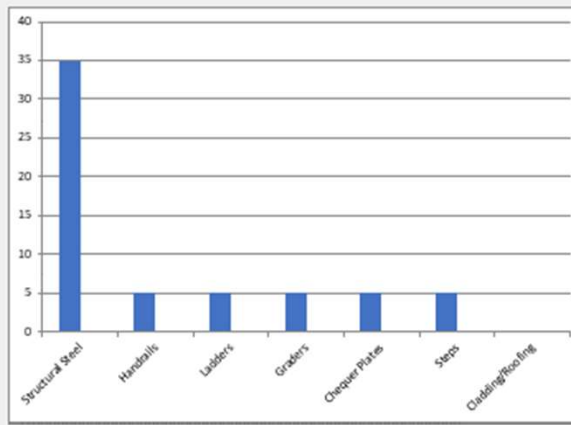
**Product Families**

Structural Steel	Handrails	Ladders	Graders	Chequer Plates	Steps	Cladding/Roofing
35	5	5	5	5	5	0

Write in the textboxes or use the spin buttons to change to the desired steel tonnage per product

Mode: Free Edit

Total Tons of Steel: 60



Product Family	Tonnage (Tons)
Structural Steel	35
Handrails	5
Ladders	5
Graders	5
Chequer Plates	5
Steps	5
Cladding/Roofing	0

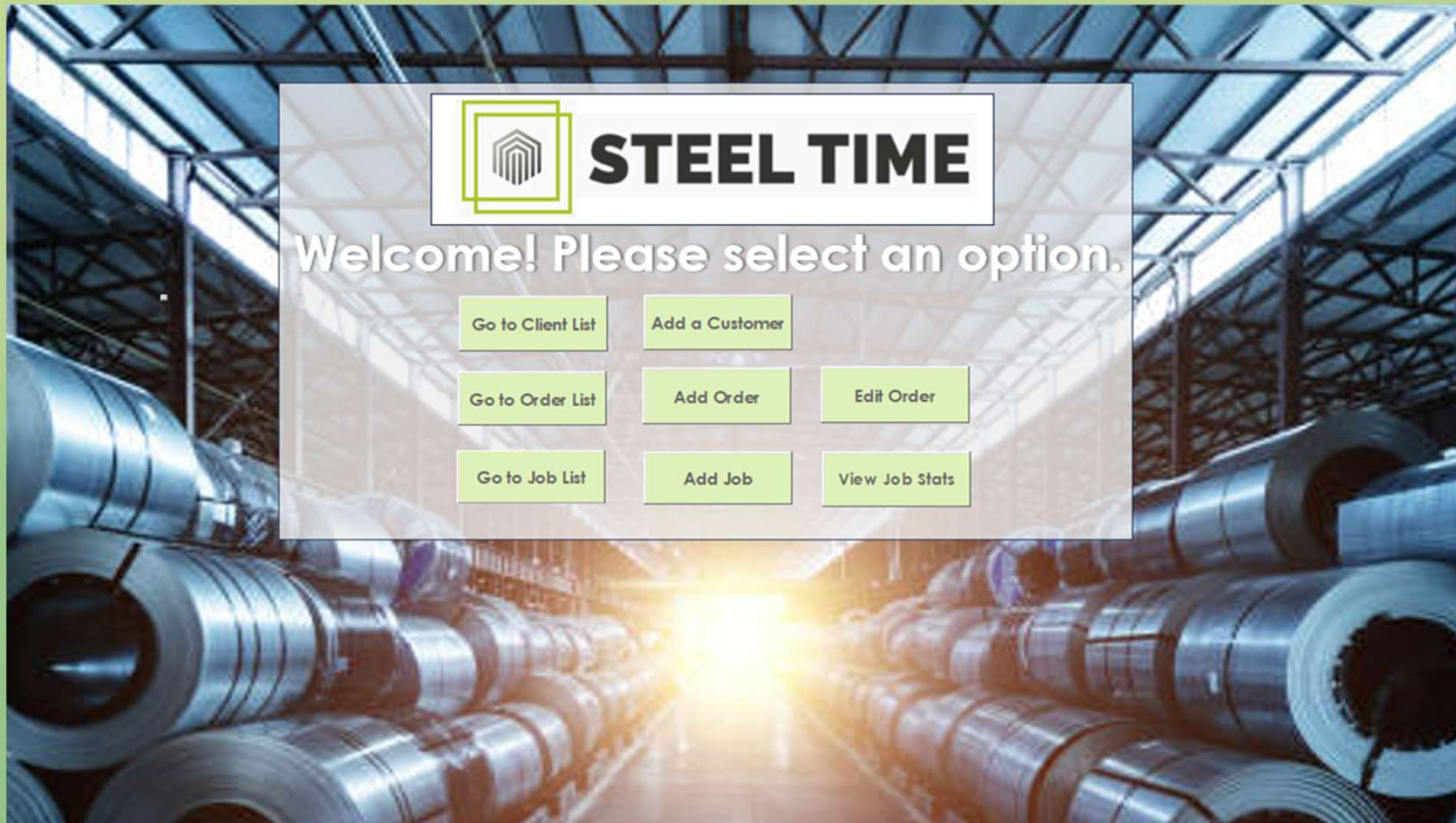
# Order List

Highlight the row with any changes made in the Order List.

