

Memo

To: Professor Pisano
From: Joel Akerman, Taha Ababou, Manuel Segimon, Bora Bulut, Zaiyan Muhammad
Team: PAPO
Date: 04/04/24
Subject: Final Prototype Testing Report

1.0 Introduction

The final prototype represents a seamless integration of database architecture, API functionality, and front-end design, offering an efficient and user-friendly platform. Our secure database ensures the safe storage and easy access of user information, while a suite of APIs facilitates essential user interactions like registration, login, and profile management, streamlining the user experience. At the heart of this prototype is a refined front-end interface, featuring a straightforward login page and a main dashboard. This dashboard employs advanced algorithms for package size analysis and cost evaluation, optimizing the drug selection process. These components work together to provide users with personalized, cost-effective drug replacements, enhancing decision-making and efficiency. This streamlined prototype underscores our commitment to enhancing healthcare outcomes through the strategic integration of technology, offering a robust tool for managing pharmaceutical data with precision and user-centric design.

1.1 Purpose

This document outlines the additions made since the second prototype testing. It highlights the specifications and tests done on the front-end, user interface, which holds a significant part of the overall PAPO Procurement Software, as well as the interaction of the UI with the database for storing user information and API implementation. All of these features will be used by all stakeholders, including developers and testers.

1.2 Scope

1.2.1 In Scope (features that will be tested in this prototype)

- **Online Database**
 - Validate the integrity of the database that stores user credentials by ensuring that it is up and running, bound to the API, and updates user information according to the changes in real time.
- **API Calls**
 - Certify that API calls create user, delete user, edit certain granted user information, log users in, log users out, and lock users after a certain number of incorrect login attempts.
- **Cost-Effective Algorithm**

- Ensure that the addPriceAverage function calculates the weighted average of the prices of the replacements based on three price segments and outputs them in a sorted order.
- **Login Page**
 - Certify that the login page accepts user email and password, cross checks them with the credentials stored in the database, and grants access to the user by taking them to the main page.
- **Main Page**
 - Verify that the main page takes in the 8-digit code of a drug and displays the top five replacement drugs in a descending order of replacement suitability.
 - Certify that the checkboxes for each of the three price segments pass in the percentages as weights in the cost-effective algorithm and return the replacements accordingly.
 - Test the checkbox to allow multiple pills and ensure it outputs replacements whose package size is greater than that of the original drug in accordance with the package size algorithm.
 - Test the 'load all' button and verify it lists all the replacements beyond the top five items when pressed.
- **Logging**
 - Ensure that the email, password, and cookie value of users are logged in a file every time they login and logout.
- **Output Accuracy and Format**
 - Ensure that the final output is accurate, properly formatted, and matches the expected criteria based on the input data.

1.3 Roles and Responsibilities

Manuel	Algorithm Developer/Head of Continuous Improvement
Taha	Front-End Developer/QA Tester
Bora	Database Developer/QA Tester
Joel	Team Leader/Product Manager
Zaiyan	Technical Project Manager

2.0 Code Overview

Packaost-Effective Algorithm

Functionality	Description
Setting Weights	Sets the weights (as percentages) for calculating the average price of drug replacements. w1, w2, and w3 represent the importance of the AWP Price, Acquisition Price, and WAC Price, respectively.
Calculate Average Price	Calculates the weighted average price of drug replacements using the formula $(w1 * \text{AWP Price} + w2 * \text{Acquisition Price} + w3 * \text{WAC Price}) / (w1 + w2 + w3)$. This is directly applied to the replacements data structure to add a new column Average Price.
Sort Replacements	Sorts the replacements data structure in ascending order based on the Average Price. This is achieved using the <code>sort_values(by='Average Price')</code> method.
Export to CSV	Exports the sorted replacements data structure to a CSV file named <code>replacements.csv</code> , ensuring no index is included in the output file.
Add Price Average and Sort	This function encapsulates the process of calculating the weighted average price and sorting the replacements. It accepts weights w1, w2, w3, and the replacements data structure as arguments, calculates the average price, sorts the replacements by this average price, and returns the sorted replacements. This function is defined twice with identical functionality and parameters.

Front-End Implementation

Login Page

Feature	Description
useState for formData	Initializes state for form data to manage username and password inputs.
useNavigate Hook	Provides navigation functionality to redirect users after successful login.
handleSubmit Function	Handles form submission, including API call for user login, displaying success or error messages, setting cookies, and navigation.
Toast Notifications	Utilizes react-toastify for displaying success or error messages upon login attempts.
Cookies Management	Sets a session cookie with an expiration date upon successful login using js-cookie.
API Interaction	Calls login_user function from API services to authenticate user credentials.
Form Input Handling	Dynamically updates form data state upon input changes, ensuring real-time synchronization of user inputs.
Conditional Navigation	Redirects users to the home page upon successful login, enhancing user experience and flow.
Remember Me Checkbox	Includes a "Remember me" option for users, potentially for future implementation of session persistence.

