**Creating The Digital Infrastructure for Waterford Consulting - Maintenance Manual**

Team MNDR - Nicholas Wharton, Donovan White, Remo Basu, Mark White

Sponsor: Ian O’Casey

Date of Issue: 03/18/2024

Project Manager: Remo Basu

**System Overview**

Winfosoft will provide consulting services to implement Microsoft Dynamics Business Central (BC) for Waterford Consultants, LLC, a professional services firm specializing in FCC and FAA Regulatory Compliance for telecommunications and utilities. The project aims to develop a way for Waterford to track their assembled RIFIS units and all of their components individually. While also replacing their existing Quickbooks financial system with Business Central. Then connect the two to produce sales reports for customers, track purchase statements from the contract manufacturer, and generate financial statistics to help Waterford better understand their business. The new system must allow for stacked Bills of Material, be user-friendly, and facilitate purchasing and inventory management. It should also be scalable and usable by all stakeholders. The system should support exports of costs and purchasing out of Business Central, requiring robust integration.

**Client Information**

* **Ian O’Casey** - Business Central Practice Leader - iocasey@usrbpartners.com

**Development Team Information**

The MNDR group including Nicholas Wharton, Donovan White, Remo Basu, and Mark White make up the development team. We have been working closely with Ian O’Casey to develop the method for tackling the problem and configuring the system to handle Waterford's requirements.

**Purpose of Maintenance Manual**

The purpose of this document is to lay out the functionality of the extension for users. Creating an easily shareable resource to educate anyone on the proper installation, maintenance, and troubleshooting of the application. Which will exist with the program for its lifecycle, so as new employees are required to maintain the application its information can be passed on.

**System Description**

The system is built on top of Microsoft Business Central to change some of the basic operations of the software. This way the system will function to Waterford's exact specifications. But it will add an extra layer of abstraction to the system's functionality which Microsoft will not maintain in the way that they will with the default application functionality.

The application extension will create a separate table in the system which will function as an item ledger. But this table will have extra fields to hold the item tracking information. Rather than using item tracking lines which associate an item in the item ledger to be associated with the default item tracking functionality of the system. Which will associate the item tracking information to the items through their associated documents, rather than directly associating the item tracking information with the item object.

Three main use-accessible sections are added to the application by the extension: the RIFIS information file input section, the updated item ledger, and the new item tracing menu. The RIFIS information file input section takes in an input file holding a list of all RIFIS items to input into the system each associated with their component's item tracking information. Then the server-side processing of the file will occur and decide whether to process the data, and it will input the sanitized information into the item ledger. The updated item ledger is set up to contain the item instance objects but with the new parameters that allow for it to be directly associated with its tracking information and components. Lastly is the item tracing menu which displays the item ledger information to be easily human readable and searchable based on its parameters for easy access for the user.

All the changes made to the system will be hosted on Microsoft’s Cloud infrastructure and accessed through the cloud by the users. While changes were made to the system such as adding new tables and changing how some of the functions interact with the tables, most of the changes are transparent to the user. However, the user will have to input the RIFIS unit information document. The file will be run through server-side checks from both Microsoft before it's passed to the extension which will run error detection before processing the file. Other than this the security of the system such as the physical, authentication, account-based access control, etc. will be handled by the default Business Central Functionality that will be maintained and patched.

**Environment**

The system utilizes the Microsoft Business Central infrastructure for operation. The equipment needed for the system consists of servers that host Business Central, along with required hardware components. The servers are connected to Microsoft’s Cloud infrastructure, which ensures a stable and reliable operation

Data storage for the system resides on Microsoft’s Cloud infrastructure. Furthermore, this includes the storage of system data, configuration files, and any additional files needed for operation.

The support software environment is integrated with Microsoft Business Central which also provides application extensions, allowing our team to implement necessary software to tailor to Waterford’s needs, if necessary. This extension also provides functionality such as RIFIS information file input, updated item ledger, and item tracking. Server-side processing handles tasks such as file input and error detection. These processes ensure the accuracy of data entered into the system. Security features and additional components are provided by Business Central which can handle aspects such as authentication and access control.

Overall, Business Central provides functionality that can help with many tasks, analysis, and proper maintenance, it works to uphold the integrity and performance of the system.

