Van Eck SS/SSS GSWSA Inventory Project

**Database Inventory Tracking**

**(SQL conversion)**

**Van Eck**

**11/24/2020**

**Version 1.0.3**

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# INTRODUCTION

## PURPOSE

This document contains information for a database system that will be focused on supporting the Grand Strand Water and Sewer Authority (GSWSA) business. The system will be limited to the creation of SQL architecture and SQL Queries for inventory management part of the database system.

## INTENDED AUDIENCE AND PERTINENT SECTIONS

The audience of this document will be Dr Paul S. Cerkez, the writers, and GSWSA engineers. Dr Cerkez’s pertinent sections will be the whole document to grade this document and future documents and code. The writers (Nathan Marshall and Dustin Kuczynski) for this document stands as a framework and a guide for future documents and coding. The GSWSA engineers most pertinent sections are the Constraints, system features, and features. These sections are most important to them due to it allowing them to see at a first glance if we, the writers, understand the problem set forth.

## PROJECT SCOPE

The scope of this project is limited to the creation of the documentation and code for the conversion of an IBM AS/400 db2 mainframe database to MS SQL. This will include the supporting documentation, creation of the database structure, architecture, and corresponding SQL statements. It will be limited to the inventory management part of the system and will support Business Intelligence (BI) analysis. Throughout this project, the writers of this document as well as those assigned to this project will not utilize customer or organization data within the initial database owned by the project owners to ensure data owned by GSWSA maintains its security and privacy.

## DOCUMENT CONVENTIONS

Requirements/Specifications shall be numbered as follows:

#1. The ORD HLR Number

SS.###2. First level decomposition

SSS###3. Second Level Decomposition

Example

1.

1.SS001

1.SS001.SSS001

2

## REFERENCES

List any referenced document names or links.

Concept of Operations Documentation, Project ORD, Active Inventory Tab, HLRs Draft, NEW Requirements document. [stsci.edu HLR guide](https://apst.stsci.edu/apt/documents/documentation/user-req-doc-july-2000/node3.html).

# DESCRIPTION

## PRODUCT PERSPECTIVE

The system is going to function the same for users and the objective of the current transfer to MySQL database is to be seamless and not impact the user base, but the new MySQL database will be aimed at keeping legacy systems with the addition of desired upgrades such as being web-based. The new database is expected to support all features in MySQL such functionalities are listed below and will be further identified and defined within the Database Design Document (DBDD).

* + - The system is expected to be of high-level architectural diagrams, operational nodes, activities performed at each node, connectivities and information flow between nodes.
    - Interfaces to external systems and procedures.
    - Capabilities or functions of the system to include activities and relationships among activities, input and outputs, constraints (e.g. policy, guidance), and mechanisms that perform such activities.
    - (IF AVAILABLE) Charts and accompanying descriptions showing inputs, outputs, data flow, and manual and automated processes enough to understand the situation from a user's standpoint.
    - Performance characteristics like speed, throughput, volume, and frequency.
    - Quality functionalities such as reliability, maintainability, availability, flexibility, portability, usability, and efficiency.
    - Provisions for safety, security, privacy, and continuity of operations in emergencies.
    - The new system is expected to handle multiple users, become faster than the old legacy system, and will be scalable.

## FEATURES

1. Support Inventory Management
2. System Availability 100% during 0600-2000
3. System data capture reliability shall be 100%
4. System/Data “Archiving” shall be 100%
5. Data integrity shall be 100%
6. Minimum of 3 access points
7. Support multiple users
8. Maintain security for PII
9. Support employee management
10. Support data analytics
11. The system shall be scalable with business growth
12. Bar-coded inventory
13. Support ‘order’ management(inventory)
14. Support invoice management(purchases)
15. Provide a “web” presence
16. Capability to support all major browsers
17. Support normal hour service calls
18. Support emergency after-hour calls
19. Support “pick-item” preselected items
20. Support assembly of components from parts
21. GSWSA able to modify user/user’s capability/access
22. Support for current legacy reports from the new system
23. System support users as defined by GSWSA
24. All temporal data should be held in appropriate temporal data type attributes
25. Historical Usage of specific items
26. Inventory Items staged on trucks for after-hours emergencies

## USER OVERVIEW

Define groups and describe user characteristics.