Password and Username Inputs	Provides input fields for username and password with validation, ensuring user input is captured securely.
Link to Registration Page	Offers navigation to the registration page for new users who do not have an account yet.
Styling and Accessibility	Implements a responsive and accessible design for the login form, improving user interaction and inclusivity.

Main Page

Feature	Description
useNavigate Hook	Utilizes useNavigate for navigation control, redirecting users to the login page if they are not authenticated.
Authentication Check	Checks for the presence of a token cookie to verify user authentication; redirects unauthenticated users to the login page.
RecentOrders Component	Incorporates the RecentOrders component to display recent orders, illustrating modular design and component reuse.
No Data Constants	Uses NO_DATA constant to handle scenarios where there is no data available to display in components.
Dashboard Layout	Creates a dashboard layout with a flexible structure using flex display to organize components like RecentOrders.
DashboardStatsGrid Component	Presents a grid of statistics including total sales, expenses, customers, and orders, enhancing the dashboard's informative capacity.

Icons for Visualization	Employs icons from Io5 library (IoBagHandle, IoPieChart, IoPeople, IoCart) for intuitive visual representation of different statistics.
BoxWrapper Component	Utilizes a BoxWrapper function to standardize the appearance of statistic boxes, promoting a consistent and clean UI design.
Statistical Data Display	Showcases key business metrics (sales, expenses, customers, orders) in an easy-to-read format, underlining the dashboard's role as a decision-making tool.
Styling and Theming	Implements a cohesive styling and color theme across the dashboard, using tailwind classes for aesthetics and alignment.