[illegible]

## STEEL TIME

[Return Home](#)



# Homepage

Step 1: Add A Customer.


Step 2: Add An Order.

Step 2.5: Edit An Order (optional).

Step 3: Add A Job.

## Start New Job



**STEEL TIME**

**Customer:**

**Order**

**Product:**

**Min. Quality:**

Metalcraft Services of Tampa, Inc.	\$	42,936.87	12/06/2023
SteelTime	\$	47,436.10	12/19/2023
Birl's Light Fab	\$	50,683.07	12/08/2023
Preferred Metal Products, Inc.	\$	70,336.62	12/06/2023
W.P. Law Inc.	\$	130,538.43	12/05/2023
Absolute Welding & Consulting, LLC	\$	130,616.70	12/08/2023
WayKen	\$	144,596.34	12/05/2023
Leatherwood Manufacturing Inc.	\$	222,710.21	12/04/2023

## Start New Job

Allows the user to filter by quality view the options for each product in order by price. The user then chooses an option from the list.

# Transportation Calculation

- Used <https://nominatim.org/> API to geocode location based off user inputted address to coordinates
- Used Haversine formula to calculate distance between vendor and customer (as the crow flies)
- determines the great circle distance between two points on a sphere given their longitude and latitude

$$\text{hav}(\theta) = \text{hav}(\varphi_2 - \varphi_1) + \cos(\varphi_1) \cos(\varphi_2) \text{hav}(\lambda_2 - \lambda_1)$$

- \* $\varphi_1$ ,  $\varphi_2$  are the latitude of point 1 and latitude of point 2,  $\lambda_1$ ,  $\lambda_2$  are the longitude of point 1 and longitude of point 2.



# Cost Calculation

- Once distance was found in miles multiplied by 10 dollars per mile for distance
- Multiplied by constant of 1.25 to account for labor hours
- Used production cost of vendor times amount of steel for product

STRUCTURAL STEEL PRODUCTION COST
1.34
10.36
8.92
6.73
17.97
14.60
4.26
8.81
10.79
17.94

LATITUDE	LONGITUDE
30.2870693	-82.9626884
33.6104736	-85.104187
32.853056	-80.007901
33.85440445	-84.21175385
32.571367	-82.330483
34.803179	-82.424181
28.045418	-82.411995
27.88221	-82.719928
32.838031	-79.856603
28.56751	-81.422688

Distance ( in miles) \* 10 dollars per mile \* production cost ( dollars per ton) \* amount of tons \* 1.25 (labor constant) = Total Cost to produce


# Due Date Calculation

- Used production lead times of vendor times amount of steel for product to calculate the date that job could be fulfilled.
- Compared that to order for job date and added it as an option if the due date was before that specific date

# Job Checkout

Allows the user to view their choices and finalize their order.

Job Checkout

**STEEL TIME**

Customer Name: Rodolfo

Order Name: House

Job Summary

Structural Steel:	SteelTime	\$	4,889.57	12/03/2023
Handrails:	SteelTime	\$	4,889.57	12/03/2023
Ladders:	Metalcraft Services of Tampa, Inc.	\$	42,936.87	12/04/2023
Graders:	SteelTime	\$	4,889.57	12/03/2023
Chequer Plates:	SteelTime	\$	4,889.57	12/03/2023
Steps:	SteelTime	\$	4,889.57	12/03/2023
Roofing:	SteelTime	\$	4,889.57	12/03/2023
Total Cost:	72274.29			

