A group of golf balls in a row

Description automatically generated

Object Specification - interfaces

Functional Specification – Technical Specification – Release Notes

|  |  |
| --- | --- |
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| Document Version: | 0.01 |
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| Document Update Date: | 11/30/2024 |





**Program *EXCEL*erate**

***Transform today, Excel tomorrow***

# Document Information

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| Item | Description |
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**Document History**

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| 1.3 | Adding Logic for Automatic Batch Determination | Arunkumar | 01/28/2025 |  |  |
| 1.4 | Technical Specification for auto batch determination | Gizala Kanuga | 02/01/2025 |  |  |
| 1.5 | Technical specification for multiple IBD in same PO scenario | Sameera Senarathna | 02/28/2025 |  |  |

# Documentation Roles

This describes who or what function is responsible for completing the various sections in this document.

**Business Requirements** – this section to be completed by the Business with the support of the Functional Consultant

**Functional Specification** – this section to be completed by the Functional Consultant with the support of the Business

**Technical Specification** – this section to be completed by the Technical Consultant with the support of the Functional Consultant

**Middleware Specification –** this section to be completed by the Middleware Consultant with the support of Functional / Technical Consultant

**Security** – this section to be completed by the Functional Consultant and the Technical Consultant

**Quality Assurance** – this section to be completed by the QA Team

**Release Notes –** this section can be completed by any team. They can add any notes relevant to the different release.

**Appendix** – this section to be updated, as needed, by any involved parties

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1. Business Requirements
   1. Business drivers and justification

Acushnet's business team needs accurate stock visibility in both the Manhattan (third-party warehouse system) and SAP systems. Therefore, the details of any goods movements created in the warehouse system (Manhattan) must be replicated in the S4 system to maintain an accurate inventory balance.

To keep the same inventory level in line with WMS, it is essential to synchronize Goods movements such as cycle counts, transfer postings, and scrapping initiated from Manhattan with the SAP S/4 system. This functional specification specifies the necessity and functionality in detail for an automated interface designed to maintain stock synchronization between Digital WMS and S/4.

* 1. General Requirements

*(Describe the general requirements.)*

|  |  |
| --- | --- |
| What is the processing frequency for this Interface? |  |
| What is the expected volume of messages processed via this interface? | It will depend upon the number of goods movements created in the Manhattan system. |
| What type(s) of business data will be contained in the message?  (Order data, invoice data, inventory data, shipping papers, quality data, etc.) | Inventory Adjustment relevant data (cycle counts, transfer postings, and scrapping) |
| Sender System Name | Manhattan |
| Receive System Name | SAP S4 |
| Middleware Name | Web Methods |

* 1. Data Flow diagram

Middleware

Web Methods

IDOC

Json

Sender System

Manhattan

Receiver System

S/4

* 1. Sender System
     + 1. Description of the sender system and its functionality

Manhattan will be the sending system in this instance. Goods Movement will be carried out in the warehouse, and the details will be transmitted to the S4 system. The WM system (Manhattan) will be responsible for filtering and transmitting only relevant transactions to the S/4 system. For instance, internal WM movements like bin-to-bin transfers that do not affect the inventory in the S4 system will not be transmitted.

* + - 1. Process flow overview
* Goods movements are initiated from the Warehouse system (Manhattan).
* Web Methods will Map the data as requested from SAP S/4 and send this data, which will trigger FSHGMCR01 - MBGMCR IDoc in SAP S/4 to execute the goods movement.
  1. Receiver System
     + 1. Description of the Receiver System

SAP S/4 is the system which will be receiving the goods movement details from the Manhattan system.

* + - 1. Process flow overview
* Middleware will create the IDOC and send it to SAP S4. In SAP S4, the IDOC will be created in ready-to-process status.
* A Scheduled background Job will process the Idoc, which will lead to the Creation of a material document upon successful processing.
* Inventory will update & Financial values will be updated subsequently.