2.1 Visualization

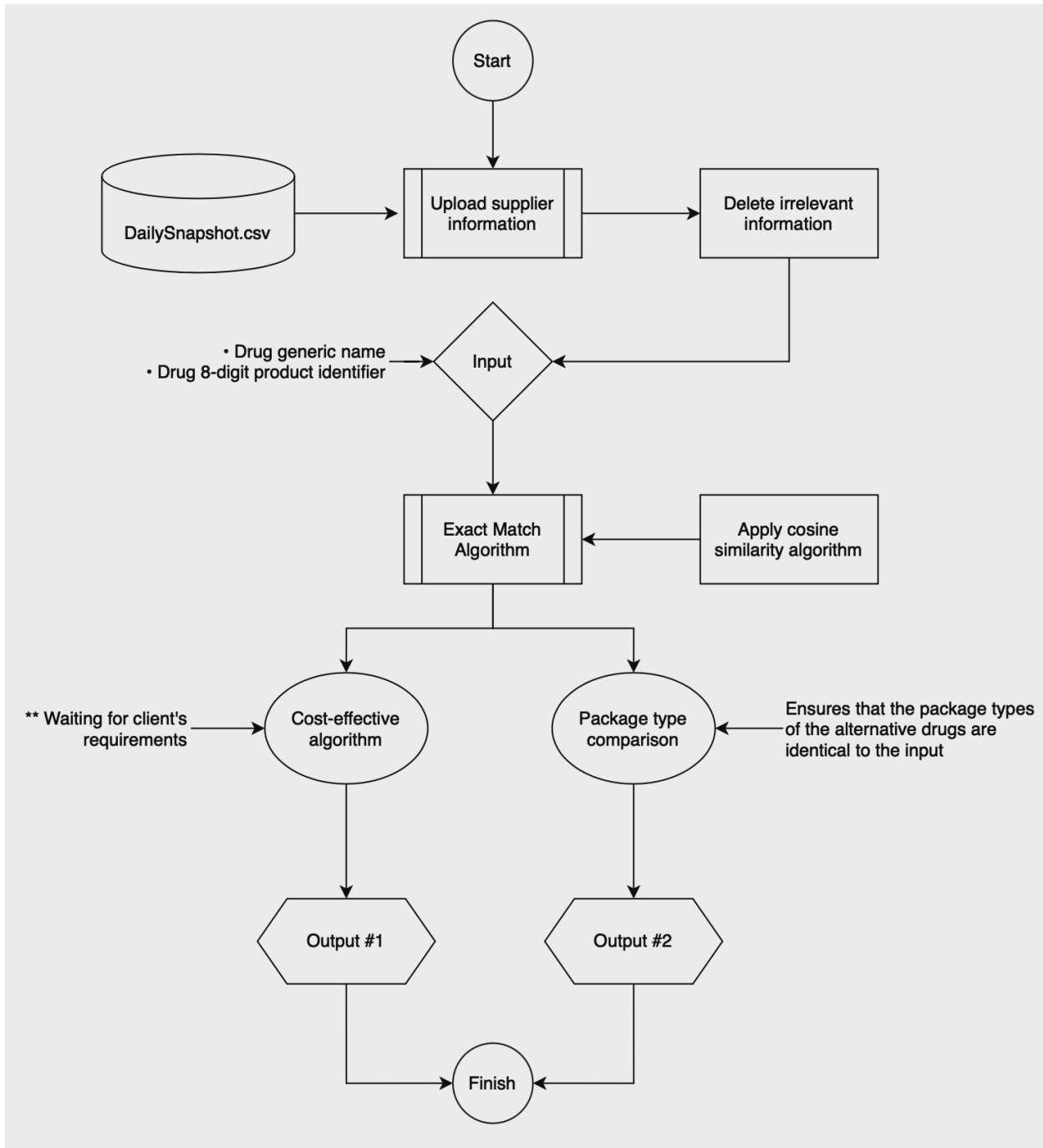


Figure A. Prototype Flowchart

3.0 Test Methodology

3.1 Pre-Testing Setup Procedure

- 1) Database Preparation:
 - a) Login to AWS with admin credentials. Find the PostgreSQL database created to store user information. Ensure it is up and running, security protocols are set to accept incoming connections, and it is made 'publicly available'.
- 2) Environment Setup:
 - a) Ensure that the development and testing environments are properly configured, including any necessary software, databases, and network configurations.
 - b) Verify that all dependencies and libraries used in the project are installed and up-to-date.
- 3) Data and Script Preparation:
 - a) Ensure the client's data file, 'Daily Snapshot.csv', is stored in the API. This file contains the data set required for the testing.
- 4) Environment Verification:
 - a) Ensure API is up and running and that it responds in a timely manner.
- 5) Browser Setup:
 - a) Launch a reliable browser and navigate to the project website:
<https://papo-pearl.vercel.app/home>

By following these enhanced setup procedures, the testing environment will be optimally prepared, ensuring a smooth and efficient testing process.

3.2 Testing Procedure

- 1) After navigating to the project website, observe the dynamic text on the left side that shows the capability of the software and the login box on the right side.
- 2) Under 'Your email,' enter the email of a registered user, and under 'Password,' enter the password of that user. Press the 'Sign in' button right below.
- 3) In the GitHub repository, find the update log file with the email, password, and cookie value of the user who just logged in.
- 4) After being taken to the main page, find the 'Search drug' box on the upper left corner. Enter the 8-digit identifier of the drug to find alternatives to.
- 5) Using the slides for each price segment, change the percent of the amount that could be ordered from that vendor. Make sure the sum of the percentages is equal to 100%.
- 6) Optionally, press the checkbox to allow multiple pills to acquire replacements whose package size is greater than that of the original drug in accordance with the package size algorithm.
- 7) Press enter to list the replacements. Observe the top five replacements based on match accuracy.
- 8) Press 'load all' to observe all the replacements identified by the algorithm.

3.3 Measurable Criteria

Criteria ID	Criteria Description	Target Value	Measurement Method
MC1	Accuracy of Cost Analysis Algorithm	$\geq 98\%$ accuracy	Compare algorithm output with known data
MC2	Response Time of Cost Analysis Calculations	≤ 2 seconds	Measure time from request to response
MC3	Login Page Authentication	100% accuracy	Manual and automated login attempts with valid/invalid credentials
MC4	Main Page Functionality	100% compliance	Manual verification of drug code input and replacement display
MC5	Price Segment Weight Application	100% accuracy	Automated tests with varied weights for price segments
MC6	Logging of User Credentials and Activities	100% accuracy	Audit logs for login/logout actions and data consistency

MC7	Output Accuracy of Replacement Drugs	100% accuracy	Manual and automated verification against expected outputs
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3.4 Test Cases

The following pages, operations, active ingredient-drug code combinations will be tested:

Description
Login page
Main page (Dashboard) - Correct credentials grant access
entecavir ORAL TABLET 0.5 MG - 10000077 (Cost weights 0.5, 0.4, 0.1)
entecavir ORAL TABLET 0.5 MG - 10000077 (Cost weights 0, 0, 1)
entecavir ORAL TABLET 1 MG - 10000082 (Cost weights 0.3, 0.3, 0.4)
entecavir ORAL TABLET 1 MG - 10000082 (Cost weights 0.3, 0.3, 0.4) (Multiple: Yes)
METHADONE HCL 10 MG/5 ML SOL 5 - 10083467 (Cost weights 0.2, 0.2, 0.6)
METHADONE HCL 10 MG/5 ML SOL 5 - 10083467 (Cost weights 0.8, 0.1, 0.1)
ISOSORBIDE DINITRATE 5 MG TAB - 10208756 (Cost weights: 0, 0.1, 0.9)
ISOSORBIDE DINITRATE 5 MG TAB - 10208756 (Cost weights: 0, 0.1, 0.9) (Multiple: Yes)
Audit logs in backend.log
Logout

