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Customs Clearance Management System

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Customs Management System

By

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Custom Management System

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A project submitted in partial fulfillment of the requirements for the degree of
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Dr. Yonglei Tao

04/23/2020

Your Professor

Date

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Abstract

Logistics management is an integral part of supply chain management system that coordinates and optimizes the entire logistic activities by integrating its functionalities with other businesses like marketing, sales, and information technology. It mainly includes inbound and outbound transportation of goods and services which generally involves custom clearance while transporting them internationally.

The proposed approach provides an enterprise customs brokerage software solution that enables the goods and services companies to automate customs compliance documentation for the shipment of their product across the world. The normal custom clearance process includes a vast amount of paperwork which generally takes few hours to complete. However, by using the software proposed in this project the whole process can be completed in lesser amount of time as clearance and entry/exit of freight is handled electronically. The major goal of designing this software is to provide the solution for customs brokers who majorly handles international shipments on behalf of their customers.

The new functionalities which are added in the system as part of this project includes the addition of item detail such as its dimension detail, customs detail for all the countries, country details in which it generally gets shipped, import details, export details etc. This new feature helps the customers to fetch large amount of data from the pre-existing product which has been shipped earlier and it automatically fills the declaration service forms which is nearly eighty pages of information when followed traditional way. It saves lot of time for the customers while shipping the products at the Customs borders all around the world.

Introduction

Logistics mainly deals with import and export of goods and services. It generally must go through the custom clearance process while entering and leaving any country. This whole process is very lengthy and hence we need an application which can help to complete this custom clearance process electronically and save customers time.

The Existing web application provides an enterprise software solution to the goods and services companies to automate customs compliance documentation for the shipment of the goods while transporting them internationally. The custom clearance process generally takes lot of time because it includes large amount of paperwork. However, by using the software proposed in this project the whole process can be completed in lesser amount of time. The process is handled electronically and allows the customers to save the detail of any new or existing item in advance that can be fetched at the time of custom clearance process and it could be completed faster. The major goal of designing this software is to provide the solution for customs brokers who majorly handles international shipments on behalf of their customers.

This project involves the features like saving the core data of an item, saving the import, export details for every country in a grid, fetching the details if that item has any data and providing functionalities like modifying the date and time based on different time zone for different countries has been accomplished. The motivation behind adding these functionalities into existing system was to make the system more flexible. Currently when a customer uses this software, he needs to add the data of an item which is being shipped manually into the system. This data involves the information's such as its dimension detail, country detail in which it is being shipped, import details, export details, ECN details, etc. All together it becomes a huge data to enter every time when the item is transported internationally which is a loophole of the system. The enhancements done in this project would make the architecture more flexible and easier to use. The goal was to achieve a robust system and provide a better user experience. The features which are developed as part of this project allows a user to

enter the dimension detail, custom detail, country data, import data, and export data to be saved before the shipment process begins and this data would be available at the custom border. Having this data readymade would make the custom clearance easier just clicking a button would send the entire item detail to the custom clearance department and based on the item the whole process would be done much faster.

Background and Related Work

The existing system provides the solution to the lengthy custom clearance process for the companies who need to transport their goods and services internationally. It makes the businesses work very easier and comparatively less time consuming when compared to traditional way where everything was done on paper. The traditional way was to use paper to make and maintain records. The information which needs to be entered is a large data which generally could take up to around 4-5 hours to enter the record that makes this process very time consuming and tiring for the person who is handling this. The existing software has provided a very useful solution where this whole thing could be done electronically and makes the custom clearance process easier and quick to pass. The software has some tie-ups with the government of different countries from which it takes the custom rule standards and defines the requirement based on the country rules in the application.

Although the existing software is efficient enough to provide a lesser time-consuming solution to the customers but still there are some shortcomings in the system. For example, when a company wants to ship a cargo to another country the software demands to enter the details of the item being shipped. The information entered here are the dimension details of every item, the city, and warehouses details in which it is being shipped, owner information, party information, the manufacturer detail, information about what all countries this item gets transported to etc. These details need to be added every time the company is shipping the product. The issue here is even if the same product is being shipped another time it still needs to enter the same data again which could be infuriating at times for customers. To overcome this issue the enhancements are done in this project.

Program Requirements/Proposed Work

As discussed in the previous section, one of the shortcomings of the existing system was to enter the data of a previously shipped item into the system while transporting the same item for the second time. If the data entered earlier while transporting an item could be saved somewhere and is made possible to be fetched while clearing the customs second time, then that would reduce the pain of customers adequately. To implement this feature, I have developed an additional tab in the system which basically deals with saving the data of an item in advance.