**System Maintenance Procedures**

* Regular system health checks
  + Routine health checks on components will monitor system performance metrics and address any anomalies or performance issues promptly
* Data backup and recovery
  + Robust data backup strategy involving regular backups of the database, including both full and incremental backups
* Security management
  + System logs are monitored habitually, while regularly reviewing and updating access controls and permissions to maintain the safeguarding of sensitive data
  + Protocols established for incident response and resolution, with post-incident reviews to implement preventive measures
* Documentation
  + Comprehensive documentation of system configuration, settings, and maintenance procedures
  + Continuous, iterative improvement based on performance metrics and user/stakeholder feedback

**Software Unit Maintenance Procedures**

RIFIS Information File Input

* Description
  + The RIFIS information input section takes in an input file holding a list of all RIFIS items to input into the system each associated with their component's item tracking information. Then the server-side processing of the file will occur and decide whether to process the data, and it will input the sanitized information into the item ledger.
* Functions
  + Input File
  + Sanitize File Data
  + Append to Item Ledger
* Input
  + File Input
    - Containing one or more item instance object records.
* Processing
  + Initialization procedures
    - Will be set up by installing the extension into the environment and authorizing its use.
  + Core processing procedures
    - Process the file and each of its contained records.
  + Branching conditions
    - Is the file empty?
    - Do all the present records have all the necessary parameters filled?
    - Do all the present records have more parameters than the maximum possible?
    - Does each parameter meet its required format?
* Restrictions
  + Size of the input file.
  + Max and Min number of parameters per record.
  + Records must be included for each record.
* Exit conditions
  + Either all the records in the file have been verified and added to the item ledger, or one was found to have failed the verification so none of the files item records are added to the item ledger, and the file input is aborted.
* Communications
  + This will communicate technically with the updated item ledger as the information pulled from the file if formatted properly will be input into the updated item ledger.
* Output
  + It will output to the user if the input was accepted or rejected.
* Unique features
  + Directly associates the RIFIS units with the RIFIS components at the object level rather than through the documents they're associated with. While also directly associating the objects with the item tracking information (serial and lot number).
* Data Structures
  + Input Sheet
  + Item instance object record
* Verification Procedures
  + Verify the overall input file integrity.
  + Verify the correctness of each item instance object record.
* Interfaces
  + Directly interfaces with the user as the menu will have to allow the user to choose to input a new RIFIS information file, and allow the user to select the file to input.
  + It will also interface with the item ledger as it has to append the co

Updated Item Tracing Menu

* Description
  + The item tracing menu which displays the item ledger information to be easily human readable and searchable based on its parameters for easy access for the user.
* Functions
  + Get all Item-tracing data from the item ledger
  + Sort item tracing data
  + Present the user with the specified item tracking information
* Input
  + Parameters to search the item tracking information.
* Processing
  + Initialization procedures
    - Pull the current item identification and item tracking data from the item ledger.
  + Core processing procedures
    - Filter only the specified item data to be displayed.
    - Sort the item data as it's required to be displayed.
  + Branching conditions
    - How is the user filtering the data?
    - How is the user sorting the data?
  + Restrictions
    - Only shows item identification and item tracking data of the searched items.
  + Exit conditions
    - Once the user closes the window
  + Communications
    - Communicate with the item ledger to get the required information.
  + Output
    - The item tracking information for all objects associated with the parameters being searched for
  + Unique features
    - Can read and display the object-associated item tracking Information for each object and display the information.
* Data Structures
  + Item records
  + An array of a single item records item identification information and item tracking information.
  + List of items records to display
* Verification Procedures
  + Un needed as the records are verified before being placed into the item ledger.
* Interfaces
  + Interfaces with the user through a GUI that allows them to input the parameters for sorting and filtering which items will be shown.

**Database Maintenance Procedures**

* Regular Backups:
  + Implement a regular backup schedule for the database. This should include both full and incremental backups to ensure data integrity and availability in case of any unforeseen events.
* Monitoring and Performance Tuning:
  + Monitor database performance regularly to identify any bottlenecks or performance issues.
  + Optimize database queries and indexes to improve overall system performance.
  + Adjust database configuration settings as needed to optimize performance.
* Security Updates and Patch Management:
  + Stay informed about security updates and patches released by Microsoft for Business Central.
  + Apply patches and updates in a timely manner to ensure the security of the system.
  + Regularly review and update access controls and permissions to protect sensitive data.
* Data Integrity Checks:
  + Implement data integrity checks to ensure that data stored in the database remains accurate and consistent.
  + Perform regular data validation and verification processes to identify any discrepancies or errors in the data.
* Database Maintenance Tasks:
  + Regularly perform database maintenance tasks such as index rebuilds, database reorganization, and statistics updates to optimize performance and ensure data integrity.
  + Monitor database storage usage and plan for capacity expansion as needed to accommodate growing data volumes.
* Backup and Restore Testing:
  + Regularly test backup and restore procedures to ensure that data can be successfully recovered in the event of a disaster or data loss.
* Monitoring for Custom Functionality:
  + Monitor the custom extensions added to the system for any issues or errors.
  + Regularly review and update custom code to ensure compatibility with system updates and patches.
* User Training and Support:
  + Provide training and support to users on how to use the system effectively and efficiently.
  + Address any user questions or issues related to database functionality or custom extensions.
* Documentation:
  + Maintain up-to-date documentation of the database schema, custom extensions, and maintenance procedures.
  + Document any changes or updates made to the system for future reference.