



BOXIFY

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1 Project Summary

Warehousing is an integral part of the modern global transportation and shipping supply chain. The world shipping industry has been expanding and ever-growing year after year. With this massive growth came the need to expand storage facilities to accommodate this growth. The aim of BOXIFY is to optimize the process of storage and reduce the costs associated with the storage and warehousing of boxes.

Boxify allows users to optimize the process of storing boxes in a time-saving and cost-effective manner. It can now be done digitally instead of the old method of performing the calculations manually. We allow the user to calculate the optimum storage by inputting information about the types of boxes used by the business. This allows small to medium businesses which don't have the expertise in optimization and the knowledge of optimization methods to optimize their storage facilities easily and seamlessly, saving money and space in the process.

2 Methodologies

Html, css, js and php are used together in this project. Also Photopea is used as an online photo editor.



Figure 1: HTML Logo

Websites and web-based documents use HTML[4] as their default language. It aids a browser in comprehending the structure and style of a document or files for internet reading.



Figure 2: CSS Logo

CSS[3] is an acronym for Cascading Style Sheets, which is a set of It is the language used to describe how Web pages are presented to viewers, including colors, layout, and fonts.

The purpose of CSS is to create online style sheets. It works with any XML-based markup language and is not dependent on HTML.

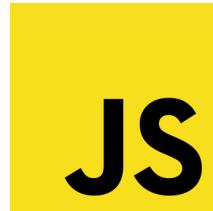


Figure 3: JS Logo

JavaScript[5] is a programming language for creating dynamically updated material, controlling multimedia, animating pictures, and pretty much anything else.



Figure 4: PHP Logo

Hypertext Preprocessor (PHP)[6] is an acronym for Hypertext Preprocessor. It's a server-side scripting language for building web applications that's open-source. By scripting language, it means a program that is script-based written for the automation of tasks.



Figure 5: Photopea Logo

Photopea[2] is a powerful image editor that can handle both raster and vector images. It may be used for simple activities like resizing photos as well as more complicated tasks like designing web sites, producing graphics, and processing photographs.

3 User Manual

3.1 Home Page

The homepage is the landing page of the website. It is the first thing that the visitor of the site will see, and so it had to be clean and minimal, to draw in the user to click further into the website, and not be overwhelmed by too many words or images. The homepage contains a navbar which is consistent throughout the website, and a footer which is also consistent throughout most of the website. The page has a central box which acts as an intermediary layer to display the central text more clearly over the complex image background. *Figure 6* shows central text, and it is surrounded by a dark box to create contrast to increase the visibility of the text.



Figure 6: Home Page

“Our Mission” is a link to the about us page, which displays information about the aim of the website, and the objectives which we set to accomplish. Moreover, it gives an overview of the team that’s behind the website.

The navigation bar shown in *Figure 7* allows for fluid movements between the main pages of the website. Note that before the user signs into the website, the user cannot access the “Calculate” and the “Reports” Pages. If the user did not sign in, he will be redirected to the sign in page to do so.



Figure 7: NavBar

When the user clicks on the sign in NavBar, the user will be redirected to the sign in page. Where the user then can sign into the website or make an account through the sign-up page.



Figure 8: Footer

The footer shown in *Figure 8* allows the user to access the “Suggestions”, “About Us”, “Privacy”, and “Blog”. In the homepage the footer is set to be almost transparent for aesthetic reasons.