Back

Exit to Home

Check Out

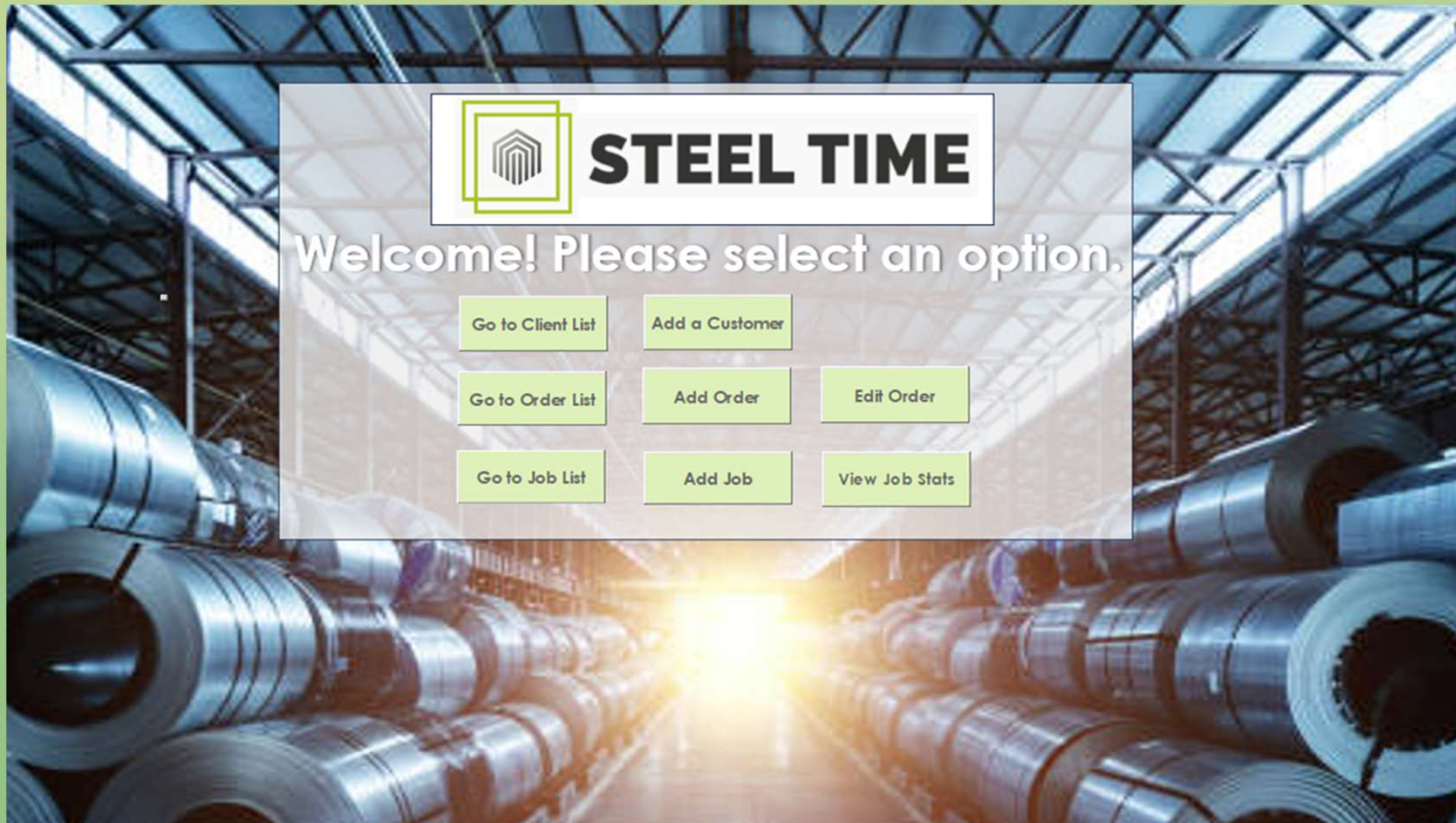
# Job List

Allows user to view previous jobs stored in the system.

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## STEEL TIME

[Go Home](#)



# Homepage

Step 1: Add A Customer.

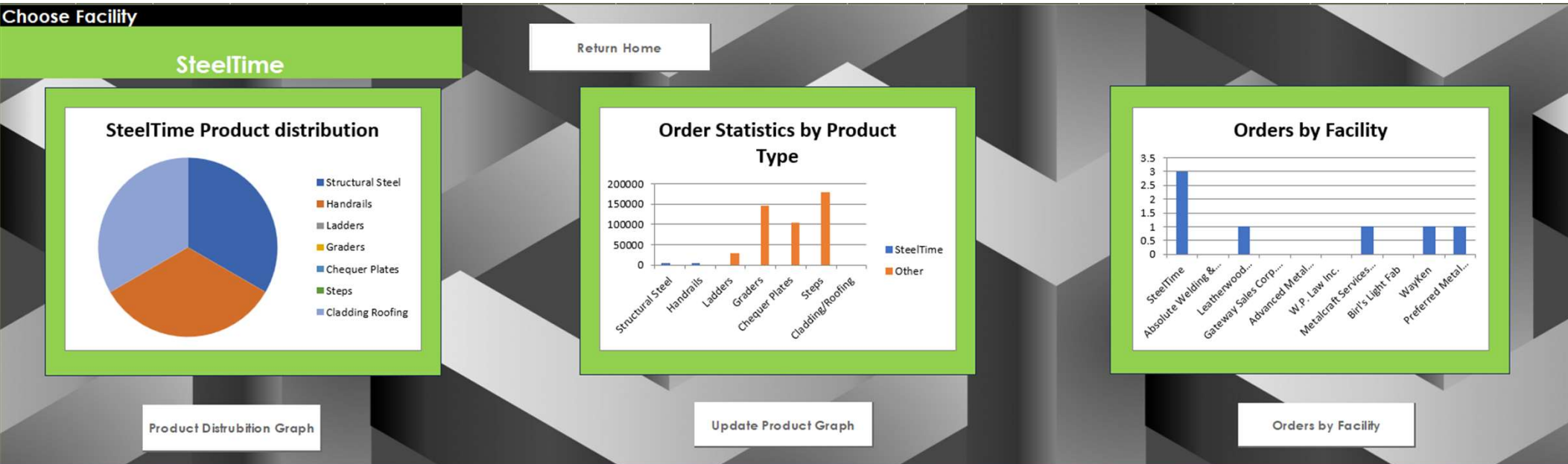
Step 2: Add An Order.