The tab name is Item Management. This tab has a landing page which has certain features which are controlled through buttons. This page has buttons like Find, Download, Edit Filter, Clear All etc. Find button lists all the items present under that owner and the result is shown in the item grid. The Edit Filter button provides the functionality of having a configurable search grid. By default, there are 2 fields based on which it gives the result in the grid. However, this result could be filtered based on other column names in the grid. When Edit Filter button is clicked it gives a modal from which the search fields could be selected or deselected. Same ways the number of columns could also be configured and accordingly the columns could be made visible on the item grid. Download button and Clear All button is not functioning right now which could be considered as a future work. The item existing in the item grid list could be edited or a new item can be added.

Adding a new item requires saving the core data of an item, saving the import, export details for every country in a grid, saving the dimension and country details of the item etc. Once the Item detail is saved successfully then it appears in the list on item detail page. When double clicked it shows all the data saved earlier and the details can be edited. One of the features which was developed was to maintain the modified date in two different forms. The system has two modified dates at two different places one exists in import, export grid and the other appears in item grid. The implementation is done in a way that when an item in grid is clicked and even if nothing has been modified inside still the grid would show the different modified on date and time. The reason why

it was done this way because on an item level the item contains lots and lots of data so when it is clicked it changes the modified on and modified by. Modified by is taken from the customers id from which he has logged in. This Modified on sets the date and time based on different time zone for different countries. On the other hand, the import, export grids modified on is changed only if any data has been modified inside the grid. Same as item grid the modified by is fetched from the customers login id. The dimension panel provides the panel to add the dimension detail of an item and import, export grids allows to add the information about where the item can be imported and where could that be exported and other information's related to the import and export.

This newly added features help the customers to fetch the data of an existing item during clearance process on customs border. This reduces the effort of users and saves lot of time. Using this feature the user will not have to spend the time entering the details of an item into system. The system will have track of old item, which was shipped earlier, and new items registered into the system. Using the product id and owner id the system will fetch the information from item management.

Implementation

The web application is available online which could be used by registered customers. The application is being hosted and maintained by AWS's EC2 server. Amazon Elastic Compute Cloud provides cloud computing platform and services on which the applications can run virtually. The newly added features are completely developed in Java with little use of Vaadin framework for User Interface. Using Java and Vaadin framework was the most interesting part of this development. Vaadin provides several components which makes the development easier when it comes to UI. Creating buttons and having in-line grids are few examples where Vaadin components are used. For developing API's Java programming language is used. Save, find by id, find all, update, delete by id, and delete all are some of the API's which are developed using JPA repository. AWS's EC2 is being used to host and maintain the application in different countries.

To build the project Jenkins Server is used and for deployment AWS EC2. Oracle's SQL Developer is used as a database. SQL queries were written in order to make tables, alter tables, adding a new column or removing one were part of it.

Using AWS EC2 to host the application was something I had to learn because I did not have any prior experience of doing something similar. For UI development I was familiar with some other frameworks like Angular but learning and reading about Vaadin framework was something very interesting. Using any other UI framework could have been an alternative but sticking with Vaadin was intentional as learning and exploring new things was the prime objectives throughout the development of this project.

Results

The new features of the application are tested on organizational level and it almost satisfies all the requirements proposed in the system. However, there are still few features which needs to be implemented for example, functioning of Download button and Clear All has not been implemented in this project and could be considered as part of future work. Exporting this whole data to other parts of the system was the major goal which has been fulfilled partially and could be enhanced further.

Conclusions and Future Work

The new system successfully overcome almost all the issues which existed while following traditional approach of passing customs clearance borders. Having a facility where this complex process could be done so easily is a great advantage for goods and services businesses. Having these features into the existing system would simplify the architecture of the software. Currently the new enhancements done as part of this project is in item management level and as part of future work this data on an item level could be available to the different part of the system who are still manually entering this entire item information into the system.