Score sheet	Pass/Fail	Comments
1. Accuracy of Cost Analysis Algorithm: a. Compare algorithm output with known data	<input type="checkbox"/>	
2. Response Time of Cost Analysis Calculations: Measure time from request to response	<input type="checkbox"/>	

3. Login Page Authentication: a. Manual login attempts with valid/invalid credentials	<input type="checkbox"/>	
4. Main Page Functionality: a. Manual verification of drug code input and replacement display	<input type="checkbox"/>	
5. Price Segment Weight Application: a. Automated tests with varied weights for price segments	<input type="checkbox"/>	
6. Logging of User Credentials and Activities: a. Audit logs for login/logout actions and data consistency	<input type="checkbox"/>	
7. Output Accuracy of Replacement Drugs: a. Manual and automated verification against expected outputs	<input type="checkbox"/>	

4.0 Results

4.1.1 Test Case Outputs

In the final testing phase of our enhanced pharmacy procurement system, we achieved significant successes across various critical functionalities. The accuracy of the cost analysis algorithm was validated against known data, proving its reliability in providing precise cost evaluations for informed purchasing decisions. The system demonstrated swift response times in cost analysis calculations, ensuring real-time data accessibility. Authentication tests on the login page, through both valid and invalid manual login attempts, confirmed the robust security measures in place to protect sensitive information. Functionality checks on the main page verified the accurate processing of drug code inputs and the correct display of replacement drugs, facilitating easy access to alternative medication options. Automated tests assessing the application of varied weights for price segments confirmed the system's adaptability to different pricing strategies. Moreover, the logging of user credentials and activities through audit logs demonstrated a high level of data integrity and security compliance. The output accuracy for replacement drugs, verified through both manual and automated methods, underscored the system's capability to offer viable and precise alternatives. The following outputs have been observed:

Login page



Buyer: There is a drug shortage for X drug,
find me another one!

Sign in to your account

Your username

Password

☐ Remember me [Forgot password?](#)

[Sign in](#)

Don't have an account yet? [Contact Us](#)

Main page (Dashboard) - Correct credentials grant access

PAPO

- Search
- History
- Favorites
- Help & Support
- Logout


☐ Multiple?

Showing results for


[Save results](#)

Item Number	NDC Number	Size Qty	Retail Pack Quantity	340B Price	GPO Price	Retail Price	WAC Price	Contract Flag	Generic Name	Form	Size	True Similarity	%	MCG	M	IU	MEQ	UN	Total_MG	Total_ML	Total_MM	Basic Form	Average Price
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entecavir ORAL TABLET 0.5 MG - 10000077 (Cost weights 0.5, 0.4, 0.1)

<div>  <div> <input type="text" value="10000077"/> <div> <input type="button" value="0.5"/> <input type="button" value="0.4"/> <input type="button" value="0.1"/> <input type="checkbox"/> Multiple? <input type="button" value="Search"/> </div> </div> </div> <div> <input type="button" value="Help & Support"/> <input type="button" value="Logout"/> </div>														
<div>Showing results for</div> <div>Save results</div>														
Item Number	NDC Number	Size Qty	Retail Pack Quantity	340B Price	GPO Price	WAC Price	Contract Flag	Generic Name	Form	Size	True Similarity	Total_MG	Basic Form	Average Price
10249597	42806065830	30	1	133305	739	800	N	entecavir	ORAL TABLET 0.5 MG	0.5 MG TAB 30	1	0.5	Other/Undefined	14026.1
10161780	31722083330	30	1	133297	2954	4000	C	entecavir	ORAL TABLET 0.5 MG	0.5MG TAB 30	0.706611739	0.5	Other/Undefined	16511.3
10160949	65862084130	30	1	133305	5910	6400	N	entecavir	ORAL TABLET 0.5 MG	0.5MG TAB 30	0.706611739	0.5	Other/Undefined	18894.5
10172843	69097042602	30	1	133305	5910	6400	N	entecavir	ORAL TABLET 0.5 MG	0.5MG TAB 30	0.706611739	0.5	Other/Undefined	18894.5
10184859	68382092006	30	1	133305	7239	7840	N	entecavir	ORAL TABLET 0.5 MG	0.5 MG TAB 30	1	0.5	Other/Undefined	20146.1
10229261	43547043603	30	1	133305	9233	10000	N	entecavir	ORAL TABLET 0.5 MG	0.5 MG TAB 30	1	0.5	Other/Undefined	22023.7
10251874	50268028912	20	1	44575	4178	37146	C	entecavir	ORAL TABLET 0.5 MG	0.5 MG TAB 20 (2X10)	0.6427599635	0.5	Other/Undefined	24701.7
10165690	31722083390	90	1	399913	8477	12000	C	entecavir	ORAL TABLET 0.5 MG	0.5MG TAB 90	0.5603852326	0.5	Other/Undefined	49382.1

entecavir ORAL TABLET 0.5 MG - 10000077 (Cost weights 0, 0, 1)