The following are the groups that will be using the Inventory System. Warehouse Manager, Warehouse Pickers, Field Workers, Accounting Department, Purchasing Department, and any other GSWSA employee with a need to use the inventory system. The IT Staff consisting of an IT Manager, Programmer Analyst, Help Desk Administrator, and an intern will be responsible for the support of the system.

## OPERATING ENVIRONMENT

Describe where the ‘system’ software will function hardware platform, operating systems, and other software components or applications with which it must work in conjunction.

The system will be running on the MySQL software and the operating system and hardware specifications will be hosted by the GSWSA system administrator (SA) on GSWSA equipment. The SA’s are responsible for hardware maintenance and operating (OS) system software updates. Software updates to the SQL codebase are the sole responsibility of GSWSA system administrators.

## CONTRAINTS: IMPLEMENTATION / DESIGN

Describe limitations impacting development.

Not having all the information regarding the project in the ConOps and ORD limits this document currently. Testing of the data will be limited to dummy data or data provided as some inventory data is considered sensitive data by GSWSA. All documentation associated with this project is access limited to the CCU Computing Science Department and the GSWSA.

## DOCUMENTATION

Describe content, mode of delivery, and standards.

Deliverables such as documentation include but are not limited to documents such as the Con-Ops, ORD, DBDD, and more. These documents will be delivered digitally upon completion of the project, with oversight and modification to such documents made during the course of this project.

ConOps: Version 0.1, 9/21/20, Word Document, CSCI-425 Instructor provided, uploaded in teams

ORD: Version 0.1, 9/21/20, Word Document, CSCI-425 Instructor provided, uploaded in teams

SS/SSS: Version 1.0.2, 10/15/20, Word Document, CSCI-425 Instructor provided, uploaded in teams

DBDD: Version 1.0.2, 10/15/20, Word Document, CSCI-425 Instructor provided, uploaded in teams

## ASSUMPTIONS / DEPENDENCIES

Detail all **assumed** factors (not known facts) that could potentially impact technical specifications set forth. Include external factors.

* + Hardware that can optimally run the new MySQL database.
  + Grand Strand end-users will know how to work in MySQL.
  + Information is entered into correct fields.
  + Policies for security, storage, hardware already set

SYSTEM FEATURES

1.Support Inventory Management

1.SS001 Define/Scope inventory concept

1.SS001.SSS001 Inventory items will span 1-week to 1-month usage

1.SS001.SSS002 Items beyond one month will use “just in time supply” source

1.SS001.SSS003 Inventory stockage tracking

1. Current stock level
2. Low limit (reorder limit)
3. High limit
4. Cost (wholesale)
5. Item Identifier (part number, part model number)
6. Alternate item identifier
7. Item name
8. Supplier
9. Retail price

2.System Availability 100% during 0600-2000

2.SS002 Define Availability

2.SS002.SSS001 System will be fully accessible at regular business hours.

2.SS002.SSS002 No features should be locked during regular operation.

3.System data capture reliability shall be 100%

3.SS003 Define capture reliability

3.SS003.SSS001 System will not alter or distort any user gathered entries.

temporal data should be held in appropriate temporal data type attributes

3.SS003.SSS002 System will not round or change numbers of user gathered data.

4.System/Data “Archiving” shall be 100%

4.SS004 Define System “Archiving”

4.SS004.SSS001 System will hide sensitive user data from an unauthorized person(s).

4.SS004.SSS002 System will properly encrypt sensitive data.

1. Secure encryption key
2. Possess an SSL (Secure Sockets Layer)

5.Data integrity shall be 100%

5.SS005 Define data integrity

5.SS005.SSS001 All recorded data will be accurate and honest to records.

6.Minimum of 3 access points

6.SS006 Define three access point concept

7.Support multiple users

7.SS007 Define multi-user concept

7.SS007.SSS001 The system will allow for multiple users to work or access records at once.