Step 2.5: Edit An Order (optional).

Step 3: Add A Job.

Step 4: View Job Statistics.

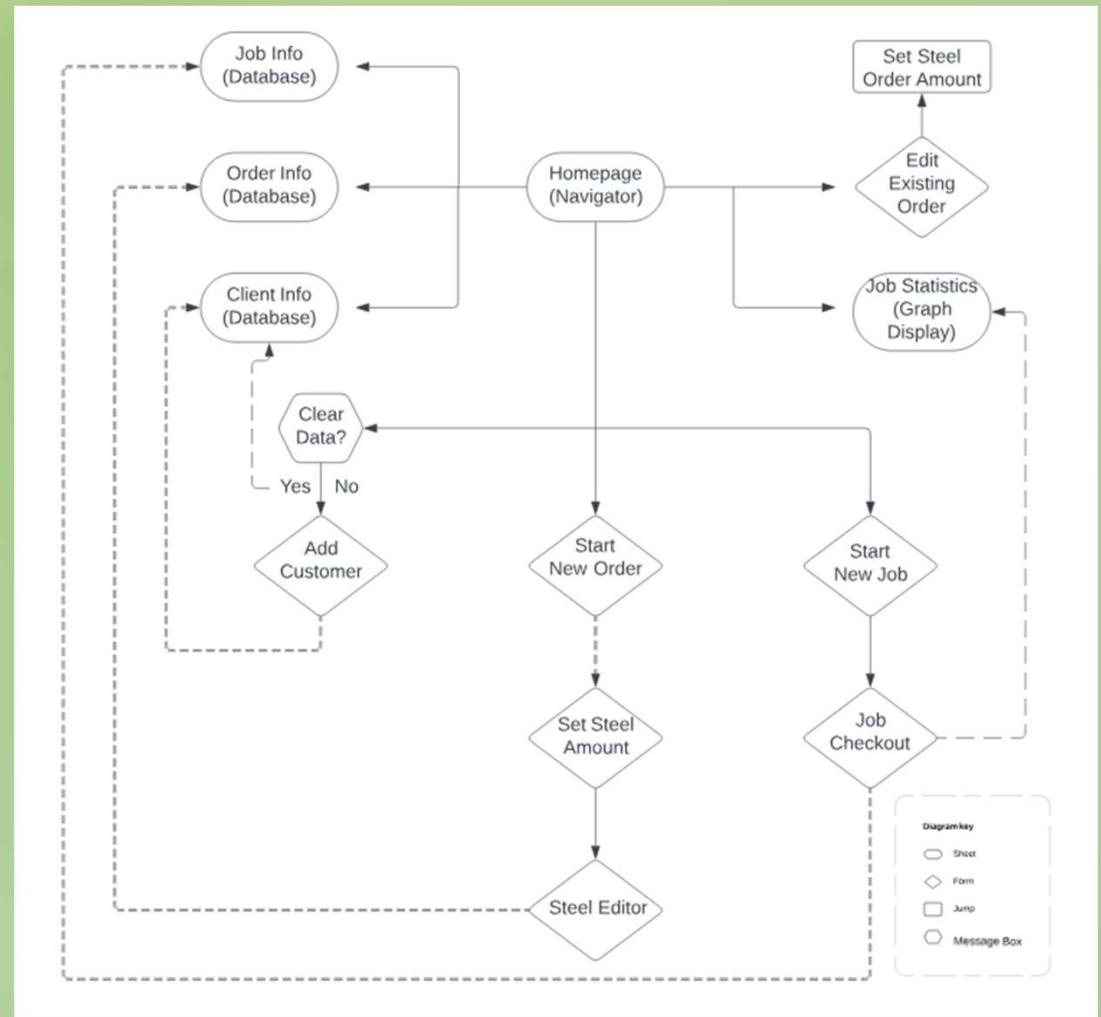




# Order Statistics

- Allows the user to view data regarding past orders in graphical form.

# Program Logic



# Thank you!

Questions?