<div>  <div> <input type="text" value="10000077"/> <div> <input type="button" value="0"/> <input type="button" value="0"/> <input type="button" value="1"/> <input type="checkbox"/> Multiple? <input type="button" value="Search"/> </div> </div> </div> <div> <input type="button" value="Help & Support"/> <input type="button" value="Logout"/> </div>														
<div>Showing results for</div> <div>Save results</div>														
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10251874	50268028912	20	1	44575	4178	37146	C	entecavir	ORAL TABLET 0.5 MG	0.5 MG TAB 20 (2X10)	0.6427599635	0.5	Other/Undefined	44575
10167970	60687021625	5X6	1	78678	31667	65565	C	entecavir	ORAL TABLET 0.5 MG	0.5 MG TAB 5X6 UD AH	0.6189752469	0.5	Other/Undefined	78678
10161780	31722083330	30	1	133297	2954	4000	C	entecavir	ORAL TABLET 0.5 MG	0.5MG TAB 30	0.706611739	0.5	Other/Undefined	133297
10249597	42806065830	30	1	133305	739	800	N	entecavir	ORAL TABLET 0.5 MG	0.5 MG TAB 30	1	0.5	Other/Undefined	133305
10184859	68382092006	30	1	133305	7239	7840	N	entecavir	ORAL TABLET 0.5 MG	0.5 MG TAB 30	1	0.5	Other/Undefined	133305
10229261	43547043603	30	1	133305	9233	10000	N	entecavir	ORAL TABLET 0.5 MG	0.5 MG TAB 30	1	0.5	Other/Undefined	133305
10160949	65862084130	30	1	133305	5910	6400	N	entecavir	ORAL TABLET 0.5 MG	0.5MG TAB 30	0.706611739	0.5	Other/Undefined	133305
10172843	69097042602	30	1	133305	5910	6400	N	entecavir	ORAL TABLET 0.5 MG	0.5MG TAB 30	0.706611739	0.5	Other/Undefined	133305

entecavir ORAL TABLET 1 MG - 10000082 (Cost weights 0.3, 0.3, 0.4)