3.2 Calculations

After creating our table, its style was changed to give it a stylish look. After preparing our table, the radio button was determined for each SKU Code. In this way, it facilitated which box should be selected when making calculations.

```
<form method="POST" action="result.php">
    <table width="99%" border="0" style="font-family: 'Lucida Grande', 'Lucida Sans Unicode', 'Lucida Sans', 'DejaVu Sans', Verdana, 'sans-serif'; text-align: center;" width="98%">
        <tr style="background-color: orange; font-size: 14px; color: #f9f9f9;">
            <td width="12%"><strong>SKU Code</strong></td>
            <td width="11%"><strong>Box Type</strong></td>
            <td width="10%"><strong>n</strong></td>
            <td width="11%"><strong>Height of Box</strong></td>
            <td width="13%"><strong>Weight of Empty Box</strong></td>
            <td width="13%"><strong>Current Cost of Box</strong></td>
            <td width="13%"><strong>Price per KG for Box</strong></td>
            <td width="17%"><strong>Number of Boxes in One Layer of the Pallet</strong></td>
        </tr>
        <tr>
            <td colspan="8" style="text-align: center; background-color: #333333; opacity: 0.6; color: #f9f9f9;">Percentages according to area it will occupy</td>
        </tr>
        <tr>
            <td><input type="radio" name="SKUCode" value="444930" checked="checked">444930</td>
            <td>1961</td>
            <td>1</td>
            <td>87,96</td>
            <td>0,38</td>
            <td>2,53</td>
            <td>0,86</td>
            <td>12</td>
        </tr>
        <tr style="background-color: #333333; opacity: 0.6; color: #f9f9f9;">
            <td><input type="radio" name="SKUCode" value="444943">444943</td>
            <td>1957</td>
            <td>2</td>
            <td>87,95</td>
            <td>0,38</td>
            <td>2,53</td>
            <td>0,87</td>
            <td>12</td>
        </tr>
    </table>
</form>
```

Figure 9: Calculation Table I

The boxes have been made transparent to create a more fluid image. We received five pieces of data from the user and we will use this data for our calculations later.

```
<input type="text" name="PalletsInTheVehicle" placeholder="Pallets In The Vehicle" style="background-color: transparent; font-size: 18px;">
<input type="text" name="CostOfTheVehicle" placeholder="Cost Of The Vehicle" style="background-color: transparent; font-size: 18px;">
<input type="text" name="MaximumLayerForPallet" placeholder="Maximum Layer For Pallet" style="background-color: transparent; font-size: 18px;">
<input type="text" name="DesiredProductNumbers" placeholder="Desired Product Numbers" style="background-color: transparent; font-size: 18px;">
<input type="text" name="NumberOfLayersForBox" placeholder="Number Of Layers For Box" style="background-color: transparent; font-size: 18px;">
<br>
Getting some data from users for calculations and send to result page for calculation
<input type="submit" value="Calculate" class="btn">
```

Figure 10: Calculation Table II

We have defined the data from the first page to be used in the calculation page. Then, we determined the values defined according to the radio button selected by the user.

```
$PalletsInTheVehicle = $_POST['PalletsInTheVehicle'];
$CostOfTheVehicle = $_POST['CostOfTheVehicle'];
$MaximumLayerForPallet = $_POST['MaximumLayerForPallet'];
$DesiredProductNumbers = $_POST['DesiredProductNumbers'];
$mn=$_POST['NumberOfLayersForBox'];

On our first page, we defined the data we received
from the user to use in calculations.

switch ($SKUCode)
{
    case '444930':
        $hn=87.06;
        $an=0.38;
        $bn=2.53;
        $cn=0.86;
        $fn=12.0;
        break;

    case '444934':
        $hn=87.05;
        $an=0.38;
        $bn=2.53;
        $cn=0.87;
        $fn=12.0;
        break;
}
```

For each box we defined the data it
should use in the switch case

Figure 11: Calculation Table III

Here are the operations used for the calculations shown in *Figure 12*. The final values, are reflected to the graph as you can see from *Figure 13*

```
$MaxBoxOnPallet=($MaximumLayerForPallet/$hn)*$fn;
$BoxUpgradingCost=$cn*$bn*$DesiredProductNumbers;
$BoxOnTheOldPallet=$mn*$fn;
$Pallet=$DesiredProductNumbers/$BoxOnTheOldPallet;
$x=($Pallet/$PalletsInTheVehicle)*$CostOfTheVehicle;
$OldBoxCost=$bn*$DesiredProductNumbers;
$New=((($DesiredProductNumbers/$MaxBoxOnPallet)/$PalletsInTheVehicle)*$CostOfTheVehicle);

$NewBoxCost=$OldBoxCost+$BoxUpgradingCost;

$TotalOldCost=$x+$OldBoxCost;
$NewCost=$New+$NewBoxCost;
```