1. System user limit
2. Multiple access points

8.Maintain security for PII

8.SS008 Define security of PII

8.SS008.SSS001 The system will track users

1. Each user will have unique credentials

8.SS008.SSS002 The user's access will depend on GSWSA SA’s

9.Support employee management

9.SS009 Define/Scope management concept

9.SS009.SSS001 System admins will handle the management

10.Support data analytics

10.SS010 Define data analytics concept

10.SS010.SSS001 Convert data into analytics for a user to view

1. Charts
2. Data flows
3. Descriptions depicting input and outputs

11.System shall be scalable with business growth

11.SS011 Define scalable

11.SS011.SSS001 System can be accessed with multiple users

11.SS011.SSS002 Major browser support

12.Scope bar-coded inventory system

12.SS012 Scope Bar-coded inventory

12.SS0012.SSS001 Proper synced bar-code per item

12.SS0012.SSS002 Item tracking

* + - 1. Tracked individually with “SerializedEquipment”
      2. Item Name
      3. Supplier
      4. Cost (wholesale)
      5. Retail price
      6. Item Identifier

12.SS0012.SSS003 Entering new stock upon receipt should force serial numbers to be recorded

12.SS0012.SSS004 Picking an item for deployment (or staging) should force the user to choose the serial number of the specific device picked

12.SS0012.SSS005 The location of any item of SerializedEquipment should be able to be determined if given a serial number.

* + - 1. this can be done through the WorkOrder information for the job which ordered the item

13.Support ‘order’ management(inventory)

13.SS013 Define order management scope

13.SS013.SSS001 Orders will be ordered in demand

14.Support invoice management(purchases)

14.SS014 Define order management scope

14.SS014.SSS001 Orders purchased will be recorded with receipt

14.SS014.SSS002 Items will be serialized

1. Bar-codes
2. Serial number registration

14.SS014.SSS003 Items will be registered for one time or multi-usage

14.SS014.SSS004 Items will span from one-week use to one-month usage

15.Provide a “web” presence

15.SS015 Define “web” presence

15.SS015.SSS001 Hotlinks to FAQ for GSWSA website

15.SS015.SSS002 Additional Information on GSWSA website

16.Capability to support all major browsers

16.SSS016 Define major browser support

16.SS016.SSS001 Accessible through popular web browsers

1. Google Chrome
2. Internet Edge
3. Mozilla Firefox
4. Bing

16.SS016.SSS002 Minimal web-based restrictions

17.Support normal hour service calls

17.SS017 Define Normal hour call support

17.SS017.SSS001 Proper operator training

17.SS017.SSS002 Proper service and connection

18.Support emergency after-hour calls

18.SS018 Define Emergency Scope

18.SS018.SSS001 Proper operator training

18.SS018.SSS002 Proper service and connection

18.SS018.SSS003 Emergency notification

1. Phone notify
2. Email Notify

19.Support “pick-item” preselected items

19.SS019 Define “pick-item” Concept

19.SS019.SSS001 Items “picked” will be at the discretion of GSWSA

19.SS019.SSS002 Staged items will be pickable

19.SS019.SSS003 Picked item tracking

1. Unique ID
2. Master ID
3. G/L#
4. WO# Charged
5. WO# ITems
6. Item #
7. Item Description
8. QTY
9. Picked QTY

20.Support assembly of components from parts

20.SS020 Define assembly of components form parts concept

20.SS020.SSS001 Item is assembly it is decomposed into individual parts’

1. Tracked individual items
2. Recorded assembly logs

20.SS020.SSS002 Inventory items can be assembled from other inventory items

20.SS020.SSS003 Composition and decomposition traceable from Inventory Rows

21.GSWSA able to modify user/user’s capability/access

21.SS021 Define GSWSA ability to modify user concept

21.SS021.SSS001 Ability to remove and add new users

21.SS021.SSS002 Ability to take away data access or grant

1. Sensitive data access
2. Private log access
3. Inventory access

22.Support for current legacy reports from new system

22.SS022 Define legacy compatible concept

22.SS022.SSS001 Access to “classic styled report logs”

1. For older users

23.System support users as defined by GSWSA

23.SS023 Define Supporting users

23.SS023.SSS001 Seamless change

23.SS023.SSS002 “web presence”