<div> </div> <div> <div> <div>Search</div> <div>History</div> <div>Favorites</div> </div> <div> <div>Help & Support</div> <div>Logout</div> </div> </div> <div> <input type="text" value="10000082"/> <div> <input type="text" value="0.3"/> <input type="text" value="0.3"/> <input type="text" value="0.4"/> <input type="checkbox"/> Multiple? </div> <div>Search</div> </div> <div> <div>Showing results for</div> <div>Save results</div> </div> <table> <tr> <th>Item Number</th><th>NDC Number</th><th>Size Qty</th><th>Retail Pack Quantity</th><th>340B Price</th><th>GPO Price</th><th>WAC Price</th><th>Contract Flag</th><th>Generic Name</th><th>Form</th><th>Size</th><th>True Similarity</th><th>Total_MG</th><th>Basic Form</th><th>Average Price</th></tr> <tr> <td>10249686</td><td>42806065930</td><td>30</td><td>1</td><td>133305</td><td>831</td><td>900</td><td>N</td><td>entecavir</td><td>ORAL TABLET 1 MG</td><td>1 MG TAB 30</td><td>1</td><td>1</td><td>Other/Undefined</td><td>53841.3</td></tr> <tr> <td>10161781</td><td>31722083430</td><td>30</td><td>1</td><td>133297</td><td>2720</td><td>4000</td><td>C</td><td>entecavir</td><td>ORAL TABLET 1 MG</td><td>1MG TAB 30</td><td>0.6940414237</td><td>1</td><td>Other/Undefined</td><td>55334.8</td></tr> <tr> <td>10172844</td><td>69097042502</td><td>30</td><td>1</td><td>133305</td><td>5910</td><td>6400</td><td>N</td><td>entecavir</td><td>ORAL TABLET 1 MG</td><td>1MG TAB 30</td><td>0.6940414237</td><td>1</td><td>Other/Undefined</td><td>57015</td></tr> <tr> <td>10161050</td><td>65862084230</td><td>30</td><td>1</td><td>133305</td><td>5910</td><td>6400</td><td>N</td><td>entecavir</td><td>ORAL TABLET 1 MG</td><td>1MG TAB 30</td><td>0.6940414237</td><td>1</td><td>Other/Undefined</td><td>57015</td></tr> <tr> <td>10184880</td><td>68382092106</td><td>30</td><td>1</td><td>133305</td><td>7239</td><td>7840</td><td>N</td><td>entecavir</td><td>ORAL TABLET 1 MG</td><td>1 MG TAB 30</td><td>1</td><td>1</td><td>Other/Undefined</td><td>57845.7</td></tr> <tr> <td>10229260</td><td>43547043703</td><td>30</td><td>1</td><td>133305</td><td>9233</td><td>10000</td><td>N</td><td>entecavir</td><td>ORAL TABLET 1 MG</td><td>1 MG TAB 30</td><td>1</td><td>1</td><td>Other/Undefined</td><td>59091.9</td></tr> <tr> <td>10186738</td><td>51991089633</td><td>30</td><td>1</td><td>133305</td><td>18466</td><td>20000</td><td>N</td><td>entecavir</td><td>ORAL TABLET 1 MG</td><td>1 MG TAB 30</td><td>1</td><td>1</td><td>Other/Undefined</td><td>64861.8</td></tr> </table>															Item Number	NDC Number	Size Qty	Retail Pack Quantity	340B Price	GPO Price	WAC Price	Contract Flag	Generic Name	Form	Size	True Similarity	Total_MG	Basic Form	Average Price	10249686	42806065930	30	1	133305	831	900	N	entecavir	ORAL TABLET 1 MG	1 MG TAB 30	1	1	Other/Undefined	53841.3	10161781	31722083430	30	1	133297	2720	4000	C	entecavir	ORAL TABLET 1 MG	1MG TAB 30	0.6940414237	1	Other/Undefined	55334.8	10172844	69097042502	30	1	133305	5910	6400	N	entecavir	ORAL TABLET 1 MG	1MG TAB 30	0.6940414237	1	Other/Undefined	57015	10161050	65862084230	30	1	133305	5910	6400	N	entecavir	ORAL TABLET 1 MG	1MG TAB 30	0.6940414237	1	Other/Undefined	57015	10184880	68382092106	30	1	133305	7239	7840	N	entecavir	ORAL TABLET 1 MG	1 MG TAB 30	1	1	Other/Undefined	57845.7	10229260	43547043703	30	1	133305	9233	10000	N	entecavir	ORAL TABLET 1 MG	1 MG TAB 30	1	1	Other/Undefined	59091.9	10186738	51991089633	30	1	133305	18466	20000	N	entecavir	ORAL TABLET 1 MG	1 MG TAB 30	1	1	Other/Undefined	64861.8
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entecavir ORAL TABLET 1 MG - 10000082 (Cost weights 0.3, 0.3, 0.4) (Multiple: Yes)

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METHADONE HCL 10 MG/5 ML SOL 5 - 10083467 (Cost weights 0.2, 0.2, 0.6)

- Search
- History
- Favorites
- Help & Support
- Logout

☐ Multiple?
 Search

Showing results for

[Save results](#)

Item Number	NDC Number	Size Qty	Retail Pack Quantity	340B Price	GPO Price	WAC Price	Contract Flag	Generic Name	Form	Size	True Similarity	Total_MG	Total_ML	Basic Form	Average Price
10043023	00054355663	500	1	6907	4428	5526	C	methadone	HCl ORAL SOLUTION 10	10 MG/5 ML SOL 5	1	10	5	Other/Undefined	6135
10265607	00406622105	500	1	9000	5103	5526	N	methadone	HCl ORAL SOLUTION 10	10MG/5ML SOL 500	0.6130625008	10	5	Other/Undefined	7525.8

METHADONE HCL 10 MG/5 ML SOL 5 - 10083467 (Cost weights 0.8, 0.1, 0.1)

- Search
- History
- Favorites
- Help & Support
- Logout

☐ Multiple?
 Search

Showing results for

[Save results](#)

Item Number	NDC Number	Size Qty	Retail Pack Quantity	340B Price	GPO Price	WAC Price	Contract Flag	Generic Name	Form	Size	True Similarity	Total_MG	Total_ML	Basic Form	Average Price
10043023	00054355663	500	1	6907	4428	5526	C	methadone	HCl ORAL SOLUTION 10	10 MG/5 ML SOL 5	1	10	5	Other/Undefined	5554.3
10265607	00406622105	500	1	9000	5103	5526	N	methadone	HCl ORAL SOLUTION 10	10MG/5ML SOL 500	0.6130625008	10	5	Other/Undefined	5831.1

ISOSORBIDE DINITRATE 5 MG TAB - 10208756 (Cost weights: 0, 0.1, 0.9)