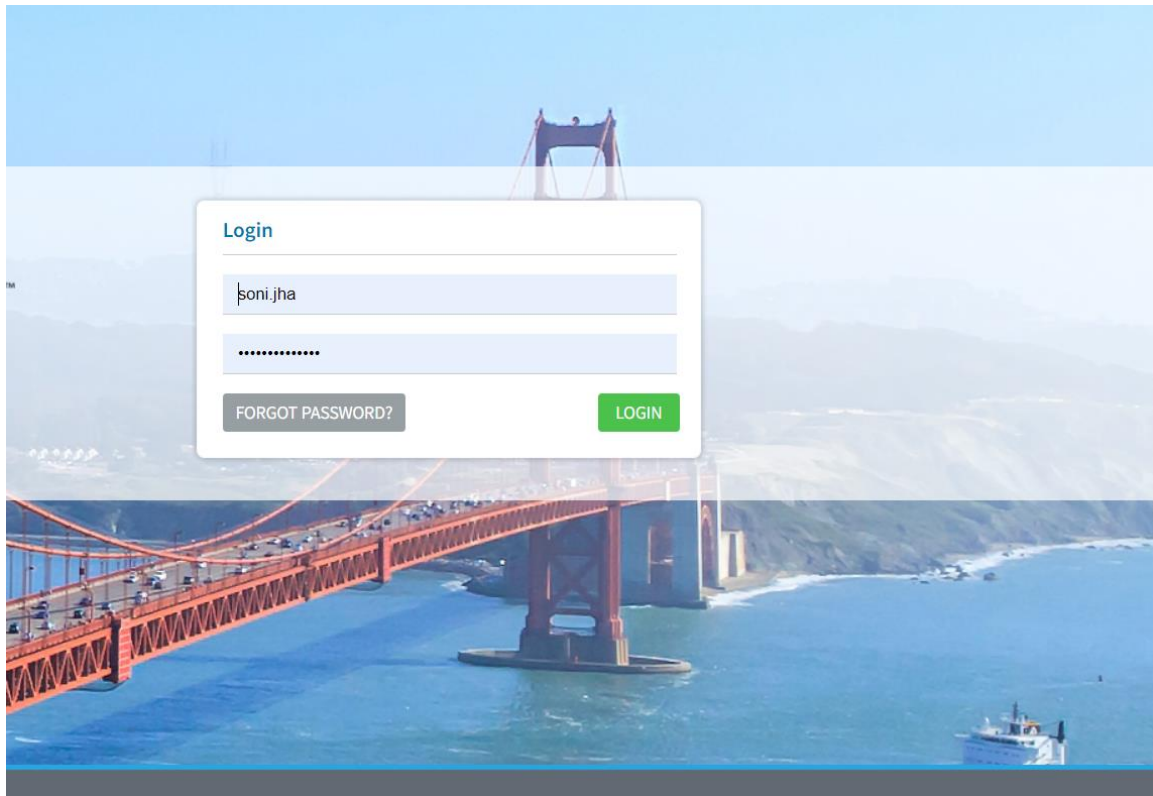
Bibliography

The existing system is one of the projects of the company BluJay Solutions and this project is an enhancement in the existing system.

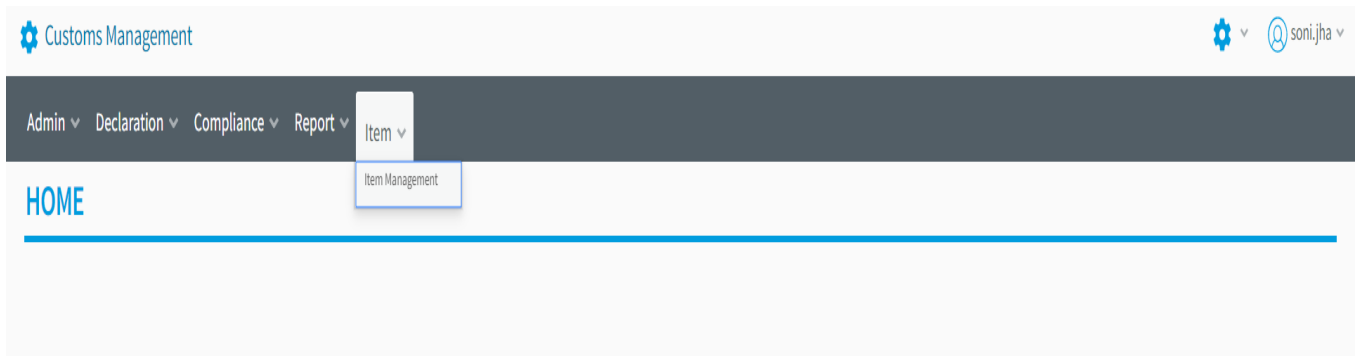
<https://www.blujaysolutions.com/>

Screenshots

Login Page



New Development: Item Management Tab



Item detail page:

The screenshot shows the 'ITEM MANAGEMENT' page. At the top, there's a search bar with the text 'MARK RADFORD TEST' and a 'NEW ITEM' button. Below the search bar, there are two input fields for 'Item ID' and 'Family'. To the right of these fields are buttons for 'DOWNLOAD', 'EXPORT DATA', 'EDIT FILTER', 'CLEAR ALL', and 'FIND'. Below the buttons, it says 'Result Count: 42'. The main part of the page is a table with the following columns: Item ID, Family, Sub-Family, Active Item, Item Created By, Item Created On, Item Modified By, and Item Modified On. The table contains four rows of data.

Item ID	Family	Sub-Family	Active Item	Item Created By	Item Created On	Item Modified By	Item Modified On
Jackets	Clothes	Shirt		soni.jha	2020-04-08 04:38:52 PM UTC	soni.jha	2020-04-16 09:08:37 AM UTC
Sofa	Furniture	Chair	✓	soni.jha	2020-04-08 12:50:28 PM UTC	soni.jha	2020-04-16 09:10:21 AM UTC
abcd				soni.jha	2020-04-08 01:00:34 AM UTC	soni.jha	2020-04-08 01:00:34 AM UTC
teen patti				soni.jha	2020-04-08 05:33:59 AM UTC	soni.jha	2020-04-08 01:36:18 AM UTC

An item page when New Item button is clicked on previous page:

Customs Management soni.jha

Admin ▾ Declaration ▾ Compliance ▾ Report ▾ Item ▾

ITEM DETAIL

CLOSE SAVE

Owner	MARK RADFORD TEST	Item ID	Jackets	Commercial Name		Description	
Alternate Description		Family	Clothes	Sub-Family	Shirt	Country of Origin	
Branch/Department		Main Product	<input type="checkbox"/>	Component	<input type="checkbox"/>	Active	<input type="checkbox"/>

General Country-Specific

Afghanistan ▾

Andorra ▾

Antarctica ▾

Armenia ▾

Austria ▾

Bangladesh ▾

Bolivia (Plurinational State of) ▾

When a specific country is clicked from the collapse expand bar

Customs Management soni.jha

Admin ▾ Declaration ▾ Compliance ▾ Report ▾ Item ▾

General Country-Specific

Afghanistan ^

Local Name	Shrug	Price	20	Price Currency	dhs
Eligible for Import	<input checked="" type="checkbox"/>	Note On Import Eligibility	Cotton Shrug		
Eligible for Export	<input checked="" type="checkbox"/>	Note On Export Eligibility	Any detail		

IMPORT										
Tariff Code	Stat...	Effective Date	Expiration Date	Date of Classification	Active	BTI Indicator	BTI Num...	Created By	Created On	
1501101010		2021-04-11 08:00:00 AM UTC	2021-05-15 08:00:00 AM UTC	2020-04-10 11:08:36 PM UTC	✓	✓	321321	soni.jha	2020-04-10 11:08:36 PM UTC	s

EXPORT									
Tariff Code	Stat...	Effective Date	Expiration Date	Date of Classification	Active	Created By	Created On	Modified By	Modified On
224		2020-04-19 07:13:52 PM UTC	2020-04-19 07:13:52 PM UTC	2020-04-19 07:13:52 PM UTC	✓	soni.jha	2020-04-19 09:36:09 PM UTC	soni.jha	2020-04-16 01:06:53 #

When General tab is clicked this page appears where we can add the general data like customs and dimensions data.

Customs Management

soni.jha

Admin
Declaration
Compliance
Report
Item

Owner
MARK RADFORD TEST
Item ID
Jackets
Commercial Name
Description

Alternate Description
Family
Clothes
Sub-Family
Shirt
Country of Origin

Branch/Department
Main Product
Component
Active

General
Country-Specific

Customs Data

HS Code
1205
Global Import Classification Status
Global Export Classification Status

Global Import Eligibility
Note On Import Eligibility
Import details can be added here

Global Export Eligibility
Note On Export Eligibility
Export details can be added here

Additional Details

SKU UOM
abc123
SKU Quantity
23
Package Code
abc222
Price

Price Currency
Length
Width
Height

Dimension UOM
Commercial UOM
Gross Weight
Net Weight

Weight UOM
Net Volume
Gross Volume
Volume UOM

UPC Code
Hazardous Material