23.SS023.SSS003 Normal hour call support

23.SS023.SSS004 Legacy report support system

24. All temporal data should be held in appropriate temporal data type attributes

24.SS024 Temporal data needs to be correct date and time fields

24.SS024.SSS001 Temporal data should be based in the correct time zone

25.Histortical usage of specific items

25.SS025 Historical usage be done with date ranges

25.SS025.SSS001 Determined from inventory transaction data

1. Using date fields

25.SS025.SSS002 historical usage should not rely on fields in the item master file

1. Needs to include item cost

26.InventoryItems staged on trucks for after-hours emergencies

26.SS026.SSS001 Staged items should be part of warehouses stock

1. Stock and quantity assigned to the warehouse

26.SS026.SSS002 List of items staged to a vehicle be available for inventory on demand

26.SS026.SSs003 These items should be ‘Pickable’

# REQUIREMENTS OF EXTERNAL INTERFACE

## USER INTERFACES

Requirements for the user interface are not applicable in this project. The scope of this project is maintained within the back-end database architecture and structure.

## HARDWARE INTERFACES

The hardware interfaces for the database system will meet all requirements that the GSWSA System Administrator (SA) sets forth for the database system.

## SOFTWARE INTERFACES

Access to the database will be limited to the browsers Chrome, Firefox, and Microsoft Edge. Any additional software interfaces and current interfaces will meet the standards set forth by the GSWSA SA.

## COMMUNICATION INTERFACES

The communication interfaces for the database system will meet all requirements that the GSWSA IT manager sets forth for the database system.

# ADDITIONAL NONFUNCTIONAL REQUIREMENTS

## PERFORMANCE

* + **System Availability 100% during hours of 0600-2000** - The system will be available from six o'clock in the morning to eight o'clock at night with access to one hundred percent access to all system features.
  + **System shall be able to scale with business growth** – The system will be able to have new tables and modify/add/remove existing columns from the database to accommodate growth and efficiency
  + **Capability to support all major browsers** – allow users to access systems through “popular” browsers such as Google Chrome, Firefox, etc.
  + **Support multiple users** – This will allow like stated multiple users to access our systems at the same time.
  + All temporal data should be held in appropriate temporal data type attributes.
  + **Support normal service calls** – Users may call for help during regular hours.
  + **Support after-hour emergency service calls** - Users may call during an emergency even after hours.
  + **GSWSA able to modify user/user’s capability/access** - The GSWSA can take away user privileges, access to certain data at their discretion, and they are even able to delete users as they see fit.

## SAFETY

* + **System/Data 'Archiving' shall be 100%** - The system will always be hidden and encrypted.

## SECURITY

* + **Maintain Security for PII** - The system has measures for determining person(s) with identity measures such as personal authentication ID’s.
  + **Implement System Security** – This will be a checkpoint to verify the authentication of users.
  + **GSWSA able to modify users and users' capabilities/access** - The GSWSA can revoke or give new access/permissions and remove users at their discretion.

## SOFTWARE QUALITY

* + **System data capture reliability shall be 100%** - The system will with one hundred percent accuracy record all data passed to it by system users.
  + **Data integrity shall be 100%** - The data listed shall be honest and consistent throughout the entire system.
  + **Support Data analytics** – The system needs to support the analytics required for GSWA Business Intelligence and other teams that require analytics.
  + **Provide a web presence** – The system will have web-based access.
  + **Support for current legacy reports from new system** – Users can still access old-styled reports.
  + **All temporal data should be held in appropriate temporal data type attributes –** All data about time and dates are to be recorded in the correct fields.
  + **Minimum of three access points** – User can access the database within three access points.