Figure 12: Operations

```
<script>
var xValues = ["Old Cost", "New Cost"];
var yValues = [<?php echo (int)$TotalOldCost?>, <?php echo (int)$NewCost?>];
var barColors = ["rgba(247,160,0,1)","rgba(247,185,0,1)"];
```

Figure 13: Taking Values

The table as seen in *Figure* contains data such as the SKU Code weight, height, price of our boxes and how many layers we can put on a pallet. There is different data for each box. It maps them to the data they belong to in the switch case. A code snip from the switch case part is shown above on *Figure 11*.

SKU Code	Box Type	n	Height of Box	Weight of Empty Box	Current Cost of Box	Price per KG for Box	Number of Boxes in One Layer of the Pallet
● 444930	1961	1	87,06	0,38	2,53	0,86	12
● 444943	1957	2	87,05	0,38	2,53	0,87	12
○ 445098	3775	3	95,08	0,23	2,53	0,86	24
● 448229	2677	4	90,09	0,35	5,2	2,09	10
○ 448279	2686	5	170,13	0,78	6,02	2,11	9
● 448280	2682	6	123,88	0,40	6,02	2,11	11
○ 448947	3749	7	100,01	0,23	2,53	0,86	22
● 448948	3443	8	85,07	0,48	5,2	2,08	16
○ 449340	1887	9	70,06	0,48	3,61	0,72	10
● 449341	1837	10	95,07	0,55	3,61	0,72	10
○ 449346	1819	11	90,07	0,60	4,04	1,21	10
● 449347	2993	12	125,1	0,82	6,71	2,35	10
○ 449363	1828	13	103,09	0,70	4,04	1,21	10
● 449621	2751	14	185,14	0,31	6,71	2,35	10
○ 450183	3523	15	140,11	0,61	6,02	2,11	9
● 451194	2934	16	95,07	0,54	3,61	0,72	10
○ 451197	2935	17	105,08	0,69	6,71	2,34	10
● 451198	3517	18	70,07	0,29	3,54	1,06	16
○ 451202	2933	19	105,08	0,60	6,71	2,35	10
● 453584	3850	20	95,08	0,29	4,09	1,40	15
○ 454354	3187	21	70,07	0,31	3,54	1,06	15

Figure 14: Calculation Table

3.3 Cost Analysis

Cost Analysis page works as a summary of user's calculation. User can easily see the amount of saved money. The main layout of the Cost Analysis page shown below in *Figure 15*.