1. Functional Specification
   1. Sender system
      * 1. Process Flow Overview

Goods Movement data (Inventory Adjustment) will be created in the Manhattan system and transferred to WebMethods. Upon creating the Goods movement document, an associated JSON file will be triggered from Manhattan to Web Methods.

* Goods Movement data generated and saved in the Manhattan system.
* Generate JSON file for the goods movement data to the middleware Web methods.
* Web Methods will Map the data per the SAP S/4 destination structure and send this data to SAP, which will trigger FSHGMCR01 - MBGMCR IDoc in SAP S/4 to execute the good movement.
  + - 1. Sender Message Content / Sample Message

*(Provide details on the content of the message and the format. Please attached a sample message from the sender system. If it’s a IDOC please export it to XML and attach the xml content)*

* + - 1. Triggering Method
      2. Special processing Notes

*(Explain any special business logics needs to implement in sender system to filter or convert data)*

* + - 1. Status Updates / Message acknowledgements

*(Explain any status updates or message acknowledgements required by sender system to complete the outbound message process)*

* + - 1. Configuration Requirements
  1. Receiver System
     + 1. Process flow overview

Inventory Adjustment will be made in the Warehouse and sent from S/4. This Inventory Adjustment data will be recorded in the Manhattan system and interfaced to SAP S/4 via Web Methods in an IDoc format with the attributes below.

* The IDoc will include the Data which belongs to the Material Document for the Inventory Adjustment.
* The IDoc will be received and queued in S/4 under the Ready to Process status.
* The IDoc will be processed with a scheduled background Job. Upon Successfully Processing, a material document will be created in SAP S/4 to execute the below movements,
* 501 - Goods receipt without purchase order: unrestricted-use stock
* 502 - Goods issue without purchase order: unrestricted-use stock
* 503 - Goods receipt without purchase order: stock in quality inspection
* 504- Goods issue without purchase order: stock in quality inspection
* 505 - Goods receipt without purchase order: blocked stock
* 506 - Goods issue without purchase order: blocked stock
* 551 - Scrapping from unrestricted-use stock
* 553 - Scrapping from inspection stock
* 555 - Scrapping from blocked stock
* 201 - Goods issue for a cost center
* 261 - Goods issue for an order
* 701 – GR Physical Inventory difference in unrestricted-use stock
* 702 – GI Physical Inventory difference in unrestricted-use stock
* 703 - GR Physical Inventory difference in quality inspection stock
* 704 – GI Physical Inventory difference in quality inspection stock
* 707 - GR Physical Inventory difference in blocked stock
* 708 – GI Physical Inventory difference in blocked stock
* 321 – Stock Transfer from Quality to Unrestricted
* 322 – Stock Transfer from Unrestricted to Quality
* 349 –Stock Transfer from Blocked to Quality
* 350 – Stock Transfer from Quality to Blocked
* 343 –Stock Transfer from Blocked to Unrestricted
* 344 –Srock Transfer from Unrestricted to Blocked
* 105 - GR-Blocked to Unrestricted
* 105 - GR-Blocked to Quality (Stock type – X)
* 105 - GR-Blocked to Blocked (Stock type -S)
* 106 – Un Restricted to GR Blocked
* 106 - Quality to GR-Blocked (Stock type – X)
* 106 - Blocked to GR-Blocked (Stock type – S)

|  |  |
| --- | --- |
|  |  |
|  |  |

* Condition codes from Manhattan to be mapped with SAP movement types. This will be updated in the Mapping document.
  + - 1. Receiving system data format

The message will be sent out with

Message Type – MBGMCR

Basic type – FSHGMCR01

GR Blocked inventory Adjustment details will be sent out with the

Message Type – WMMBXY

Basic Type - WMMBID02

* + - 1. Triggering Methods

• Below Partner type set-up needs to be done as a master data, prior to goods movement.

