**MAINTENANCE DOCUMENTATION**

**INTRODUCTION**

This Maintenance Documentation provides guidelines for ensuring the continuous functionality, security, and efficiency of the AU Water Refilling Station’s Sales and Employee Management System. Proper maintenance is essential to prevent system errors, data loss, and security vulnerabilities that could affect daily operations.

Regular system maintenance includes checking for software updates, monitoring security threats, fixing bugs, and optimizing performance. Ensuring that the system remains stable and secure will help maintain accurate financial computations, and efficient employee management.

Maintaining a user-friendly interface with proper fonts, colors, and organized layouts contributes to smooth navigation and better user experience. This documentation outlines the necessary maintenance tasks, troubleshooting steps, and best practices to keep the system running efficiently and securely.

**MAINTENANCE PLAN**

The development team outlines the overall plan and strategy for maintaining the system.

1. The development team plans to perform a blue-green testing in deployment that is convenient for maintenance. In regular checking of the system, after the deployment the development team will get the primary issues, bugs, and client suggestion in the very first to second day of the deployment.
2. Let the client use the system for a week with proper information that any issues, bugs and suggestions should be written for future updates.
3. After a week, the development team consults the client if the system works as it intended and collect the list if there is any.
4. If there are some things need to fix the system will still work and the software engineer will develop the latest version of the application to resolve any issues faced by the client, as well as the suggestions if there is any.
5. Probably the most common issues to occur was the light errors that will affect the fundamental of processes of management.

**Possible Maintenance**

1. **Corrective Maintenance**. The development team, expected this type of maintenance in the first few weeks of the deployment as the client will see some functions and light common problems that probably overlooked by the development team.
2. **Adaptive Maintenance**. The development team prepared themselves for possible additional features whenever the client suggests things to add.
3. **Perfective Maintenance.** This type of maintenance is more likely is not the focus of the development team as they focus more on adaptative software by the client’s need. The development always has room for improvement.
4. **Preventive Maintenance**. This type of maintenance comes along with the corrective maintenance, any type of possible issues to appear in the future will be resolved immediately as long as the development team got sight on it early.

**MAINTENANCE SCHEDULE**

This shows the frequency of maintenance support for the system in the AU Water Refilling Station.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Task | Description | Frequency | Responsible Person | Status |
| Database backup | Create full backups of the database | Weekly | Caranguian, Emilfred | Continuous |
| Security Updates | Apply patches and updates to the system | Monthly | Caranguian, Emilfred | Continuous |
| Bug Fixes | Fix reported errors or issues | As needed | Caranguian, Emilfred & Besa, Jaymark | Continuous |
| System Performance Check | Monitor system performance and optimize | Quarterly | Dayandante, Tolentino, Medina, Tongco, Deguzman, Macayayong | Completed |

**ISSUE TRACKING AND BUG REPORTS**

These are the issues and bugs encountered throughout the development of the system, it includes the severity, date and status.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Issue ID | Description | Severity | Reported By | Date Reported | Status |
| ISSUE001 | The New Password and Confirm Password must not be the same as the Current Password when updating the password. If the password that is changed to the old one is the same, put a message box that says, "You cannot use your current password to change a new password, kindly use a different password." | High | Besa, Jaymark | Feb/05/2025 | Fixed |
| CORRECTNESS  002 | When you click edit, you need to at least highlight the price textboxes to determine that you are able to edit or modify prices. | High | Balansay, Rubylyn | Feb/05/2025 | Fixed |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| CORRECTNESS  003 | In the sorting it is probably essential that the address and date of employment are also sorted. | High | Besa, Jaymark | Feb/05/2025 | Fixed |
| ISSUE004 | In the Salary Tab, the selection of employee Full name should not accept type characters from the user. | High | Besa, Jaymark | Feb/05/2025 | Fixed |
| ISSUE005 | In Water and Electricity Bills, when a row is selected, the data is not populated in the textboxes. | High | Besa, Jaymark | Feb/05/2025 | Fixed |

**BACKUP AND RECOVERY PLAN**

This state the backup and recovery plan of the development team for the system, here describes the backup strategy and provide recovery steps in case of data loss or system failure.

**Backup Procedure**

The development team will discuss to the client the importance of the data retrieval to avoid data loss. It includes the possible issues to occur and its answer to resolve.