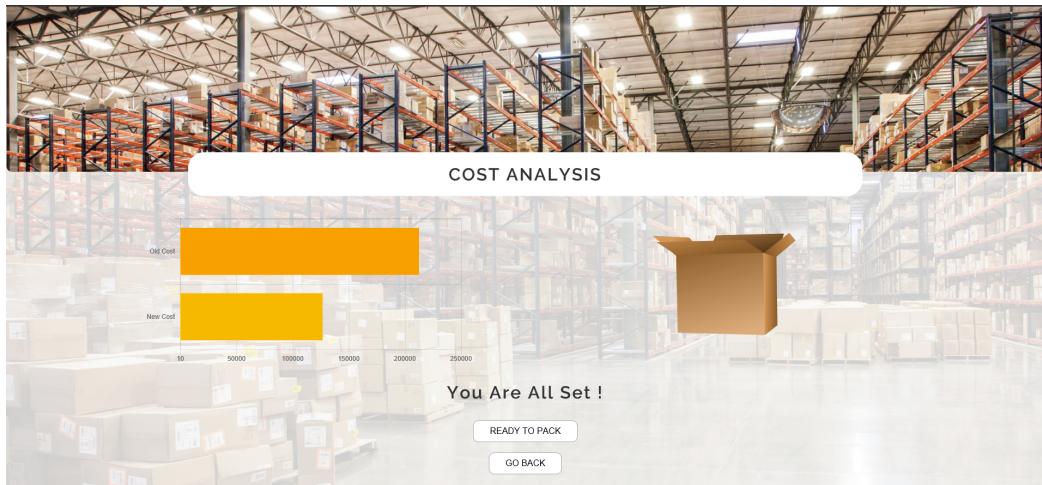


Figure 15: Cost Analysis

When the user moves the cursor over the graph, he can see the exact amount of old and new cost as shown on *Figure 16* & *Figure 17*.

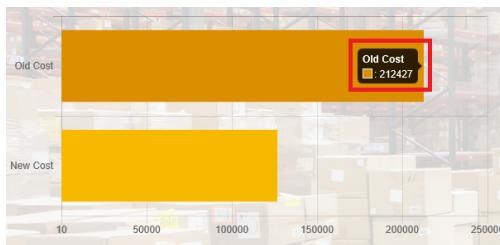


Figure 16: Old Cost



Figure 17: New Cost

After the comparing new and old values, user can go back to calculation page or either can click to 'Ready To Pack' button. When the 'Ready To Pack' button clicked, the box which is on the right hand side of the page starts folding up. The samples of folding process is shown in *Figure 18*[1].



Figure 18: Folding Process

As you can see from the *Code 1*, to get this folding effect, several images are putted over on each other. All of the images except first one, are hidden.

```

1 <div class="container">
2   <div class="box"></div>
3   <div class="box stack-top"></div>
4   ...

```

Code 1: Folding Effect

By managing the fade-in and fade-out times of the images, the folding effect has been created. You can find a snip from this algorithm below in *Code 2*.

```

1 $( "document" ) . ready ( function () {
2   $( "#btn1" ) . click ( function () {
3     $( "#box4" ) . hide ( 1 );
4     $( "#box1" ) . fadeIn ( 1 ) . fadeOut ( 500 );
5     $( "#box3" ) . delay ( 500 ) . fadeIn ( 500 ) . fadeOut ( 500 );
6   ...

```

Code 2: Folding Effect Algorithm

3.4 Blog

User can get inspired from the Boxify's blog page. This page has ideas for warehouses from several online sources. 'Go To Website' button directs the user to the website of the article.

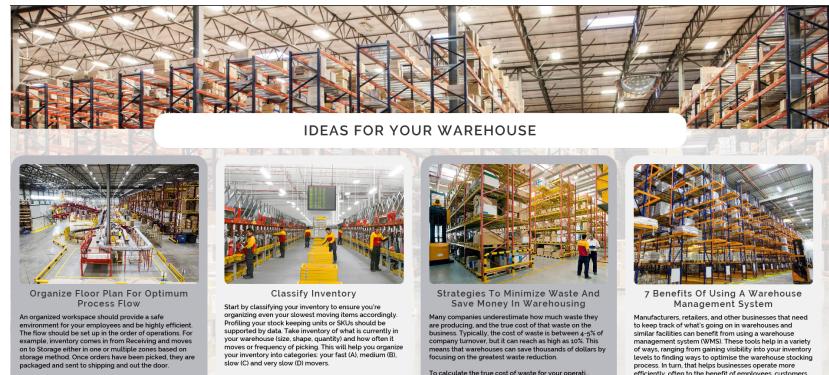


Figure 19: Blog Page

A sample from the view of a single blog is given in *Figure 20*. The blog page has this item in each of 2 rows and 4 columns.