|  |  |
| --- | --- |
| *Source System* | *Manhattan* |
| *Basic IDoc Type* | *FSHGMCR01* |
| *Message Type* | *MBGMCR* |
| *Message Variant* | *158* |
| *Message Function* | *MTN* |

* The above message type is to be set up to a scheduled background Job which processes sequentially to execute the Goods Movements in SAP. The background Job frequency is to be decided during the batch job scheduling discussions.
  + - 1. Special processing notes

*(Explain any special program logics needs to implement in receiver system to filter or convert data)*

* SAP S4 Stock type must be mapped based on the Manhattan stock type. The movement type for the IDOC posting is to be mapped based on the stock type during IDOC Posting.
  + 321 - Quality to Unrestricted
  + 322 - Unrestricted to Quality
  + 349 -Blocked to Quality
  + 350 - Quality to Blocked
  + 343 -Block to Unrestricted
  + 344 -Unrestricted to Blocked

**Adding logic for Automatic Batch Determination:**

* Third party warehouse system (Manhattan) does not have the batch information while sending the inventory adjustment to SAP S4 system. So, there is requirement to do the automatic batch determination while processing the IDoc FSHGMCR01 and message type MBGMCR.
* Function module ‘BAPI\_IDOC\_INPUT1 is used in the IDoc FSHGMCR01 and Function Module MB\_CREATE\_GOODS\_MOVEMENT used to create inventory adjustments in SAP system.
* To do auto batch determination, call function module VB\_BATCH\_DETERMINATION inside ‘MB\_CREATE\_GOODS\_MOVEMENT’ using enhancement.

Test Variant for Batch Determination: **Automatic Batch**

* Material, Plant, Storage location, Movement type, Quantity details in the IDoc need to be updated as Input for the function module VB\_BATCH\_DETERMINATION.
* We can get the Unit of Measurement (MEINS, ERFME) by passing the Material number (MATNR) into the MARA table.
* We can get the availability check indicator (MTVFP) by passing the Material Number (MATNR) and Plant (WERKS) into the MARC table.
* Logic to get Stock Type (LBBSA)
* Pass the movement type into the table T156 and check the value of SHKZG If the value is H, then consider the value of CNT02 as ‘’01’’ Else the value of CNT02 as ‘’02’’
* Pass the movement type into the table T156 and get the posting string reference BUSTR.
* Pass the Posting string reference and Special Stock indicator in the IDoc into the table T156SY -BUSTR, T156SY – SOBKZ with the filter where the WERTU =’’X ‘’ & MENGU =’’X’’ and get the quantity string BUSTM.
* E1BP2017\_GM\_ITEM\_CREATE - MOVE\_TYPE
* E1BP2017\_GM\_ITEM\_CREATE - SPEC\_STOCK
* Pass the quantity string (BUSTM), Consec Counter (CNT02) and Stock modifier (ZUSTD) as “” into the table T156M to get the Stock Type (Primary Posting) (LBBSA)
* If there is no values for the above selection, Pass the Special Stock indicator (SOBKZ) as “ ” into the table T156C to get the Stock Type (Primary Posting) (LBBSA)
* Once automatic batch determination is completed, Inventory adjustments need to be posted with the specific batches.
* Inventory adjustments need to be posted with multiple lines if there is a batch split.
* Batch determination will be done based on the standard batch determination. Condition records need to be created with the combination of material, movement type and plant.
* Batch determination condition record will be vary based on the scenarios like with or without sorting rule and with or without search criteria. This will be determined in the condition record.

* + - 1. Configuration requirements

*(Explain any configuration requirements in receiver system. Ex: Scheduling, enabling functions)*

* 1. Data mappings

*(Attach mapping document here. This should include field mapping from source data structure to target data structure)*



* 1. Message monitoring and re-processing

**Error Handling**

* WE02 is the standard transaction for monitoring IDocs. This transaction can be used with:
  + Basic type – FSHGMCR01
  + Message type – MBGMCR
  + Direction = 2 Inbound

**Reprocessing**

* Business can set-up IDoc Reprocessing Job to re-process the failed IDoc in S/4. The Reprocessing Job requirement and frequency can be decided during the background Job scheduling discussions.
  1. Role of middleware tool

Middleware web methods convert the JSON file received from Manhattan to SAP S4 Inbound IDOC (FSHGMCR01).