# APPENDICES

## APPENDIX A: GLOSSARY OF TERMS

GSWSA – Grand Strand Water and Sewer Authority

I/O – Input/output

BI – Business Analysis

Writers – Nathan Marshall and Dustin Kuczynski

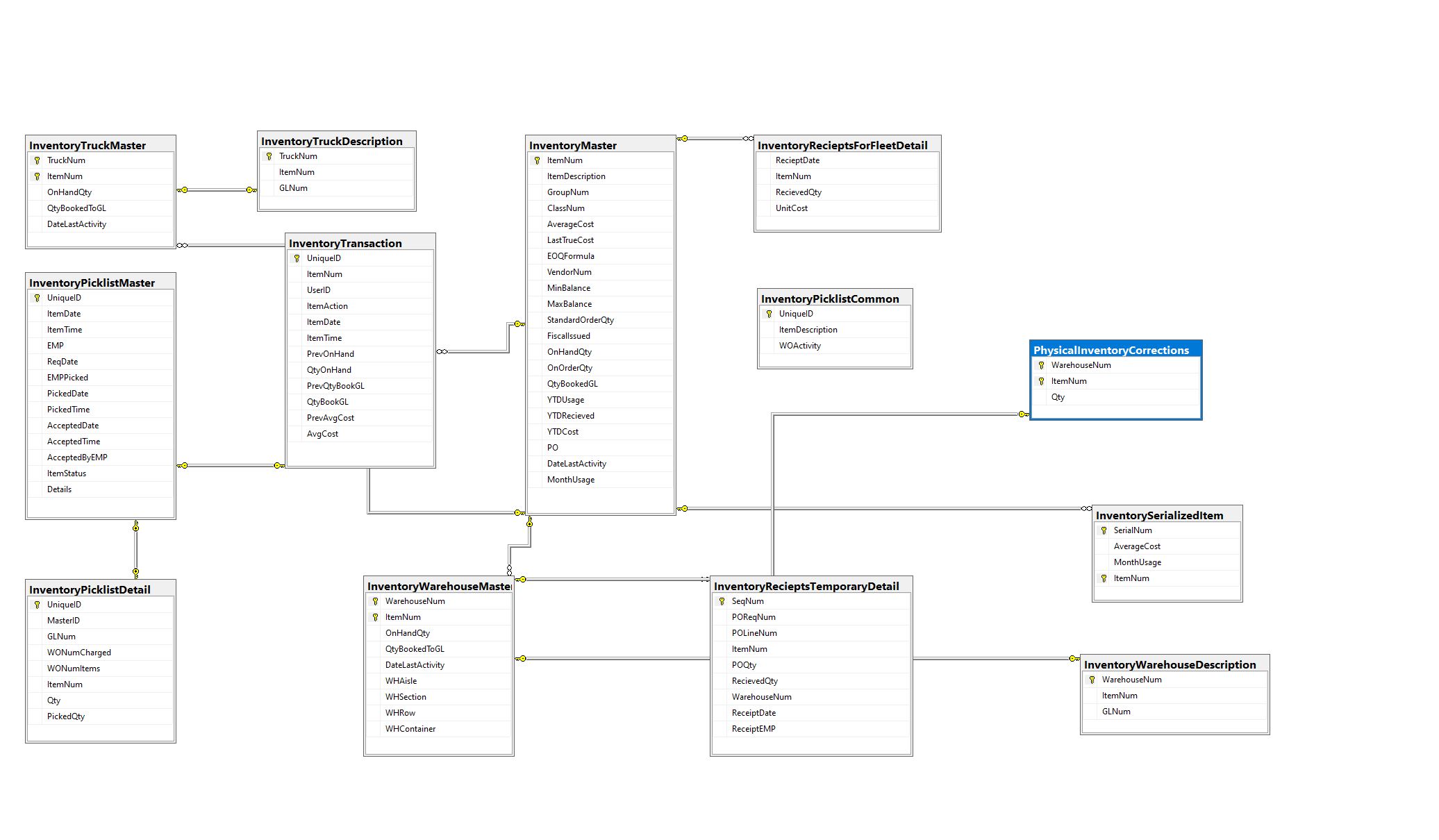
IT – Information Technology

OS – Operating System

## APPENDIX B: ANALYSIS DOCUMENTATION

List file/document names / provided links to all diagrams, models, additional findings pertinent to technical specification development.

**GSWSA Inventory Database ERD Diagram**



## APPENDIX C: ISSUES

List all unresolved issues, TBDs, pending decisions, findings required, conflicts, etc.

| ISSUES | | |
| --- | --- | --- |
| ID | DESCRIPTION | PARTY RESPONSIBLE |
|  |  |  |
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