- Search
- History
- Favorited
- Help & Support
- Logout

☐ Multiple?
 Search

Showing results for

Save results

Item Number	NDC Number	Size Qty	Retail Pack Quantity	340B Price	GPO Price	WAC Price	Contract Flag	Generic Name	Form	Size	True Similarity	Total_MG	Basic Form	Average Price
10169401	50268044715	50	1	5317	2423	4431	C	isosorbide dinitrate	ORAL TABL	5 MG TAB (5X10)	0.6753499784	5	Other/Undefined	5027.6
10173711	49884002001	100	1	9851	4672	7880	C	isosorbide dinitrate	ORAL TABL	5MG TAB 1	0.5879251695	5	Other/Undefined	9333.1
10018787	00143176901	100	1	9851	4851	5253	N	isosorbide dinitrate	ORAL TABL	5 MG TAB	1	5	Other/Undefined	9351
10022078	00781163501	100	1	9851	5093	7880	C	isosorbide dinitrate	ORAL TABL	5 MG TAB	1	5	Other/Undefined	9375.2

ISOSORBIDE DINITRATE 5 MG TAB - 10208756 (Cost weights: 0, 0.1, 0.9) (Multiple: Yes)

- Search
- History
- Favorited
- Help & Support
- Logout

☒ Multiple?
 Search

Showing results for

Save results

Item Number	NDC Number	Size Qty	Retail Pack Quantity	340B Price	GPO Price	WAC Price	Contract Flag	Generic Name	Form	Size	True Similarity	Total_MG	Basic Form	Average Price
10169401	50268044715	50	1	5317	2423	4431	C	isosorbide dinitrate	ORAL TABL	5 MG TAB (5X10)	0.6753499784	5	Other/Undefined	5027.6
10173711	49884002001	100	1	9851	4672	7880	C	isosorbide dinitrate	ORAL TABL	5MG TAB 1	0.5879251695	5	Other/Undefined	9333.1
10018787	00143176901	100	1	9851	4851	5253	N	isosorbide dinitrate	ORAL TABL	5 MG TAB	1	5	Other/Undefined	9351
10022078	00781163501	100	1	9851	5093	7880	C	isosorbide dinitrate	ORAL TABL	5 MG TAB	1	5	Other/Undefined	9375.2

Audit logs in backend.log

```
2024-04-04 02:13:57,198 - root - INFO - Drug replacements retrieved successfully
2024-04-04 02:13:58,196 - root - INFO - Drug replacements retrieved successfully
2024-04-04 02:14:02,970 - root - INFO - Drug replacements retrieved successfully
2024-04-04 02:14:05,046 - root - INFO - Drug replacements retrieved successfully
2024-04-04 02:14:06,065 - root - INFO - Drug replacements retrieved successfully
2024-04-04 02:15:36,803 - root - INFO - Drug replacements retrieved successfully
2024-04-04 02:15:38,136 - root - INFO - Drug replacements retrieved successfully
2024-04-04 02:16:42,307 - root - INFO - Drug replacements retrieved successfully
2024-04-04 02:28:18,320 - root - INFO - User logged in: test99
2024-04-04 02:28:28,867 - root - INFO - Drug replacements retrieved successfully
2024-04-04 02:28:32,363 - root - INFO - Drug replacements retrieved successfully
2024-04-04 02:28:38,161 - root - INFO - Drug replacements retrieved successfully
2024-04-04 02:28:43,310 - root - INFO - Drug replacements retrieved successfully
2024-04-04 02:28:47,413 - root - INFO - Drug replacements retrieved successfully
2024-04-04 02:28:48,498 - root - INFO - Drug replacements retrieved successfully
2024-04-04 02:29:39,982 - root - INFO - Drug replacements retrieved successfully
2024-04-04 02:29:42,429 - root - INFO - Drug replacements retrieved successfully
2024-04-04 02:30:47,650 - root - INFO - Drug replacements retrieved successfully
2024-04-04 02:30:53,603 - root - INFO - Drug replacements retrieved successfully
2024-04-04 02:30:59,550 - root - INFO - Drug replacements retrieved successfully
2024-04-04 02:31:06,907 - root - INFO - Drug replacements retrieved successfully
2024-04-04 02:31:11,027 - root - INFO - Drug replacements retrieved successfully
2024-04-04 02:31:12,194 - root - INFO - Drug replacements retrieved successfully
2024-04-04 02:31:13,133 - root - INFO - Drug replacements retrieved successfully
2024-04-04 02:31:39,545 - root - INFO - Drug replacements retrieved successfully
2024-04-04 02:34:28,720 - root - INFO - Drug replacements retrieved successfully
2024-04-04 02:35:36,611 - root - INFO - Drug replacements retrieved successfully
2024-04-04 02:35:41,040 - root - INFO - Drug replacements retrieved successfully
2024-04-04 02:35:42,495 - root - INFO - Drug replacements retrieved successfully
2024-04-04 02:35:44,057 - root - INFO - Drug replacements retrieved successfully
2024-04-04 02:35:52,675 - root - INFO - Drug replacements retrieved successfully
2024-04-04 02:36:04,252 - root - WARNING - Invalid login attempt:
2024-04-04 02:36:04,252 - root - ERROR - Error during login: 401: Invalid credentials.
2024-04-04 02:36:06,840 - root - WARNING - Invalid login attempt:
2024-04-04 02:36:06,841 - root - ERROR - Error during login: 401: Invalid credentials.
2024-04-04 02:36:12,580 - root - INFO - User logged in: test99
```