1. Technical Specification
   1. Assumptions
      * + 1. Movement type and stock type mapping is to be done by the Middleware.
          2. The standard IDOC takes care of the requested functionality with additional enhancement for Inbound process to determine PO Line-item number.
   2. Clean Core Compliance Checklist
      * 1. General Information
           1. Tier Level:  Tier 1
           2. Tier 2
           3. Tier 3 \*If checked, its mandatory to provide the “rationale for selection” in below Tier 3 section
        2. Detailed Information

|  |  |
| --- | --- |
| Tier 1 Checks | Remarks on requirements |
| Can be standard API’s like ODATA service, SOAP APIs used to serve the business integration requirements | N/A |
| Can be business events used to produce and consume events for outbound and inbound process | N/A |
| Can be business requirement meet with Custom BO and Custom CDS view | N/A |

|  |  |
| --- | --- |
| Tier 2 Checks | Remarks on requirements |
| Can be business requirement meet with SAP unreleased objects and for which we need to create a custom wrapper. | N/A |
| Brief about the unreleased object advantage over the released objects | N/A |

|  |  |
| --- | --- |
| Tier 3 Checks | Remarks on requirements |
| Are customizations necessary and justified? | Yes. Need to apply customization to set inbound value for PO Line-item number |
| Have all alternatives (Tier 1 and Tier 2) been considered and ruled out? Brief about other explored options if any. | Yes. Not achievable using Tier 1 & 2. |
| Brief about the Tier 3 option which is planned to use like IDOCs, SEGW, BOPF, Custom Remote FM and Custom Webservice | IDOC interface is used  Message type: MBGMCR  Basic type FSHGMCR01 |
| Rationale for selection? | Requirement can be achieved via IDOC |

* + - 1. Enhancement Framework Control Details

Header Table

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| RICEF Id | Sub Area | Active | ENH Description | ENH Type | Object Type | Object Name |
| PTP-I-158 | POLINE\_UPDATE | X | UPDATE PO LINE NUMBER |  |  |  |
| PTP-I-158 | INBDEL\_UPDATE | X |  |  |  |  |

Item Table

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| RICEF Id | Sub Area | Sequence No | Field name | Sign | Option | Low | High |
| PTP-I-158 | POLINE\_UPDATE | 01 | SEGNAM | I | EQ | E1MBXYI |  |

* 1. Sender system
     + 1. Technical developments or configurable components on sender system

*n/a*

* + - 1. Communication method

*n/a*

* + - 1. Sender message structure in detail

*n/a*

* + - 1. Detailed Design
         1. n/a

Object names

Provide the following information:

|  |  |
| --- | --- |
| Object Type | Name |
| Eg: ABAP Report Program | Program Name |

Tables Used

*(Mention any custom table creations)*

Data Selection

(Mention data selection strategies used deliver best performance. )

Program Interfaces

* + - * 1. (List any SAP library objects used BAPIs, Function Modules, RFCs, Classes, IDOCs, Enhancement Objects,)
      1. Security & Authorization Objects

*(Provide any details on security controls implemented within the source system data processing)*

* 1. Receiver system
     + 1. Technical developments or configurable components in receiver system

*Partner Profile Configuration*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Partner No. | Partner type | Message Type | Message Code | Message Function | Process Code |
| Manhattan | LS | MBGMCR | 158 | MTN | BAPI |

* + - 1. Communication method

IDOC will be triggered by Webmethod

* + - 1. Receiver message structure in detail

Message type MBGMCR and Basic type FSHGMCR01 is used.