1. Commonly, to save the data the system has a generate report functionality of specific range of date inserted. It is to conserve the data depends on the client’s need.
2. After the generate report, in reports page that’s the storage of all of the generated reports of data. It also allows the client to select from each row to export the data to the device. It ensures the client to have a softcopy of the data in case of facing system malfunction or data corruption.
3. Here comes the discussion of how to save the data properly, informing the client an export should not be the last step of saving the data because it has risk of data corruption under the device itself when malfunctioned and it will need time to recover.
4. Printing a hardcopy and saving in a safe document folder or workplace would work, therefore it will be one of the suggestions of the development team for data safety.
5. Lastly, the common way to save the file is to save it into the cloud storage or over the network which gives the client the convenient way of accessibility and ensure the data was saved and abled to retrieve under the network connection.

**Recovery Steps**

These are the steps to restore a backup in case of system failure or any data corruption occur in the system.

1. Go to the “Reports” page if still accessible and select the rows from the table that are needed to be save.
2. Once rows are selected, click the “Export” to export the data to an Excel format and save it into document file accordingly to where the businesses files are saved to avoid misplacement of the file.

If the system is not totally accessible and impossible to export the data from it, the secondary way would work.

1. Open the SQL Server Management Studio 19 (SSMS19), search it into the search bar in the task bar if cannot find it in the desktop.
2. Click “Connect” after the SQL Server dialog pop-up.
3. Once connected, click the “Databases”, select the “AU Water Refilling Station” that is the database name of the system.
4. Once the database is selected, right click on it. Point the cursor to “Task” to appear the other selection of choices.
5. In appeared sidebar from task, select the “Export Data-tier Application…”
6. Once selected, click “Next”.
7. It should show the Save to local disk and there is “Browse” button for browsing own desktop folders and locate where the file should be saved.
8. Remember or list down the file path of where the bacpac file is save for easy navigation of the software engineer to locate.

Once the recovery steps are done, kindly contact the support team for further assistance. Provide the following information when reaching out.

**Support Email:** mail.org.noreply@gmail.com

**Note:** When sending us a concern kindly include your contact information as well so, we the development team can contact you directly as soon as we read your email to our support services mail.

**SECURITY MEASURES**

To ensure the security, integrity and reliability of the system, it includes the security policies and measures for the transparency of the stakeholder, development team and future researchers.

**Security Policies and Measures**

To ensure the security and integrity of the data and an account of the user, the following security policies and measures are implemented.

1. **Access Control Rules**
   1. **Role-Based Access Control (RBAC)**.Only authorized user can access the system.
   2. **Rate Limiting**. Limit the number of OTP request to avoid guess chance.
2. **Authentication Mechanism.** 
   1. **Email Verification.** Only registered email addresses can request a password reset.
   2. **One Time Password (OTP) Verification.** OTPs are randomly generated and valid for one time. The system verifies OTP first before the allowing a password reset.

**DOCUMENTATION UPDATES**

The following updates and modifications have been implemented to enhance system functionality, improve user experience, and optimize the management.

1. **Login Form Enhancement.** The PIN authentication feature has been removed from the login form to streamline the authentication process while maintaining security measures using an enhanced version of password changes using a Gmail and an OTP verification.
2. **Addition of Commission Rate Function.** After the deployment the client suggests to add the manipulation of commission of employee’s salary per gallon delivered instead of being fixed in code. This allows the client to update and manipulate the salary rate.
3. **Report Frequency Adjustment.** The system now generates monthly reports instead of weekly reports, providing a more comprehensive analysis of sales, expenses, and overall business performance.
4. **Computerized Financial Calculations**. A daily net income computation feature has been integrated, allowing real-time tracking of financial performance and profitability.
5. **Data Export Functionality.** Users can now export data to Excel, enabling efficient data analysis, record-keeping, and report generation.
6. **Product Inventory Expansion**. The system now supports the addition of small gallon products, it is for the future purposes when the business expands and sell small gallon products as well.
7. **Database Structure Optimization.** New data types and relational constraints have been introduced to strengthen database integrity, enhance query performance, and maintain data consistency across system modules.
8. **Password Recovery Simplification.** The authentication question requirement has been removed from the forgotten password process, streamlining the recovery flow while implementing OTP-based verification for enhanced security.

**CONCLUSION AND RECOMMENDATION**

This section presents the conclusion and recommendations of the development team regarding the maintenance plan for the Sales and Employee Management System of AU Water Refilling Station.

The maintenance plan provides a structured approach to ensuring the system's reliability, security, and efficiency from the time it is deployed to the client’s workstation. By following the outlined steps and procedures, the development team can effectively handle updates, maintenance, and issues such as bugs and system enhancements.

This plan helps the development team better understand their tasks and quickly resolve any issues that may arise. It also serves as a useful reference for both the team and the client in addressing future challenges and improving the system as needed.

The development team recommends carefully reading and understanding this document to ensure proper handling of any system-related problems, following the planned maintenance approach.