Logout

4.1.2 Implications of the Results

Score sheet	Pass/Fail	Comments
1. Accuracy of Cost Analysis Algorithm: Compare algorithm output with known data	<input checked="" type="checkbox"/>	Cost Analysis Algorithm works as intended
2. Response Time of Cost Analysis Calculations: Measure time from request to response	<input checked="" type="checkbox"/>	Instant response
3. Login Page Authentication: Manual login attempts with valid/invalid credentials	<input checked="" type="checkbox"/>	Valid credentials grant access - invalid credentials don't grant access
4. Main Page Functionality: Manual verification of drug code input and replacement display	<input checked="" type="checkbox"/>	Drug code input provides accurate output

5. Price Segment Weight Application: Automated tests with varied weights for price segments	<input checked="" type="checkbox"/>	Price Segment Weight Application works appropriately
6. Logging of User Credentials and Activities: Audit logs for login/logout actions and data consistency	<input checked="" type="checkbox"/>	Activities are logged within backend.log
7. Output Accuracy of Replacement Drugs: Manual and automated verification against expected outputs	<input checked="" type="checkbox"/>	Outputs are accurate

The implications of our testing results for the enhanced pharmacy procurement system are profound, especially from a technical standpoint. The demonstrated accuracy of the cost analysis algorithm not only validates the mathematical models and data processing techniques employed but also underscores the system's capability to handle complex calculations with precision. This precision is critical for enabling pharmacies to rely on the software for financial planning and budgeting. The swift response times observed during cost analysis calculations reflect the system's optimized performance and efficient handling of data queries, suggesting that the underlying architecture is well-suited for real-time applications. The success in login page authentication tests indicates the robustness of the security framework, incorporating effective mechanisms to prevent unauthorized access, thereby protecting sensitive data. The system's adept handling of drug code inputs and replacement drug displays on the main page showcases its user-friendly interface and the effectiveness of its database querying processes. The ability to accurately apply varied weights for price segments during automated testing reveals the system's flexible design, allowing for customizable pricing strategies to accommodate different pharmacy needs. Furthermore, the precise logging of user credentials and activities ensures a high level of compliance with data protection regulations, indicating a well-implemented audit trail mechanism. Lastly, the accuracy in identifying and suggesting replacement drugs validates the algorithm's reliability and the comprehensive nature of the drug database, highlighting the system's potential to significantly impact procurement strategies. These technical achievements not only enhance the system's usability and reliability but also set a new standard for the development of future pharmacy procurement technologies.

5.0 Conclusion

Our prototype encapsulates the seamless integration of a reliable online database, robust API functionality, and advanced algorithms to elevate user experience and efficiency. The database secures user credentials and updates information in real time, ensuring data integrity. Our APIs facilitate essential user operations, including registration, authentication, and security measures against unauthorized access. At the core, our cost-effective algorithm meticulously calculates and sorts drug replacements by leveraging weighted averages of price segments, providing users with financially optimal options. The login page rigorously validates credentials, granting access to a main page where users can intuitively search for and customize drug replacements based on their preferences. Logging user activities enhances security, while the system's design ensures the accuracy and user-friendliness of outputs, affirming our prototype as a leading solution in pharmaceutical data management.

5.1 Future Milestones

5.1.1 UI Tweaks

- Objective: Enhance user experience by simplifying the main page to display only essential information.
- Action Plan: Conduct user research to identify key data points of interest and redesign the main page UI to focus on these elements.

5.1.2 Customer Installation

- Objective: Ensure the product is easily installable by clients on their systems.
- Action Plan: Develop a comprehensive installation guide and an installer package that automates the setup process as much as possible.

5.1.3 Obtain Real Price Data from the Client

- Objective: Accurately calculate and display drug replacement options using real-world pricing.
- Action Plan: Work with the client to establish a secure, automated process for regularly updating drug price data in the system.

5.1.4 Settings Page Tweaks

- Objective: Streamline user management and data import processes within the application.
- Action Plan: Implement a settings section for admin users, featuring user creation tools and CSV upload capabilities for easy data management..

6.0 Appendix

- GitHub repository:
<https://github.com/BU-EC463>