* + - 1. Detailed design

|  |  |
| --- | --- |
| * + - * 1. IDOC Type | * + - * 1. Inbound |
| * + - * 1. Partner No | * + - * 1. Manhattan |
| * + - * 1. Partner Type | * + - * 1. LS |
| * + - * 1. Partner Role | * + - * 1. LS |
| * + - * 1. Basic type | * + - * 1. FSHGMCR01 |
| * + - * 1. Message type | * + - * 1. MBGMCR |
| * + - * 1. Extension | * + - * 1. n/a |
| * + - * 1. IDOC Process code | * + - * 1. BAPI |
| * + - * 1. Message Variant | * + - * 1. 158 |
| * + - * 1. Message Function | * + - * 1. MTN |

Movement type and stock type mapping is handled by Middleware.

Enhancement needed to update Inbound value for PO Line-Item Number

Step 1: Maintain enhancement framework details using ZENHMAINT tcode with the following values – from 3.2.3 Enhancement framework control details

Step 2: Create User Exit via CMOD for Inventory Adjustment from Manhattan - IDOC Enhancement with the name ZPTP\_158, then in Enhancement Assignment tab it needs to maintain the SMOD MWMIDO08 user exit. Under component, it needs to activate the function exit EXIT\_SAPLLMDE\_002.

Step 3: Once user exit has been activated include program ZXLIDU10 will be created. For this step, it needs to create custom class-method to locally handle the update Line-item number with Class Name ZCL\_PTP\_INVENTORY\_ADJUSTMENT and Method Name UPDATE\_PO\_LINE with the following logic.

* + Parameters: CH\_IDOC\_DATA(Changing) idoc segment values, CH\_MSEG(Changing) GR structure.
  + Check enhancement framework is activated for this object based on entered value in 3.2.3(Enhancement Framework Control)
  + Using CH\_IDOC\_DATA for segment name E1MBXYI(retrieved from enhancement framework) check EBELN is not NULL and EBELP is NULL to proceed selection from EKPO table and get EBELP where EBELN = E1MBXYI-EBELN and MATNR = E1MBXYI-MATNR.
  + Changing value for CH\_MSEG where EBELN = E1MBXYI-EBELN and MATNR = E1MBXYI-MATNR and set value for CH\_MSEG-EBELP

Auto Batch Determination Logic

Function Module: IDOC\_INPUT\_MBGMCR

Implicit Enhancement: ZEI\_PTP\_158\_BATCH\_DETERMINATE

Read database table ZOTC\_T\_IDOCCONFI by passing IDOC\_CONTRL parameters in runtime.

If entry exists in ZOTC\_T\_IDOCCONFI table, check for the enhancement framework switch. If switch is active, set the LV\_BATCH\_FLAG to ‘X’. Export LV\_BATCH\_FLAG to memory ID ‘ZBATCH\_FLAG.

Function Module: MB\_CREATE\_GOODS\_MOVEMENT

Implicit Enhancement: ZEI\_PTP\_158\_AUTO\_BATCH\_ASSIGN

* Import LV\_BATCH\_FLAG from memory id “BATCH\_FLAG”. This is to ensure that the batch auto determination happens only for IDOC Message type and Message function.
* Fetch Material (MATNR), Unit of Measure (MEINS), Plant (WERKS), Checking Group for availability check (MTVFP) from database table General Material Master (MARA) and Plant Data for Material (MARC) table for a given Material and Plant.
* For every entry in Input Data of Material Document Items (IMSEG), fill KOMPH structure and X\_BDCOM structure.
* Logic for deriving Stock Type of Goods Movement (Primary Posting) X\_BDCOM-LBBSA:
  + Fetch SHKZG (debit/credit indicator), BUSTR from T156 based on BWART (Movement Type). Set CNT02 as ‘01’ if the SHKZG is ‘H’ else set CNT02 as ‘02’.
  + Fetch BUSTM from T156SY based on T156-BUSTR and IMSEG-SOBKZ from previous steps.
  + Fetch LBBSA from T156M based on T156SY-BUSTM, T156-CNT02 and ZUSTD as blank. If found, pass to X\_BDCOM-LBBSA. If not found, fetch LBBSA from T56C based on SOBKZ as blank.
  + Call function module ‘VB\_BATCH\_DETERMINATION’ by passing XKOMPH and X\_BDCOM structure filled in previous steps. This function module will return table BDBATCH with the proposed batch.
    - 1. Assign BDBATCH-CHARG to IMSEG-CHARG.