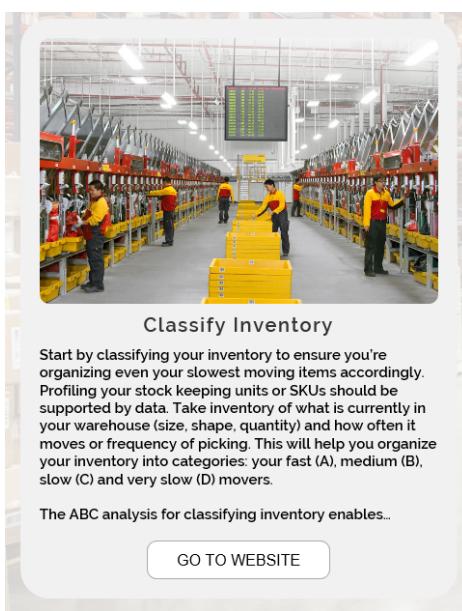


Figure 20: Blog Item

3.5 About Us

The "About Us" page not only introduces the people working on the project but also tells the users why and how the project exists and what benefits it has. When the user enters the about us page, a page divided into 2 will appear as it's shown in *Figure 21*. On the left , as seen in *Figure 22*, there is the introduction of the teammates. On the right side of the website (*Figure 23*), there is information about the project.

Meet with the Team

Let our team show you the most convenient way to store your personal items affordably as an extension of your factory.

Aleyna Kurt

Aleyna Kurt

A senior industrial engineering student who will make sure your project is optimized.

Necdet Gürhan Türe

Necdet Gürhan Türe

Suggestions About Us Privacy Policy

About Company

Boxify History

Boxify is a young, innovative self storage company on a mission to bring the self storage industry into the 21st century. Our staff of dynamic thinkers is goal oriented and plans to change the way people think of self storage forever.

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Figure 21: About Us Page

Meet with the Team

Let our team show you the most convenient way to store your personal items affordably as an extension of your factory.

Aleyna Kurt

Aleyna Kurt

A senior industrial engineering student who will make sure your project is optimized.

Necdet Gürhan Türe

Necdet Gürhan Türe

About Company

Boxify History

Boxify is a young, innovative self storage company on a mission to bring the self storage industry into the 21st century. Our staff of dynamic thinkers is goal oriented and plans to change the way people think of self storage forever.

Figure 23: Company

Figure 22: Team

3.6 Privacy Policy

For a website that wants customers' data to do the calculation, it's needed a Privacy Policy. So as it can be seen in *Figure 24*, the privacy policy page is neat and clear for it to be understandable by the customer. Since the focus is on the text, the focus of the customer is controlled by marginalizing the text in the middle of the page.

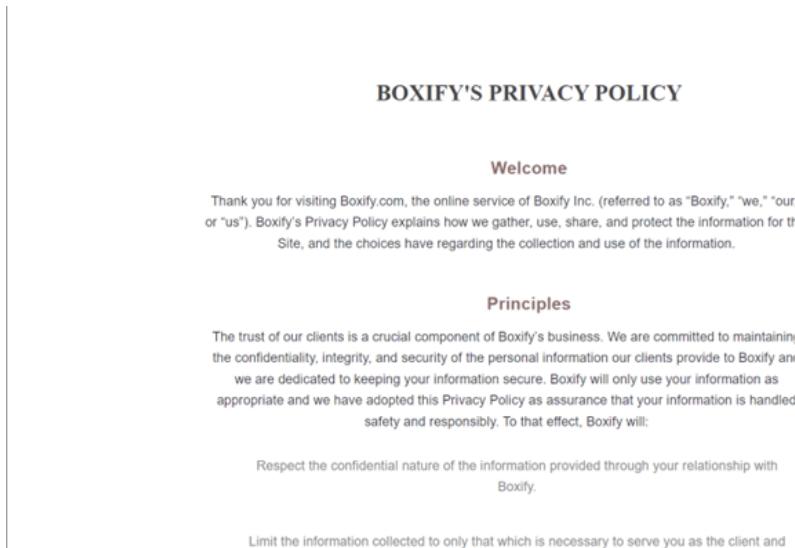


Figure 24: Privacy Page

References

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- [2] P. Team. Photopea. <https://www.photopea.com/learn/>.
- [3] Wikipedia. Css. <https://en.wikipedia.org/wiki/CSS>.
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