Begin 1.5 Technical specification for multiple IBDs in same PO scenario

A new method added in the class **ZCL\_PTP\_INVENTORY\_ADJUSTMENT~ UPDATE\_IBD\_WHEN\_MULTIPLE\_IN\_PO** ( calling in ZXLIDU10 ) to manage the scenario of multiple inbound deliveries in same PO. ( there was an error in the standard since it fetches only the first inbound delivery always regardless of the first inbound delivery is already used for GR )

**Loigc**

Pass the purchase order number (t\_imseg- EBELN) and line item (t\_imseg- EBELP) into the table EKES to get the Inbound delivery (VBELN) created against the PO Line Item. Pass the Inbound delivery (VBELN) into the table LIKP and check the status GBSTK.   
 A  Not yet processed  
 C  Completely processed

If an inbound delivery exists with status is C; and then check for an inbound delivery which status is A. If it exists use it for consumption in t\_imseg-vlief\_avis

End 1.5

Object names

Provide the following information:

|  |  |
| --- | --- |
| Object Type | Name |
| Enhancement Project(CMOD) | ZPTP\_158 |
| Class | ZCL\_PTP\_INVENTORY\_ADJUSTMENT |
| Include Program | ZXLIDU10 |
| Implicit Enhancement | ZEI\_PTP\_158\_AUTO\_BATCH\_ASSIGN  ZEI\_PTP\_158\_BATCH\_DETERMINATE |

Tables Used

*(Mention any custom table creations)*

Program Interfaces

Message type MBGMCR and Basic type FSHGMCR01 is used.

* + - 1. Message monitoring and re-processing

The IDOC will be monitored in SAP via IDOC Cockpit.

This cockpit will allow modifications to the transmission data for the IDOC.

If a message needs re-transmitting, then the sales assistant will need to correct the information and re-transmit a failed IDOC.

* + - 1. Security & Authorization Objects

*(Provide any details on security controls implemented within the receiving system data processing)*

1. Middleware Specification

(Below section is specifically for SAP PI/PO middleware tool. If you are using a different tool please change below section accordingly and use. If the

* 1. SLD Configurations

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Product | Software component | Software version: | Technical system | Business system |
|  |  |  |  |  |
| . |  |  |  |  |

* 1. Integration Directory
     1. (Include screenshots of middleware configurations )
        1. Configuration Scenario
        2. Sender Communication Channel
        3. Receiver Communication Channel
  2. Integration Repository
     + 1. Data Types
       2. Message Types
       3. External Definitions
       4. Mapping Objects
       5. UDF Details
       6. Operational Mapping
  3. Alerts

*(Provide any alerts configured in middleware system)*

* 1. Additional configurations required on sender , receiver and middleware systems

*(Explain any configurations required on each system for the integration to work)*

*Eg: RFC Destinations*

1. Quality Assurance Requirements
   * + - 1. Describe the (Quality Assurance scope, such as levels of unit and integration testing, automated testing tools, sign-off procedures, etc.)
   1. Test scenarios & data

*(Provide test scenarios and test data in the above excel sheet)*

1. Release Notes
   * 1. Developers / QA team / Consultant Notes
     2. Document any and all test cases and integration testing scenarios or scripts.
2. Appendix
   * 1. Please note any links to external documents, such as Blueprints or other requirement documents, which may be useful and relevant to this document.

|  |  |
| --- | --- |
| Document Name | Document Path or Link |
|  |  |



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